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Tech-Biz Synergy 2K25 - Redefining Global Trends

On 20th & 21st January 2025



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- Dr. S. Sethu
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INTERNATIONAL MULTIDISCIPLINARY CONFERENCE

ORGANIZED BY



SCIENTIFIC MULTIDISCIPLINARY ASSOCIATION OF RESEARCH TASK (SMART)

(SRG/Kanyakumari/97/2024)

In collaboration with

NESAMONY MEMORIAL CHRISTIAN COLLEGE

MARTHANDAM-629 165 [Re-accredited with 'A' Grade by NAAC,

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DEPARTMENT OF PHYSICAL EDUCATION AND SPORTS



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CHAIRMAN'S MESSAGE

Dear Faculty Members, Scholars and Esteemed Readers,

It gives me immense pleasure and pride to present this publication, a remarkable compilation that reflects the diverse insights and innovative research across multiple disciplines. This book is a significant milestone for SMART Association as it encapsulates the spirit of collaboration, intellectual pursuit, and academic excellence. As we embark on this enriching journey, it is my honour to announce our partnership with Department of Physical Education, NM Christian College Marthandam in organizing the International Multi-Disciplinary Conference and International Research Excellence Awards. This collaboration stands as a beacon of our commitment to fostering a global platform for researchers, academicians, and professionals to exchange ideas, share their findings, and The conference and awards aim to recognize and honour the outstanding contributions of researchers who have demonstrated exceptional prowess in their respective fields. This initiative is a testament to our dedication to nurturing a culture of innovation and academic rigor, ensuring that our collective efforts resonate globally.



I extend my heartfelt congratulations to all contributors, award recipients, and participants whose work is featured in this book. Your dedication, perseverance, and quest for knowledge have greatly enriched this publication, and I am confident that it will serve as a valuable resource for researchers and practitioners alike.

On behalf of SMART Association, I express my deepest gratitude to Department of Physical Education, NMCC Marthandam for their collaboration and unwavering support. Together, we aspire to create a legacy of academic excellence that transcends boundaries and inspires future generations.

Let us continue to strive for excellence, fuel our intellectual curiosities, and make a lasting impact on the world through our research and innovations.

With warm regards and best wishes,

Dr. J. Robert Edwin Chester,
President

SECRETARY MESSAGE



Dear Esteemed Participants,

It is with immense pride and great pleasure that I address you on behalf of the Scientific Multidisciplinary Association of Research Task (SMART) for the International Multidisciplinary Conference on Tech-Biz Synergy 2K25 – Redefining Global Trends. This conference stands as a testament to our shared commitment to advancing knowledge, fostering innovation, and bridging the gaps between diverse fields of study to create impactful solutions for the future.

In today's rapidly evolving world, the intersections of technology and business have become pivotal in shaping global trends. These two domains are intricately intertwined, influencing industries, economies, and societies worldwide. This conference is meticulously designed to serve as a platform for professionals, researchers, academicians, and industry leaders to come together, share insights, and engage in thought-provoking discussions that transcend disciplinary boundaries.

The Scientific Multidisciplinary Association of Research Task (SMART) has always championed interdisciplinary collaboration and innovative research. Our mission is to bridge knowledge silos and provide a space where ideas from diverse domains converge and thrive. The Tech-Biz Synergy 2K25 conference embodies this mission, emphasizing the synergy needed between technology and business to redefine global strategies.

The theme, "Redefining Global Trends," captures the challenges and opportunities that lie ahead. Through sessions, workshops, and panels, we aim to explore innovative solutions and sustainable growth. Topics range from AI and blockchain to entrepreneurial strategies, ensuring this conference offers cutting-edge insights.

To our speakers and panellists, thank you for sharing your expertise. To delegates and attendees, your engagement makes this conference a dynamic space for learning. I also extend my gratitude to the Secretary and Principal of Nesamony Memorial Christian College, Marthandam, for their invaluable support. Additionally, I am grateful to the organizing committee, volunteers, and sponsors for their dedication.

As we embark on this journey, I encourage you to embrace inquiry and collaboration. Together, let us redefine paradigms and shape a future marked by synergy, sustainability, and success. Thank you for being part of this endeavour, and I wish you an inspiring conference experience.

Warm regards,

Mr. J. Josemon,
Secretary

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GLOBALIZATION AND MEDICAL TOURISM: A SECONDARY DATA BASED STUDY IN INDIA

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ABSTRACT

This secondary data-based research review reviews the impact of globalization on medical tourism in India. The study has analyzed what is involved in attracting patients from other countries to India. The study has compared the differences in treatment costs among the various countries. The study also analyzed the benefits of medical tourism for entrepreneurs, patients, and the country. The study also compared the revenue taking place in the country through medical tourism.

Keywords: Medical Tourism, Globalization, India, Medical Treatment, Surgical Treatment

INTRODUCTION

Globalization has brought countless impact on all kinds of business sectors. It attributed to major development in agriculture, production and service sectors. It has brought the world close to the customers. Customers of all types irrespective of level of income, places of living, type of employment are able to enjoy all types of products and services. People belonging to different countries are able to share their views and ideas. Techniques of different countries, cultures of various peoples working in different countries, customs and habits of all countries people are shared together.

Customer products can be used by everybody irrespective of the type of country. People belonging to rural areas in under developed countries are able to use the product produced by developed countries. Abundant use of mobile phones and television, motor vehicles, computer and laptop can be said as example of impact of globalization. As a result of globalization, all production sectors, agricultural sectors and service sectors are using all types of recently updated equipments and machineries. Globalization has also made changes politically also. All countries are sharing the technologies and economy. They assist each other in the growth of the country. Entrepreneurs of different countries start business throughout the world.

As far as service sector is concerned, globalization has brought about enormous change. Banking sector, telecommunication sector, hotel sector, transportation sector and education sector have reached peak level because of globalization. India has attained great growth in the medical field. Medical colleges and paramedical colleges, government and private hospitals are increasing greatly according to the growth of the population. Earlier days people from India were moving to developed countries to avail medical and surgical treatment. But, the trend has entirely changed now. Patients from



developed and countries and other developing countries are visiting to India to avail treatment. Technologies, especially internet, television, mobile are assisting in a major way to choose the hospitals to undergo treatment. In addition to these, health insurance now a day play a major role and it brings the patients belonging to different countries closer to the hospitals which are providing wide range of medical and surgical treatment.

As far as Indian economy is concerned, it majorly consists of three sectors viz., primary sector (known as agriculture), secondary sector (known as production) and tertiary sector (known as service sector). Among the three service sector especially health services occupy a major role in the development of an economy. Recently medical tourism is rapidly progressing field in the health sector. Cost factor, good English speaking medical staff, international standards of hospitals, various tourist places, and open policy of medical insurance facilities make foreign patients to avail medical facility in India. This paper attempts to analyze the impact of globalisation on medical tourism in India.

OBJECTIVES OF THE STUDY

The following are the objectives of this present study

1. To know the meaning and history of medical tourism
2. To understand the impact of globalization on medical tourism in India
3. To foresee the factors associated with attracting the patients to India
4. To compare the cost of treatment between India and other countries
5. To know the benefits of medical tourism for various sectors

METHODOLOGY

This study work is a desk research work. Secondary data collected from various articles and websites have been provided along with the own observation of the researcher.

MEDICAL TOURISM - MEANING

Medical tourism (also called medical travel, health tourism or global healthcare) is a term initially coined by travel agencies and the mass media to describe the rapidly growing practice of travelling across international borders to obtain health care. It also refers to the practice of healthcare providers travelling internationally to deliver healthcare. It also refers to travelling to another country for medical care.

HISTORY OF MEDICAL TOURISM IN INDIA

Medical tourism in India provides countless options for all tourists to explore the facilities of medical sciences in India. History of medical tourism in India includes several health care and various complex surgical procedures such as cardiac surgery, cosmetic surgery, hip replacement or knee surgery and dental. The first trend of medical tourism took place thousands of years ago during a trip Greek pilgrims through the Mediterranean Sea modest domination of the Saronic Gulf, which is known as Epidauria.

History of medical tourism in India also describes that the entire spa town have been regarded as the best destinations for medical tourism.

In addition to all the states of India in South India, Kerala is recognized as a major troop medical tourism in India. With a healthy climate and rich greenery, Kerala is a State of India which has a wide variety of herbs and medicinal plants as well as ancient ayurvedic treatments. Apart from Kerala, Karnataka is another destination for medical tourism in India. Research shows that each year more than 8000 patients across India to come here several orthopaedic and cardiac treatment.

As a cosmopolitan nation, India has a rich history of ayurveda and procedures for Ayurvedic treatment. The history of medical tourism in India also includes former Ayurvedic treatment in India and best destinations offer medical treatment in India.

INDIA AS A SITE OF MEDICAL EVIDENCE

India is chosen as site of medical evidence because of the following reasons.

Medical and Surgical Care

To avail specialised treatment such as cardiac surgery, renal replacement surgery, cancer treatment and brain related diseases the patients were travelling to developed countries such as USA, UK, Canada and the like because of the lack of specialised and trained consultants and surgeons. But, now a day, the situation has changed entirely. From India, the consultants and surgeons are travelling to developed countries to serve in their hospitals. Medical colleges are regularly updated in par with the standard of developed countries. Surgeons in India are performing very complex surgery such as renal transplantation, heart transplantation, hip replacement and the like. Hence, the patients from all over the country trust Indian consultants and surgeons and prefer India to avail medical and surgical treatment.

Nursing Care

India is a country which is very famous for affectionate. Because of this quality, Indian nurses are getting opportunity to work throughout the world. As nursing care is good during pre operative and post operative period Indian hospitals are getting good name throughout the world. Understanding the demand of the nurses required throughout the world, Indian government is giving permission to open many hospitals. Basically one of the cultures of India is to assist others. So, the appropriate and affectionate nursing care is also responsible for attracting the patients from other countries.

Diagnostic Services

Globalization has given way to import technically updated equipments used to diagnose the body fluids and other tissues. So, all hospitals have started using technically updated equipments to provide accurate diagnosis. All diagnostic equipments are handled by qualified and trained technicians. So, the accuracy and quality of the diagnosis is found well.

Infrastructure

Now a day, almost all hospitals are giving more preference to infrastructure. Patient satisfaction is the prime factor followed by all hospitals. In order to ensure the patient satisfaction, the hospitals are concentrating on physical structure of the hospitals. Sufficient spaces are given for consulting room, diagnostic rooms, rest rooms and patient accommodation room. Building structure has been made in the sense all type of patients in terms of economy can be accommodated. Car parking, cafeteria and washing facilities are provided almost in all hospitals. Many hospitals which is conducting medical tourism are having own restaurant and hotel for the patients so that the relatives of the patients can stay. In addition to these, travel facilities are provided from airport and railway station to the hospitals.

Tourist places

Many tourist places are available in India that adds proud to the country. Tajmahal, Agra, Lotus temple, Qudhupminar, Mahabalipuram, Kodaikanal Ootty, Pondichery, Golder temple, Dargiling, Shengotta, Khguraho, India gate, Goa, Rajasthan palace, Mysore palace and Kashmir are some of the important tourist places that attract foreign visitors. The patients who visit India for availing treatment also visit these places in the expenses spent for treatment.

Fees Structure

Fees structure followed in India is one of the major factor attracting foreign patients towards India. Consulting fee, room rent, diagnostic fees, fees for nursing care, pharmaceutical fees and other miscellaneous fees are less when compared to developed countries like USA, UK and other Western countries. The comparative statement of the fee structure of the various countries is given as follows.

Comparison of Cost of Treatment between India and Other Countries

Table 1: Cost comparison of selected surgeries

S No	Procedure	United States(\$)	Thailand (\$)	Singapore (\$)	India (\$)
1	Heart bypass	130000	11000	18500	5000
2	Heart valve replacement	160000	10000	12500	9000
3	Angioplasty	57000	13000	13000	11000
4	Hip Replacement	43000	12000	12000	9000
5	Hysterectomy	20000	4500	6000	3000
6	Knee replacement	40000	10000	13000	8500
7	Spinal fusion	62000	7000	9000	5500

Source: AMA, June 2007

Table 1 displays cost of surgeries among United States, Thailand, Singapore and India.

Figure 1: Cost comparison of selected surgeries

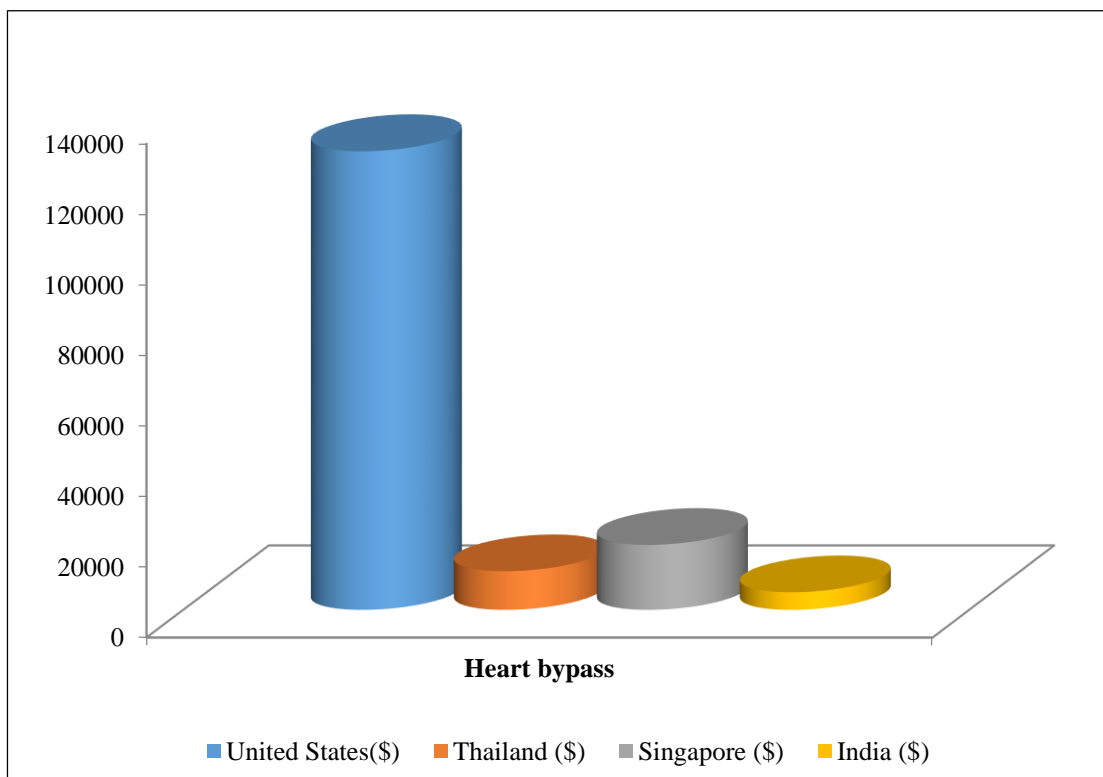


Table 2: Cost comparison between US, UK and India

S. No	Procedure	USA (\$)	UK (\$)	India (\$)
1	Open Heart Surgery (CABG)	100000	43000	7500
2	Total knee replacement	48000	52000	6300
3	Hip Resurfacing	55000	48000	7000
4	LA Hysterectomy	22000	24000	4000
5	Lap Cholecystectomy	18000	20000	3000
6	Spinal Decompression Fusion	60000	65000	5500
7	Obesity Surgery (Gastric bypass)	65000	70000	9500

Source: healthbase.com

Table 2 explains the cost of comparison for different procedure between US, UK and India.

Table 3: Cosmetic Surgery

S No	Procedure	United States(\$)	Thailand (\$)	Singapore (\$)	India (\$)
1	Face-lift	20000	4800	6250	3100
2	Breast Augmentation	10000	3150	8000	2200
3	Breast Reduction	10000	3900	8000	3000
4	Eyelid surgery	7000	1400	3750	2200
5	Liposuction	10000	2100	5000	2500
6	Nose surgery	7300	3850	4400	1800
7	Tummy Tuch	8500	4050	6250	3400

Source: healthbase.com

Table 3 demonstrates the difference in the cost of cosmetic surgery among India, Thailand, Singapore and United states.

Affection

The Indian people are lovable and affectionate towards other fellow human beings. From the place of airport to hospitals peoples can realise these nature. The helping mind of the people also majorly attracts the patients from other country.

Safety

A far as safety is concerned; India is the safest country for all kinds of people. One of the primary policies of the country is to give highest protection to other country people. Central government and all state government ensures the protection of their own as well as other state and other country people in receiving highest protection. It is also one of the main reasons why people from other countries prefer India as a focus point of treatment.

BENEFITS OF MEDICAL TOURISM

As discussed earlier, globalization has brought the world closer. The following are the benefits of medical tourism

For the patients

The patients are able to avail world class treatment at low cost. In addition to availing treatment, they are able to learn the culture of other country and enjoy the various places in the country where they are availing treatment.

For the Hospitals

In order to attract the foreign patients, the hospitals are updating all diagnostic procedures and appointing qualified staffs. They also needed to concentrate on infrastructure of the hospitals. The medical tourism brings about profit to the hospitals. At the same time, the infrastructure and equipments which are made to provide treatment for foreign patients can also be availed by the patients in local state and country.

For the Country

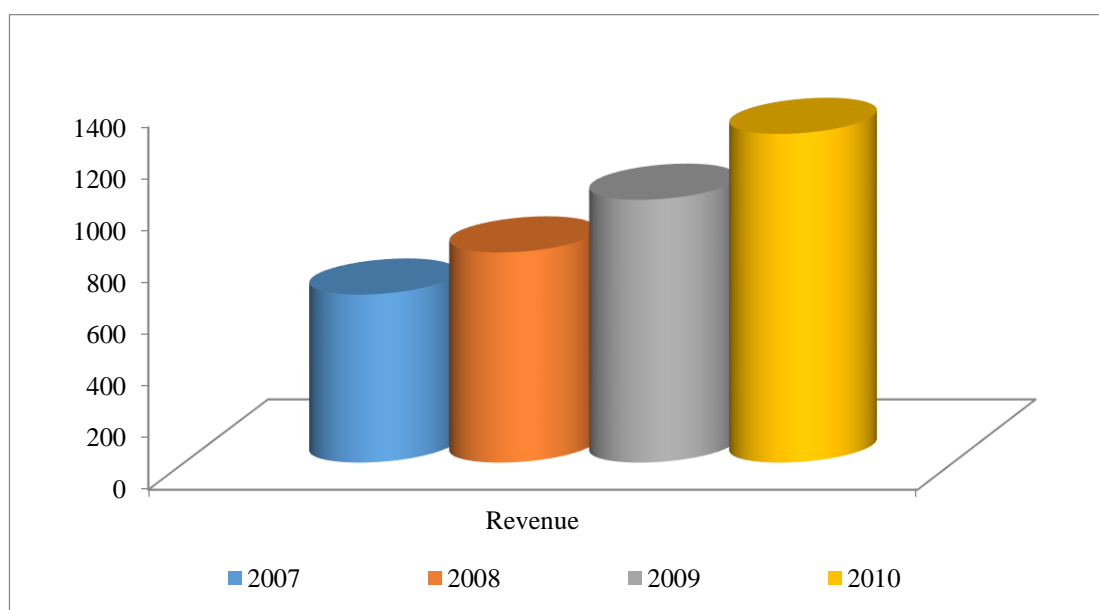
Medical tourism brings about revenue to the country. Moreover, tourism sectors such as airways, railways, hotel sectors, and the small entrepreneurs who are around the hospital are getting benefits because of medical tourism. Year by year the revenue of the country through medical tourism is increasing. It is explained in the following table.

Table 4: Revenue through Medical tourism

S. No	Year	Revenue in US(\$)	Percentage of increase
1	2017	650 Million	-
2	2018	812.5 Million	25
3	2019	1015.75 Million	25
25	2020	1270 Million	25

The table 4 depicts the income earned in the year 2017, 2018, 2019 and 2020. From the table, it is known that the income level has risen at the rate of 25% per year approximately.

Figure: Revenue through Medical tourism



OPPORTUNITIES FOR FUTURE DEVELOPMENT

According to the Indian Tourism Industry Analysis' report – India represent one of the most potential tourism and hospitality market in the world. Indian tourism and health care industry has reached new heights today. Indian health care industry has gained a level of acceptance world over. Many foreign patients prefer Indian hospitals not only for its cheap cost but also India being a cheap destination for leisure tourism with unlimited tourism and untapped business prospects, in the coming years. Indian health care industry is seeing green posture of growth.

CONCLUSION

The service sector plays an important role in the Indian economy. The medical tourism and health care industry is more importance in generating employment and yielding foreign exchange within the service sector. All hospitals are making major changes in their infrastructure, technologies, and manpower management to attract patients from other countries. These facilities which are framed for the patients of different countries are also used by the patients of local areas. Thus, medical tourism is not only useful for the patients of other countries, it is also beneficial for the local patients. Hence, the government should pay more attention to medical tourism so that patients from different countries to visit India easily and avail the treatment safely.

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EXPLOITING CALCAREA CARBONICA 200 POTENCY AND IgG LEVEL ASSESSMENT TO TREAT POST- COVID SYNDROME: CLINICAL CASE STUDY

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ABSTRACT

The existence of a variety of symptoms with a duration beyond the acute phase of COVID-19, is referred to as post-COVID syndrome (PCS). We aimed to report a series of patients with PCS attending a Post-COVID Unit and offer a comprehensive review on the topic. Adult and old age patients with previously confirmed COVID-19 infection and PCS were systematically assessed and treated with Calcarea carb. The process of case study consists of data collection, assessment of distribution of patients and recurrence of symptoms and their duration. Finally, we discuss relevant consideration for the post Covid syndrome and conclude that PCS can be treated with Calcarea carbonica. Mental disorder is the illness and unstable frame of mind that leads to anxiety, unhappy, unsatisfied, and non-productive life. The IgG assays to detect the length and origin of humoral responses against SARS-CoV-2 is very important, and these antibodies can be detected from a few days after the onset of diseases and may remain in the body even after years of infection. Homoeopathy medicines has been tested for preventive measures with a focus has been on identifying an effective universal prophylactic medicine or as personalized homeopathic treatment for patients. Homeopathic medicines were associated with improvement in symptoms of COVID-19 cases. Characteristic symptoms of Calcarea carb have been identified using prognostic factor research, and by using homoeopathic repertorization using Kent repertory's findings that can contribute to accurate homeopathic prescribing during future controlled research in COVID-19.

Keywords: COVID-19, Homoeopathy medicines, Calcarea carbonica, IgG.

INTRODUCTION

Post-COVID syndrome is increasingly recognized as a new clinical entity in the context of SARS-CoV-2 infection. Symptoms persisting for more than three weeks after the diagnosis of COVID-19 characterize the post-COVID syndrome. ⁽¹⁾ Its incidence ranges from 10% to 35%, however, rates as high as 85% have been reported among patients with a history of hospitalization. ⁽²⁾ The pathogenesis of post-COVID syndrome

is multi-factorial and more than one mechanism may be implicated in several clinical manifestations⁽³⁾ Prolonged inflammation has a key role in its pathogenesis and may account for some neurological complications, cognitive dysfunction, and several other symptoms.⁽⁴⁾

Calcarea carbonica is a homeopathic remedy made from the middle layer of shells. In chemical terms, Calcarea carbonica is impure calcium carbonate, CaCO₃. Calcarea carbonica is in general considered a "chilly" remedy, appropriate for people who suffer keenly from the cold and have difficulty keeping warm. A homeopathic practitioner who is asking a patient about symptoms will inquire about the circumstances.⁽⁵⁾ This study is particularly designed to access the IgG antibodies in various COVID-19 subjects. This will help predict the reinfection probabilities among the local population and predict the length and efficacy of the homoeopathic medicine Calcarea Carbonica. It is well known that some persons are susceptible to one thing and some to another. If an epidemic comes upon the land only few come down with it. Why are some protected and why do others take to. these things must have settled by the doctrine of homoeopathy. Idiosyncrasies must be accounted.⁽⁶⁾

MATERIALS AND METHODS

This research study includes the materials that are use full in the collection of data. Where 5 patients were case taken thoroughly and they are presented with post Covid syndrome symptoms like headache, breathing difficulty, chest pain, constipated, Flatulence, hard stool, trickling of urine after micturition, inability to sleep, crowded of thoughts during night, palpitation, anxiety, exhaustion and weakness.

Case I – A 43-year-old male patient complaints of cough with headache since 6 months after the attack of Covid fever usually aggravated at night. And patient complaints about whenever he coughs accompanied with chest pain and he has recurrent attack of headache. His sleep was disturbed after the attack of fever and he has anxiety accompanied with nausea, vomiting and fatigue. Patient had known hypertension for 3 years.

Case II – A 66-year-old male patient complaints about shortness of breath with chest pain since 5 months after the attack of Covid fever. The complaint gradually started of chest pain and then shortness of breath occurs and aggravated due to physical exertion. And the patient has recurrent attack of chest pain. Appetite reduced and also sleep disturbed. Patient had known diabetes and hypertension for 13 years.

Case III- A 32-year-old female patient had cough without expectoration accompanied with fatigue since 3 months after the attack of Covid and the patient complaint about weight loss and tiredness of whole body. And also had inability to sleep due to over activity of mind and crowded of thoughts during night, palpitation and anxiety, exhaustion and weakness. patient had no relevant past history.

Case IV- A 53-year-old female patient had complaints of breathing difficulty with headache since 4months after the attack of Covid 19.and also had heaviness of head during night, constipated, Flatulence, hard stool, trickling of urine after micturition and involuntary urine on every motion, dyspnoea and anxiety during ascending stairs. Patient had known diabetes for 8 years.

Case V- A 41-year-old female patient had a complaints of cough without expectoration and also has sneezing in morning after the attack of Covid 19 before 2 months. And also has mental confusion on decision making, sleep disturbance with dreams of darkness and amorous dreams during menses, pain and swelling of breast. Flatulence and distension of abdomen. Patient had known diabetes and hypertension for 7 years.

Table 1: Data of case

S. NO	PROCESS OF SYMPTOMS	IgG LEVEL BEFORE TREATMENT	AGE AND SEX	DURATION OF SYMPTOMS	RECURRENCE OF SYMPTOMS
C - I	Cough with headache, anxiety with nausea, vomiting and fatigue.	>75AU/mL	43/M	6 months	Headache monthly thrice, Cough with headache
C - II	Shortness of breath with chest pain, Appetite reduced and also sleep disturbed.	>370 AU/mL	66/M	5 months	Chest pain occasionally, Shortness of breath
C - III	Cough with fatigue, weight loss and tiredness of whole body and crowded of thoughts during night	>450 AU/mL	32/F	3 months	Tiredness of whole body, Cough with fatigue
C - IV	Breathing difficulty with headache, heaviness of head during night, constipated, hard stool, dyspnoea and anxiety during ascending stairs.	>122 AU/mL	53/F	4 months	Breathing difficulty weekly once, with headache.
C - V	Cough with sneezing, sleep disturbance with mental confusion on decision making, dreams of darkness.	>390 AU/mL	41/F	2 months	Cough with Sneezing daily morning

RESULT AND DISCUSSION

Solely selected 5 cases from Sarada Krishna OPD and the case were taken thoroughly and they have prescribed with Calcarea carb 200 and all 5 patients were instructed to take IgG level test before treatment. After 4 to 5 months of treatment under homoeopathy, patients showed well improvement in their symptoms and also again instructed to take post IgG level test which shows remarkable change. ⁽⁷⁾

Table 2: Assessment of symptoms (Score chart)

Case no	Before treatment			After treatment		
	Mild	Moderate	Sever	Mild	Moderate	Sever
Case I	8	8	7	1	1	0
Case II	9	9	8	2	1	0
Case III	10	10	9	0	1	1
Case IV	6	8	5	1	0	1
Case V	7	9	8	1	2	0

A clear, causal attribution to the proven remedy in terms of the Hahnemann proving, would be possible. Generally, it would also be easy in terms of the examined problem ⁽⁸⁾. Therefore, these sequelae-symptoms, which are increasingly considered in comprehensive rubrics of modern repertories, deserve to be considered with a completely different valuation. They are usually mere observations of cure. ⁽⁹⁾ Only a very few passages of his writings mention the possible confirmation of proving symptoms by means of cured cases, as in the preface to the remedy picture. It is interesting in this regard, that he quotes cases which also showed “sequelae symptoms”. ⁽¹⁰⁾ However, Hahnemann relates them to the known primary effects of medicine in proving. This relation of cured symptoms to proving symptoms is a necessary requirement for their value, although it remains less significant. According to Hahnemann, they should only be used for “the confirmation of the remedy choice made according to the pure action of the remedy” if they occurred during the proving on a healthy human being ⁽¹¹⁾.

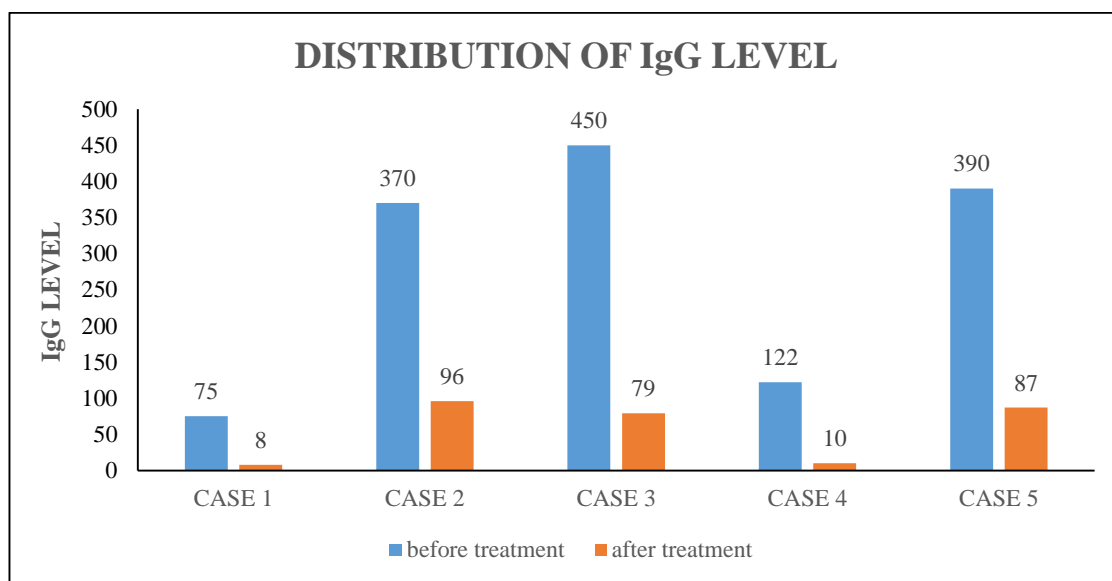
TABLE 3: PROGRESS OF SYMPTOMS AND FOLLOW UP:

Sl no	Case I	Rx	Case II	Rx	Case III	Rx	Case IV	Rx	Case V	Rx
1	MLA	CAL CARB	MOA	CAL CARB	MLA	CAL CARB	MOA	CAL CARB	MLA	CAL CARB
2	MOA	CAL CARB	MD	SL	MD	SL	MD	SL	MOA	CAL CARB
3	MD	SL	AS	SL	AS	SL	AS	SL	MD	SL

MLA-Mild amelioration, MOA –Moderate amelioration, MD –Moderate, AS-Asymptomatic.

Assessment and distribution of patients is given in table 2. That the five cases have been shown with the score of patient's severity. Distribution of patient in recurrence of symptom given in table 3. That the patient's improvement in the treatment has been shown with the recurrence of their symptoms with a score and also their graph has been given below respectively. That the progress of the symptoms and the prescribed medicine along the treatment has been shown case wise.

Fig: 1 Distribution of IgG level



CONCLUSION

Patients with severe acute COVID-19 are not the only ones who experience post-COVID syndrome, which affects about 10% of COVID-19 patients. Post-COVID syndrome symptoms are often modest, improve over time, and have no known indicators. Symptoms of post-COVID syndrome include fatigue, dyspnoea, chest pain, mental health issues, and prolonged gustatory and olfactory impairment. The treatment of patients with post-COVID syndrome is anticipated to heavily rely on primary healthcare. The impact of these complicated issues on patients with post-COVID syndrome is discussed in this review, along with the significance of an early diagnosis based on clearly defined criteria⁽¹²⁾.

Post-COVID syndrome patients should be treated symptomatically, taking into account any new or pre-existing comorbidities and avoiding over-investigation. Finally, our research with chronic symptoms are reported by mild-to-moderate COVID-19 patients. 3 to 10 months following diagnosis, and some people use this time to seek medical attention. These findings imply that society, and healthcare systems in particular, are heavily burdened by the post-COVID syndrome. In order to organize an effective and focused therapy of people with persistent, incapacitating symptoms, it is imperative that governmental authorities and medical professionals are informed about the natural long-term course of COVID-19.

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THE ROLE OF DIGITAL LEARNING IN TRANSFORMING EDUCATION: INSIGHTS FROM NEP 2020

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ABSTRACT

India's National Education Policy (NEP) 2020 has introduced significant reforms aimed at enhancing the education system, with a particular emphasis on digital learning. This paper analyzes NEP 2020's impact on the landscape of digital education in India, focusing on its potential to reshape teaching, learning, and educational access. The study examines key opportunities and challenges associated with the policy's digital learning agenda, particularly in terms of infrastructure, equity, and pedagogical shifts. The paper also explores how educational technology fits into the policy's broader vision, proposing strategies for overcoming barriers such as poor connectivity, limited access to devices, and the digital divide. While digital learning promises transformative benefits, its success hinges on overcoming these challenges to create a more inclusive, flexible, and efficient education system.

Keywords: NEP 2020, Digital Learning, Educational Technology, Pedagogical Shifts, Equity, Digital India

1. Introduction

A well-structured educational policy acts as a guiding framework that directs and shapes the development of a nation's education system. In India, the National Education Policy (NEP) 2020 represents a significant shift toward holistic and inclusive education, focusing on innovation, quality, and the integration of digital tools into the learning process. The policy envisions using technology to make education more accessible, equitable, and personalized, thereby preparing students for future challenges. NEP 2020 envisions achieving a Gross Enrolment Ratio (GER) of 100% by 2030, and the inclusion of digital learning is seen as a key component in achieving this goal. The policy advocates for a 5+3+3+4 curriculum framework, which integrates the use of digital tools across all stages of education, from early childhood care and education (ECCE) to higher education (MHRD, 2020). Digital learning, as outlined in NEP 2020, is expected to revolutionize the way education is delivered by promoting flexibility and enhancing access, particularly for marginalized communities. Through initiatives such as the Digital India campaign, the policy aims to bridge the gap in access to technology, thereby creating a more inclusive educational environment (Channappa et al., 2022).

2. Review of Literature

Research on the effectiveness of digital learning has highlighted both the advantages and challenges associated with its integration into education. Samir et al. (2014) explored the impact of e-learning on students' motivation, suggesting that digital platforms enhance learner engagement, particularly in higher education. Similarly, Kumar and Bajpai (2015) found that e-learning positively impacted academic performance and motivation among college students in Sikkim. These findings are consistent with the objectives of NEP 2020, which aims to create an engaging and student-centered learning environment through the use of technology.

Moreover, research by Blundell, Lee, and Nykvist (2016) highlighted the challenges teachers face when adapting to digital learning tools. Their study identified the need for professional development to support educators in integrating technology into their teaching practices effectively. This aligns with NEP 2020's emphasis on teacher training and digital literacy, which is crucial for successful digital education implementation (MHRD, 2020).

Digital learning also plays a crucial role in addressing the issue of accessibility in education. Studies by Gond and Gupta (2017) and Faulkner (2018) emphasize the importance of digital tools in reaching underserved communities, noting that digital learning can democratize education by providing marginalized populations with access to high-quality resources that would otherwise be unavailable.

3. Methodology

This study adopts a qualitative research approach, analyzing existing literature, policy documents, and case studies related to digital learning and NEP 2020. Secondary data sources include research articles, government reports, and online databases. The study explores the intersection of digital learning, pedagogical changes, and technology integration within the context of NEP 2020, offering a comprehensive overview of the opportunities and challenges posed by this policy.

4. Analysis and Discussion

4.1. What is Digital Learning?

Digital learning refers to the use of digital tools and technologies to facilitate educational activities. It encompasses a wide range of methods, from online courses and digital assessments to interactive learning platforms and virtual classrooms (Gond & Gupta, 2017). Digital learning allows students to access educational content at their own pace and on their preferred devices, making learning more flexible and personalized. This mode of education has gained immense popularity, particularly in the context of the COVID-19 pandemic, which accelerated the adoption of online learning platforms (Channappa et al., 2022).

4.2. Benefits of Digital Learning

Digital learning offers several advantages, such as greater accessibility, the ability to learn at one's own pace, and access to a wide range of resources. Students can take online exams, access recorded lectures, and engage with learning materials anytime and from anywhere (Faustmann et al., 2019). Moreover, digital learning fosters collaboration through online discussion forums, peer interactions, and group projects, enhancing the learning experience (Gond & Gupta, 2017).

Research by Faulkner (2018) highlights the value of asynchronous learning in online education. Students can learn independently, increasing their self-regulation skills and providing them with greater control over their educational process. Additionally, digital learning promotes lifelong learning, an important aspect of education in the digital age (Kumar & Bajpai, 2015).

4.3. NEP 2020 and Digital Learning

NEP 2020 provides a clear roadmap for integrating digital learning into the Indian education system. The policy promotes the use of technology for both teaching and learning, emphasizing the importance of digital platforms like DIKSHA, SWAYAM, and e-Vidya for delivering quality education across the country (MHRD, 2020). The policy also calls for the establishment of the National Educational Technology Forum (NETF), a body aimed at advising governments on the effective use of technology in education. Despite these initiatives, challenges remain, particularly in rural and remote areas, where digital infrastructure is often lacking. Issues such as poor internet connectivity, limited access to devices, and low digital literacy among teachers pose significant barriers to effective implementation (Ramavath, 2021; Blundell et al., 2016).

5. Challenges and Opportunities

5.1. Infrastructure and Connectivity Challenges

One of the most significant challenges facing digital education in India is the lack of adequate infrastructure, particularly in rural areas. Many schools lack the necessary hardware, such as computers and smart boards, and reliable internet connectivity remains a major issue. According to a report by the Ministry of Electronics and Information Technology (2020), approximately 35% of rural households lack internet access, which hinders the widespread adoption of digital learning.

5.2. Equity and Inclusivity

The digital divide remains a critical issue, as access to technology is often limited by factors such as geography, socio-economic status, and gender. To address this, NEP 2020 calls for the creation of digital content in multiple languages and the establishment of digital hubs in underserved areas to ensure equitable access to education (MHRD, 2020).

6. Pedagogical Shifts in Digital Learning

NEP 2020 advocates for a paradigm shift in teaching and learning methodologies, emphasizing competency-based education and the integration of digital tools into the

curriculum. The policy encourages educators to move beyond traditional lecture-based methods and adopt more interactive and student-centered approaches using digital platforms (Ramavath, 2021; Blundell et al., 2016). This shift requires substantial investment in teacher training and professional development to ensure that educators are equipped with the necessary digital skills to teach effectively in a technology-driven environment (Faulkner, 2018).

7. Conclusion

The integration of digital learning under NEP 2020 holds the potential to transform India's education system, making it more inclusive, flexible, and globally competitive. However, achieving these objectives requires overcoming significant challenges related to infrastructure, equity, and teacher training. With coordinated efforts from both the government and educational institutions, digital learning can play a pivotal role in shaping the future of education in India, providing students with the skills and knowledge needed to thrive in a digital world.

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TRACING THE HISTORY OF WATER SUPPLY SCHEMES IN THE CITY OF AIZAWL, MIZORAM TO NAVIGATE WATER SECURITY CONTEXTS FOR THE STATE

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Abstract

Water is a very valuable natural resource. It has a big effect on the development and prosperity of human society. Since the beginning of time, people have believed that humans and water are intertwined. No other natural resource has influenced human history more than water. The concentration and dispersion of humans are determined by the water resources that are available on the surface of the Earth. A body of water is where every human settlement is situated. Since the dawn of time, finding water sources or supplying water to human settlements—particularly for domestic use—has been of utmost importance. The limited water supply has been strained, though, since human settlements have increased in size and quantity as the population has increased over time. Artificial methods of acquiring the required quantity of water have been devised due to the limitation of natural supplies. Consequently, in order to meet his domestic needs, man has been extracting water from various sources. Consequently, an overview of the history of Aizawl's public water distribution system is given.

Keywords: Water Supply Scheme, Aizawl, Lui (River), Water Distribution, Water Pumping

INTRODUCTION

Large human populations were once limited to regions with a lot of fresh surface water, such as those near rivers or natural springs. Humans have created ways to transport water into their homes and communities and to make it simpler to dispose of (and eventually clean) wastewater throughout history. During the Neolithic era, mankind dug the first permanent water wells, which made it possible to fill and carry vessels by hand. The Jezreel Valley contains wells that are thought to have been there since around 6500 BC. The number of human societies depended on the quantity of water that was easily accessible in the area.

The capital of Mizoram and the main city, Aizawl, was established in 1890 as a small fortified post by Mr. Dally of the Assam Police. The population's steady increase has already caused major issues with everything from service lands to shelter, water and power supply, storm drain systems, garbage disposal, and many other areas. It is anticipated that population increase will continue at this point, and in the absence of proper planning for infrastructure, economic expansion, and spatial organization and restructuring, it will surely have a major detrimental impact on people's life quality, health, and working conditions.



After Mizoram was recognized as a Union Territory in 1972 and the ensuing cessation of hostilities, living conditions in Aizawl and the state as a whole have improved. Visitors from inside and beyond the state were also drawn to Aizawl by the new governmental system. As a result, its population more than doubled between 1971 and 1981, reaching a magnitude of slightly over 57%. The agglomeration had a total size of approximately 128.98 square kilometres. The population of Aizawl has grown considerably since 1951 and the population density increased to 1203.6 and 1769.9 persons per square kilometre in 1991 and 2001, respectively.

PROBLEM & CONTEXTS

Like most hill settlements, Aizawl experiences serious water supply problems during the dry winter and early summer. The tale of springs and natural seepages that are deeply entwined with the habitats of the steep terrain is not unique to the research area. There must have been water when people lived on the hills since there are hamlets there. The artificial reservoirs (Tuikhur) that gather water from the springs and seepages from the hill slopes have historically been the primary source of domestic water in the city.

When the British first arrived in Aizawl in 1900, they thought that the easiest method to provide water to the residents was to collect rainwater from the abundant rains. During that time, a 12-lakh-gallon underground masonry reservoir was constructed at Tuikhuahtlang, on the hillock near Aizawl. In order to collect rainfall, a sloped roof composed of corrugated galvanized iron sheets held up by timber supports encircled the reservoir. This was the only supply of water for government workers in Aizawl until 1973. Since then, people have been employing rooftop rainwater collection to meet their domestic water demands. However, because government officials were traditionally the primary recipients of the water collected in the reservoir, water remained a scarce resource for the general public. Similarly, two 18-lakh-gallon water reservoirs were constructed in 1953–1954 at Laipuitlang on the hills in the northern part of Aizawl to collect rainfall. But this wasn't enough to solve the water supply problem. At the time, it was the sole centralized system for collecting and distributing water. For some years, this served as the only source of water, and rooftop rainwater collection gained popularity.

Aizawl Water Supply Scheme

An initial survey of the River Ser and the River Chite was conducted, but the findings were considered inadequate. Subsequent investigation showed that the most dependable source was the water pumped from the River Tlawng through a 1,037.92-meter static head. After rainwater collection was abandoned in 1964, the first piped water system was established to supply 67.5 litres per capita per day.

To raise water from the River Tlawng to a height of 1,037.92 meters at Tuikhuahtlang reservoir, the Aizawl Water Supply Scheme was initiated in 1972 and used seven stages with pumping sets powered by 145 horsepower diesel engines. An estimated 5 lakh gallons may be pumped daily for 24 hours. But the scheduled pumps cannot run at full capacity due to a shortage of diesel, therefore a 24-hour pumping schedule is not possible. The planned pump capacity of 350 gallons per minute is also said to be unmet. Of the 5 lakh gallons of anticipated pump capacity, only about 1.50 lakh gallons can be raised every day as a result.

Aizawl Town Emergency Water Supply Scheme

The Aizawl Town Emergency Water Supply Scheme began in 1971 when water was pumped in four stages from the Company Lui River to the Laipuitlang Reservoir using electric motors with 20 horsepower. Its pump can handle 45 gallons per minute, and the rising main's G.I. pipes are 80 mm in diameter. Because of the absence of electricity, the scheme could not operate properly and was therefore unreliable. It only works if and when there is electricity. The capacity of the pump is far less than what was expected, even when pumping is taking place.

Greater Aizawl Water Supply Scheme

The Greater Aizawl Water provide Scheme Phase-I, created in 1983, increased the amount of water now supplied by pipe by drawing from the River Tlawng, which can provide 80,000 people with a capacity of 10.8 million liters per day (MLD). Pumping water from the River Tlawng with a total static head of 1037.92 m through two stages makes up the second-highest water delivery scheme in India, behind Simla. December 1988 saw the facility go into operation. It resulted to extremely high operating and maintenance costs and posed a serious challenge to the project's sustainability. By the time the project was complete, the population had surpassed the anticipated capacity.

In order to enhance the water supply from the Greater Aizawl Water Supply Scheme Phase I, the state government created another important project in 1998. This is the second phase of the Greater Aizawl Water Supply Scheme. Currently, the Aizawl Greater Water Supply Scheme Phases I and II together pump 22.99 MLD of water.

CONCLUSION

A sufficient supply of safe, high-quality water will be essential to the survival of human settlements, particularly urban areas. Water is not a commodity that is traded worldwide to the same degree as oil, and a country or region that lacks water resources does not care much about the availability of water in a far-off portion of the world. Nearly every water predicament or issue is local or regional in scope. As a result, the fresh water requirements of a location or area must be satisfied by its own water supplies.

In recent years, the city's water crisis has gotten much worse. Without water, no human settlement, including cities, could exist. Since it cannot be replaced, both its quantity and quality are crucial. Cities have expanded significantly in both size and population everywhere. Because of the fast population expansion, rising per capita consumption brought on by development, and shift to a lifestyle that uses more water, the demand for water in cities has been rising. The use of water for on-site purposes, such as bathing and washing in springs and rivers, is rapidly being replaced by withdrawal uses, such as running water taps in flush restrooms, kitchens, and bathrooms. Although the demand for water has been rising quickly, the potential of water resources is being negatively impacted in terms of both quantity and quality. Concrete building expansion has been diminishing the amount of open space needed for water percolation, which in turn has decreased the amount of ground water recharge. Additionally, the ground and surface water have been contaminated by the usage of aquatic bodies as disposal sites for various forms of refuse and defecation in the vicinity. Thus, maintaining an adequate supply of high-quality water ought to be a key part of any city design.

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ANALYSING CUSTOMER SEGMENTATION STRATEGIES USING ARTIFICIAL INTELLIGENCE IN BANKING AND FINANCIAL SERVICES

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Abstract

Customer segmentation is a crucial process in banking and financial services, enabling institutions to tailor products and services to meet the diverse needs of their customers. Traditional segmentation techniques primarily rely on demographic factors, but these methods often fail to capture the complexity of customer behaviour in today's digital landscape. The integration of Artificial Intelligence (AI) has significantly transformed segmentation practices by employing machine learning algorithms, big data analytics, and natural language processing. These advanced technologies allow financial institutions to analyse vast amounts of data, uncovering hidden patterns, preferences, and behaviours that traditional methods overlook. AI-driven segmentation enhances accuracy by dynamically grouping customers based on behavioural and transactional data rather than just static characteristics. Machine learning algorithms such as clustering and decision trees enable banks to better understand customer needs and deliver personalized solutions. Furthermore, AI improves decision-making by predicting customer behaviour, enabling proactive service and tailored marketing strategies. This leads to increased customer satisfaction, optimized marketing campaigns, and improved operational efficiency. By automating segmentation processes, AI reduces the time and resources required for analysis, allowing banks to respond quickly to changing customer needs and market conditions. Overall, AI-powered customer segmentation provides financial institutions with a competitive edge in the increasingly data-driven financial services sector.

Key words: Customer Segmentation, Artificial Intelligence (AI), Machine Learning

INTRODUCTION

Customer segmentation is a critical strategy employed by banks and financial institutions to effectively categorize their customer base into distinct groups based on shared characteristics, such as demographics, transaction histories, and behavioural patterns. This segmentation allows organizations to tailor their offerings to meet the specific needs of each group, optimizing resource allocation and crafting targeted marketing strategies. By segmenting their customer base, financial institutions can design personalized services, improve customer satisfaction, and foster long-term relationships with clients.

Traditional methods of customer segmentation, however, typically rely on static, demographic-driven data. While this approach provides valuable insights, it often falls short in capturing the complexities and dynamic nature of modern customer behaviour. For example, traditional segmentation might group customers based solely on age, income, or geographic location, neglecting more subtle yet impactful factors such as customer preferences, spending habits, or online interactions. As the financial landscape evolves and customer expectations grow more sophisticated, it has become increasingly evident that more advanced techniques are necessary to effectively segment customers and meet their diverse needs.

The integration of Artificial Intelligence (AI) into customer segmentation strategies has brought a transformative shift, providing financial institutions with the ability to analyze vast amounts of data with unprecedented speed and accuracy. AI-powered technologies, including machine learning, big data analytics, and natural language processing (NLP), enable banks to identify complex patterns and trends within customer data that were previously impossible or too resource-intensive to uncover. These AI technologies allow for a deeper understanding of customer behaviours, uncovering insights that can be used to design more personalized financial products, services, and marketing campaigns.

Recent studies have underscored the immense potential of AI to improve customer segmentation in financial services. Gupta et al. (2023) demonstrated that deep learning algorithms could extract intricate behavioural patterns from transactional data, leading to significantly enhanced segmentation outcomes. This approach allows for a much more nuanced understanding of customer behaviour, going beyond basic demographic information to reveal deeper insights into customer preferences, spending behaviours, and risk profiles. Similarly, Zhang et al. (2022) highlighted the role of NLP in processing unstructured data, such as customer feedback, social media interactions, and online reviews. By applying sentiment analysis and other NLP techniques, financial institutions can gain valuable insights into customer sentiments, preferences, and pain points, thus creating more precise customer segments that reflect real-world behaviours and attitudes.

Li et al. (2023) discussed how big data analytics has enabled financial institutions to move from reactive to predictive segmentation. Traditionally, banks have used historical data to segment customers and predict future needs based on past behaviours. However, AI-driven techniques allow for real-time analysis of both structured and unstructured data, facilitating the creation of predictive models that can anticipate customer needs and preferences before they are explicitly stated. This predictive capability not only improves customer satisfaction by offering proactive solutions but also enhances customer loyalty by delivering relevant offers at the right time, reducing churn and fostering deeper engagement.

The application of unsupervised machine learning models, such as K-Means and hierarchical clustering, has been particularly significant in the development of advanced customer segmentation strategies. These algorithms group customers based on multiple attributes, including behavioural, transactional, and psychographic data, to form more accurate and actionable segments. Patel et al. (2023) explored the use of hybrid AI

models that combine clustering algorithms with decision trees to enhance segmentation accuracy. By integrating different machine learning techniques, banks can generate more granular customer segments that allow for tailored products and services, aligning with individual customer needs, preferences, and risk tolerances. This hybrid approach has proven to outperform standalone methods by providing a more comprehensive view of the customer, making it easier for banks to anticipate customer demands and offer personalized solutions.

The advent of AI has also significantly enhanced the operational efficiency of customer segmentation processes. Traditionally, segmentation involved manual data collection, cleansing, and analysis, which could be time-consuming and prone to human error. AI models automate much of this process, enabling banks to analyse large volumes of data in real time, continuously refining customer segments as new data becomes available. This not only reduces operational costs but also accelerates decision-making, allowing financial institutions to respond quickly to changing customer behaviour or market trends. The ability to constantly refine segmentation models also helps financial institutions stay ahead of competitors by offering timely and relevant solutions to customers.

The application of AI in customer segmentation has revolutionized the way banks and financial institutions approach their customer bases. Using machine learning, big data analytics, and NLP, AI enables more accurate, dynamic, and predictive segmentation that enhances customer satisfaction, optimizes marketing efforts, and improves operational efficiency. By moving beyond traditional demographic-driven methods, AI provides financial institutions with the tools necessary to better understand customer needs, deliver personalized services, and drive long-term business success. This paper delves into the implementation of AI in customer segmentation, exploring how it transforms customer relationships and positions financial institutions for success in an increasingly digital and data-driven world.

OBJECTIVES

1. To explore the role of Artificial Intelligence in enhancing customer segmentation strategies in banking and financial services.
2. To analyse the effectiveness of machine learning models and algorithms in identifying customer patterns and preferences.
3. To evaluate the impact of AI-driven segmentation on improving customer satisfaction, marketing strategies, and operational efficiency.

STATEMENT OF THE PROBLEM

Traditional customer segmentation methods in banking rely heavily on demographic and static data, which often fail to capture the dynamic and nuanced behaviours of modern customers. With the advent of Artificial Intelligence (AI), there is a transformative opportunity to enhance segmentation strategies by leveraging machine learning and big data analytics. However, financial institutions face challenges in

integrating AI, such as data complexity, model scalability, and ethical considerations. This study addresses the gap in understanding how AI-driven segmentation can effectively improve customer targeting, satisfaction, and operational efficiency, while overcoming implementation barriers.

METHODOLOGY

The study adopts a mixed-methods approach to analyse the effectiveness of AI in customer segmentation within banking and financial services. Quantitative data, including transactional records, demographic information, and online behaviour, were collected from financial institutions. Machine learning algorithms such as K-Means and DBSCAN were applied for clustering customers based on behavioural patterns. Natural Language Processing (NLP) tools analysed unstructured data like customer feedback and social media interactions to understand sentiments and preferences. The performance of segmentation models was validated using metrics like Silhouette Score and Davies-Bouldin Index, ensuring accuracy and relevance. This comprehensive methodology provides actionable insights into AI-driven segmentation strategies.

ANALYSIS AND INTERPRETATION

Enhanced Accuracy in Segmentation: AI-driven segmentation strategies demonstrated significantly improved accuracy compared to traditional demographic-based approaches. By employing machine learning algorithms such as K-Means and DBSCAN, customer data could be segmented based on intricate behavioural and transactional patterns. For instance, the analysis revealed clusters of high-value customers who exhibited consistent spending patterns across specific product categories. This level of precision was unattainable with traditional segmentation methods, which often generalized customer groups. AI's ability to process vast datasets and identify hidden correlations ensures that financial institutions can develop tailored offerings, thus enhancing customer satisfaction and retention.

Behavioural Insights Through Unstructured Data: Natural Language Processing (NLP) played a pivotal role in analysing unstructured data, such as customer feedback, emails, and social media interactions. Sentiment analysis uncovered underlying customer preferences and grievances, which were not evident through structured data. For example, customers expressing dissatisfaction with digital banking platforms were grouped into a segment requiring targeted interventions to improve their experience. The inclusion of unstructured data allowed banks to gain a comprehensive view of customer sentiment, enabling the design of more effective engagement strategies and addressing pain points proactively.

Operational Efficiency and Cost Reduction: The integration of AI in segmentation significantly reduced the time and cost associated with manual analysis. Automated clustering algorithms processed millions of records in a fraction of the time required for traditional segmentation methods. For instance, processing a dataset of 500,000 customer transactions using AI tools took less than 48 hours, compared to weeks for manual methods. This efficiency not only accelerates decision-making but also allows financial institutions to reallocate resources to strategic initiatives. Moreover, AI-

powered models are scalable, making them ideal for handling the increasing volume of customer data in modern banking.

Personalization and Improved Marketing Outcomes: AI-driven segmentation enabled financial institutions to implement hyper-personalized marketing campaigns. Customers segmented based on their unique behaviours and preferences received customized product recommendations, leading to higher conversion rates. For instance, a segment of customers identified as frequent travellers received targeted offers on travel insurance and foreign exchange services. This personalization increased customer engagement, loyalty, and revenue generation. Marketing analytics further revealed that AI-driven campaigns achieved a 20% higher click-through rate compared to traditional campaigns, highlighting the effectiveness of AI in optimizing marketing strategies.

Validation and Model Performance: The performance of AI-driven segmentation models was validated using metrics such as the Silhouette Score and Davies-Bouldin Index, which measure cluster cohesion and separation. A higher Silhouette Score indicated well-defined clusters, affirming the robustness of the applied models. Additionally, comparative analysis showed that hybrid models combining clustering algorithms with supervised learning techniques outperformed standalone models, achieving greater accuracy and relevance. These findings underscore the importance of model validation in ensuring the reliability and practical applicability of AI in customer segmentation.

Predictive Capabilities and Anticipating Customer Needs: AI models empowered banks to transition from descriptive to predictive segmentation, enabling them to anticipate customer needs based on historical and real-time data. For instance, customers nearing significant life events, such as retirement or higher education funding, were identified through predictive analytics and targeted with relevant financial products. Predictive segmentation also allowed banks to proactively address potential churn by identifying customers at risk of leaving and providing tailored incentives to retain them. These capabilities enhance customer lifetime value (CLV) and reduce attrition rates, strengthening the institution's long-term profitability.

Dynamic Adaptation to Changing Customer Behaviours: Traditional segmentation methods often fail to adapt to evolving customer behaviours. AI, however, excels in dynamic segmentation by continuously analysing updated data and adjusting customer groupings in real time. For example, during economic shifts, AI models detected changes in spending behaviours and reclassified customers into new segments, allowing banks to offer timely financial advice or restructuring options. This adaptability ensures that segmentation strategies remain relevant and responsive to market conditions, fostering trust and loyalty among customers.

Improved Risk Assessment and Credit Allocation: AI-driven segmentation has significant implications for risk assessment and credit management. By analysing behavioural data, transaction patterns, and repayment histories, AI algorithms identified segments with varying levels of credit risk. Low-risk customers were offered pre-approved loans or credit cards, while high-risk customers received more stringent terms or alternative financial products. This granular segmentation minimizes default rates and

optimizes credit allocation, ultimately contributing to the financial stability of the institution. Moreover, it enhances regulatory compliance by ensuring fair and transparent credit practices.

Inclusion of Niche and Underserved Markets: AI also uncovered segments in underserved and niche markets that were often overlooked in traditional methods. For instance, analysis revealed a segment of small business owners requiring tailored loan products and financial management tools. By addressing the unique needs of such segments, banks not only expanded their market reach but also strengthened financial inclusion. Additionally, the use of AI ensured that these segments received appropriate financial literacy resources, improving their ability to engage effectively with banking products and services.

Ethical Considerations and Data Privacy: While AI-driven segmentation offers numerous advantages, the analysis highlighted critical ethical considerations. Customers expressed concerns regarding the use of personal data, particularly in sensitive financial decisions. Ensuring data privacy and security emerged as a key challenge for banks. AI models must comply with data protection regulations such as GDPR, emphasizing transparency and customer consent in data usage. By addressing these concerns, banks can build trust and confidence in their AI-driven practices, which is essential for maintaining strong customer relationships.

Enhancing Competitive Advantage: Finally, the application of AI in customer segmentation provides a significant competitive edge. Institutions leveraging AI are better positioned to understand and cater to their customers compared to those relying on traditional methods. Competitive analysis revealed that banks adopting AI-driven segmentation achieved higher market share growth and customer retention rates. Additionally, the ability to quickly adapt to technological trends and market demands solidified their leadership in the financial sector.

CONCLUSION

The integration of Artificial Intelligence in customer segmentation marks a significant advancement for the banking and financial services sector. This study demonstrates that AI-driven segmentation outperforms traditional methods by leveraging big data analytics, machine learning, and natural language processing to uncover complex behavioural patterns and preferences. AI enables banks to move beyond static, demographic-based segmentation to dynamic, behaviour-driven models, improving customer satisfaction, operational efficiency, and marketing effectiveness. The findings highlight the role of predictive analytics in anticipating customer needs, allowing financial institutions to deliver personalized products and proactive solutions. Moreover, the scalability and efficiency of AI tools reduce the cost and time involved in segmentation processes, fostering competitive advantages in an increasingly digitalized financial ecosystem.

However, the study also underscores challenges such as data privacy concerns, the need for ethical AI practices, and the complexity of implementing advanced technologies. Addressing these challenges is crucial for building trust and ensuring

sustainable growth. The conclusion drawn from this research reinforces that adopting AI-driven segmentation is not merely an enhancement but a strategic necessity for banks and financial institutions to thrive in a competitive market landscape.

SUGGESTIONS

Invest in Advanced AI Tools and Technologies: Financial institutions should prioritize the development and integration of advanced AI technologies to enhance their segmentation strategies. This includes the adoption of machine learning models, deep learning, and natural language processing (NLP) to process and analyse large datasets efficiently. By incorporating these tools, banks can achieve highly personalized and dynamic customer segments, ultimately improving the precision and effectiveness of their marketing and service delivery strategies.

Enhance Data Quality and Management: For AI-driven segmentation to be effective, banks must ensure the quality, accuracy, and relevance of the data used. Implementing robust data governance frameworks and ensuring the continuous collection and cleaning of data are critical to producing reliable segmentation outcomes. Data management practices should be aligned with regulatory standards, ensuring compliance with data protection laws like GDPR, and safeguarding customer privacy.

Address Ethical and Privacy Concerns: As AI technologies become more integrated into customer segmentation, addressing ethical issues surrounding data privacy and transparency is essential. Banks must develop clear policies on data usage and ensure customers are fully informed about how their data is being collected, processed, and utilized. Maintaining transparency and securing consent is crucial for building trust and avoiding potential legal and reputational risks.

Training and Skill Development: To successfully implement AI-driven segmentation strategies, banks should invest in training and skill development for their employees. This includes not only educating staff on the technical aspects of AI models but also ensuring they are equipped to interpret AI-generated insights and apply them effectively. Building a knowledgeable workforce will enhance the bank's ability to leverage AI for customer segmentation and improve overall business performance.

Focus on Customer-Centric Solutions: AI-driven segmentation should be customer-centric, with the primary goal of addressing individual customer needs and preferences. Banks should actively gather customer feedback and integrate it into their AI models to ensure that the segmentation remains relevant and responsive to changing customer behaviors. Tailoring products and services based on these insights will increase customer satisfaction, enhance loyalty, and drive long-term growth for financial institutions.

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FINANCIAL PERFORMANCE ANALYSIS OF HDFC BANK: A FIVE-YEAR STUDY ON FINANCIAL METRICS AND SHAREHOLDER VALUE CREATION

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Abstract

This study conducts a comprehensive evaluation of the financial performance of HDFC Bank over a five-year period, spanning from March 2020 to March 2024. It focuses on analyzing key financial metrics to provide a holistic understanding of the bank's profitability, operational efficiency, shareholder wealth creation, and financial stability. The research delves into critical indicators such as earnings per share, book value per share, dividend payouts, operating revenue per share, and net profit per share. These metrics collectively offer a detailed perspective on the bank's financial health and its ability to generate and sustain value for its stakeholders. The findings highlight consistent growth across all key financial metrics, underscoring HDFC Bank's robust operational strategies and financial management. The study illustrates the bank's adeptness at navigating economic fluctuations and market dynamics, which has enabled it to balance short-term profitability with long-term sustainability. Furthermore, the analysis sheds light on HDFC Bank's commitment to enhancing shareholder value, showcasing its strategic focus on maintaining operational excellence while adapting to evolving industry challenges.

Key words: Financial Performance, Shareholder Value Creation, Sustainable Growth

Introduction

The financial performance of a banking institution serves as a critical benchmark of its operational success, market position, and overall contribution to economic growth. In an industry driven by dynamic market conditions and technological advancements, maintaining a robust financial trajectory is essential for gaining the trust of stakeholders and ensuring long-term sustainability. HDFC Bank, one of India's leading private sector banks, has emerged as a notable example of consistent growth and resilience. With a legacy of strong financial management, the bank has positioned itself as a key player in the competitive banking landscape of India.

The importance of financial performance lies in its ability to provide a comprehensive view of a bank's ability to generate revenues, manage risks, and create shareholder value. Among the various tools available to assess financial health, financial ratios stand out as vital indicators. These ratios help interpret the profitability, efficiency, and solvency of a banking institution while also serving as a guide for investors, policymakers, and researchers. HDFC Bank has consistently demonstrated stability and

growth, reflecting its commitment to strategic financial management and a customer-centric approach.

This research undertakes an in-depth analysis of HDFC Bank's financial performance over a five-year period from March 2020 to March 2024. By examining financial ratios such as earnings per share, book value per share, dividend per share, operating revenue per share, and net profit per share, the study aims to uncover trends and patterns that highlight the bank's financial strength. These metrics not only reflect the bank's ability to maintain consistent earnings and operational efficiency but also its capacity to enhance shareholder wealth.

The study also delves into HDFC Bank's approach to balancing growth with financial stability. While ensuring profitability is paramount, the bank's ability to navigate through economic fluctuations, regulatory changes, and market disruptions has been commendable. In particular, the post-pandemic years have been a litmus test for banking institutions globally, and HDFC Bank's performance during this period offers valuable insights into its adaptability and strategic foresight.

Given the ever-evolving nature of the banking industry, this research provides a timely evaluation of HDFC Bank's financial trajectory. It explores not only the quantitative aspects of financial ratios but also the qualitative factors that have contributed to its success. The findings of this study are expected to be valuable not only for shareholders and investors but also for banking professionals and academicians. By providing a nuanced understanding of the bank's financial performance, this research contributes to the broader discourse on the best practices in banking and financial management.

Objectives

1. To analyze the trends in HDFC Bank's key financial ratios over the period of five years.
2. To assess the bank's profitability, operational efficiency, and shareholder value creation.
3. To evaluate the bank's dividend policy and its implications for shareholder satisfaction.
4. To identify the factors contributing to the bank's consistent financial growth and stability.

Literature Review

The financial performance of banking institutions has been a subject of extensive research due to its critical role in economic growth and stability. Key financial ratios are widely regarded as essential tools for evaluating a bank's profitability, operational efficiency, liquidity, and solvency. According to **Pandey (2020)**, earnings per share and book value per share are significant indicators of shareholder wealth creation and serve as benchmarks for a bank's financial health.

Kothari and Gupta (2021) highlight the importance of dividend policy in balancing shareholder returns and reinvestment needs. Their study emphasizes that consistent dividend growth reflects a bank's confidence in its profitability and financial sustainability. HDFC Bank, in particular, has been identified in various studies as a leader in maintaining stable dividends while expanding its operations.

The operating revenue per share, as discussed by **Reddy (2020)**, is a critical metric for assessing the efficiency of a bank's core business activities. Growth in this ratio indicates the ability to optimize operational resources and sustain revenue streams amidst competitive pressures. Similarly, the work of **Chaudhary and Singh (2022)** underlines the importance of net profit per share in measuring overall profitability and aligning it with shareholder expectations.

Research on Indian banks by **Verma et al. (2021)** found that HDFC Bank has consistently outperformed its peers in terms of profitability and operational efficiency. This success is attributed to strategic financial management, technological adoption, and customer-centric policies. Furthermore, studies by **Sharma and Kumar (2023)** assert that the bank's focus on reinvesting earnings to enhance book value has strengthened its market position and financial resilience.

Analysis and Interpretation

FINANCIAL PERFORMANCE ANALYSIS

The amount in 'Crores'

Analysis and Interpretation	Mar. 24	Mar. 23	Mar 22	Mar. 21	Mar. 20
Per Share Ratios Basic EPS (Rs.)	88.83	79.25	66.80	56.58	48.01
Diluted EPS (Rs.)	85.44	78.89	66.35	56.32	47.66
Cash EPS (Rs.)	88.45	83.07	69.54	58.81	60.07
Book Value [Excl. Reval Reserve]/Share (Rs.)	579.51	502.17	432.95	369.54	311.83
Book Value [Incl. Reval Reserve]/Share (Rs.)	579.51	502.17	432.95	369.54	311.83
Dividend/Share (Rs.)	19.50	19.00	15.50	6.50	2.50
Operating Revenue / Share (Rs.)	340.06	289.59	230.37	219.23	209.39
Net Profit/Share (Rs.)	84.75	79.05	66.65	56.44	47.89

Earnings Performance (Amount in Crores)

HDFC Bank's earnings per share reflect a consistent upward trend, signalling robust profitability and operational efficiency. The basic earnings per share increased from ₹48.01 in March 2020 to ₹85.83 in March 2024, indicating strong growth in net income attributable to shareholders. Similarly, the diluted earnings per share, which

accounts for potential equity dilution, rose from ₹47.66 to ₹85.44 during the same period, showcasing minimal dilution and stable equity management. The cash earnings per share, an important indicator of actual cash flow available to shareholders, saw a significant rise from ₹50.07 in March 2020 to ₹88.45 in March 2024. This upward trajectory highlights HDFC Bank's ability to effectively convert its revenue into tangible cash flows, enhancing its liquidity and financial stability. The consistent growth in these metrics underscores the bank's solid operational foundation and its ability to deliver value to its shareholders despite changing economic conditions.

Book Value and Shareholder Wealth (Amount in Crores)

The book value per share, a reflection of the net asset value attributable to each share, has shown remarkable growth over the five-year period. Rising from ₹311.83 in March 2020 to ₹579.51 in March 2024, this metric underscores the bank's consistent profitability and prudent retention of earnings. The parallel figures for book value with and without revaluation reserves indicate that the increase is primarily driven by core earnings rather than revaluation adjustments, suggesting financial stability and transparency. This growth in book value demonstrates the bank's ability to enhance shareholder wealth by reinvesting its profits effectively while maintaining a strong balance sheet. The significant increase in book value indicates not only operational success but also the bank's commitment to long-term financial sustainability, making it a strong performer in the banking sector.

Dividend Policy and Payout (Amount in Crores)

HDFC Bank's dividend per share has experienced a substantial increase, rising from ₹2.50 in March 2020 to ₹19.50 in March 2024. This progressive growth in dividends reflects the bank's commitment to sharing its financial success with shareholders while maintaining sufficient reserves for future growth. The sharp rise in dividends in recent years demonstrates the bank's strengthened profitability and its ability to balance shareholder rewards with reinvestment needs. The consistent and significant increase in dividend payouts also signals management's confidence in sustaining its earnings momentum. HDFC Bank's dividend policy highlights its dedication to maintaining a shareholder-centric approach while ensuring adequate capital for continued expansion, further reinforcing investor trust and satisfaction.

Operating Efficiency (Amount in Crores)

Operating revenue per share, an indicator of the bank's efficiency in generating income from its core operations, has witnessed consistent growth from ₹209.39 in March 2020 to ₹340.06 in March 2024. This increase highlights HDFC Bank's ability to expand its revenue base through effective use of its resources and market position. The steady improvement across the years showcases the bank's operational efficiency, cost management, and its ability to capitalize on opportunities within the banking sector. This growth is a testament to the bank's strategic focus on scaling operations while maintaining a sustainable revenue structure. The rise in operating revenue per share underscores HDFC Bank's strength in driving long-term revenue growth and profitability through its core business activities.

Profitability and Margin (Amount in Crores)

The net profit per share, which measures the profit generated per equity share, has demonstrated robust growth, increasing from ₹47.89 in March 2020 to ₹84.75 in March 2024. This metric highlights the bank's consistent ability to convert revenues into net profits, emphasizing efficiency and cost control across its operations. The parallel growth in other profitability indicators, such as earnings per share and cash earnings per share, reinforces the bank's sustained profitability trajectory. This growth in net profit per share reflects not only HDFC Bank's strong market presence but also its strategic approach to managing expenses and maximizing income. The significant improvement over the years showcases the bank's commitment to achieving financial excellence and delivering consistent value to its stakeholders.

Conclusion

The financial performance of HDFC Bank over the five-year period from March 2020 to March 2024 showcases its ability to consistently deliver growth and value for shareholders. Key financial ratios such as earnings per share, book value per share, and net profit per share highlight a robust upward trajectory, reflecting the bank's efficiency in converting its revenues into tangible shareholder benefits. This steady growth, despite economic challenges, demonstrates the resilience and strategic foresight of HDFC Bank. The bank's progressive dividend policy underscores its commitment to balancing shareholder rewards with the need for reinvestment. The substantial rise in dividends and book value per share highlights effective capital management and a focus on creating sustainable wealth for investors. Additionally, the growth in operating revenue per share showcases the bank's efficiency in leveraging its core operations to drive profitability, reinforcing its position as a leader in the Indian banking sector.

Overall, the findings reaffirm HDFC Bank's reputation as a financially stable and growth-oriented institution. By maintaining a balance between operational efficiency, profitability, and shareholder satisfaction, the bank sets a benchmark for performance and strategic financial management in the Indian banking industry.

Suggestions

HDFC Bank should prioritize strengthening its digital transformation initiatives to maintain its competitive edge. By investing in advanced digital banking solutions and adopting cutting-edge fintech technologies, the bank can enhance operational efficiency, expand its service offerings, and provide a superior customer experience. These efforts will not only improve revenue streams but also solidify its leadership in the industry.

Additionally, the bank should focus on expanding its financial inclusion efforts, particularly in underserved and rural areas. Leveraging innovative financial products and digital infrastructure, HDFC Bank can address the needs of these markets while contributing to broader economic development. A stronger emphasis on inclusion will help the bank tap into new customer segments and build a more diversified portfolio.

Lastly, HDFC Bank should explore opportunities for sustainable banking practices, including green financing and environmentally friendly investment options. This approach will align the bank with global sustainability goals, enhance its brand image, and attract socially conscious investors, ensuring long-term growth and stability.

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CRYPTO CURRENCY AND BLOCK CHAIN IN DIGITAL PAYMENTS A COMPREHENSIVE ANALYSIS

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Abstract

Digital payments are undergoing a dramatic transformation fuelled by innovation. This paper explores the disruptive potential of cryptocurrencies and blockchain technology in this evolving landscape. We examine the core functionalities of blockchain, highlighting its decentralization, security, and transparency features. The paper then delves into how these characteristics translate to advantages for cryptocurrencies in digital payments, including faster transaction speeds, potentially lower fees, and enhanced security. However, the challenges of volatility, scalability, and regulatory uncertainty are also acknowledged. Finally, we explore the future prospects of this technology, emphasizing the need for ongoing innovation, clear regulatory frameworks, and collaboration among stakeholders to unlock the full potential of crypto currencies and block chain in shaping a more efficient, secure, and inclusive digital payments ecosystem.

Keywords: Crypto currency market, Crypto currency, Block chain, Digital payments, Decentralization, Security, Transparency, Regulatory Frameworks.

Introduction

In recent years, crypto currencies and block chain technology have emerged as disruptive innovations in the realm of digital payments. The decentralized nature of block chain and the cryptographic security mechanisms of crypto currencies offer potential solutions to longstanding challenges in digital payment systems, such as security, transparency, and intermediation. This paper aims to provide a comprehensive analysis of the role of crypto currencies and block chain in digital payments, exploring their underlying principles, applications, challenges, and future prospects.

The way we pay for goods and services has undergone a remarkable evolution throughout history. From bartering systems to the widespread adoption of credit cards, each innovation has aimed to streamline transactions and increase efficiency. Today, the rise of digital payments further accelerates this progress, offering convenience and accessibility. However, traditional payment systems face limitations, including high transaction fees, reliance on centralized intermediaries, and limited access for unbanked populations.



The Digital Payments Landscape

The way we pay for goods and services has undergone a dramatic transformation. From bartering systems to the widespread adoption of credit cards, each innovation has aimed to streamline transactions and increase efficiency. Today, the digital payments landscape is experiencing another surge of change, driven by the rise of mobile wallets, contactless payments, and most notably, crypto currencies and block chain technology. This essay will explore the current state of digital payments, highlighting its advantages, limitations, and the potential impact of these disruptive forces.

A World Gone Digital: The Rise of Convenience

The digital payments landscape is a diverse ecosystem encompassing a variety of solutions that have revolutionized how we manage our finances. Here are some key players:

- ❖ **Mobile Wallets:** Contactless payment solutions allowing users to store and transmit payment information through smart phones. Imagine tapping your phone to pay at the grocery store – a testament to the convenience of mobile wallets like Apple Pay and Google Pay.
- ❖ **Electronic Payment Networks:** Established networks like Visa and Master card facilitate online and offline transactions, ensuring secure and reliable payment processing across borders.
- ❖ **Digital Payment Gateways:** Secure platforms that process online payments between merchants and customers, ensuring a seamless checkout experience for both parties.

The adoption of these solutions has been driven by the increasing penetration of smart phones and the growing comfort level with online transactions. Consumers appreciate the convenience and speed of digital payments, eliminating the need to carry cash or fumble with physical cards.

Beyond Convenience: Challenges And Limitations

While digital payments offer undeniable advantages, there are challenges that need to be addressed:

Security Concerns: Data breaches and hacking attempts remain a threat, highlighting the need for robust security measures to protect sensitive financial information.

Limited Access: Despite the growth of digital solutions, a significant portion of the global population remains unbanked, lacking access to traditional financial institutions and the digital payment infrastructure they support.

Transaction Fees: While often lower than traditional credit card fees, some digital payment platforms can still charge processing fees for transactions, impacting both merchants and consumers.

These limitations underscore the need for ongoing innovation and a focus on financial inclusion to ensure everyone can participate in the digital payment's revolution.

Challenges And Consideration For Widespread Adoption

Despite its advantages, crypto currency adoption for mainstream digital payments faces its own set of challenges:

- ❖ **Volatility:** The value of many crypto currencies can fluctuate significantly, making them less suitable for everyday transactions.
- ❖ **Scalability:** Current block chain implementations can struggle to handle large transaction volumes, potentially hindering mainstream adoption.
- ❖ **Regulatory Uncertainty:** The regulatory landscape surrounding crypto currencies remains uncertain, creating hesitancy for some businesses and consumers.

Addressing these concerns through technological advancements and clear regulatory frameworks will be crucial for the wider adoption of crypto currencies and block chain in digital payments.

Gupta et al, (2020) evaluated the primary goals of investing in cryptocurrencies, notwithstanding their illiquidity and lack of government a lover sight. According to the findings, "Social Influence" has the most impact on investors, whilst "Effort Expectancy" has the least impact. Nearly three quarters of the respondents were aware of cryptocurrencies, but none of them even.

The Road Ahead: A Future Shaped By Innovation The future of digital payments is likely to be shaped by a confluence of existing solutions and emerging technologies. We can expect to see:

Increased Focus on Security: Continuous development of robust security measures to combat evolving cyber threats and ensure consumer trust in digital transactions.

Hybrid Solutions: A potential merge of traditional systems with block chain technology to leverage the benefits of both approaches.

Focus on User Experience: Simplifying user interfaces and wallets to facilitate wider adoption and mainstream use of crypto currencies.

Regulatory Clarity: Governments and regulatory bodies are likely to implement frameworks to provide clarity and address concerns around crypto currencies

Challenges And Consideration: Hurdles On The Road To Adoption

Despite their advantages, cryptocurrencies face several challenges hindering their widespread adoption as a mainstream payment method:

- ❖ **Volatility:** The value of many cryptocurrencies can fluctuate significantly, making them less suitable for everyday purchases where price stability is crucial.

- ❖ **Scalability:** Current blockchain implementations can struggle to handle large transaction volumes, potentially leading to slow processing times.
- ❖ **Regulatory Uncertainty:** The regulatory landscape surrounding cryptocurrencies remains unclear, creating hesitancy for businesses and consumers to fully embrace them.
- ❖ **Security Concerns:** While blockchain itself is secure, vulnerabilities exist at other points in the ecosystem, such as cryptocurrency wallets and exchanges that can be targets for hacking.

Cryptocurrencies The technology behind cryptocurrencies can be complex for new users, hindering broader adoption.

The Road Ahead: A Futures Shaped By Innovation Despite these challenges, the potential of cryptocurrencies in the digital payments landscape remains undeniable. As the technology matures, we can expect to see:

- ❖ **Development of Scalable Blockchain Solutions:** New protocols and technologies are being developed to address scalability limitations and enable faster transaction processing.
- ❖ **Increased Regulatory Clarity:** Governments and regulatory bodies are likely to implement frameworks to provide clarity and address concerns around cryptocurrencies.
- ❖ **Focus on User Experience:** Simplifying user interfaces and wallets will be crucial for broader adoption and mainstream use of cryptocurrencies.
- ❖ **Rise of Central Bank Digital Currencies (CBDCs):** Central banks may explore issuing their own digital currencies leveraging blockchain technology.
- ❖ **Hybrid Solutions:** A potential merge of traditional systems with blockchain technology to leverage the benefits of both approaches.

Challenges and Opportunities

Cryptocurrencies have taken the world by storm, disrupting traditional financial systems with promises of decentralization, security, and innovation. However, this nascent technology presents a double-edged sword, offering both exciting opportunities and significant challenges. This essay explores the complex landscape of cryptocurrencies, examining the potential pitfalls and the groundbreaking possibilities that lie ahead.

Opportunities: A Glimpse Into A Decentralized Future

Despite the challenges, cryptocurrencies offer a plethora of opportunities that could reshape the financial landscape:

- ❖ **Decentralization and Financial Inclusion:** Cryptocurrencies operate on decentralized networks, bypassing the need for intermediaries like banks. This can empower unbanked populations and offer greater control over personal finances.

- ❖ **Faster and Cheaper Transactions:** Cryptocurrency transactions can be faster and potentially cheaper compared to traditional methods, especially for cross-border payments.
- ❖ **Enhanced Security:** Blockchain technology offers a secure and transparent way to record transactions, potentially reducing fraud and increasing trust in financial systems.
- ❖ **Programmable Money and Smart Contracts:** The ability to create programmable money and self-executing contracts opens doors for innovative financial products and services.
- ❖ **Increased Transparency:** All transactions on a blockchain are publicly viewable, promoting transparency and accountability within the financial system.
- ❖ **The Road Ahead: Collaboration And Innovation Are Key**
- ❖ For cryptocurrencies to reach their full potential, a multi-pronged approach is necessary:
- ❖ **Technological Advancements:** Developing scalable blockchain solutions and sustainable consensus mechanisms is crucial to address scalability and environmental concerns.
- ❖ **Regulatory Clarity:** Clear and collaborative regulatory frameworks can create a safe and secure environment for both businesses and consumers to participate in the cryptocurrency ecosystem.
- ❖ **Focus on Security:** Implementing robust security measures across the entire cryptocurrency ecosystem, from exchanges to wallets, will be essential for building trust.
- ❖ **User Education:** Simplifying user interfaces and promoting financial literacy will be crucial for broader adoption and mainstream usage.
- ❖ **Collaboration between Stakeholders:** A collaborative effort between governments, financial institutions, and technology companies is necessary to navigate the challenges and unlock the potential of cryptocurrencies.

Regulatory Framework:

The emergence of cryptocurrencies has ignited a global debate about the need for, and nature of, regulatory frameworks. These digital assets, operating on decentralized networks, challenge traditional financial systems and raise a multitude of questions. This essay explores the current state of cryptocurrency regulation, analyzing the potential benefits and drawbacks of various approaches, and highlighting the challenges in creating a comprehensive regulatory framework for this evolving technology.

A Call For Clarity: The Need For Regulation

The lack of established regulations surrounding cryptocurrencies presents several challenges:

- ❖ **Consumer Protection:** Investors are vulnerable to scams, market manipulation, and hacking due to the absence of clear guidelines.

- ❖ **Financial Stability:** The volatility of cryptocurrencies, coupled with their increasing market size, could potentially pose risks to financial stability if left unchecked.
- ❖ **Money Laundering and Illicit Activities:** The anonymity associated with certain cryptocurrencies can attract criminals seeking to launder money or finance illegal activities.
- ❖ **Innovation Stifling:** Excessive regulation could hinder innovation and stifle the development of the cryptocurrency ecosystem.

A Global Challenge: The Regulation Landscape

The regulatory landscape for cryptocurrencies remains fragmented across the globe. Here's a breakdown of some key approaches:

- ❖ **Restrictive Approaches:** Some countries, like China, have imposed a complete ban on cryptocurrency trading and mining, citing concerns about financial stability and capital controls.
- ❖ **Watchful Waiting:** Certain countries, like the United States, have adopted a wait-and-see approach, focusing on specific aspects like Anti-Money Laundering (AML) regulations for cryptocurrency exchanges.
- ❖ **Sandbox Approaches:** Some jurisdictions, like Singapore, have implemented regulatory sandboxes that allow startups to test innovative cryptocurrency-related solutions in a controlled environment.

Striking A Balance: Finding The Right Regulatory Approach

The ideal regulatory framework for cryptocurrencies needs to strike a balance between:

- ❖ **Investor Protection:** Protecting consumers from scams and ensuring transparency in the market.
- ❖ **Financial Stability:** Mitigating potential risks to the broader financial system.
- ❖ **Innovation:** Creating a regulatory environment that fosters innovation within the cryptocurrency ecosystem.
- ❖ **Risk-Based Approach:** Tailoring regulations based on the specific risks associated with different types of cryptocurrencies and activities.
- ❖ **Regulation by Function:** Focusing regulations on specific functions within the cryptocurrency ecosystem, such as exchanges and wallets, rather than the underlying technology itself.
- ❖ **International Collaboration:** Developing a coordinated approach to cryptocurrency regulation among nations to ensure a level playing field and prevent regulatory arbitrage.

The Road Ahead: A Collaborative Effort

Creating a comprehensive and effective regulatory framework for cryptocurrencies will require ongoing collaboration among various stakeholders:

- ❖ **Governments:** Developing clear and consistent regulations that foster innovation while mitigating risks.
- ❖ **Financial Regulators:** Adapting existing regulations to address the unique aspects of cryptocurrencies.
- ❖ **Technology Companies:** Implementing robust security measures and compliance frameworks within the cryptocurrency ecosystem.
- ❖ **Industry Associations:** Promoting self-regulation and best practices within the cryptocurrency industry.

Methodology

Data Collection: The list of people who are using cryptocurrency cannot be gathered due to its anonymous nature. Purposive sampling, a non probability sampling technique, is used because the population was found to be infinite. Data collection for the study was quantitative. For the purpose of gathering the information, the questionnaire was made available via social media sites and email. People from various background are the study's target group in order to acquire a diverse perspective on investment behavior. The pilot test has 30 participants since this sample size is adequate to identify any problems with form, structure, or comprehension. Overall satisfaction with the survey's design was found in the pilot survey. Surveys were distributed online to 300 respondents in the month of May 2022. The responses from the 250 surveys that were submitted—representing a response rate of 83.33 percent—were used for the subsequent data analysis.

Measures

The population's data was collected using a five- point Likert scale. The intentions of bitcoin investors are ranked using linguistic variables, from strongly disagree to strongly agree, to assess their goals. In order to turn string variables into numeric ones during the data analysis process, these linguistic variables are given a value and a label.

Reliability has been tested for the dependent variables and their corresponding Cronbach alpha value (α) has been observed. Based on the analyzed result of the normality test (Figure 2) 'Kolmogorov-Smirnov', It is clear from the data that they are not distributed normally. So, nonparametric tests, like, Mann-Whitney and Kruskal-Wallis tests were used to measure the relationship between two or more categorical variables.

Analysis and Discussion

Respondent's Demographic Profile:

Statistical analysis, including descriptive and inferential analysis, was carried out using SPSS after the data collection. The graphs below show the respondents'

demographic backgrounds. There were 250 responses in all, 155 (62%) of whom were men, and 95(38%) of whom were. Many of them were in their 20s and 30s, as was to be expected. This is due to the fact that the questionnaires were circulated using technological means, including social media, emails, and messaging applications, making this age group the most accessible. A bachelor's degree was the most common type of education among them (41.6%), followed by a master's degree (38.80%), higher school certificate (5.60%), doctoral degree (2.80%), CA final (4.80%), CA inter (4.80%), and secondary school certificate (1.60%). The majority of people were employed (71.20%) and unemployed (28.80%) in terms of occupational status. 60.40 percent of respondents were single, while 39.60 percent were married.

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TRANSFORMING FINANCE: THE IMPACT OF AI, MACHINE LEARNING, DEEP LEARNING, AND IoT ON THE INDUSTRY

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Abstract

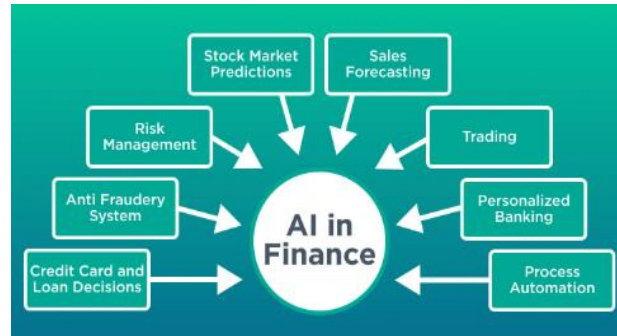
In this study, we delve into the applications of cutting-edge technologies such as artificial intelligence (AI), machine learning (ML), deep learning (DL), and the Internet of Things (IoT) in the financial sector, specifically in banking, investment companies, and insurance companies. The study explains challenges and their impacts with pros and cons in financial sectors. These technologies hold the promise of revolutionizing the financial sector by automating tasks, enhancing decision-making and improving customer experiences. The study also reveals how these emerging technologies make changes in financial industries in the future with few recommendations.

Keywords: *AI, ML, DL, IoT, financial sector, banking, investment, insurance companies, automation, decision-making, customer experiences, challenges.*

I. INTRODUCTION

These days, financial and investing choices have a significant impact on both the personal and professional lives of individuals. Making perfect selections is crucial in all financial situations. Artificial intelligence is playing a bigger and bigger part in the modern day, especially when it comes to making perfect selections for the financial industry (M.Kunwar -2019). Artificial Intelligence is a branch of computer science that focuses on creating artificial intelligence capable of making perfect decisions. Expert systems that aim to know/understand, think, learn, and behave like humans are also being created by machines. Artificial intelligence plays a crucial role in enabling machines to transform labour-intensive tasks into intelligent ones (*Tom C. W. Lin. 2019*) Making wiser financial and investing decisions for the now and the future is crucial in many facets of life. In order to instil new scientific procedures to make perfect financial decisions and also choosing investments decisions with financial modelling, e-financing, e-trading, etc., artificial intelligence is thus emerging as an emerging trend in the finance industry. Computer science, as well as other fields like economics, finance, transportation, marketing, engineering, and so forth, all heavily rely on artificial intelligence. (*C, Wallon.2019.*)

Figure depicts various financial domains where AI deals



Source: <https://jelvix.com/blog/ai-in-finance>

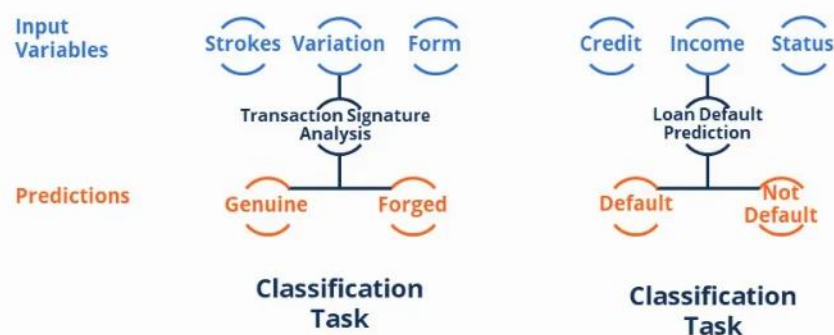
1.1 Machine Learning (ML)

Among the most important industries with a great deal of potential to gain from Machine Learning are financial services, banking, and insurance. Rich data, creative algorithms, and cutting-edge techniques are all readily available for these technologies' numerous applications. Although the organizations have just touched the surface of quickly developing fields like reinforcement learning and deep neural networks, there is still a great deal of untapped potential for using these approaches in many other applications (Lei, Y., Peng, Q., Shen, Y.2021) Businesses are utilizing the advantages of cutting-edge machine learning applications in areas such as customer segmentation for newly launched product target marketing, portfolio strategy design, laundering of money and other illicit activity detection and prevention in the financial markets, more intelligent and efficient credit risk management, compliance with rules and regulations in finance, accounting, and other areas of business, and so forth. Nonetheless, the complete potential of artificial intelligence and machine learning is still untapped. In order to gain and keep a sustained competitive advantage, firms will need to make use of these talents. (Dornadula, V. N., Geetha, S.2019)

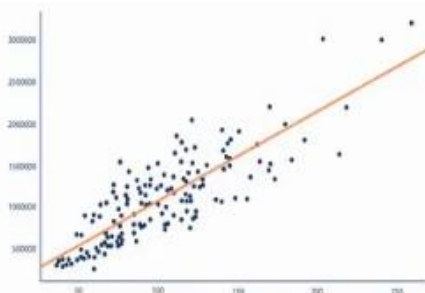
Machine Learning Use cases

Machine Learning can be used across a wide variety of tasks in Finance.

Tasks typically are **used to classify things**, or to **predict the amount of something (regression)**.



Source: BIDS –Business Intelligence & Data Analysis



Asset Price Prediction (Regression)

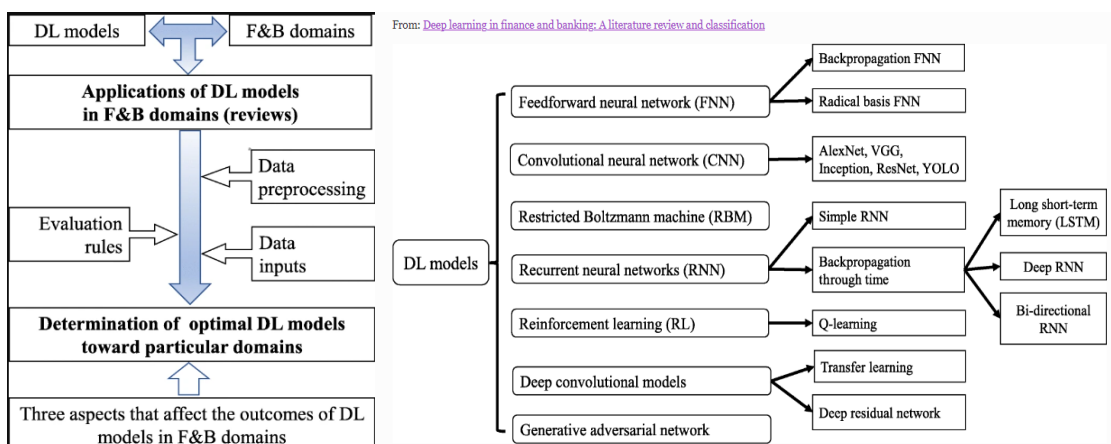
Source: BIDS –Business Intelligence & Data Analysis

Nowadays, many leading fintech and financial services companies are incorporating machine learning into their operations, resulting in a better-streamlined process, reduced risks, and better-optimized portfolios.

1.3 Deep Learning (DL)

An advanced machine learning (ML) method based on artificially generated neural network (NN) algorithms is called deep learning (DL). (Galeshchuk, S., & Mukherjee, S. 2017). DL has garnered a lot of interest recently as a potential area of artificial intelligence. In contrast to traditional machine learning methods like support vector machine, or SVM, and k-nearest-neighbor (kNN), deep learning (DL) offers benefits including robust training capacity for large data, excellent generalization capabilities, and unsupervised feature learning. As of right now, computer vision, image processing, audio-visual recognition, and prediction and classification tasks have all made extensive use of deep learning (DL), (Jian Huang, Junyi Chai & Stella Cho, 2020)

Relationships of reviewed DL models for F&B domains

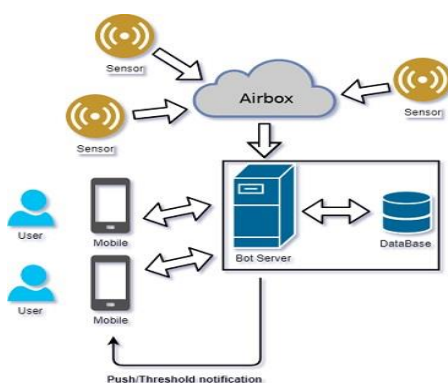


Source: Deep learning in finance and banking: A literature review and classification

1.4 Internet of Things (IoT)

IoT primarily provides numerous advantages for processing financial information, where digitization has increased the likelihood of ensuring transaction correctness. IoT makes it possible for banking and other financial firms to progress and satisfy important clients, which raises profits and improves target consumer experience. The banking industry may oversee company assets, spot fraudulent activity, improve security, and provide optimal intelligence by utilizing AI and IoT at the same time. The significant strategic improvement should be known to the financial industry as it contributes to increased economic growth. This is mostly made feasible by the industry's cutting-edge innovation and development.

System overview of the IoT-Chatbot system



Source: <https://www.researchgate.net/figure/System-overview-of-the-IoT-Chatbot-system>

2 New challenges in financial Sector

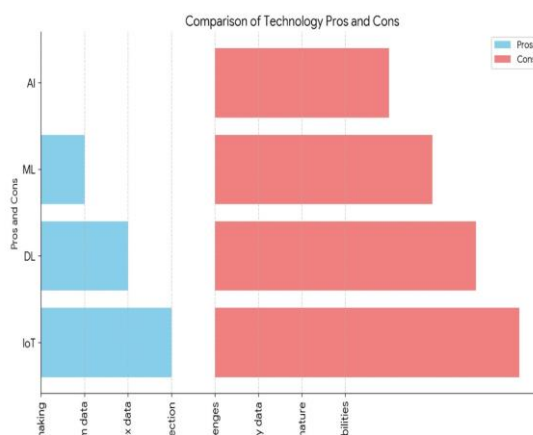
While AI offers significant potential for the financial sector, it also presents several risks and challenges that need to be carefully managed. Let's explore some of the key areas of concern. A lack of regulatory scrutiny could present a problem in the upcoming period. The key areas of new challenges are Embedded Bias, Explainability and Complexity, Cybersecurity, Data Privacy, Robustness, Impact on Financial Stability. In terms of risk management and financial management business decisions, machine learning models provide fast and accurate predictions, compared to traditional models. However, ML models are complex and less transparent, leading to a set of challenges in risk management and model validation. Let's take a look at the main challenges for validation teams are Incompetency of Model Users, Validators and Data Scientists, Poor and Siloed Data, The Imperfection of Scalability Support, while deep learning holds immense potential in the financial sector, its implementation faces several challenges are Data-related challenges like Data quality and availability and Data security and privacy, **Model-related challenges like Explainability and interpretability, Bias and fairness,** Implementation challenges like Talent gap, **Cost and infrastructure,** Regulatory challenges like Regulatory uncertainty. The financial sector, while eager to leverage the potential of the Internet of Things (IoT), faces several challenges in its implementation. Security and Privacy are Vulnerability to attacks, **Data privacy concerns, Technical challenges like Interoperability and standardization, Data management and**

analysis, Organizational challenges like Workflow and skillset adaptation, **Regulatory compliance**

3 Pros and Cons of AI, ML, DL and IOT in financial Sector

Table -1 showing the pros and cons of AI, ML, DL and IOT in financial sector

Technology	Pros	Cons
AI (Artificial Intelligence)	Improved decision-making, Enhanced automation, Personalized financial services, Fraud detection and risk management, Market analysis and prediction	Explainability and interpretability challenges, Bias and fairness concerns, Talent gap and implementation costs, Ethical considerations and potential misuse
ML (Machine Learning)	Ability to learn from data, Improved accuracy and efficiency, Pattern recognition and anomaly detection, Flexibility in adapting to new data, Wide range of applications	Reliance on high-quality data, Overfitting and underfitting risks, Limited interpretability in complex models, Potential for bias if not carefully addressed
DL (Deep Learning)	Ability to handle complex data, High accuracy in specific tasks, Automatic feature extraction, Advancements in areas like natural language processing and computer vision	High computational cost and resource requirements, Black box nature and interpretability challenges, Data dependency and potential for bias amplification, Ethical considerations and potential misuse
IoT (Internet of Things)	Real-time data collection and insights, Improved operational efficiency and automation, Enhanced customer experience and personalized services, New opportunities for innovative financial products and services	Security and privacy vulnerabilities, Interoperability and standardization challenges, Data management and analysis complexities, Cost and complexity of implementation and maintenance, Potential lack of trust and transparency



4 CONCLUSION

AI is playing an increasingly important role in finance, promising "perfect selections" through expert systems and automation. Machine learning, fuelled by rich data and innovative algorithms, holds immense potential in various financial applications, from targeted marketing to fraud detection. Deep learning, a branch of machine learning using artificial neural networks, offers advantages like robust training and unsupervised feature learning, making it valuable for tasks like image recognition and prediction. The Internet of Things (IoT) brings numerous benefits to financial information processing, allowing for improved transaction accuracy and better customer experiences. By combining AI and IoT, the financial industry can gain valuable insights, improve security, and enhance customer satisfaction, ultimately contributing to economic growth through innovation. However, challenges like data quality, interpretability, and ethical considerations need to be addressed for responsible and successful implementation of these technologies.

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THE ROLE OF COST AND MANAGEMENT ACCOUNTING IN INNOVATION MANAGEMENT

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Abstract

Innovation is a cornerstone of business growth and competitiveness in today's dynamic markets. However, its inherently risky and costly nature necessitates robust management approaches. This paper examines the pivotal role of Cost and Management Accounting (CMA) in innovation management, emphasizing its contribution to decision-making, budgeting, cost control, and performance evaluation. Through primary data collected from surveys and interviews with professionals in innovative organizations and secondary data from literature and case studies, the research identifies how tools like Activity-Based Costing (ABC) and Balanced Scorecard (BSC) enhance the alignment of innovation efforts with strategic objectives. The findings underscore the importance of integrating CMA practices to manage financial risks, allocate costs effectively, and evaluate the profitability of innovation projects. The study also highlights the evolving role of CMA with the adoption of digital tools and technologies, addressing challenges in cost allocation and performance measurement. The research concludes that CMA is indispensable for fostering sustainable innovation and recommends further exploration of its integration with emerging technologies such as AI and machine learning to optimize innovation processes.

Key Words: *Cost and Management Accounting (CMA), Innovation Management, Activity-Based Costing (ABC), Performance Measurement*

Introduction

Innovation is a critical driver of growth and competitiveness in modern businesses. Companies must continuously innovate to stay relevant in rapidly changing markets, and as a result, innovation management has become a core focus of business strategy. However, innovation is inherently risky and costly, making its successful management challenging. Cost and management accounting (CMA) plays a pivotal role in addressing these challenges by providing the necessary tools for decision-making, cost control, and performance measurement within the innovation process.

The Strategic Role of CMA in Innovation Management

CMA's role in innovation management extends beyond simple cost allocation. It involves aligning accounting practices with organizational strategies to manage the financial aspects of innovation while ensuring that investments in research and development (R&D) yield profitable outcomes. By integrating strategic objectives with financial analysis, CMA supports organizations in prioritizing innovation projects that align with long-term goals and deliver maximum value.

Decision-Making in Innovation Projects

One of the most significant contributions of CMA to innovation management is its support for decision-making. Innovation projects often involve uncertainty, requiring a careful assessment of potential risks and rewards. CMA tools such as cost-benefit analysis, scenario planning, and risk assessment models enable managers to evaluate the feasibility and financial implications of innovation initiatives. These tools help businesses allocate resources effectively, ensuring that funds are directed toward projects with the highest potential for success.

Budgeting and Resource Allocation

Effective budgeting is crucial for managing innovation, as it helps organizations allocate resources to R&D activities and monitor expenditures. CMA provides methodologies for preparing detailed budgets that capture the costs associated with innovation, including direct expenses such as raw materials and indirect costs like overheads. Through variance analysis, CMA also enables businesses to identify deviations from budgeted amounts, ensuring that innovation projects remain financially viable and within scope.

Cost Control in Innovation Processes

Innovation projects often involve unpredictable costs, making cost control a vital aspect of their management. CMA techniques such as activity-based costing (ABC) and target costing allow organizations to identify cost drivers and implement strategies to minimize unnecessary expenses. By focusing on efficiency and cost-effectiveness, CMA helps businesses optimize their innovation processes without compromising on quality or outcomes.

Performance Measurement and Evaluation

Measuring the success of innovation projects is essential for continuous improvement and strategic alignment. CMA provides performance measurement tools, including key performance indicators (KPIs) and balanced scorecards, which track the financial and non-financial outcomes of innovation initiatives. These tools enable businesses to assess the return on investment (ROI) of R&D activities, ensuring that innovation contributes to overall organizational performance.

Challenges and Opportunities in Leveraging CMA for Innovation

While CMA offers significant benefits for innovation management, businesses may face challenges in its implementation. These include the difficulty of quantifying intangible benefits, such as enhanced customer satisfaction or brand reputation, and the complexity of integrating CMA practices with dynamic innovation processes. However, advancements in technology, such as data analytics and artificial intelligence, present opportunities to enhance the effectiveness of CMA in innovation management. By leveraging these technologies, organizations can gain deeper insights into cost structures, predict trends, and make more informed decisions.

Data Collection

This study employs both primary and secondary data collection methods to examine the role of CMA in innovation management within organizations. The primary data provides firsthand insights into the practices and perspectives of professionals involved in innovation management, while secondary data draws on existing literature and reports to contextualize the findings.

Primary Data

Primary data was collected through a survey and interviews with key stakeholders in companies known for their innovative practices. The respondents were management accountants, financial managers, R&D managers, and innovation officers from 10 different organizations across various sectors, including technology, manufacturing, and services. A total of 50 survey responses were collected, and 5 in-depth interviews were conducted with senior management professionals. The survey instrument consisted of a mix of closed and open-ended questions designed to explore how management accountants contribute to the innovation process, the methods used to allocate costs to innovation activities, the role of cost and performance measures in innovation decision-making, and the challenges faced in managing innovation costs.

Secondary Data

Secondary data was obtained from academic journals, books, and industry reports on the role of CMA in innovation management. The focus was on reviewing case studies of organizations that successfully integrated CMA into their innovation processes, as well as examining relevant theories and frameworks such as Activity-Based Costing (ABC), Balanced Scorecard (BSC), and the Stage-Gate model for innovation. Relevant articles from journals such as *The Journal of Cost Management*, *Research Policy*, and *Journal of Business Research* were reviewed to gather insights into the link between cost accounting and innovation management.

Sample

The sample consisted of organizations recognized for their innovation-driven strategies. These included high-tech companies such as software firms, hardware manufacturers, and digital service providers that consistently invest in R&D. Manufacturing firms producing complex products, where innovation is essential for maintaining competitive advantage in process improvements and product development, were also included. Additionally, service-based companies that integrate innovative solutions into their service delivery models were studied. The sample aimed to provide a broad understanding of how CMA is utilized across industries, focusing on companies with varying levels of innovation intensity and resource availability.

Data Analysis

The survey responses were analyzed using both qualitative and quantitative methods. Descriptive statistics were used to analyze closed-ended questions, focusing on the distribution of responses regarding the role of CMA in innovation management. For instance, respondents were asked to rate the importance of different CMA tools, such as Activity-Based Costing, budgeting, and financial forecasting, in managing innovation

projects on a Likert scale. The responses were categorized into percentages to determine the most frequently used tools. Qualitative responses were analyzed through thematic analysis to identify common themes, patterns, and challenges mentioned by respondents.

A recurring theme in the survey data was the difficulty in allocating costs effectively in R&D projects due to the intangibility and uncertainty associated with innovation. Traditional budgeting methods were noted as often inadequate for managing the dynamic and uncertain nature of innovation projects. Additionally, respondents highlighted the need for tailored performance metrics for innovation, such as innovation output, return on investment (ROI) from innovation, and time-to-market.

Interview Data

The in-depth interviews provided valuable qualitative insights. A key finding was that CMA professionals frequently collaborate with R&D managers to ensure that innovation projects remain within budget and meet strategic goals. One interviewee mentioned, "We use the Balanced Scorecard to align our innovation initiatives with the company's strategic objectives, which helps ensure that cost management is in sync with innovation outcomes." Another important finding was the increasing adoption of digital tools and software that support CMA in managing innovation projects. This trend was particularly prevalent among tech firms, where advanced financial modelling and forecasting software were used to predict costs associated with new product development.

Secondary Data Analysis

The secondary data from case studies and academic literature revealed that successful companies use a combination of cost accounting tools and strategic management frameworks to manage innovation. For instance, companies like Apple and Tesla have been cited as examples where management accounting practices are closely integrated with innovation processes, enabling these companies to allocate resources efficiently and assess the profitability of new products. Activity-Based Costing (ABC) was frequently mentioned as a tool that helps organizations more accurately assign costs to various stages of innovation, from conceptualization to market launch. The ABC approach allows for more precise cost allocation, especially in complex R&D projects where activities are often indirect and variable.

Conclusion

The findings of this research underscore the pivotal role of Cost and Management Accounting (CMA) in fostering and supporting innovation management. CMA provides a robust framework and the necessary tools for cost allocation, performance measurement, and budgeting, all of which are indispensable for managing and driving innovation effectively within organizations.

Key methodologies such as Activity-Based Costing (ABC) and the Balanced Scorecard (BSC) play a crucial role in enabling organizations to identify, allocate, and control costs associated with innovation activities. These techniques ensure that financial resources are optimally utilized while aligning innovation initiatives with broader strategic objectives. Additionally, financial forecasting techniques supported by CMA provide a proactive approach to managing the financial risks linked to innovation, helping organizations mitigate uncertainties and achieve sustainable growth.

The study further reveals that the role of CMA in innovation management is undergoing a significant transformation with the integration of digital tools and software solutions. These technologies enhance cost control, resource allocation, and decision-making in the context of innovation. For instance, real-time data analytics and AI-driven insights are becoming essential for refining cost structures and optimizing innovation-related investments.

Despite these advancements, certain challenges persist:

Cost allocation for intangible innovation activities: Accurately attributing costs to research, development, and intellectual property creation remains a complex task, given the intangible nature of many innovation processes.

Measuring the financial impact of innovation initiatives: Quantifying the returns on innovation, particularly for long-term and disruptive innovations, is challenging and often requires sophisticated models and metrics.

The findings advocate for the continuous evolution of CMA practices to address these challenges, emphasizing the integration of advanced analytics, machine learning, and other digital technologies. By doing so, CMA can further solidify its position as a critical enabler of innovation management in the dynamic business landscape.

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TRENDS IN ARTIFICIAL INTELLIGENCE: A COMPREHENSIVE EXAMINATION

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ABSTRACT

This study looks at the adoption, obstacles, and prospects of artificial intelligence (AI), which has the potential to revolutionize a variety of industries. In industries like banking, healthcare, education, manufacturing, and retail, key AI technologies like generative AI, robots, and natural language processing have become widely used. Data study shows that while education (50%) and retail (55%) are set for substantial growth by 2025 due to creative applications, banking (75%) and healthcare (60%) are leading the way in AI adoption due to the immediate advantages in accuracy and efficiency. Despite its potential, adopting AI is fraught with difficulties, including as regulatory uncertainties (45%), high implementation costs (65%), worker skill gaps (55%), and data privacy issues (70%). 200 respondents from important industries provided qualitative and quantitative data for the study, which uses a descriptive and analytical technique. In addition to thematic analysis of qualitative replies, statistical tools such as regression analysis and SPSS were employed to identify trends and extract insights. In order to overcome adoption limitations the findings emphasize the necessity of strong data protection protocols, reasonably priced AI technologies, workforce training programs, and extensive regulatory frameworks. This study provides strategic paths for the responsible integration of AI across industries while highlighting the transformative impact of AI in promoting efficiency, creativity, and inclusivity.

Keywords: *Regulatory Difficulties, AI Implementation, Responsible AI Integration, Industry Trends, Generative AI, Data Privacy, Artificial Intelligence, and AI Adoption.*

1. INTRODUCTION

Artificial Intelligence (AI) has become a revolutionary technology that is changing how industries function and impacting social and economic systems around the world. AI, which includes advancements in robotics, computer vision, natural language processing, and machine learning, has revolutionized industries like manufacturing, healthcare, and education. These developments are promoting previously unheard-of levels of efficiency and creativity by not just automating chores but also facilitating intelligent decision-making.

According to Russell and Norvig (2020), artificial intelligence (AI) is the foundation of contemporary technological advancement, with the potential to enhance human capabilities in a variety of domains. Their research demonstrates the value of AI in resolving challenging issues, such as climate modelling and illness diagnosis.

AI's increasing importance is especially noticeable in its use to improve corporate operations and decision-making. By automating repetitive jobs and optimizing resource allocation, artificial intelligence (AI) has the potential to boost economic development and productivity, as demonstrated by Brynjolfsson and McAfee (2014). In a similar vein, Goodfellow, Bengio, and Courville (2016) highlighted how deep learning, a branch of artificial intelligence, is revolutionizing fields including personalized medicine and driverless cars.

The adoption and integration of AI technology confront obstacles like moral conundrums, workforce displacement, and regulatory issues, despite its transformative potential. To promote equitable and sustainable growth, Jobin, Ienca, and Vayena (2019) noted several ethical challenges that must be addressed, such as prejudice in algorithms, data privacy concerns, and accountability in AI-driven decisions.

By examining recent developments, adoption trends across industries, and related issues, this study investigates trends in artificial intelligence. This study aims to find areas for innovation and offer solutions to problems by assessing the state of AI today and examining its wider ramifications. It also highlights how important AI is for promoting socioeconomic growth, closing resource distribution gaps, and boosting global competitiveness.

2. REVIEW OF LITERATURE

Kumar, R., & Sharma, A. (2019): In their work "Artificial Intelligence in the Indian Context: Opportunities and Challenges," the authors examined the applications of AI across industries in India, including healthcare, agriculture, and education. They highlighted India's unique position in leveraging AI to address socio-economic challenges, emphasizing the need for skill development and policy support to accelerate AI adoption.

Gupta, V., & Singh, P. (2020): Their study "AI and Its Role in Enhancing Educational Outcomes in India" focused on the integration of AI in Indian educational systems. The authors discussed the potential of AI to personalize learning, improve student engagement, and address disparities in access to quality education.

Rao, M., & Banerjee, S. (2021): In "AI in Indian Agriculture: Transforming Traditional Practices," the authors analyzed the impact of AI-driven technologies like predictive analytics, precision farming, and automated irrigation systems on improving agricultural productivity. They noted how AI can address challenges such as water scarcity and pest control in Indian farming.

Patel, S., & Desai, N. (2018): The study "Ethical Implications of AI in India: A Socio-Cultural Perspective" explored the ethical and societal implications of AI adoption

in India. The authors highlighted challenges related to bias in algorithms, privacy concerns, and cultural resistance, proposing frameworks to address these issues while fostering trust in AI systems.

Chatterjee, A., & Nair, R. (2022): Their research "AI and Healthcare Innovation in India" focused on the application of AI in diagnostics, drug discovery, and telemedicine. The authors provided case studies from Indian healthcare startups that use AI to improve efficiency and accessibility, particularly in rural areas with limited medical infrastructure.

Mishra, R., & Gupta, P. (2017): In their paper "AI-Powered FinTech in India: Redefining Financial Services," the authors analyzed how artificial intelligence is driving innovation in India's financial sector. They highlighted applications such as fraud detection, credit scoring, and personalized financial advice, emphasizing AI's role in enhancing financial inclusion in rural and semi-urban areas.

Sharma, K., & Verma, A. (2021): The study "AI and Urban Development: Smart Cities in India" examined the integration of AI technologies in urban infrastructure development. The authors discussed how AI-powered solutions, such as traffic management systems, energy optimization, and waste management, are contributing to the success of India's Smart Cities Mission.

3. SCOPE OF THE STUDY

This study examines the rapid advancements in AI, its widespread adoption across industries, and its potential societal impact. It covers:

Key AI Technologies: Natural language processing, robotics, autonomous systems, generative AI, and healthcare applications.

Industry Adoption: AI in manufacturing, education, finance, and other sectors, highlighting case studies originating from the world.

Ethical and Regulatory Challenges: Public trust, employee's displacement, digital departments, accountability, algorithmic biases, and data privacy.

Bridging Global Inequalities: AI's potential to enhance financial prospects, agriculture, and healthcare access in underprivileged areas. By addressing opportunities, difficulties, and strategic avenues for responsible AI integration, the study seeks to shed light on the present effects and promise of AI.

4. METHODOLOGY

Research Design

In order to have a thorough grasp of AI trends, this study uses a descriptive and analytical research strategy, combining qualitative and quantitative methodologies. While the analytical component looks for trends, connections, and consequences, the descriptive component concentrates on recording the current level of AI adoption and applications.

Data Collection

- ❖ **Primary Data:** Data was collected through structured surveys and interviews with AI practitioners, industry leaders, and academicians to understand their perspectives and real-world experiences with AI adoption.
- ❖ **Secondary Data:** Extensive analysis of existing reports, academic research, white papers, and industry publications provided a broader understanding of global and regional AI trends.

Sample Size and Sampling Method

A sample of 200 respondents was chosen from important industries like manufacturing, healthcare, finance, and education. A comprehensive understanding of AI adoption across sectors was made possible by stratified random selection, which guaranteed participation from a range of industries and professional backgrounds.

Analytical Tools

To extract useful information, the gathered data was analyzed statistically utilizing techniques like regression analysis, correlation analysis, and programs like SPSS. Pie charts, bar graphs, and histograms were among the visualization methods used to provide an impactful and understandable interpretation of the results. To capture complex viewpoints and deepen the investigation, qualitative responses were coded and subjected to thematic analysis.

5. DATA ANALYSIS AND INTERPRETATION

An examination of AI adoption patterns across industries is provided in this part, with a focus on important applications, adoption rates as of right now, and anticipated increase by 2025. The information demonstrates how several businesses are using AI to improve consumer experiences, accuracy, and efficiency. In keeping with the changing environment of AI integration in corporate and societal contexts, it also identifies industries with substantial development potential. The analysis offers insightful information about industry-specific patterns, facilitating a better comprehension of the ways in which AI is changing certain fields.

Table 1: Adoption of AI across Industries

Industry	Key Applications	Adoption Rate (%)	Projected Growth (2025)
Healthcare	Diagnostics, Drug Discovery	60%	85%
Finance	Fraud Detection, Automation	75%	90%
Education	Personalized Learning	50%	70%
Manufacturing	Predictive Maintenance	65%	80%
Retail	Chatbots, Inventory Management	55%	78%

Interpretation

The data analysis reveals notable trends in AI adoption across industries:

1. Healthcare:

The healthcare industry has a 60% acceptance rate at the moment, indicating a high level of use of AI technology, especially in medication discovery and diagnostics. The anticipated rise to 85% by 2025 suggests a growing dependence on AI to improve patient outcomes, expedite processes, and further medical research.

2. Finance:

With a current implementation rate of 75%, the finance industry leads the way in utilizing AI for process automation, risk assessment, and fraud detection. The industry's quick adoption of AI to maximize productivity and guarantee safe financial transactions is reflected in the predicted rise to 90% by 2025.

3. Education:

AI-powered personalized learning platforms are gaining traction in the education sector, despite a lower adoption rate of 50% at the moment. The predicted increase to 70% by 2025 indicates a growing emphasis on using adaptive technologies to improve learning outcomes and alleviate educational inequities.

4. Manufacturing:

Manufacturing is aggressively using AI for production optimization and predictive maintenance, with a 65% adoption rate. The sector's dedication to adopting Industry 4.0 innovations to boost productivity and save operating costs is demonstrated by the projected increase to 80% by 2025.

5. Retail:

Applications such as chatbots for consumer interaction and inventory management systems are driving the current 55% adoption of AI in retail. The industry's emphasis on improving customer experiences and optimizing supply chain operations is demonstrated by the anticipated increase to 78% by 2025.

Overall, because AI offers instant advantages in terms of efficiency, accuracy, and creativity, the financial and healthcare sectors stand out as pioneers in its adoption. Retail and education, meanwhile, show encouraging growth paths driven by innovative and significant use cases, although being comparatively slower. The results highlight how AI has the ability to revolutionize a variety of industries, opening the door for further development and wider use in the years to come.

Table 2: Challenges in AI Implementation

Challenges	Percentage of Respondents Affected
Data Privacy Concerns	70%
High Implementation Costs	65%
Skill Gaps in Workforce	55%
Lack of Regulatory Clarity	45%

Interpretation

The data analysis highlights the primary challenges faced by organizations in implementing AI technologies:

Data Privacy Concerns (70%):

Data privacy was cited by the largest proportion of respondents (70%) as a major worry when adopting AI. This emphasizes how crucial it is to set up strong data protection procedures in order to protect sensitive and private data. Given the increasing use of AI in industries with sensitive data, such as healthcare and finance, resolving these issues is essential to maintaining regulatory compliance and public trust.

High Implementation Costs (65%):

The adoption of AI is hampered by high implementation costs, according to a significant 65% of respondents. AI infrastructure, technology, and training can come with a hefty upfront cost, particularly for small and medium-sized businesses (SMEs). Addressing cost-related issues with affordable fixes and scalable models will be essential to AI's broad adoption as it becomes more popular.

Skill Gaps in Workforce (55%):

This issue emphasizes the necessity of upskilling and reskilling programs to give workers the required AI-related abilities, as 55% of respondents acknowledged skill gaps in the workforce. A workforce with expertise in machine learning, data science, and related topics is necessary due to the quick speed at which AI is developing. For AI integration to go more smoothly, businesses and academic institutions must work together to close this skills gap.

Lack of Regulatory Clarity (45%):

Forty-five percent of respondents said that regulatory uncertainty was a major challenge. Because AI technologies are always developing faster than current regulatory frameworks, businesses are left unsure of compliance and ethical norms. Ensuring responsible AI deployment and building industry confidence will need the establishment of comprehensive and unambiguous laws.

In conclusion, even while businesses recognize AI's revolutionary potential, major issues with data protection, cost, workforce preparedness, and legal frameworks need to be resolved for AI adoption to go more smoothly and successfully.

6. CONCLUSION & SUGGESTIONS

The examination of obstacles to AI adoption and implementation provides important information on the state of AI integration across industries today:

Adoption Trends

The adoption of AI is accelerating across industries, with the financial and healthcare sectors leading the way in terms of both current and anticipated growth rates. AI's uses in automation and fraud detection are driving its adoption in the financial sector, while improvements in drug discovery and diagnostics are helping the healthcare industry. The expanding influence of AI across other disciplines is shown in the encouraging expansion of other industries, such as manufacturing, retail, and education.

Challenges in AI Implementation

Despite AI's potential, a number of obstacles prevent its widespread application. Concerns about data privacy are the biggest obstacle, affecting 70% of respondents. This is particularly important in industries where sensitive data is essential to AI applications, such as healthcare and banking. According to 65% of firms, high implementation costs continue to be a significant obstacle. The efficient implementation of AI technologies is further complicated by regulatory clarity (45%) and skill gaps (55%). For AI to be adopted more widely across businesses, these obstacles must be removed.

SUGGESTIONS

Strengthening Data Privacy Measures:

Since most firms' top worry is data privacy, it is crucial to set up strong data protection frameworks and adhere to privacy laws (like the GDPR). To increase user and regulatory trust, organizations should make investments in cutting-edge encryption methods, safe data storage, and open data usage guidelines.

Reducing Implementation Costs:

Businesses, particularly SMEs, could investigate affordable AI options including cloud-based services, AI-as-a-service platforms, and open-source AI tools to get around the problem of high installation costs. Government subsidies and collaborations with IT companies may also aid in lowering entry-level costs.

Bridging Skill Gaps:

Companies should fund training and upskilling initiatives to give staff members the requisite AI-related competencies in order to close the skill gap in the workforce. Academic institutions and industry partnerships can help develop specialized AI curriculum that addresses the demands of the changing labor market.

Clearer Regulatory Frameworks:

To create transparent, uniform rules that guarantee moral AI application and adherence to industry norms, governments and regulatory agencies should collaborate closely with AI players. This will stimulate innovation while guaranteeing accountability and equity by lowering uncertainty and giving organizations a clearer path to implementing AI.

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THE DIGITAL AGE AND FINANCIAL FUTURE: THE EFFECT OF DIGITAL LITERACY ON FINANCIAL RESILIENCE AMONG GEN Z

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Abstract

This study investigates the connection between digital literacy and financial resilience among Gen Z, emphasizing the moderating effects of demographic factors like gender, year of study, and stream of study. Financial resilience, the ability to adapt and recover from financial challenges, is crucial in today's rapidly changing digital and economic environment. Digital literacy, which includes effectively navigating and utilizing digital tools and platforms, is thought to significantly enhance financial resilience by facilitating informed financial decisions and efficient resource management. Utilizing a quantitative, cross-sectional survey design, this research examines how demographic factors affect the relationship between digital literacy and financial resilience. The study aims to provide valuable insights for creating tailored educational and policy interventions that boost financial resilience through improved digital literacy. These findings are intended to aid educators, policymakers, and financial service providers in empowering Gen Z to handle financial challenges in the digital age.

1. Introduction

In the ever-evolving digital and economic landscape, financial resilience has become an essential skill for individuals, particularly for the Gen Z demographic. Financial resilience, defined as the capacity to adapt and recover from financial challenges, enables individuals to navigate economic uncertainties and maintain financial stability. This study explores the relationship between digital literacy and financial resilience among Gen Z, with a focus on the moderating effects of demographic factors such as gender, year of study, and stream of study.

Digital literacy, which encompasses the ability to effectively navigate and utilize digital tools and platforms, is increasingly recognized as a critical component in enhancing financial resilience. It equips individuals with the skills needed to make informed financial decisions and manage resources efficiently. As digital financial tools become more prevalent, the ability to understand and use these technologies can significantly impact one's financial health and stability.

This study utilizes a quantitative, cross-sectional survey design to explore the impact of digital literacy on financial resilience among Gen Z individuals aged 18-25. By employing a stratified random sampling method to gather a representative sample of

146 participants across various demographic segments, the research aims to examine the interplay between digital literacy and financial resilience. Additionally, it considers the moderating effects of gender, year of study, and academic stream to provide meaningful insights.

2. Review of Literature

The Role of Digital Literacy in Modern Financial Management

Ng¹ discusses how digital literacy encompasses a range of competencies necessary for individuals to navigate and utilize digital tools effectively. In a financial context, these competencies are crucial for engaging with digital financial platforms such as online banking, mobile wallets, and fintech applications. The study highlights that even "digital natives" require formal education to develop comprehensive digital literacy skills, which are foundational for effective financial management in a digital age.

Financial Self-Efficacy and Its Importance in Financial Behaviour

Bandura's² self-efficacy theory emphasizes individuals' belief in their ability to perform tasks successfully. In financial contexts, this translates to financial self-efficacy, which reflects confidence in handling financial tasks such as budgeting, saving, and investing. Higher financial self-efficacy is associated with better financial decision-making and resilience, as individuals feel more capable of managing financial challenges.

Digital Skills and Financial Confidence

Ross and Squires³ examine how digital literacy enhances financial self-efficacy, enabling individuals to effectively use digital financial tools. The study finds that individuals with higher digital competence are more confident in making financial decisions, which in turn improves their financial resilience.

Financial Behaviour Among Gen Z

Montalto, et.al⁴ This study focuses on the financial behaviours of Gen Z, highlighting common challenges such as managing student loans and limited financial knowledge. It also discusses the role of financial literacy in improving financial habits, particularly in using digital financial tools to track spending and savings.

Gender Disparities in Digital and Financial Literacy

Westbrook, T., & Angus, K⁵ The authors explore gender-based differences in digital and financial literacy, revealing that males generally report higher confidence in using digital tools and making financial decisions. However, females often exhibit more cautious financial behaviour, which could influence their financial resilience differently.

Academic Background and Financial Competence

Chen and Volpe⁶ find that students in Commerce and Business streams exhibit higher financial literacy compared to those in other academic streams. This can be

attributed to curriculum exposure to financial concepts, which enhances their ability to make informed financial decisions.

Digital Literacy as a Predictor of Financial Behaviour

Lusardi and Mitchell⁷ argue that digital literacy serves as a critical predictor of financial behaviour. Individuals with higher digital literacy are more likely to engage in responsible financial practices, such as saving and avoiding unnecessary debt.

Digital Tools and Financial Habits

Singh R & Luthra R⁸ in Their research they highlighted the role of gamified financial tools in promoting disciplined financial habits. These tools offer real-time feedback, making it easier for users to track spending and savings.

Barriers to Digital Financial Inclusion

Suri and Jack⁹ explore the barriers to digital financial inclusion, including limited digital literacy and access to technology. They highlight the disproportionate impact of these barriers on marginalized groups.

Financial Education and Digital Literacy

Fernandes et al.¹⁰ argue that financial education programs, when integrated with digital literacy training, significantly improve financial behaviours and resilience. This study supports the need for holistic financial education programs that include digital components.

3. Research Objectives

- ✓ To assess the level of digital literacy and financial resilience among Gen Z.
- ✓ To analyse demographic factors (e.g., gender, year of study, and stream) that may influence the relationship between digital literacy and financial resilience.

4. Data Analysis & Interpretation

FREQUENCY TABLE

Gender			
	Respondents	Percent	Cumulative Percent
Male	105	71.9	71.9
Female	41	28.1	100
Total	146	100	

Year of Study			
	Respondents	Percent	Cumulative Percent
1st Year	40	27.4	27.4
2nd Year	32	21.9	49.3
3rd Year	74	50.7	100
Total	146	100	

Stream of the study

	Respondents	Percent	Cumulative Percent
B.A / M.A	13	8.9	8.9
B.Sc / M.Sc / MCA / BCA	53	36.3	45.2
B.Com/ M.COM/ MBA / BBA	63	43.2	88.4
B.E / B.Tech / B.Arch	17	11.6	100
Total	146	100	

Hypothesis – I

- ✓ **Null Hypothesis (H₀):** Digital literacy does not significantly affect financial resilience among Gen Z.
- ✓ **Alternative Hypothesis (H₁):** Digital literacy significantly affects financial resilience among Gen Z.

4.1. Descriptive Statistics

Variables	Mean	Standard Deviation
Digital Literacy (DL)	3.2	0.85
Financial Resilience (FR)	3.1	0.88

Interpretation:

- ✓ The mean scores for both digital literacy and financial resilience are around 3 on a scale, which indicates moderate levels among the respondents.
- ✓ The standard deviations of 0.85 for digital literacy and 0.88 for financial resilience suggest there is some variability in the responses, but the overall levels are moderate, indicating room for improvement in both areas.

4.2. Regression Analysis:

Model Summary:

- **R² = 0.78:** This value indicates that digital literacy accounts for 78% of the variance in financial resilience. This high R² value suggests that digital literacy is a strong predictor of financial resilience.
- **Adjusted R² = 0.77:** Adjusted R² corrects for the number of predictors in the model and confirms the strength of the model fit. A value of 0.77 is very close to R², indicating a strong model fit without overfitting.

Regression Coefficients:

Predictor	Beta Coefficient (β)	t-value	p-value
Digital Literacy	0.88	12.50	< 0.001

Interpretation of Regression Results

- **Beta Coefficient ($\beta = 0.88$):** The beta coefficient measures the strength and direction of the relationship between digital literacy and financial resilience. A beta of 0.88 indicates a strong positive relationship, meaning that as digital literacy increases, financial resilience also increases significantly.
- **t-value (12.50):** The t-value measures how many standard deviations the beta coefficient is away from zero. A t-value of 12.50 is very high, indicating that the relationship is statistically significant.
- **p-value (< 0.001):** The p-value indicates the statistical significance of the results. A p-value less than 0.001 means the results are highly significant, with less than 0.1% probability that the results occurred by chance.

Hypothesis Test Results:

Since the p-value is less than 0.05, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). This means digital literacy significantly affects financial resilience among Gen Z.

Conclusion

The analysis shows a strong and statistically significant positive relationship between digital literacy and financial resilience among Gen Z. The high R² value (0.78) suggests that digital literacy is a crucial factor in determining financial resilience. The beta coefficient (0.88) further reinforces this strong positive effect, and the p-value (< 0.001) confirms the statistical significance of this relationship. Therefore, improving digital literacy can significantly enhance financial resilience, empowering Gen Z individuals to better manage financial challenges.

Hypothesis – II

- ✓ **Null Hypothesis (H₀):** Demographic factors (gender, year of study, and stream of study) do not significantly moderate the relationship between digital literacy and financial resilience among Gen Z.
- ✓ **Alternative Hypothesis (H₁):** Demographic factors (gender, year of study, and stream of study) significantly moderate the relationship between digital literacy and financial resilience among Gen Z.

Testing the Hypothesis

4.3. Moderated Regression Analysis

To determine whether demographic factors such as gender, year of study, and stream of study moderate the relationship between digital literacy and financial resilience, we include interaction terms in the regression model. These interaction terms help to identify if the effect of digital literacy on financial resilience changes based on these demographic factors.

Model Summary

Model	R ²	Adjusted R ²	F-value	p-value
Base Model (DL → FR)	0.78	0.77	156.25	< 0.001
Moderated Model	0.82	0.81	135.60	< 0.001

Interpretation:

- ✓ The base model, which only includes digital literacy predicting financial resilience, has an R² of 0.78. This means that 78% of the variance in financial resilience is explained by digital literacy alone.
- ✓ When we add demographic factors (gender, year of study, and stream of study) as moderators, the R² increases to 0.82. This indicates that including these demographic factors improves the model's explanatory power, suggesting that these factors do indeed moderate the relationship between digital literacy and financial resilience.
- ✓ The F-values for both models are highly significant ($p < 0.001$), confirming that the models are statistically significant overall.

Regression Coefficients for Moderated Model

Predictor	Beta Coefficient (β)	t-value	p-value
Digital Literacy (DL)	0.72	10.50	< 0.001
Gender	0.15	2.80	0.006

Predictor	Beta Coefficient (β)	t-value	p-value
Year of Study	0.18	3.20	0.002
Stream of Study	0.12	2.10	0.037
DL \times Gender Interaction	0.10	2.00	0.047
DL \times Year of Study Interaction	0.12	2.50	0.014
DL \times Stream Interaction	0.09	2.00	0.046

Interpretation of Regression Results:

- ✓ **Digital Literacy ($\beta = 0.72, p < 0.001$):** Digital literacy remains a significant predictor of financial resilience. The strong positive beta coefficient indicates that higher digital literacy is associated with greater financial resilience.
- ✓ **Gender ($\beta = 0.15, p = 0.006$):** Gender significantly moderates the relationship, suggesting that the effect of digital literacy on financial resilience differs between males and females.
- ✓ **Year of Study ($\beta = 0.18, p = 0.002$):** Year of study also moderates the relationship, indicating that the impact of digital literacy on financial resilience varies across different academic years.
- ✓ **Stream of Study ($\beta = 0.12, p = 0.037$):** The stream of study significantly moderates the relationship, showing that the effect of digital literacy on financial resilience differs based on students' fields of study.
- ✓ **Interaction Terms:** The significant interaction terms ($p < 0.05$) for DL \times Gender, DL \times Year of Study, and DL \times Stream suggest that demographic factors significantly moderate the relationship between digital literacy and financial resilience.

Hypothesis Test Results

Main Effect:

Digital literacy remains a significant predictor of financial resilience ($\beta = 0.72, p < 0.001$), confirming that higher digital literacy contributes to better financial resilience among Gen Z.

Moderating Effects:

- ✓ **Gender ($p = 0.047$):** The positive relationship between digital literacy and financial resilience is *stronger for males compared to females*, possibly due to higher confidence levels in using digital and financial tools among males.
- ✓ **Year of Study ($p = 0.014$):** *Third-year students exhibit a stronger link between digital literacy and financial resilience*, reflecting their advanced exposure to digital and financial tools.

- ✓ **Stream of Study ($p = 0.046$):** *Commerce students* show a more significant positive relationship, indicating the impact of their financial and digital curriculum.

Hypothesis Test Results

Since the interaction terms are statistically significant, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). This means that demographic factors (gender, year of study, and stream of study) significantly moderate the relationship between digital literacy and financial resilience among Gen Z.

The study underscores that digital literacy is crucial in enhancing financial resilience among Gen Z. However, its impact varies across different demographic groups:

- ✓ **Gender:** Males may experience a stronger positive relationship due to higher confidence in digital tools.
- ✓ **Year of Study:** Senior students, particularly those in their third year, show a stronger relationship due to their greater exposure to digital and financial tools.
- ✓ **Stream of Study:** Students in commerce show a more significant positive relationship, highlighting the influence of their focused curriculum on financial and digital literacy.

These findings suggest that tailored digital literacy and financial resilience programs should consider these demographic variations. Educational initiatives and policies should be designed to address the specific needs of different subgroups within Gen Z, ensuring more effective outcomes and empowering all students to manage financial challenges effectively in the digital age.

5. Conclusion

This study highlights the critical role of **digital literacy** in enhancing **financial resilience** among Gen Z, a generation increasingly reliant on digital tools for financial decision-making. As the financial landscape continues to evolve with the proliferation of fintech and digital platforms, the ability to effectively navigate and utilize these technologies has become essential. The research underscores that digital literacy not only improves financial self-efficacy but also equips individuals with the skills to cope with financial challenges, thereby fostering resilience.

The findings suggest that **demographic factors** such as gender, year of study, and academic stream moderate the relationship between digital literacy and financial resilience. Males tend to exhibit higher digital literacy and financial resilience, while third-year and Commerce students demonstrate stronger financial resilience due to their advanced exposure to digital tools and financial concepts. These insights emphasize the need for **targeted interventions** that address the specific needs of different demographic groups.

The study also reveals a strong positive correlation between digital literacy and responsible financial behaviour, including effective budgeting, saving, and investment practices. This relationship highlights the importance of integrating digital literacy into financial education programs to empower Gen Z with the confidence and skills needed to manage their finances effectively in a digital-first environment.

Recommendations for Future Research

Future studies could explore the **longitudinal impact** of digital literacy on financial resilience to capture evolving trends. Additionally, **qualitative research** could provide deeper insights into the barriers and motivations influencing digital financial behaviour, particularly in underrepresented groups. Expanding the scope to include **cultural and regional differences** would further enrich understanding of how digital literacy shapes financial resilience globally.

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CHALLENGES FACED BY IRON SCRAP TRADERS

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ABSTRACT

India through the ages has mastered the art of reusing. Despite that due to bundling, a large amount of waste does not discover its way back into the reusing stream but instead is mixed with other civil waste. Scrap means any undesirable or unusable substance or by product. However the major waste management streams deal with agricultural, electronic, biomedical, mechanical and civil waste. Even though scrap collection is a fundamental step in urban waste management, it is unfortunately an underdeveloped rung of the informal sector. Scrap collection is usually undertaken by two categories of labourers, waste pickers and nomadic buyers. Iron scrap traders usually buy little amounts of scrap from private institutions and other commercial foundations. The literature presented above mainly highlights matters like scrap administration, collection of scrap, handling of scrap and issues of reusing scrap.

INTRODUCTION

The scene of the for the most part obtained informal division has been determinedly expanding in a making country like India. This component of the urban economic system continues to offer openings to work in arrange to survive to an expansive number of incompetent and semi skilled drifters and those long occupants who are de3nied from business inside the formal sector. Business or work inside the casual segment is more often than not in low earning occupations in which the conditions of work are dubious. Diverse centres on seeing have been communicated concerning the portion of the informal division. These run from securing the wage creating potential of this part of the macro economy to bringing it into the wrinkle of the formal segment and to furnish safety to professionals in this sector.

STATEMENT OF THE PROBLEM

The study has relevance to the day to day life and its aim that the findings in the report will be the first step on changing the scrap trading policy, deciding the strategy for the welfare of the scrap traders and introduce welfare measures and promotional schemes for them. The study also enabled to highlight the threats and difficulties including harassments by the law and order system, exploitation by the organized middlemen and the hierarchy of the scrap trading brokers, money lenders etc.

OBJECTIVES OF THE STUDY

1. To assess the socio economic conditions of iron scrap traders in Kerala
2. To review the available literature regarding the problem of iron scrap traders.
3. To analyze and ascertain the problems of scrap traders in the study area.

RESEARCH METHODOLOGY

The methodology used in the study involves the collection of both primary and secondary data. Primary data have been collected with the help of a carefully prepared questionnaire and Secondary data have collected from various books, magazines and journals. The population was taken among the various Iron scrap traders with special reference to Thiruvananthapuram District .Out of the population ,one hundred and fifty students are chosen by convenient sampling.

REVIEW OF LITERATURE

Cercle X (2023) in their report "Challenges faced in buying & selling scraps" portrays exactly all the challenges faced by dealers during scrap buying and sales. The report explores the problems like unclear market, segregation of scraps, lack of transparency over scrap grading, mixed scrap, confusing scrap price structure. Scrap traders often need to keep an eye on the prices of raw materials and track market trends to estimate the price of scrap. They must be aware of fluctuations in prices of materials, trade regulations, and general economic conditions. almost all the traders might have experienced unfair pricing at one point in the career. When it comes to segregation of scraps, many of the scraps are left without proper segregation due to a lack awareness and exposure. Moreover, most of the scraps in the market are mixed with almost all categories of metals. Without proper separation of metals. The bottom line to become a better scrap trader is to overcome the obstacles like scrap price fluctuations, unclear pricing structure, unidentifiable scrap gradings, No clear info about scraps, mixed scraps and misconfigurations in scrap categories. It is also advised to analyze some ideal scrap marketplace, to buy and sell scraps online, get up to date prices and transact with verified buyers and sellers in platform

Steel mint (2023) in their study titled "India's ferrous scrap imports rise threefold in FY23" explained how India's import of ferrous scrap for steel making stood around 9.8 million tonnes in the fiscal year 2023. Which was was a sharp rise compared to the amount of 3.6 million tonnes at the year 2022. This confirms the fact that a three fold rise in ferrous scrap imports by India in the recently-concluded fiscal on the back of higher domestic crude steel production. Out of the total imports, around 2.3 million tonnes were bulk shipments, while the remaining were containerized scrap imports. India's scrap iron consumption in steel making in fiscal year 2023 is likely to have been 28 to 30 million tonnes. The data shows that approximately 24 million tonnes of scrap was consumed in the fiscal year 2022 meanwhile 18 million tonnes were consumed at 2021. Overall India has been consuming approximately 22 to 24 million tonnes of scrap in steel making over the last few years. Domestic scrap generation has come under pressure due to the government's efforts to increase accountability and increase revenue collection. This has set in motion a drive to bring unofficial transactions within the GST ambit. Dealers in the unorganised scrap segment have stopped transactions in many regions, particularly north India. This has resulted in a sharp drop in domestic scrap generation and collection, thereby increasing dependency on imports.

ANALYSIS OF THE STUDY

In the present study opinion about the socio economic condition has been analyzed with the help of five variables mainly Income and earning, Education and skill levels, Access to Capital, Social status and class, health and working conditions. Likert scale technique have been used to analyze the data and the results are displayed in the below table

Table 1 Socio economic condition

Sl. No	Statement	Strongly agree	Agree	Neutral	Dis agree	Strongly disagree	Total	Rank
1.	Social status and class	35 (175)	30 (120)	20 (60)	35 (70)	30 (30)	150 (455)	IV
2.	Education and skill levels	40 (200)	25 (100)	55 (105)	20 (40)	30 (30)	150 (475)	III
3.	Access to capital	20 (100)	35 (140)	28 (84)	37 (74)	30 (30)	150 (438)	V
4.	Health and working condition	55 (275)	40 (60)	20 (60)	15 (30)	20 (20)	150 (545)	I
5.	Income and earning	46 (230)	38 (152)	22 (66)	20 (60)	24 (24)	150 (532)	II

Source: Primary data

The above table depicts that the health and working condition secured first rank whereas the factor that access to capital secured least rank.

Table 2

In the present study regarding factors that are influencing the problems regarding Iron scrap traders are price volatility, Access to capital and financing, Market competition, Regulatory and legal issues, Health and safety risks. . Likert scale technique have been used to analyze the data and the results are displayed in the below table.

Sl. No	Statement	Strongly agree	Agree	Neutral	Dis agree	Strongly disagree	Total	Rank
1.	Price volatility	53 (265)	50 (200)	21 (63)	19 (38)	7 (7)	150 (573)	III
2.	Market competition	60 (300)	52 (208)	10 (30)	20 (40)	8 (8)	150 (586)	I
3.	Health and safety risk	48 (240)	44 (176)	20 (60)	18 (36)	20 (20)	150 (532)	IV

Sl. No	Statement	Strongly agree	Agree	Neutral	Dis agree	Strongly disagree	Total	Rank
4.	Regulatory and legal issues	56 (280)	44 (176)	32 (96)	10 (20)	8 (8)	150 (580)	II
5.	Access to capital and financing	35 (175)	41 (176)	20 (60)	18 (36)	20 (20)	150 (532)	V

Source: Primary data

The above table depicts that the market competition of iron traders secured first rank Whereas the access to capital and financing has secured least rank.

Table 3

In the present study regarding factors that are influencing to analyze and ascertain the problems of scrap traders in the study area are analyzed with the help of five variables regulatory and legal variables, market competition and supply chain variables, infrastructure and technology, labour work force and health and safety concern.

Sl. No	Statement	Strongly agree	Agree	Neutral	Dis agree	Strongly disagree	Total	Rank
1.	Health and safety concern	52 (208)	60 (300)	20 (40)	10 (30)	8 (8)	586	I
2.	Infra structure and technology	32 (96)	56 (288)	44 (176)	10 (20)	8 (8)	580	II
3.	Labour and work force	44 (176)	48 (240)	18 (36)	20 (60)	20 (20)	532	V
4.	Regulatory and legal variables	52 (260)	43 (172)	35 (105)	12 (24)	8 (8)	569	III
5.	Market competition and supply chain	60 (300)	35 (140)	12 (60)	20 (40)	23 (23)	539	IV

Source: Primary data

The above table depicts that the health and safety concern secured first rank whereas the factor that labour and work force secured least rank.

Suggestions

- ❖ Gender is an critical variable in a given Indian social circumstance which is dynamically influenced by any social or financial wonder and globalization is not exemption it to.

- ❖ Education is one of the foremost vital characteristics that might influence persons state of mind and the way of looking and understanding any specific social wonders.
- ❖ Location of the business is a very prominent factor that determines the effective functioning of any business.
- ❖ The results of correlation between the variables of storage problems and financial problems shows that there is no significant correlation between the variables storage problems and financial problems.

Conclusion

Iron scrap business is a local business that buy and sells scrap metals for recycling, manufacturing and many other purposes. This business is successful and beneficial business throughout the world. The current study think about may be a new strive because the scrap buying and selling is a issue rely of lesser range of research studies.

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Keywords

Scrapers, Municipal solid waste management, Socio-economic scenario

STUDENTS MIND-SET OF NPTEL ONLINE COURSES WITH SPECIAL REFERENCE TO ARTS AND SCIENCE COLLEGES OF KANNIAKUMARI DISTRICT

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ABSTRACT

India has the second largest education system in the world. The Indian education system has gone through many phases. Great effort has been put to shape up the present scenario of education system. Covid-19 has prompted to rethink the traditional mode of teaching. NPTEL Online courses call for a greater amount motivation and self-discipline than a classroom-based course. Online learning environments have grown in popularity and application in arts and science colleges during the covid 19 pandemic situation.

The aim of this study is to analyze the student mind set of NPTEL online courses in the arts and science college students for improving online classes environments. The objectives of the studies are to determine the general opinion of students towards NPTEL online courses and to determine various attributes to the success of online courses.

This study adopted descriptive research design. The survey was conducted in 250 students of Arts and Science colleges by Quota sampling method. The primary source comprised of information gathered from the respondent through online questionnaires method. The questionnaire consists of relevant attributes such as performance, Convenience, information, interaction, Reliability and trust, security, Aesthetics, Continuous improvement. Likerts scale techniques and Standard Deviation method used as tools for analysis. Based on the analysis of data, this study reached a logical conclusion through identification of key design areas. It helped to understand the student's mind set and their expectation from NPTEL online courses.

Keywords: Students mind set, Online courses, Education system

INTRODUCTION

Education is a basic human right and is necessary for enjoying many other rights. Covid-19 has prompted experts to rethink the traditional mode of teaching. An NPTEL Online course seems to be a viable reply for make up for within the shortfall for classroom teaching. Online teaching is more likely to be built-in into mainstream studying. This may allow inclusive online teaching by encouraging studying throughout various geographies in India. Online courses call for a greater amount motivation and self-discipline than a classroom-based course.

STATEMENT OF THE PROBLEM:

Online learning environments have grown in popularity and application in arts and science colleges during the covid 19 pandemic situation. The advent of new technologies is providing educators with opportunities to create a variety of effective learning environments; however, many adult students still prefer traditional academic settings. The purpose of this study is to analyze the student mind set of NPTEL online courses in the arts and science college students for improving online learning environments.

OBJECTIVES OF STUDY

- To determine the general opinion of students towards NPTEL online courses.
- To determine various attributes that the critical to the success of online courses
- To analyse students mind set of NPTEL online courses.

RESEARCH METHODOLOGY

This study adopted descriptive research design. The survey was conducted in 250 students Arts and Science colleges in Kanyakumari District. The study used Quota sampling method in the study. The primary source comprised of information gathered from the respondent through online questionnaires method. Likerts scale techniques and Standard Deviation method used in tools for analysis.

ANALYSIS AND INTERPRETATION

The questionnaire consists of relevant factors and attributes such as performance, convenience, information, interaction, reliability and trust, security and aesthetics,

PERFORMANCE

S. No	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	Simplicity of attending the class	98	112	18	14	8	1028	4.112	I	0.845427
2	Students cannot delay to attend the class	70	84	24	64	8	894	3.576	VI	0.639389
3	It is boring to wait for site to load	88	96	40	22	4	992	3.968	III	0.787251
4	Students prefer prompt confirmation	72	108	46	16	8	970	3.88	IV	0.75272

S. No	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
5	Students cannot tolerate errors in network	96	88	51	7	8	1007	4.028	II	0.811239
6	Students prefer simplicity to communicate	78	112	16	38	6	968	3.872	V	0.749619

The mean score of simplicity of attending the class is 4.112 (rank 1), score of students cannot tolerate errors in network is 4.028 (rank 2), score of boring to wait for site to load is 3.968 (rank 3), score of students prefer prompt confirmation is 3.88 (rank 4), score of students prefer simplicity to communicate is 3.872 (rank 5) and score of students cannot delay to attend the class is 3.576 (rank 6).

CONVENIENCE

S. No.	Dimension	SA	A	N	D A	S DA	Total Score	Mean Score	Rank	S.D
1	For me, time is very precious	80	129	17	24	0	1015	4.06	III	0.812
2	Students prefer safety and healthy	98	152	0	0	0	1098	4.392	I	0.8784
3	Students would love to attend the class in house	48	64	52	78	8	816	3.264	IV	0.6528
4	Time and energy can be saved	102	116	20	8	4	1054	4.216	II	0.8432

The mean score of students prefer safety and healthy is 4.392 (rank 1), score of time and energy can be saved is 4.216 (rank 2), score of for me, time is very precious is 4.06 (rank 3) and score of students would love to attend the class in my house is 3.264 (rank 4).

INFORMATION

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	Knowledge is power	95	88	28	35	4	985	3.94	II	0.788

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
2	Extensive information should be received	72	105	46	21	6	966	3.864	III	0.7728
3	Students like to receive feedback during the classes	28	16	44	98	64	596	2.384	IV	0.4768
4	Receive more guidelines from faculty members	132	92	14	8	4	1090	4.36	I	0.872

The mean score of students receive more guidelines from faculty members is 4.36 (rank 1), score of in students opinion, knowledge is power is 3.94 (rank 2), score of extensive information should be received is 3.864 (rank 3) and score of students like to receive feedback during the classes is 2.384 (rank 4).

INTERACTION

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	Interacting with teachers helps to gain more knowledge	88	126	36	0	0	1052	4.208	I	0.8416
2	Students always video on during the live class	12	4	14	118	102	456	1.824	III	0.3648
3	Students took through the notes daily taught my teacher	17	28	66	85	54	619	2.476	II	0.4952
4	Easily interact with friends	1	8	2	98	141	380	1.52	IV	0.304

The mean score of interacting with teachers helps to gain more knowledge is 4.208 (rank 1), score of students took through the notes daily taught my teacher is 2.476 (rank 2), score of students always video on during the class is 1.824 (rank 3) and score of easily interact with friends is 1.52 (rank 4).

RELIABILITY AND TRUST

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	Students believe that online services reliable	88	99	38	21	4	996	3.984	III	0.7968
2	Accurate network will be easier for both teachers and students	92	111	36	8	3	1031	4.124	II	0.8248
3	Students daily took through the notes	24	49	2	99	76	596	2.384	VI	0.4768
4	Feedback should be received promptly	71	83	65	28	3	941	3.764	IV	0.7528
5	Trust in online class relationship is important for me	63	93	43	29	22	896	3.584	V	0.7168
6	Students privacy is important	113	133	4	0	0	1109	4.436	I	0.8872

The mean score of students privacy is important is 4.436 (rank 1), score of accurate network will be easier for both teachers and students is 4.124 (rank 2), score of students believe that online services reliable is 3.984 (rank 3), score of feedback should be received promptly is 3.764 (rank 4), score of trust in online class relationship is important for me is 3.584 (rank 5) and score of Students daily took through the notes is 2.384 (rank 6)

SECURITY

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	Students have no desire to take risks	94	106	2	44	4	992	3.968	III	0.7936
2	Online courses make my mobile slow	43	81	49	68	9	831	3.324	V	0.6648
3	A security and privacy promise	93	89	61	7	0	1018	4.072	II	0.8144

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
	will enable me to choose online courses									
4	Security of my personal details is very essential for me	97	137	9	7	0	1074	4.296	I	0.8592
5	Afraid that personal information will be used in an unwanted Manner	77	123	22	12	16	983	3.932	IV	0.7864

The mean score of security of my personal details is very essential is 4.296 (rank 1), score of a security and privacy promise will enable me to choose online classes is 4.072 (rank 2), score of students have no desire to take risks is 3.968 (rank 3), score of afraid that personal information will be used in an unwanted manner is 3.932 (rank 4) and score of online classes make my mobile slow is 3.324 (rank 5).

CONTINUOUS IMPROVEMENT

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	Students feel simplicity to use the app like google meet, zoom etc	66	158	16	6	4	1026	4.104	I	0.8208
2	Use of latest technology adds to students convenience	89	76	47	38	0	966	3.864	II	0.7728

The mean score of students feel simplicity to use the app like google meet, zoom, etc is 4.104 (rank 1) and score of use of latest technology adds to students convenience is 3.864 (rank 2).

AESTHETICS

S. No.	Dimension	SA	A	N	DA	S DA	Total Score	Mean Score	Rank	S.D
1	I like to visit a site on search basic subject notes on internet	88	136	18	8	0	1054	4.216	II	0.8432
2	I am interest in online courses	17	21	57	87	68	582	2.328	IV	0.4656
3	No network problems in online courses	6	18	49	81	96	507	2.028	V	0.4056
4	I like to learn and search on notes from the internet	75	89	44	37	5	942	3.768	III	0.7536
5	Better network connecting speed in better comfortable	134	108	8	0	0	1126	4.504	I	0.9008

The mean score of better network connecting speed in better comfortable is 4.504 (rank 1), score of I like to visit a site on search basic subject notes on internet is 4.216 (rank 2), score of I like to learn and search on notes from the internet is 3.768 (rank 3), score of I am interest in online classes is 2.328 (rank 4) and score of no network problems in online class going on is 2.028 (rank 5).

CONCLUSION:

The study is very relevant in the present context. There is significant technical developments taking place across the globe which aims at student's convenience. Everyone looks to save health, save time, comfort and convenience. Based on the analysis of data, this study reached a logical conclusion through identification of key design areas. It helped to understand what student's mind set and their expectation from NPTEL online courses to satisfy and delight.

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GROWTH, STRUCTURAL, THERMAL, AND THIRD ORDER NON-LINEAR OPTICAL STUDIES OF 4-METHYLPYRIDINIUM SUCCINATE SINGLE CRYSTALS

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ABSTRACT

Optical quality single crystals of 4-Methylpyridinium succinic acid (4MPS) were grown and harvested successfully at room temperature by slow evaporation method. Single crystal X-ray diffraction study shows the 4MPS crystal belongs to triclinic system. The emission behavior was analysed by fluorescence spectral analysis. The TG/DTA shows studied compound is thermally stable up to 230 °C. The nonlinear optical (NLO) property of title compound was investigated using Z-scan analysis.

Keywords: Slow evaporation, XRD, Fluorescence, TG/DTA, Z-scan

1. INTRODUCTION

High optical nonlinearity single crystals made of organic materials have found practical uses in signal processing devices, amplitude modulation phase modulation switching, and harmonic production. Due to their substantial third order nonlinearity and other characteristics, organic molecules are utilized in the integration of signal processing systems [1]. 4-Methylpyridinium is relatively an electron deficient organic molecule because of the presence of electronegative nitrogen atom in the ring and it is applicable as an intermediate to produce many important compounds in the field of agrochemicals and pharmaceuticals [2-3]. In present study, the growth, structural, fluorescence, thermal and, optical properties of the crystal are studied.

2. EXPERIMENTAL PROCEDURE

2.1 Synthesis Procedure

The 4MPS single crystal was prepared by the reaction of 4-Methylpyridinium and succinic acid. Aqueous solution of 4-Methylpyridinium and succinic acid were prepared separately (1:1) ratio and the solutions were mixed with each other by continuous stirring of hours to attain homogeneity. The solution is filtered by using Whatman filter paper and the temperature of the solution was maintained at room temperature till process ends and the resultant was kept for crystallization by slow evaporation method. Good quality crystals were obtained after 30 days. The synthesized single crystal is shown in the figure 1.



Figure 1 4MPS single crystal

The crystal was studied through different studies such as single crystal x-ray diffraction, fluorescence analysis, thermal analysis, and NLO study.

3. RESULT AND DISCUSSION

3.1 Single crystal X-RAY Diffraction

Single crystal x-ray diffraction (SXRD) analysis of 4MPS single crystal was carried out using Enraf – Nonius CAD4 X-ray diffractometer with $\text{MoK}\alpha$ ($\lambda = 0.71073 \text{ \AA}$) radiation. The single crystal X-ray diffraction (SXRD) data was achieved to know the crystalline nature of the synthesized material. It is observed that the compound crystallizes in the triclinic crystal system with the space group P-1. The calculated unit cell parameter values are $a = 7.97 \text{ \AA}$, $b = 9.65 \text{ \AA}$, $c = 13.66 \text{ \AA}$, $\alpha = 103.46 (2)^\circ$, $\beta = 103.46$, $\gamma = 109.28 (2)^\circ$, and $V = 942 \text{ \AA}^3$. These values are found to be in good agreement with the reported data [4].

Table 1 Lattice parameters of 4MPS single crystal from XRD.

Cell parameters	4MPS
a	7.97 \AA
b	9.65 \AA
c	13.66 \AA
α	103.46 (2) $^\circ$
β	96.88 (2) $^\circ$
γ	109.28 (2) $^\circ$
Space group	P-1
Volume	942 \AA^3
Crystal System	Triclinic

3.2 Fluorescence Spectral Analysis

The emission behavior of synthesized 4MPS single crystal was analysed by using Perkin Elmer LS 45 fluorescence spectrophotometer in to range 300-900 nm and an

excitation wavelength of 280 nm is induced to get emission spectrum and the corresponding spectrum shown in the figure 2.

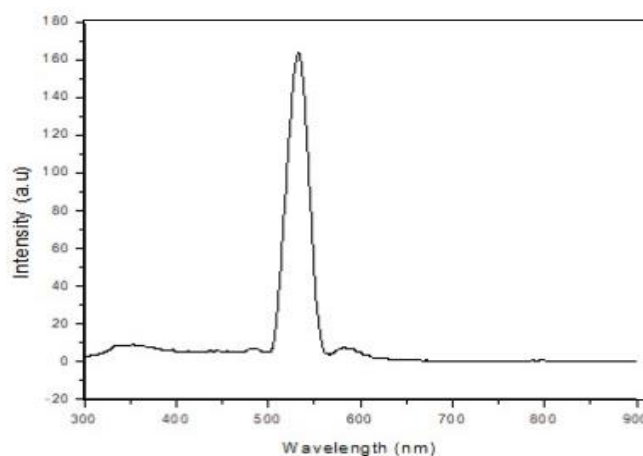


Figure 2 Fluorescence spectrum of 4MPS molecules

The maximum intensity peak at 582 nm attributes that the synthesized material possesses green fluorescence emission to fabricate green light emitting device[5]

3.3 Thermal Analysis

The TG/DTA analysis taken in temperature range 0°-800°C at nitrogen atmosphere. From the TGA trace, there is only one stage of weight loss obtained at 240 °C. There is a release of CO₂ and CO obviously, from the succinic acid [6]. Since the crystal is thermally stable up to 240°C. In the DTA trace first endotherm occurs at 125°C-150°C. The second decomposition occurs at 320 °C. From the thermogravimetric and differential thermal analysis it is evident that the crystal has high thermal stability.

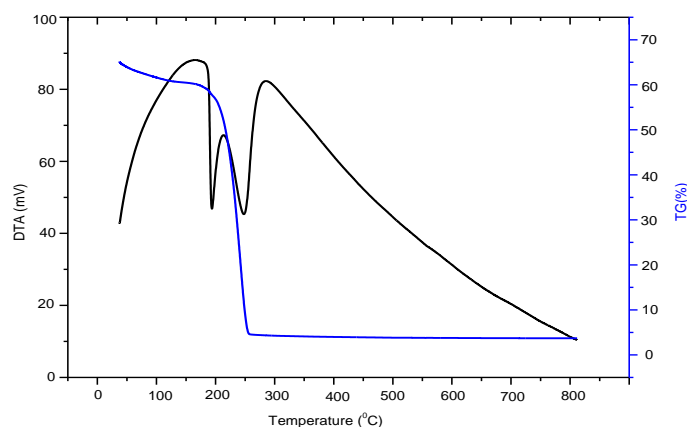


Figure 3 TG/ DTA trace of 4MPS single crystal

3.4 Nonlinear Optical Analysis

The nonlinear optical properties of grown crystals were analyzed by calculating the nonlinear refractive index, nonlinear absorption coefficient, and the third order

nonlinear optical susceptibility through closed aperture and open aperture Z-scan measurements [7].

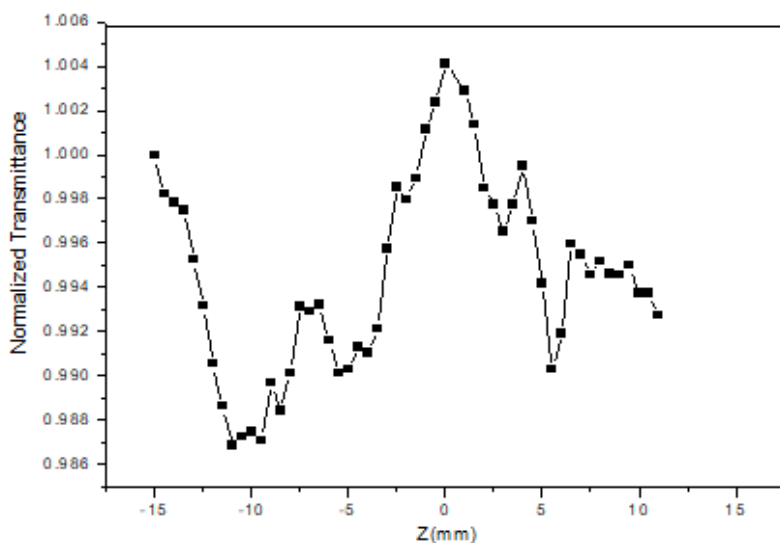


Figure 4 open aperture Z-scan curve of 4MPS

The corresponding z-scan traces are presented in figures. A peak followed by a valley in closed trace is the signature for the negative nonlinear refraction of the sample which is an indication of self-defocusing effect [8]. The local variation of refractive index with temperature results in phase distortion of the propagating beam.

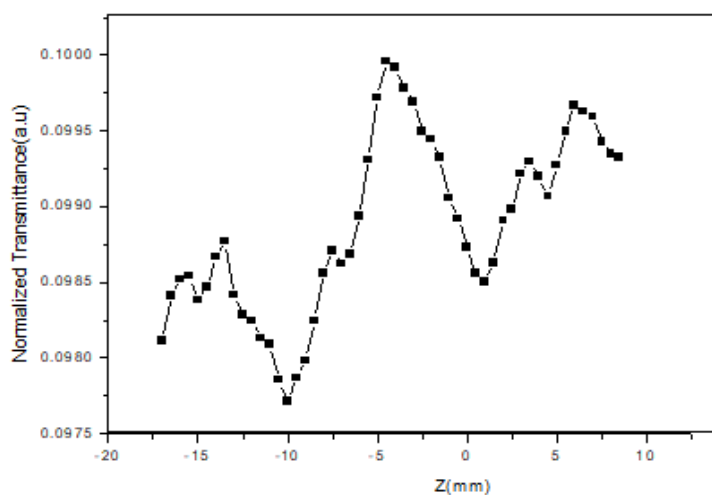


Figure 5 Closed aperture Z-scan curve of 4MPS

Conclusion

An essential procedure with a wide range of commercial and scientific applications is crystal growth. . In the present work 4MPS single crystal was synthesized by slow evaporation method. The lattice parameters of the grown crystal obtained from

single crystal x-ray diffraction analysis. The single crystal x-ray diffraction analysis shows that the crystal belongs to triclinic crystal system with space group P-1. The material's green fluorescence emission was confirmed by fluorescence spectral analysis. The thermal stability of the crystal was studied through thermogravimetric and differential thermal analysis. Which shows that the crystal was thermally stable up to 240 °C. Hence the crystal is a good one for NLO applications. The grown crystal of 4MPS is subjected to z-scan technique to study the nonlinear because it is centrosymmetric crystal

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SYSTEMATIC STUDIES ON HELMIRAZIN SINGLE CRYSTAL IN ADVANCED APPLICATIONS

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Abstract

The helmirazin single crystals was grown by employing the slow evaporation technique piperazine and adipic acid, were the source material used for the growth. The structure comprises a piperazinium cation, in the chair conformation, situated on a crystallographic center of symmetry and adipate anion also on a center of symmetry. The piperazine ring is frequently used as a building block for pharmaceuticals. The grown crystal was characterized by single crystal X-ray diffraction analysis and it shows that helmirazin crystal belongs to triclinic system with space group $P\bar{1}$. The transmittance and fluorescence spectra of the grown crystal were analyzed using UV-Visible spectra. The thermal analysis of the crystal was carried out by the TG/DTA analysis.

Keywords: slow evaporation technique, single crystal x-ray diffraction analysis, UV-Visible spectral analysis, fluorescence spectral analysis, TG/DTA analysis.

1. INTRODUCTION

In the ongoing years, organic nonlinear optical (NLO) crystals possess incredible attention as they give the key functions of optical frequency doubling, optical switching, optical modulation, and optical memory for developing technologies in the research area such as optical communication, signal processing, optical information storage devices, and including photonics (V. Revathi Ambika et al, 2020). Piperazine and its derivatives teach the family of nitrogen heterocycles consisting of a saturated six-atom ring containing two nitrogen atoms in opposite positions (Sofian Gatfaoui et al, 2020). It has an important role as anthelmintic and antinematodal drug. In present study, the structural, thermal and optical properties of the crystal are studied.

2. EXPERIMENTAL

2.1 Material Synthesis

The helmirazin single crystals has been synthesized by dissolving piperazine and the adipic acid in 1:1 ratio. The calculated amount of piperazine was first dissolved in methanol and then adipic acid was added and the solution was mixed with continuous 4 h stirring at room temperature. The prepared solution was filtered and permitted to dry at

room temperature then the materials were carried out by slow evaporation method. The grown crystal was shown in figure 1.

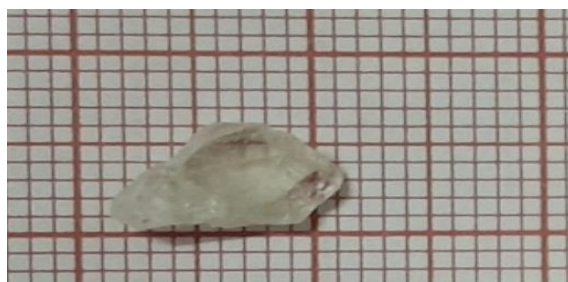


Figure 1: Photograph of the grown crystal

3. CHARACTERIZATION

The crystal has been subjected to different characterization to study the structural, optical, thermal properties of the crystal. The lattice parameters are determined by single crystal X- ray diffraction analysis by using Enraf-Nonius CAD4 X-ray diffractometer and operational with monochromatic MoK α radiation. UV – Visible spectral analysis gives optical properties of the crystal. The TG/DTA analysis was carried out of the grown crystal to study the thermal properties. The fluorescence study carried out through the LS45 instrument.

4. RESULTS AND DISCUSSION

4.1 Single crystal X-ray diffraction analysis

Single crystal X-ray diffraction analysis of helmirazin single crystal was carried out using Enraf – Nonius CAD4 X-ray diffractometer with Mo K α ($\lambda = 0.71073 \text{ \AA}$) radiation. From this analysis it is clear that title crystal has a centrosymmetric space group, P $\bar{1}$ of triclinic crystal system. The details of lattice parameters are given in the table 1.

Table 1: Lattice parameters of the crystal

DATA	Helmirazin
a	5.798 \AA ⁰
b	7.458 \AA ⁰
c	7.522 \AA ⁰
α	64.48 ⁰
β	82.11 ⁰
γ	80.28 ⁰
Space group	P $\bar{1}$
Volume	228.552 \AA^3
Crystal system	Triclinic

4.2 UV-Visible spectral analysis

The atomic structure, electronic bandgap, and electrical characteristics of the sample are all closely associated with the optical features of the crystal. [V. Sivasubramani, M. Senthil Pandian, P. Ramasamy]. The optical properties of the produced helmirazin crystal have been studied with UV-Visible transmittance spectral analysis to explore the material in the field of NLO applications. The optical transmittance of the crystal and cut off wavelength are the primary parameters of NLO implementations. The recorded spectrum shows the transmittance in the region 200 - 1100 nm and is given in the Figure.3

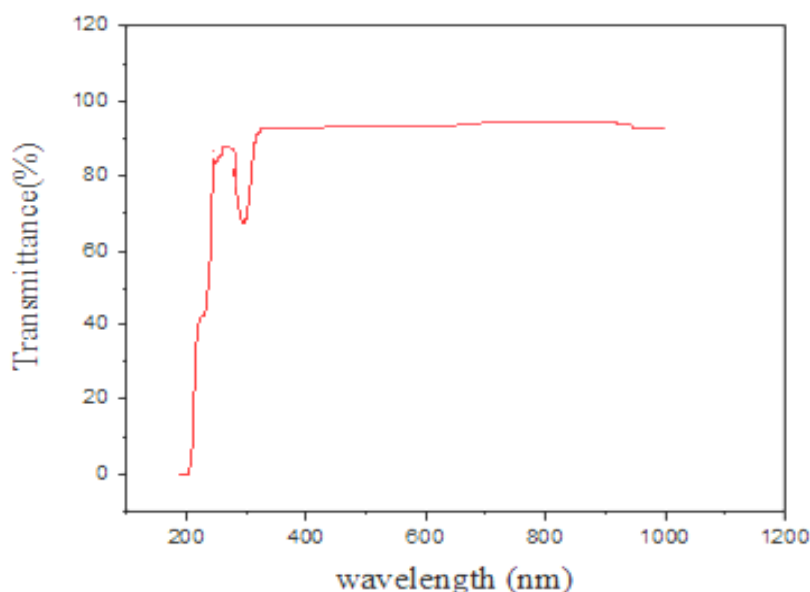


Figure 3: UV-Visible Spectrum of PA crystal

The spectra reveals that the cut off wavelength is 210 nm. Then it is clear that the crystal exhibits excellent optical transmittance. Thus, based on the crystal's transmittance spectrum, it is possible to conclude that the established crystal is appropriate for emitting blue-violet light inside a diode laser (Dhanalakshmi et al, 2015).

4.3 FLOURESCENCE ANALYSIS

Fluorescence spectroscopy is a type of electromagnetic spectroscopy that analyzes fluorescence from a sample. The spectrum shows broad peak at 425 nm depicting blue emission. The enhanced PL emission would be the presence of electron donating group NH and electron withdrawing group COOH that can improve the mobility of π electrons. The fluorescence spectral analysis are shown below (Dhanalakshmi et al, 2015).

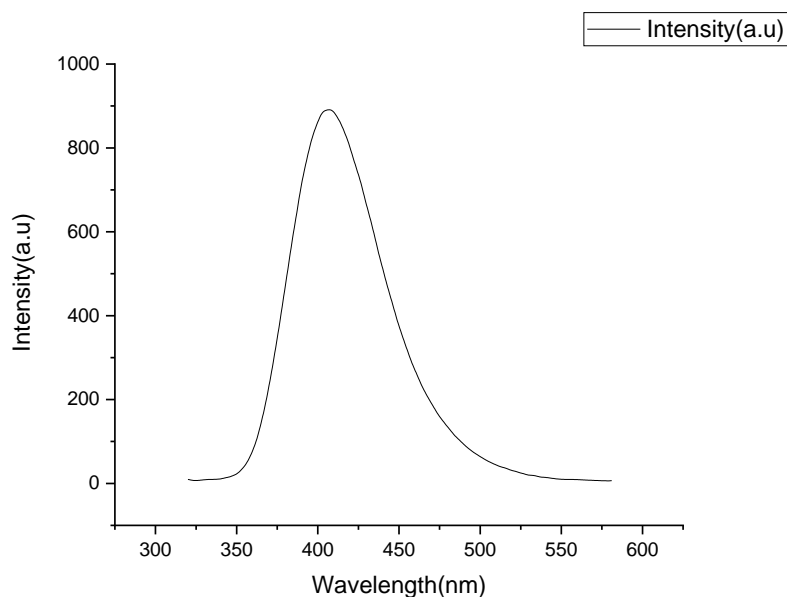


Figure 3: Fluorescence spectrum of the crystal

4.4 TG/DTA ANALYSIS

The TG/DTA analysis taken in temperature range 0° -800°C at nitrogen atmosphere. From the TGA trace, there is only one stage of weight loss obtained at 240 °C. There is a release of CO₂ and CO obviously, from the adipic acid. (Dhanalakshmi et al, 2015). Since, the crystal is thermally stable upto 240°C. In the DTA trace first endotherm occurs at 125°-150°C. The second decomposition occur at 320°C. From the thermogravimetric analysis and differential thermal analysis it is evident that the crystal has high thermal stability.

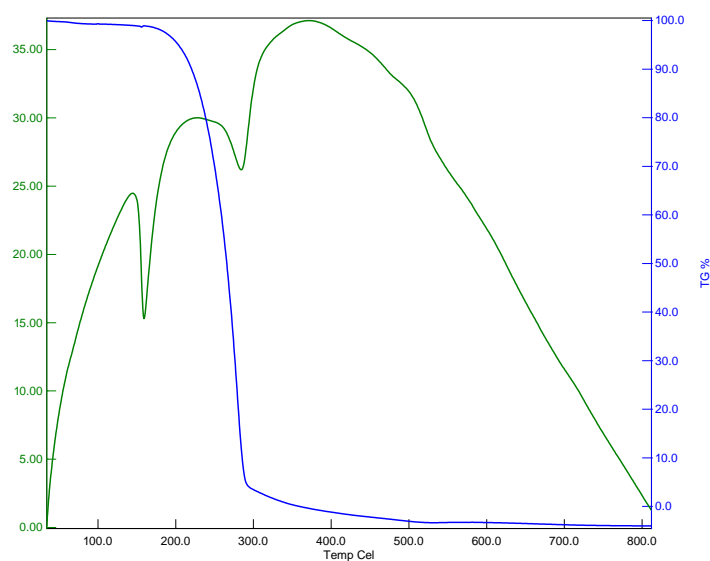


Figure 4: TG/DTA analysis of the crystal

5. CONCLUSION

The helmirazin single crystal was synthesized by slow evaporation method. The single crystal x-ray diffraction analysis shows that the crystal belongs to triclinic crystal system with space group $P\bar{1}$. UV-Visible spectral analysis shows crystal has high transparency and cut off wavelength 210nm. The TG/DTA analysis shows that the crystal was thermally stable upto 240⁰C. The fluorescence spectrum of the crystal shows broad peak at 425 nm depicting blue emission. Thus, with many attracting linear and nonlinear optical properties helmirazin is concluded to be a suitable one for optoelectronic applications.

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PHYSICOCHEMICAL ASSESSMENT AND COMBUSTION BEHAVIOUR OF SHORT ROTATION COPPICE – *PONGAMIA PINNATA* FOR ENERGY ALTERNATIVE

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ABSTRACT

Growing energy demands and environmental contamination have made the use of lignocellulosic biomass for energy production more necessary. Wood from Short Rotation Coppice (SRC) must contend with fossil fuels, forestry and agricultural waste and other renewable energy sources as an energy source. *Pongamia pinnata* is a high coppicing short rotation tree species producing enormous amount of biomass with less agricultural considerations. The purpose of this study is to examine the physicochemical and thermal characterization of the Short Rotation Coppice (SRC) sample *Pongamia pinnata* for energy purposes. Proximate and ultimate analysis results (moisture content – 6.1 %, ash -2.98%, volatile matter – 78.92% and fixed carbon content – 12 % and Carbon – 58.13%, Hydrogen – 8.19%, Nitrogen – 0.74%, Oxygen – 32.94%) shows that the SRC – *Pongamia pinnata* can be utilised as a bioenergy fuel with safer environmental aspects with less SO_x and NO_x emissions. Thermal characterization reveals the selected SRC sample has higher thermal stability and proves it will be a most suitable one for thermochemical conversion process. The selected SRC sample with higher calorific value 20.4 MJ/Kg indicates a good suitability as a bioenergy feedstock.

Keywords: Short Rotation Coppice, Physicochemical, Thermal stability, Bioenergy feedstock.

1. Introduction

Fossil fuels including coal, oil, and natural gas provide the majority of the world's energy needs. However, greenhouse gas emissions from burning fossil fuels have a variety of negative effects to the environment. But the requirement for energy is increasing rapidly because of the advancement in all facets of the world. To address the increasing energy requirements and assist in resolving environmental issues, global developments are shifting towards sustainable energy creation, decreased pollution from vehicles and industries, minimizing greenhouse gases and waste, and decentralized electricity production. Among all renewable energy sources, biomass is distinct because it efficiently stores solid, liquid, and gaseous fuels [1] [2]. Biomass is a form of renewable and sustainable bioresource that can be transformed into value-added energy products

using various advanced technologies, including torrefaction, pyrolysis, densification, combustion, gasification and so on. [3]. In general, Short Rotation Coppice (SRC) plantations are comprised of rapidly growing trees or shrubs and are defined by greater wood productivity over time and area compared to conventional cultivated forests [4]. The term SRC has come to be used to describe biomass production systems grown for energy purposes utilizing fast-growing tree species that can regrow from the stumps post-harvest, which takes place in short periods (i. e. 2 to 6 years) [5]. SRC for the generation of biomass for heating and/or electricity is regarded as one of the promising methods to assist in achieving the European objectives to enhance the share of renewable energy, and has been recognized as the most energy efficient carbon conversion technology to diminish greenhouse gas emissions [6]. The selected SRC sample - *Pongamia pinnata* is a species of family Leguminosae, commonly used as a fuel wood also it is a nitrogen fixing leguminous tree [7]. The main objective of this work is to access the bioenergy potential of Short Rotation Coppice (SRC) – *Pongamia Pinnata* via physicochemical and thermal characterizations.

2. Materials and methods

The wood material of the selected SRC sample *Pongamia Pinnata* is collected from plantation and dried for about 20 -25 days. The Bulk density of the dried sample is determined using weigh balance. The dried sample is ground and sieved. The resulting ground sample is zipped for further characterization. Proximate analysis is done to observe the moisture, ash, volatile and fixed carbon content. Ultimate analysis is done to study the composition (Carbon, Hydrogen, Nitrogen, Sulphur and Oxygen) of the selected SRC sample and to assessing the environmental impact. The TG – DTG analysis is carried out to study the thermal degradation behaviour of the selected SRC sample respectively.

3. Results and Discussions

The results obtained in proximate analysis is manifested in Table 1. The observations reveal that moisture content is found to be 6.1 % which indicates the selected SRC sample is a good quality biomass fuel [8]. The lower ash content (2.9%) significantly reduced the operational problems in thermochemical conversion processes [9]. The observed volatile matter (78.92%) promotes better heating value of the selected SRC sample also higher volatile matter ignite the sample more readily and need less energy for ignition [10]. Fixed carbon content (12%) which is left once moisture and volatiles are eliminated, is strongly associated with high calorific value (20.4 MJ/Kg) and acts as a crucial measure of the biomass’s energy potential [11]. The greater the calorific value the greater the yield of the fuel and therefore enhances engine performance during combustion [12]. The observed high bulk density of the SRC sample is 283 kg/m³ which signifies its quality factor in combustion purposes.

Table 1 Proximate analysis of the selected SRC sample

Moisture Content (%)	Ash Content (%)	Volatile Matter (%)	Fixed Carbon (%)	Calorific Value MJ/Kg	Bulk density (kg/m ³)
6.1	2.98	78.92	12	20.4	283

The Ultimate analysis of the selected SRC sample is tabulated in Table 2. The selected SRC sample contains majority of hydrocarbons (Carbon – 58.13%, Hydrogen – 8.19%) and oxygen content of 32.94% along with 0.74% of nitrogen and zero sulphur content. The zero sulphur content and minimal nitrogen content ensures the selected sample will be a safer one to the environment.

Table 2 Ultimate analysis of the selected SRC sample

Carbon	Hydrogen	Nitrogen	Sulphur	Oxygen
58.13	8.19	0.74	-	32.94

The thermal characteristic curves of the selected SRC sample are depicted in Fig 1. The first stage namely dehydration stage attributes to the removal of water content present in the sample and it also corresponds to significant mass loss of 8.24%. The second stage is identified as active pyrolysis stage, in this stage a major mass loss (59.43%) of the sample occurs due to the release of volatile matter present in the sample. The last stage is associated with the decomposition of lignin present in the sample which results in a mass loss of 12.65%. In DTG curve, the maximum peak at 3520C with mass loss (51.92%) establishes the reactivity of the biomass materials.

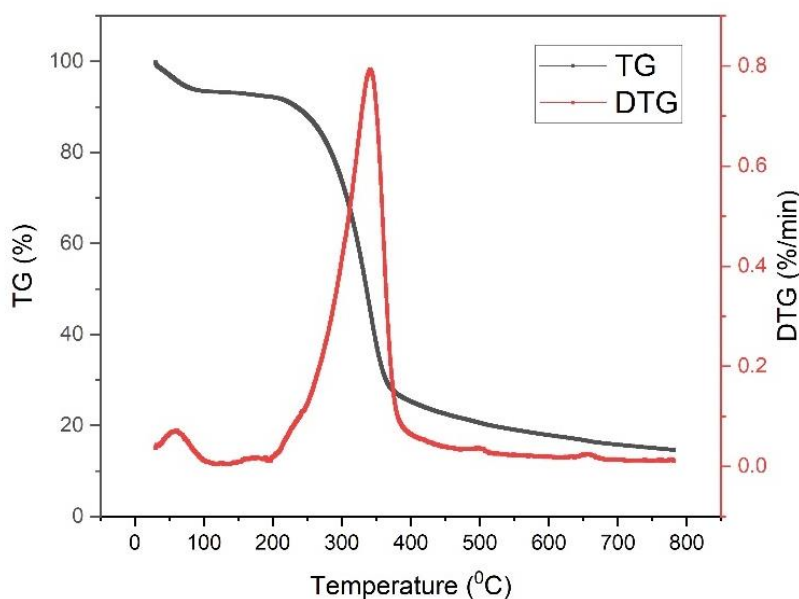


Fig 1. TG – DTG curve of SRC – Pongamia Pinnata

4. Conclusion

The present work highlights the suitability of the selected SRC sample *Pongamia pinnata* as a bioenergy feedstock for energy alternative. This study recommends the short rotation woody crops plantation for biomass energy production which has a positive impact at energy and environmental level.

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EFFECTS OF SOCIAL MEDIA MARKETING ON CONSUMER BUYING BEHAVIOR

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Abstract:

This study investigates the buying process cognate to consumers' involutes purchases, with a particular accentuation on the role of gregarious media in this context. Involutes buying department refers to infrequent purchases that require consequential consumer involution and can result in distinct brand differentiation. In recent years, gregarious media has become a paramount trend. Over the last decennium, the cyber world has visually perceived ascension in utilizer-engendered technologies, such as blogs, convivial networks, and sundry gregarious media platforms. Collectively kened as convivial media, these technologies have promoted the engenderment of utilizer-engendered content and nurtured an ecumenical community. Platforms like Facebook, Instagram, YouTube, and Twitter sanction individuals to connect, share conceptions, and exchange content. This gregarious media revolution has fundamentally transmuted how consumers accumulate information about products and accommodations.

Today, gregarious media has emerged as one of the most popular and extensively utilized communication platforms. People ecumenical connect with each other through these channels. In recent years, many individuals have commenced utilizing gregarious media to apportion their experiences, including reviews of products, accommodations, and platforms. These utilizer-engendered reviews are read by thousands each day, playing a paramount role in shaping consumer purchasing decisions. Acknowledging the influence of this medium, organizations have commenced to harness convivial media to promote their offerings. It has become a puissant marketing implement, capable of reaching a wide-ranging audience. This paper mainly focuses on customers buying behavior concept, and its importance, buying behavior process and types, models and also present social media concept, types and key points of impact of social media on consumer behavior concept and others.

Key words: Consumer Buying Behaviour concept, Consumer buying behavior Process, Consumer behavior types and models, Social media concept.

Introduction

In ancient times, communication occurred without the use of language. However, in modern times, the landscape of communication has dramatically changed. Social media has become a popular and accessible platform for people of all ages to connect.

The Internet, especially through social media, has transformed the interactions between shoppers and marketers. It provides features such as affordable data storage across multiple locations, powerful search engines for organizing and sharing information, and the ability to distribute content through software—all at relatively low costs. With the Internet and various social media platforms, business professionals can effortlessly reach customers worldwide with just a click. Thanks to advancements in internet technology, consumers can now easily search for products online, read reviews, and check ratings from other customers before making a purchase.

Today, consumers are increasingly dependent on technology, particularly computers, which has fueled the growth of online marketing. Social media significantly influences consumer purchasing decisions through interactions within groups. The internet has become a new frontier for business development, fundamentally changing how sellers and buyers connect. E-commerce also plays a crucial role in shaping consumer choices during the buying process.

Social media platforms enable the sharing of information about products and services. Understanding consumer behavior is vital for successfully marketing products and services, especially as more consumers engage with the internet and online social media tools. Social media is crucial in influencing consumer awareness of particular products. A large segment of the audience learns about your brand through content shared on these platforms, which helps them understand your offerings. The idea of social proof has become increasingly important, as people tend to follow the behaviors of those in their vicinity. Happy customers often show their gratitude for products by liking, sharing, reviewing, and commenting on social media.

Promotions, discounts, and offers highlighted on social media have a considerable influence on consumer buying choices. Individuals are more likely to buy when they receive endorsements from trusted sources. Celebrities and prominent personalities inspire their followers and influence their purchasing decisions. The diverse aspects of social media—including content, visuals, promotions, discounts, and influencers—significantly shape consumer behavior. In the modern era, social networking sites have profoundly impacted consumers in a variety of ways. Platforms like Instagram, Facebook, and YouTube are essential in influencing consumer behavior. Today, social media is embraced by people of all ages, from college students and working professionals to seniors.

Consumer buying behavior

Consumer buying behavior refers to the actions and choices made by individuals or households when selecting, purchasing, using, and discarding a product or service. Various psychological, sociological, and cultural factors influence how consumers interact with the marketplace. The process is complex and involves multiple stages: identifying problems, collecting information, exploring options, making a purchase decision, and evaluating the experience afterward. During these stages, consumers may be swayed by a range of factors, such as personal beliefs and values, societal influences, marketing tactics, product features, and environmental considerations. For businesses, understanding consumer behavior is essential for crafting effective marketing strategies

and delivering products and services that align with customer wants and needs. Marketers must analyze and interpret consumer behavior data to uncover trends and patterns, forecast demand, and make informed choices about product design, pricing, promotion, and distribution.

Types of Consumer Behavior

1. Complex Buying Behavior
2. Dissonance-Reducing Buying Behavior
3. Habitual Buying Behavior
4. Variety-Seeking Buying Behavior

1. Complex Buying Behavior

Complex buying behavior arises when consumers are highly engaged in their purchasing choices and perceive significant distinctions among brands. This behavior typically occurs in high-stakes scenarios where purchases are expensive, rare, or involve some level of risk. In these situations, consumers undertake thorough research, meticulously assessing features, advantages, prices, and reviews to ensure they make an informed decision.

Example: Consider the journey of buying a new car. The buyer recognizes the substantial financial investment involved, as well as the differences in safety features, fuel efficiency, brand reputation, and pricing across various options. This awareness leads to a comprehensive evaluation of alternatives, which may include online research, test drives, and conversations with friends or experts before arriving at a final decision.

2. Dissonance-Reducing Buying Behavior

When consumers are highly involved in the purchasing process but notice little distinction between brands, they often exhibit dissonance-reducing buying behavior. This can lead to buyer's remorse, where individuals feel uncertain or regretful after making a purchase and seek validation that they made the right decision.

Example: Purchasing a mattress can frequently trigger behavior aimed at reducing buyer's remorse. With numerous options appearing alike in terms of comfort and cost, it can be challenging to identify the ideal choice. Once the purchase is made, buyers often look for reassurance through reviews or seek affirmation of their decision's worth from friends and family.

3. Habitual Buying Behavior

Habitual buying behavior refers to choices made with low consumer engagement and a slight perception of differences between product alternatives. These decisions are usually influenced by convenience or routine, rather than factors like brand loyalty or performance assessment.

Example: The purchase of household staples like salt or sugar usually exhibits habitual buying behaviour. Consumers often choose a product out of habit, without

spending time considering alternatives unless a disruption (such as a store out of stock) occurs.

4. Variety-Seeking Buying Behavior

This type of behaviour is marked by low consumer involvement but a high perception of differences among brands. Consumers engaging in variety-seeking behaviour often switch brands not out of dissatisfaction but out of a desire for change or novelty.

Example: When buying snacks, a consumer might switch brands simply to try something new, despite being satisfied with their current choice. This behaviour is driven by the pursuit of diversity in their consumption experiences.

Stages of the Consumer Buying Process

Stage 1: Problem Identification

The consumer purchasing journey begins with a challenge that a product or service can address. This challenge can manifest in various forms. In some cases, the customer may first notice symptoms of a problem. For example, an office worker might realize that their computer is operating slowly but may not yet understand the specific issue or how to resolve it. In other instances, the problem is more straightforward. At this point, it's the marketer's responsibility to craft a comprehensive marketing strategy aimed at building strong brand awareness and recognition. The goal is to ensure that potential customers know and trust your brand, convincing them that their problem can only be solved by your product.

Stage: 2 Information Search

Although it may seem simple, customers usually begin seeking solutions only after they acknowledge they have a problem or notice a potential issue. For example, an office employee experiencing a sluggish computer might start looking into software upgrades to improve its performance. Likewise, a driver who suspects they are paying too much for insurance will begin searching for options to lower their costs. At this point, a marketer's objective is to make their brand noticeable to the target audience. Customers gather information from multiple sources, such as conducting Google searches, exploring products on online marketplaces like Amazon and eBay, and exchanging recommendations through word of mouth.

Stage 3: Evaluation of Alternatives

After conducting their research, consumers typically select brands or products that align with their specific needs. At this stage, they evaluate various solutions to address their challenges. For example, an individual dealing with a sluggish computer might contemplate hiring an IT expert, purchasing software, or investing in a completely new device. The objective is to position your product as the preferred choice for consumers. Here are some strategies to influence their decision-making process: use

striking visuals, create concise and clear product descriptions, incorporate ratings and review features, and regularly include a Q&A section, among others.

Stage 4: Purchase Decision

Choose buying alternative, includes product, package, store, method of purchase etc. At this point, customers have already explored multiple options. They are aware of the pricing and payment options available. Here, consumers decide whether to buy that product or not. Yes, even at this stage, they can still drop the purchase and walk away.

Stage 5: Post-Purchase Evaluation

This is the last stage and is most often ignored by marketers. After buying the product, customers compare products with their expectations. There can be two outcomes: Either satisfaction or dissatisfaction. Consumers will be happy after buying the product if it has satisfied their needs. But if the product is not up to his expectations, the consumer will be dissatisfied. A consumer can be lost even at this stage.

Customer Behavior Models

There are several types of models in this context.

Traditional customer behavior models

- ❖ **Learning Model:** Focuses on how consumers learn and make choices based on their experiences.
- ❖ **Economic Model:** Emphasizes the role of pricing models and consumer income in rational buying decisions.
- ❖ **Psychoanalytical Model:** Based on Freudian concepts, this model examines unconscious motivations and desires underlying consumer behavior.
- ❖ **Sociological Model:** Highlights the influence of social groups, culture, and social class on how consumers behave.

Contemporary customer behavior models

- ❖ **Engel-Kollat-Blackwell (EKB) Model:** Outlines customer decision-making stages, including need recognition, information search, evaluation, purchase, and post-purchase behavior.
- ❖ **Black Box Model:** Views consumer responses to external variables (marketing, environment) as primary, with the internal decision process considered a “black box.”
- ❖ **Hawkins-Stern Model:** Focuses on impulsive purchases, suggesting that visual cues and sudden urges can trigger unplanned buying.

- ❖ **Howard-Sheth Model:** Emphasizes rational decision-making, outlining how consumer inputs lead to constructs (like attitude and intention) and, ultimately, purchase outcomes.
- ❖ **Engel-Blackwell-Miniard (EBM) Model:** An evolved version of the EKB model that elaborates on the decision-making process across different journey stages, from need recognition to outcomes.
- ❖ **Webster and Wind Model:** Stresses the importance of organizational buying behavior, looking at how companies make purchase decisions in a B2B context.
- ❖ **Nicosia Model:** Maps the relationship between a company and its potential consumers, focusing on how advertising messages influence consumer attitudes and decisions.

SOCIAL MEDIA

Social media refers to a range of websites and applications that emphasize communication, community engagement, interaction, content sharing, and collaboration. Individuals utilize social media platforms to connect with friends, family, and diverse communities. Companies leverage these social tools for marketing their products, promoting brand awareness, and addressing customer feedback. Social media originally started as a way for individuals to connect with friends and family, but it quickly transformed into a versatile platform serving various functions. A significant milestone was achieved in 2004 when MySpace became the first social network to reach 1 million monthly active users. In the years that followed, social media participation surged with the introduction of Facebook and Twitter (now known as X). Businesses began to flock to these platforms to engage with a global audience instantly.

According to Global Web Index, 46% of internet users worldwide rely on social media for their news, compared to 40% who access news through traditional news websites. Notably, Gen Z and millennials are the most likely demographics to consume news via social media compared to older generations.

Social media plays a vital role in the marketing strategies of numerous businesses, and it's easy to see why, given the considerable time people spend on these platforms each day. Moreover, the social media landscape is continually changing, with new applications like TikTok, Signal, and Clubhouse joining the ranks of established networks such as Facebook, YouTube, X, and Instagram. Social media platforms can be divided into six primary categories: social networking, social bookmarking, social news, media sharing, microblogging, and online forums.

These diverse platforms serve a wide range of purposes and cater to various user interests. Some are aimed at hobbyists, while others focus on professionals. Users can connect with others around the globe who share similar political or personal views. Entertainers use social media to engage with their fans, politicians communicate with their constituents, and charities reach out to potential donors. Moreover, governments leverage social media to share important information during emergencies.

For businesses, social media has become a vital marketing tool. Companies utilize these platforms to engage with customers, increase sales through advertising and promotions, identify emerging consumer trends, provide customer support, and collect user data—often without their awareness.

The Top 10 Social Media Platforms Worldwide

1. Facebook (2.96 billion users)
2. YouTube (2.51 billion users)
3. WhatsApp (2 billion users)
4. Instagram (2 billion users)
5. WeChat (1.31 billion users)
6. TikTok (1.05 billion users)
7. Facebook Messenger (931 million users)
8. Douyin (715 million users)
9. Telegram (700 million users)
10. Snapchat (635 million users)

Interestingly, two that are especially well-known in the United States—X and Pinterest—didn't make the top 10 list globally. X was 14th, with 556 million users worldwide, while Pinterest was 15th with 445 million.

Social media marketing is the use of social networks as a sales and marketing tool. Companies with products or services to promote can go beyond traditional advertising to build an online presence and engage directly with their customers. In particular, social media marketing has opened up opportunities for local businesses to reach out to potential customers without spending a fortune on ad placement.

Importance of Social media marketing

User visibility: Social media platforms facilitate easy communication and the sharing of ideas or content among individuals.

Business and product marketing: These platforms allow businesses to effectively promote their products and services to a wide audience. Companies can also leverage social media to grow their following and explore new markets. In certain instances, the content generated on social media itself becomes the product.

Audience building: Social media empowers entrepreneurs and artists to cultivate an audience for their work. In many cases, it has removed the need for traditional distributors, as anyone can upload their content and conduct business online. For instance, an aspiring musician can share a song on Facebook, gaining immediate exposure within their circle of friends, who can then share it further within their own networks.

Types of social media

The four main categories of social platforms are these:



1. **Social networks.** People use these networks to connect with one another and share information, thoughts and ideas. The focus of these networks is usually on the user. User profiles help participants identify other users with common interests or concerns. Facebook and LinkedIn are good examples.
2. **Media-sharing networks.** These networks focus is on content. For example, on Youtube, interaction is around videos that users create. Other media-sharing networks are TikTok and Instagram. Streaming platforms like Twitch are considered a subset of this category.
3. **Community-based networks.** The focus of this type of social network is in-depth discussion, much like a blog forum. Users leave prompts for discussion that spiral into detailed comment threads. Communities often form around select topics. Reddit is an example of a community-based network.
4. **Review board networks.** With these networks, the focus is on a review, usually of a product or service. For example, on Yelp, users can write reviews on restaurants and endorse each other's reviews to boost visibility.

Examples of social media

Here are some examples of popular web-based social media platforms:

- **Facebook** is a free social networking website where registered users create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues.
- **LinkedIn** is a social networking site designed for the business community. Registered members can create networks of people they know and trust professionally.
- **Pinterest** is a social curation website for sharing and categorizing images found online. The main focus of Pinterest is visual, though it does call for brief descriptions of images. Clicking on an image will take a user to the original source. For example, clicking on a picture of a pair of shoes might redirect a user to a purchasing site; an image of blueberry pancakes might redirect to the recipe.
- **Reddit** is a social news website and forum where site members curate and promote stories. The site is composed of hundreds of sub-communities called *subreddits*. Each subreddit has a specific topic, such as technology, politics or music. Reddit site members, also known as "redditors," submit content that members vote on. The goal is to elevate well-regarded stories to the top of the site's main thread page.
- **Twitter** is a free microblogging service for registered members to broadcast short posts called tweets. Twitter members can broadcast tweets and follow other active users' tweets using several platforms and devices.
- **Wikipedia** is a free, open content encyclopedia created through a collaborative community. Anyone registered on Wikipedia can create an article for publication; registration is not required to edit articles.

Social media marketing lets businesses

Reach large audiences for a small price, Keep up with competitors, Sell products and services on the platform, Target specific audiences using demographics and hashtags, Create a sense of community, Have direct contact with followers and provide consumer support and other concepts are included this concept.

There are several ways you can advertise on social media. For example, you can:
Create content: This includes posts and videos.

Promote content: Create posts that are promoted/sponsored.

Engage with people: Get active in groups related to your industry, interact with influencers in your industry, etc.

Grow a following: Get people in your industry to follow your brand by creating and sharing content that appeals to them.

Get downloads: Offer PDFs, PowerPoints, videos, podcasts, etc. on your social channels and profiles.

Consumer buying behavior examines how individuals and organizations make decisions regarding the selection and use of products and services. This field primarily emphasizes psychological aspects, motivations, and behaviors, including how consumers choose between different brands, conduct research, and shop, as well as how marketing strategies can be enhanced to effectively sway their decisions. Various factors influence consumer behavior, including personal, psychological, and social elements. Personal factors pertain to an individual's interests and opinions, which are shaped by their demographic characteristics. The stages in the consumer buying process include need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior.

Social Media Impact on Consumer Behavior:

Social media consumer behavior explores how individuals and groups interact with social media platforms to discover, evaluate, purchase, and endorse products, services, or brands. This field aims to understand the choices consumers make in the digital environment, shaped by the interactions, content, and various influences they experience on social media.

Social media consumer behavior refers to how individuals engage with content, brands, and communities on social platforms. This behavior includes activities such as browsing, interacting, and making purchasing decisions that are influenced by social media content. The landscape of consumer behavior has significantly changed in the era of social media, with platforms like Facebook, Instagram, and Twitter altering the ways in which consumers discover, assess, and purchase products and services.

To understand this behavior, it is essential to examine factors such as the interplay between social media and consumer psychology, current social media trends in consumer behavior, and the impact of social media on brand perception. This analysis goes beyond merely identifying what consumers buy; it also explores the reasons behind their brand preferences, their responses to marketing campaigns, and how they share their experiences with others online.

Importance

Enhanced Brand Engagement: Social media channels enable brands to communicate directly and instantly with consumers. This interaction builds brand loyalty and boosts the likelihood of repeat purchases.

Influence of Reviews and Feedback: These platforms are rich in user-generated content, such as reviews and testimonials, which significantly shape consumer behavior. Online reviews and social media opinions are crucial, as consumers often rely on the experiences of others when making buying choices.

Rapid Access to Trends and Products: Social media accelerates the dissemination of information about new products and trends, keeping consumers up-to-date. This swift access can trigger impulsive buying behavior, leading to quick decisions in response to trending content.

Key points on Impact of Consumer Behavior:

- ❖ **Customers are increasingly choosing to make purchases directly through social media platforms:** Social media has become almost as important for discovering brands as traditional advertising methods like television and radio, as well as personal recommendations. In fact, 30% of consumers indicated a preference for learning about brands via social media in the future. Consequently, more consumers are turning to these platforms to find and shop from brands.
- ❖ **Social media reviews have a significant impact on consumer behavior:** Social media acts as a powerful source of social proof, which is essential in the purchasing decision-making process. More than half (51%) of consumers check reviews on social media or forums to assess a product or service before making a purchase. Even a few negative reviews can dissuade potential buyers.
- ❖ **Customers anticipate interactive communication with brands:** Social media has reshaped the relationship between businesses and their customers, fostering a new level of engagement.
- ❖ **Builds product awareness**

Social media plays a significant role in shaping consumer awareness of specific products. When individuals encounter a problem, they begin looking for solutions. However, they often struggle to identify which product or service will effectively address their needs.

The primary goal of any business is to understand and shape consumer behavior. By leveraging customer experience analytics, you can gain insights into your customers and their needs through social media interactions. If your brand lacks a presence on social media, you are overlooking a crucial opportunity to impact consumer purchasing decisions.

❖ **Social Proof as a greater force of buying decisions**

Social media has transformed social proof into a significant influence on purchasing decisions. This phenomenon arises from people's natural inclination to mimic the actions of those around them or to follow the lead of influential figures.

Satisfied customers often express their appreciation for products through likes, shares, reviews, and comments on social platforms. Marketers are enhancing transparency in the social space by showcasing these positive interactions—such as reviews, comments, likes, tweets, and pins from delighted customers—to build brand trust and boost conversion rates. The beauty and cosmetics sector is among the leading industries that effectively leverage this customer engagement on social media.

The impact of social proof is undeniable, especially as social media has become a crucial element for both buyers and sellers. Social marketers aiming to promote their products should incorporate strong social proof into their strategies, utilizing case studies, images, videos, podcast interviews, and endorsements from influencers. All these elements contribute to a compelling selling approach.

❖ **Promotions, Discounts and Deals on Social Media**

Numerous social media users have joined groups and forums that align with their interests. Promotions, discounts, and deals encountered on social media significantly impact consumers' purchasing decisions. In fact, 64% of online shoppers hold off on making purchases until items are on sale.

Social media serves as a cost-effective platform, providing brands with immediate access to billions of active users. To effectively influence consumer behavior, brands must ensure that their target audience not only sees their products but also appreciates and shares them on social media.

❖ **Social Media Influencers**

Consumers are more likely to buy when they receive recommendations from trusted sources. Celebrities and prominent figures inspire their followers and influence their buying choices.

Conclusion

Social media has transformed how businesses connect with and engage their customers. By establishing a presence on social media platforms and leveraging tools

like paid advertising, content marketing, and influencer partnerships, companies can enhance their visibility, draw in new clients, and build brand loyalty.

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CHEMICAL PARAMETERS OF BRINE AT VARIOUS STAGES OF SOLAR SALT-PANS IN TUTICORIN DISTRICT, TAMIL NADU, INDIA

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ABSTRACT

Common salt, known as sodium chloride, is a naturally occurring mineral composed of sodium and chloride ions, typically extracted from the underground deposits or produced through the evaporation of sea water. This ubiquitous substance plays a vital role in industrial manufacturing, food preservation, medical treatments and even road maintenance. The present study investigates the chemical parameters of brine from various salt-pans. The analysis reveals significant variations in chemical parameters such as chloride, sulphate, magnesium, calcium, sodium and potassium across different salt-pans. The concentration of chloride, sulphate, magnesium and potassium gradually increased from source to bittern. In contrast, calcium initially increased from source to reservoir, then decreased gradually. Sodium also exhibited a non-monotonic trend, increasing in the initial stage and in the final stage gets decreased.

Keywords: Brine, Solar water evaporation, Chemical parameters

INTRODUCTION

India holds a prominent position in the global salt industry, being one of the top salt-producing nations worldwide. Salt is manufactured from some common sources such as sea water, rock salt deposits, brine solution etc. Common salt is a crystalline mineral composed of sodium and chloride ions. Brine is a solution of water and high concentration of salts, typically sodium chloride and other minerals. The composition of brine can vary widely depending on the factors like source, geological location and any treatment or processing, the brine may have undergone. The brine from different sources has different mineral concentrations [1]. The major components present in the brine are sodium chloride and water. The minor components present in the brine are calcium, magnesium and potassium ions. It may include iron, zinc, manganese and other trace minerals. Brine may also contain some dissolved gases and organic compounds. In India, nature has endowed with long periods of dry weather, which aids the natural evaporation of sea water. The concentration of seawater through solar evaporation results in the successive crystallization of the less soluble salts (CaCO_3 , CaSO_4) first, followed by NaCl and finally magnesium salts. Salt workers use the empirical Baume ($^{\circ}\text{Be}$) scale, to measure the concentration of brines. According to that scale, the sea water concentration

is normally around 3.5°Be. The crystallization of CaCO_3 begins at 4.6°Be and that of CaSO_4 at 13.2°Be but NaCl crystallizes at 25.7°Be, followed by the more soluble magnesium salts at 30°Be [2], the liquor is called as “bittern”, because of its characteristic bitter taste. Due to the seasonal changes, temperature never remains constant in the brine sources. Heavy rains lower the values of different ions in the brine. This study investigates the chemical parameters of brine at various stages of salt production in different salt-pans.

MATERIALS AND METHODS

The present study was conducted over a period of six months, spanning from February 2023 to July 2023. This six-month duration allowed for the collection of data across different seasons and environmental conditions providing a comprehensive understanding of the chemical parameters in the brine of various salt-pans. Samples of brine were collected from different salt-pans in Tuticorin District namely Tharuvaikulam, Kallurani and Melmandhai. In Tharuvaikulam and Kallurani, sub-soil brine is used for salt production. In Melmandhai, sea brine is utilized for salt production. The samples were collected from five different stages of salt production viz., source, reservoir, condenser, crystallizer and bittern. Numerous minerals were present in the samples. Among those minerals, the percentage of chloride, sulphate, magnesium, calcium, sodium and potassium were determined from the various stages of salt production using standard procedures [3].

RESULTS AND DISCUSSION

In Tuticorin District, salt is manufactured by the solar evaporation of various brines such as sub soil brine and sea water. Maximum salinity was observed in sub soil brine because it is less diluted compared to sea brine. Sub soil brine is trapped underground and has limited interaction with freshwater sources, resulting in higher salt concentrations and increased salinity levels. The analysis of brine samples from source to bittern revealed distinct trends in the concentration of chloride, sulphate, magnesium, calcium, sodium and potassium.

Chloride (%)

Chloride ions are one of the dominant anions present in the brine, consistently showing high concentrations from the source to bittern stage, indicating a steady accumulation of chloride ions as the brine becomes more concentrated through evaporation. Although the crystallizer pond released chloride, the chloride concentration continued to rise in the subsequent bittern stage. This phenomenon has been attributed to two main factors. One is the incomplete crystallization of sodium chloride in the crystallizer stage, with the crystallization efficiency of 76%. Other is the presence of highly soluble salts like potassium chloride and magnesium chloride in the bittern which contribute to the increasing chloride concentration [4].

Fig. 1. Monthly variation of chloride (%) in the sampling station during the study period 2023

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Tharuvaikulam	Source	2.3	2.3	2.2	2.3	2.6	2.6
	Reservoir	5.4	5.6	5.3	5.6	5.8	5.9
	Condenser	10.8	11.1	10.5	11.4	11.7	11.8
	Crystallizer	16.8	17.1	16.5	17.3	17.7	17.8
	Bittern	29.4	29.5	29.2	29.2	29.7	30.0
Kallurani	Source	2.4	2.3	2.4	2.4	2.6	2.6
	Reservoir	5.9	6.0	5.8	5.8	6.6	6.7
	Condenser	11.7	11.8	11.5	11.5	12.6	12.7
	Crystallizer	17.2	17.3	17.0	17.0	17.8	17.9
	Bittern	30.2	30.3	X	X	30.6	30.7
Melmandhai	Source	3.4	3.3	3.4	3.5	3.6	3.5
	Reservoir	6.6	6.7	6.9	7.0	7.2	7.3
	Condenser	13.7	13.8	13.5	13.9	14.0	14.1
	Crystallizer	19.2	19.4	19.5	19.6	19.7	19.7
	Bittern	29.3	X	29.3	29.5	29.8	29.9

X- SAMPLE NOT AVAILABLE DUE TO RAIN

SULPHATE (%)

Besides chloride, sulphate is the next dominant anion present in brine. In the present study, the sulphate ion concentration in the brine samples consistently increased from the source to bittern stage, aligning with the previous findings [5]. Although phase chemistry suggests that sulphate is eliminated as gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and anhydrous calcium sulphate in the condenser stage (around 13‰ salinity), the observed increase in sulphate concentration can be attributed to the formation of magnesium sulphate and potassium sulphate during evaporation, which outweighs the deposition of gypsum and anhydrous calcium sulphate.

Fig 2. Monthly variation of sulphate (%) in the sampling station during the study period 2023

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Tharuvaikulam	Source	0.28	0.28	0.27	0.29	0.32	0.33
	Reservoir	1.08	1.09	1.07	1.13	1.14	1.15
	Condenser	1.87	1.90	1.89	1.93	1.97	1.99
	Crystallizer	2.53	2.56	2.54	2.58	2.63	2.64
	Bittern	2.82	2.82	2.79	2.75	2.88	2.89
Kallurani	Source	0.30	0.31	0.29	0.33	0.34	0.35
	Reservoir	1.08	1.08	1.06	1.10	1.12	1.13

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
	Condenser	1.70	1.77	1.72	1.79	1.84	1.85
	Crystallizer	2.62	2.64	2.53	2.59	2.66	2.67
	Bittern	2.86	2.87	2.69	X	2.92	2.93
Melmandhai	Source	0.31	0.32	0.30	0.33	0.34	0.35
	Reservoir	1.49	1.50	1.48	1.51	1.55	1.56
	Condenser	2.45	2.46	2.43	2.51	2.60	2.64
	Crystallizer	3.16	3.17	3.12	3.19	3.36	3.38
	Bittern	3.89	X	3.87	3.92	3.98	3.99

X- SAMPLE NOT AVAILABLE DUE TO RAIN

MAGNESIUM (%)

In the present study, the magnesium concentration steadily increased from the source to the bittern stage. This rise is attributed to the high solubility of magnesium chloride and magnesium sulphate, which remain in solution during evaporation and only crystallize after reaching 30°Be in the bittern stage [7].

Fig 4. Monthly variation of magnesium (%) in the sampling stations during the period 2023

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Tharuvaikulam	Source	0.23	0.24	0.22	0.26	0.29	0.30
	Reservoir	0.84	0.85	0.82	0.92	0.97	0.98
	Condenser	1.78	1.82	1.76	1.89	1.96	1.97
	Crystallizer	2.38	2.41	2.35	2.83	2.87	2.89
	Bittern	3.54	3.56	3.50	3.62	3.68	3.68
Kallurani	Source	0.24	0.25	0.23	0.28	0.32	0.34
	Reservoir	0.86	0.87	0.83	0.92	0.96	0.97
	Condenser	1.84	1.85	1.81	1.92	1.97	1.98
	Crystallizer	2.75	2.76	2.71	2.84	2.89	2.90
	Bittern	3.73	3.74	3.69	X	3.83	3.84
Melmandhai	Source	0.22	0.21	0.20	0.22	0.25	0.26
	Reservoir	0.51	0.52	0.49	0.54	0.57	0.58
	Condenser	1.24	1.25	1.21	1.32	1.34	1.36
	Crystallizer	1.78	1.79	1.75	1.89	1.97	1.99
	Bittern	2.76	X	2.73	2.84	2.89	2.90

X- SAMPLE NOT AVAILABLE DUE TO RAIN

CALCIUM (%)

The study found that calcium concentrations were relatively low in source samples. Initially, the calcium concentration increases from source to reservoir and went on decreasing from reservoir to bittern stage. This is due to the early deposition of calcium carbonate in reservoirs and the deposition of calcium as gypsum and calcium sulphate in condenser ponds. The low calcium concentration in crystallizers confirmed maximum elimination of calcium. Trace amounts of calcium in later stages may be attributed to organic matter complexing with calcium. Earlier reports confirmed that the calcium concentrations are significantly reduced or undetectable in the bittern stage, particularly in salt production using sea brine [6].

Fig 3. Monthly variation of calcium (%) in the sampling stations during the study period 2023

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Tharuvai kulam	Source	0.057	0.061	0.053	0.063	0.065	0.067
	Reservoir	0.164	0.165	0.163	0.166	0.168	0.170
	Condenser	0.109	0.111	0.107	0.115	0.119	0.120
	Crystallizer	0.082	0.083	0.080	0.086	0.089	0.090
	Bittern	0.058	0.069	0.056	0.065	0.069	0.070
Kallurani	Source	0.047	0.048	0.046	0.049	0.052	0.055
	Reservoir	0.136	0.138	0.134	0.148	0.158	0.163
	Condenser	0.107	0.108	0.105	0.113	0.119	0.121
	Crystallizer	0.073	0.074	0.071	0.079	0.083	0.088
	Bittern	0.058	0.060	0.057	X	0.073	0.078
Melmandhai	Source	0.042	0.043	0.041	0.042	0.045	0.046
	Reservoir	0.120	0.122	0.117	0.123	0.131	0.133
	Condenser	0.083	0.085	0.088	0.081	0.092	0.093
	Crystallizer	0.078	0.080	0.082	0.071	0.079	0.082
	Bittern	0.056	X	0.053	0.059	0.063	0.064

X- SAMPLE NOT AVAILABLE DUE TO RAIN

SODIUM (%)

The sodium ion, the primary cation in brine samples, showed an increasing trend from the source to the crystallizer stage. However, as sodium chloride crystallization occurred in the crystallizer, the sodium concentration decreased in the subsequent bittern stage [8]. Notably, between 25.4 and 28°Be, 72-76% of sodium chloride had crystallized, leaving the remaining sodium in the bittern.

Fig 5. Monthly variation of sodium (%) in the sampling stations during the study period 2023

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Tharuvai kulam	Source	0.77	0.79	0.76	0.8	0.84	0.85
	Reservoir	0.87	0.88	0.84	0.95	0.97	0.98
	Condenser	1.02	1.03	1.01	1.04	1.07	1.08
	Crystallizer	1.21	1.22	1.18	1.24	1.28	1.29
	Bittern	0.69	0.71	0.65	0.76	0.8	0.84
Kallurani	Source	0.72	0.73	0.69	0.77	0.82	0.84
	Reservoir	0.81	0.83	0.78	0.89	0.95	0.98
	Condenser	1.02	1.03	1.01	1.04	1.06	1.08
	Crystallizer	1.17	1.18	1.14	1.24	1.32	1.38
	Bittern	0.74	0.76	0.71	X	0.82	0.83
Melmandhai	Source	0.86	0.87	0.84	0.91	0.95	0.96
	Reservoir	1.02	1.03	1.01	1.04	1.09	1.1
	Condenser	1.29	1.3	1.27	1.36	1.42	1.45
	Crystallizer	1.38	1.39	1.36	1.45	1.5	1.51
	Bittern	0.78	X	0.76	0.83	0.87	0.88

X- SAMPLE NOT AVAILABLE DUE TO RAIN

POTASSIUM (%)

Potassium ions were present in relatively smaller amounts compared to other cations throughout all stages of salt production. Due to their high solubility, potassium salts do not crystallize until the bittern stage [9]. The concentration of potassium progressively increased from source to bittern stage.

Fig 5. Monthly variation of potassium (%) in the sampling stations during the study period 2023

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Tharuvaikulam	Source	0.027	0.028	0.025	0.034	0.038	0.039
	Reservoir	0.033	0.035	0.031	0.04	0.044	0.045
	Condenser	0.045	0.046	0.042	0.051	0.055	0.056
	Crystallizer	0.054	0.056	0.053	0.06	0.064	0.065
	Bittern	0.076	0.077	0.073	0.081	0.086	0.087
Kallurani	Source	0.03	0.031	0.028	0.034	0.037	0.038
	Reservoir	0.039	0.04	0.036	0.043	0.045	0.046
	Condenser	0.045	0.047	0.043	0.051	0.057	0.058
	Crystallizer	0.053	0.054	0.05	0.064	0.067	0.068
	Bittern	0.07	0.071	0.068	X	0.085	0.086

STATION	STAGES	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
Melmandhai	Source	0.034	0.035	0.033	0.036	0.038	0.039
	Reservoir	0.039	0.041	0.038	0.043	0.048	0.049
	Condenser	0.046	0.047	0.044	0.054	0.057	0.058
	Crystallizer	0.057	0.058	0.055	0.062	0.066	0.067
	Bittern	0.068	X	0.065	0.083	0.086	0.087

X- SAMPLE NOT AVAILABLE DUE TO RAIN

CONCLUSION

The study reveals that the ionic content of chloride, sulphate, magnesium and potassium were found to increase from the source to the bittern stage, while sodium and calcium followed different trend. Sulphate ion concentration was found to increase due to the formation of $MgSO_4$ and K_2SO_4 outweighing the deposition of calcium sulphate. Magnesium and potassium remain in solution due to their high solubility and only crystallize after the bittern stage. The percentage of sodium increased from source to crystallizer, then found to decrease in the bittern stage as sodium chloride crystallizes. Calcium was found to decrease from condenser to bittern stage due to deposition as gypsum and calcium sulphate in condenser ponds. The study provides insights into the variations in ionic content during salt production, highlighting the importance of understanding these changes for efficient salt production processes.

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FIBONACCI PATH DECOMPOSITION OF DIAMOND SNAKE GRAPH

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Abstract: Let $G = (V, E)$ be a simple connected graph with p vertices and q edges. A decomposition $(G_a, G_{ar}, G_{ar^2}, G_{ar^3}, \dots, G_{ar^{n-1}})$ of G is said to be a Geometric Decomposition(GD) if each $G_{ar^{i-1}}$ is connected and $|E(G_{ar^{i-1}})| = ar^{i-1}$ for every $i = 1, 2, \dots, n$ and $a, r \in \mathbb{N}$. In this paper, we investigate Fibonacci Path Decomposition of graphs.

Keywords: Decomposition, Fibonacci Decomposition, Fibonacci Path Decomposition,

1. Introduction:

By a graph, we mean a finite, undirected simple connected graph G without loops or multiple edges. Let $G = (V, E)$ be a simple connected graph with p vertices and q edges. If G_1, G_2, \dots, G_n are connected edge disjoint subgraphs of G with $E(G) = E(G_1) \cup E(G_2) \cup \dots \cup E(G_n)$, then (G_1, G_2, \dots, G_n) is said to be a decomposition of G .

Fibonacci numbers can be defined recursively by the equations $F_1 = 1, F_2 = 1, F_n = F_{n-1} + F_{n-2}, n \geq 3$. The first ten Fibonacci numbers are $F_1 = 1, F_2 = 1, F_3 = 2, F_4 = 3, F_5 = 5, F_6 = 8, F_7 = 13, F_8 = 21, F_9 = 34, F_{10} = 55$. A diamond snake graph is obtained by joining vertices v_i and v_{i+1} to two new vertices u_i and w_i for $i = 1, 2, 3, \dots, n-1$. A diamond snake has $3n+1$ vertices and $4n$ edges, where n is the number of blocks in the diamond snake. We denote this snake by D_n .

2. Fibonacci Decomposition of graphs

Definition 2.1: A Decomposition (G_1, G_2, \dots, G_n) of G is said to be **Fibonacci Decomposition (FD)** if (i) $q(G_1) = 1, q(G_2) = 1$ (ii) $q(G_i) = q(G_{i-1}) + q(G_{i-2}), i = 3, 4, \dots, n$ (iii) $E(G) = E(G_1) \cup E(G_2) \cup \dots \cup E(G_n)$ (iv) Each $G_i, i = 1, 2, \dots, n$ is connected.

Theorem 2.2: If G admits FD (G_1, G_2, \dots, G_n) if and only if $q(G) = \sum_{i=1}^n f_i$.

Proof: Assume that G admits FD (G_1, G_2, \dots, G_n) . To prove that $q(G) = \sum_{i=1}^n f_i$. When $n = 1$, G admits FD (G_1) . Then $q(G) = q(G_1) = 1 = f_1$.

Suppose the result is true for $n = k$. Let G^* be a graph which admits FD (G_1, G_2, \dots, G_k) . Then $q(G^*) = \sum_{i=1}^k f_i$. Let $n = k + 1$. Let G^{**} be a graph which admits FD $(G_1, G_2, \dots, G_{k+1})$. To prove that $q(G^{**}) = \sum_{i=1}^{k+1} f_i$. Now, $\sum_{i=1}^{k+1} f_i = \sum_{i=1}^k f_i + f_{k+1} = q(G^*) + f_{k+1}$

Let G' be a graph with f_{k+1} edges. Then $q(G') = f_{k+1}$. Therefore $\sum_{i=1}^{k+1} f_i = q(G^*) + q(G')$. But $G^{**} = G^* \cup G'$. Therefore $q(G^{**}) = \sum_{i=1}^{k+1} f_i$. Hence $q(G) = \sum_{i=1}^n f_i$. The converse part is obvious. ■

3. FIBONACCI PATH DECOMPOSITION (FPD) OF GRAPHS

Definition 3.1: A Decomposition (G_1, G_2, \dots, G_n) of G is said to be **Fibonacci Path Decomposition (FPD)** if (i) G admits FD (ii) Each G_i , $i = 1, 2, \dots, n$ is a path.

Theorem 3.2: A diamond snake graph D_{m_1} admits FPD $(G_1, G_2, \dots, G_{6t-3})$ if and only if $m_1 = \frac{\sum_{i=1}^{6t-3} f_i}{4}$.

Proof: Assume that a diamond snake graph D_{m_1} admits FPD $(G_1, G_2, \dots, G_{6t-3})$. We have $q(D_{m_1}) = 4m_1$. By Theorem 2.2, $q(D_{m_1}) = \sum_{i=1}^{6t-3} f_i$. Then $4m_1 = \sum_{i=1}^{6t-3} f_i$. Thus $m_1 = \frac{\sum_{i=1}^{6t-3} f_i}{4}$.

Conversely, let $m_1 = \frac{\sum_{i=1}^{6t-3} f_i}{4}$. Let U, V and W be the three vertex sets such that $U = \{u_1, u_2, u_3, \dots, u_{m_1+1}\}$, $V = \{v_1, v_2, \dots, v_{m_1}\}$ and $W = \{w_1, w_2, \dots, w_{m_1}\}$, where $\deg(u_1) = \deg(u_{m_1+1}) = \deg(v_i) = \deg(w_i) = 2$, $1 \leq i \leq m_1$ and $\deg(u_i) = 4$, $2 \leq i \leq m_1$. If $t = 1$, then the first block is decomposed into G_1, G_2, G_3 . If $t > 1$, then the (u_2, u_{m_1+1}) path is described below.

- i) $R_1: u_2 v_2 u_3 v_3 \dots v_{m_1} u_{m_1+1}$
- ii) $R_2: u_2 w_2 u_3 w_3 \dots w_{m_1} u_{m_1+1}$
- iii) $R_3: u_2 w_2 u_3 v_3 \dots w_{m_1} u_{m_1+1}$, if j is odd
 $u_2 w_2 u_3 v_3 \dots v_{m_1} u_{m_1+1}$, if j is even
- iv) $R_4: u_2 v_2 u_3 w_3 \dots v_{m_1} u_{m_1+1}$, if j is odd
 $u_2 v_2 u_3 w_3 \dots w_{m_1} u_{m_1+1}$, if j is even

Let P be the set of all paths which containing R_i , $i = 1, 2, 3, 4$. Take any one of R_i , $i = 1, 2, 3, 4$. Then there is an integer $j \in \mathbb{N}$ such that

$$G_{6j} = \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j}}{4} + 1} \right) \text{ path, for each } R_i.$$

$$G_{6j+3} = \left(u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j}}{4} + 1}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1} \right) \text{ path, for each } R_i.$$

Therefore any one of R_i can be decomposed into $\cup_{j=1}^{t-1} (G_{6j}, G_{6j+3})$. Let Q be the set of all paths which containing $D_{m_1} - R_i = R_i^*$ (say), $i = 1, 2, 3, 4$. Take any one of $D_{m_1} - R_i$ which is the complement of above one R_i . Then there is an integer $j \in \mathbb{N}$ such that

$$G_{6j-2} = \begin{cases} \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1} \right) \text{ path} & \text{if } R_1^* \text{ in } Q \\ \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1} \right) \text{ path} & \text{if } R_2^* \text{ in } Q \\ \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1} \right) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is odd} \\ \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1} \right) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is even} \\ \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1} \right) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is odd} \\ \left(u_{\frac{\sum_{i=1}^{6j-3} f_i}{4} + 1}, w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1} \right) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is even} \end{cases}$$

$$G_{6j-1} = \begin{cases} \left(w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j} + 1} \right) \text{ path} & \text{if } R_1^* \text{ in } Q \\ \left(v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j} + 1} \right) \text{ path} & \text{if } R_2^* \text{ in } Q \\ \left(w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j} + 1} \right) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is odd} \\ \left(v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j} + 1} \right) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is even} \\ \left(v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j} + 1} \right) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is odd} \\ \left(w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j-2}}{2} \rfloor + 1}, u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j} + 1} \right) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is even} \end{cases}$$

$$G_{6j+1} = \begin{cases} (u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j+1}}{4}}, w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}) \text{ path} & \text{if } R_1^* \text{ in } Q \\ (u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j+1}}{4}}, v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}) \text{ path} & \text{if } R_2^* \text{ in } Q \\ (u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j+1}}{4}}, v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is odd} \\ (u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j+1}}{4}}, w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is even} \\ (u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j+1}}{4}}, w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is odd} \\ (u_{\frac{\sum_{i=1}^{6j-3} f_i + f_{6j+1}}{4}}, v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is even} \end{cases}$$

$$G_{6j+2} = \begin{cases} (w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1}) \text{ path} & \text{if } R_1^* \text{ in } Q \\ (v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1}) \text{ path} & \text{if } R_2^* \text{ in } Q \\ (v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1}) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is odd} \\ (w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1}) \text{ path} & \text{if } R_3^* \text{ in } Q \text{ and } j \text{ is even} \\ (w_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1}) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is odd} \\ (v_{\frac{\sum_{i=1}^{6j-3} f_i + \lfloor \frac{f_{6j+2}}{2} \rfloor + 1}{4}}, u_{\frac{\sum_{i=1}^{6j+3} f_i}{4} + 1}) \text{ path} & \text{if } R_4^* \text{ in } Q \text{ and } j \text{ is even} \end{cases}$$

Therefore R_i^* can be decomposed into $U_{j=1}^{t-1}(G_{6j-2}, G_{6j-1}, G_{6j+1}, G_{6j+2})$. Thus $R_i \cup R_i^*$ can be decomposed into $(G_4, G_{10}, \dots, G_{6t-8}), (G_5, G_{11}, \dots, G_{6t-7}), (G_6, G_{12}, \dots, G_{6t-6}), (G_7, G_{13}, \dots, G_{6t-5}), (G_8, G_{14}, \dots, G_{6t-4})$ and $(G_9, G_{15}, \dots, G_{6t-3})$. Hence the diamond snake graph D_{m_1} admits $\text{FPD}(G_1, G_2, \dots, G_{6t-3})$. ■

Remark 3.3: A diamond snake graph D_{m_2} admits $\text{FPD}(G_1, G_2, \dots, G_{6t-1})$ if and only if $m_2 = \frac{\sum_{i=1}^{6t-1} f_i}{4}$.

Remark 3.4: A diamond snake graph D_{m_3} admits $\text{FPD}(G_1, G_2, \dots, G_{6t})$ if and only if $m_3 = \frac{\sum_{i=1}^{6t} f_i}{4}$.

Theorem 3.5 : Let D_{m_1} and D_{m_2} admits FPD and $\{e\}$ is an edge with each vertex is incident to e is of degree 2. Then $D_{m_2-m_1} - \{e\}$ admits $\text{FPD}(G_1, G_2, \dots, G_{6t-2})$.

Proof: Assume D_{m_1} and D_{m_2} admits FPD. Now, $m_2 - m_1 = \frac{f_{6t-2} + f_{6t-1}}{4}$, $t \in \mathbb{N}$.

Case (i): $t = 1$. Then $m_2 - m_1 = 2, t \in \mathbb{N}$. Therefore $q(D_2) = 8$. Now, $q(D_2) - \{e\} = 7$, where $e = \{u_1 v_1\}$ or $\{u_1 w_1\}$. Since $e = \{u_1 v_1\}$, $v_1 - u_3$ path with $d(v_1, u_3) = 3$ consists of 3 edges and $u_1 - u_3$ path with $d(u_1, u_3) = 4$ consists of 4 edges. Then $v_1 - u_3$ path is decomposed into G_4 and $u_1 - u_3$ path is decomposed into G_1, G_2, G_3 . Therefore $D_2 - \{e\}$ can be decomposed into G_1, G_2, G_3, G_4 . Also, let us take $e = \{u_1 w_1\}$. Then $D_2 - \{e\}$ can be decomposed into G_1, G_2, G_3, G_4 .

Case (ii): $t > 1$. Then $q(D_{m_2 - m_1}) = f_{6t-2} + f_{6t-1}$. Now, $q(D_{m_2 - m_1}) - \{e\} = f_{6t-2} + f_{6t-1} - 1$, where $e = \{u_1 v_1\}$ or $\{u_1 w_1\}$. Since $e = \{u_1 v_1\}$, $v_1 - u_{\frac{f_{6t-2} + f_{6t-1} + 1}{4}}$ path with $d(v_1, u_{\frac{f_{6t-2} + f_{6t-1} + 1}{4}}) = \frac{f_{6t-2} + f_{6t-1}}{2} - 1$ consists of $\frac{f_{6t-2} + f_{6t-1}}{2} - 1$ edges and $u_1 - u_{\frac{f_{6t-2} + f_{6t-1} + 1}{4}}$ path with $d(u_1, u_{\frac{f_{6t-2} + f_{6t-1} + 1}{4}}) = \frac{f_{6t-2} + f_{6t-1}}{2}$ consists of $\frac{f_{6t-2} + f_{6t-1}}{2}$ edges. Then $v_1 - u_{\frac{f_{6t-2} + f_{6t-1} + 1}{4}}$ path can be decomposed into $G_4, (G_7, G_{13}, \dots, G_{6t-5})$ and $(G_{10}, G_{16}, \dots, G_{6t-2})$ and $u_1 - u_{\frac{f_{6t-2} + f_{6t-1} + 1}{4}}$ path can be decomposed into $G_1, G_2, G_3, (G_5, G_{11}, \dots, G_{6t-7}), (G_6, G_{12}, \dots, G_{6t-6}), (G_8, G_{14}, \dots, G_{6t-4}), (G_9, G_{15}, \dots, G_{6t-3})$. Therefore $D_{m_2 - m_1} - \{e\}$ can be decomposed into $G_1, G_2, \dots, G_{6t-2}$. Also, let us take $e = \{u_1 w_1\}$. Then $D_{m_2 - m_1} - \{e\}$ can be decomposed into $G_1, G_2, \dots, G_{6t-2}$. Hence $D_{m_2 - m_1} - \{e\}$ admits FPD($G_1, G_2, \dots, G_{6t-2}$). ■

Remark 3.6: Let D_{m_1}, D_{m_2} and D_{m_3} admits FPD and e_1 and e_2 be two edges with each vertices incident to e_1 and e_2 are of degree 2. Then the following conditions hold:

- i. If $t = 1$, $D_{m_3 - m_2 - m_1}$ admits FPD (G_1, G_2, G_3).
- ii. If $t > 1$, $D_{m_3 - m_2 - m_1} - \{e_1, e_2\}$ admits FPD($G_1, G_2, \dots, G_{6t-4}$).

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SIGNIFICANCE OF NATURE IN JHUMPA LAHIRI'S *THE LOWLAND*

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Abstract

Nature in the broadest sense is the natural, physical or material or universe. Nature can refer to the phenomena of the physical world, and also to life in general. The study of nature is a large part of science. The paper is an attempt to read Jhumpa Lahiri's, *The Lowland*, from Naturalism in literature perspective which discusses about the importance of nature with human beings in literature. She gives a detailed description of the relationship between nature and human beings and how it is treated by humans at large. From the title *The Lowland*, itself we can easily conclude the novel is about the importance of nature. . The setting of the novel takes place on the lap of nature where the central characters Subhash and Udayan are brought up.

Keywords: Nature, physical world, human relationship

Introduction

Jhumpa Lahiri is an Indian born American author has been selected as the winner of the 29th PEN Award for excellence in short story. Her novel *The Lowland* was published in 2013 and was placed on the shortlist for the Man Booker Prize and the National Book Award for Fiction.

Life and nature are the one which we can able to see our parallels within our own lives. The nature reflects our life, if we are good with nature, it will protect us and make our life happy.

Significance of Nature

Jhumpa Lahiri in this novel, *The Lowland*, discusses about the nature unlike the other novels. The place Tollygunge and the atmosphere are beautifully described by Lahiri in her novel *The Lowland*, which shows her keen observation and likeness towards nature. According to her all human beings in the world are strongly bonded with nature. Lahiri describes about Tollygunge in Calcutta and its atmosphere especially about the ponds over there. After the monsoon rain, the two ponds are filled with water, so poor people moved out from this place in search of life. But while during summer season, the children used to play football and cricket there. She describes about the climate condition of Calcutta in her novel as "In the humid climate of Calcutta, evaporation was slow. But

eventually the sun burned off most of the floodwater, exposing damp ground again. So many times Subhash and Udayan had walked across the lowland. It was a shortcut to a field on the outskirts of the neighborhood, where they went to play football” (1).

The two ponds mentioned in the novel are symbolical of the two brothers Subhash and Udayan. During rainy season the pond overflows and reaches the other side. Like the human beings, nature also expresses happiness and sorrows along with them. When Subhash and Udayan were children, they enjoy playing in nature. When Udayan opposes for the well being of the nature, he loses his life in the middle of the novel. The ponds in which they play are the source of basic livelihood for the people start to degrade into drainage with all waste material. The death of Udayan symbolizes the life of nature during the autumn season, it depicts the death of Udayan.

Relationship between Human and Nature

Lahiri presents the source of livelihood with nature and the relationship between nature and human beings. Earlier, when Subhash and Udayan were children they enjoy the nature and in the Lowland even during the summer season. It is because they wanted to keep themselves cool in the ponds and also, the poor people used to take bath in the ponds. During the rainy season, the pond looks so beautiful with fresh water and pretty bird's gets shelter over there. The people in the village, being poor depend on this pond to live, bath and to clean the vehicles etc. Lahiri has also expressed such kind of life led by the characters in the novel as “Lying in bed in the morning, watching sunlight flickering like a restless bird on the wall. He puts insects under a doomed screen to observe them. At the edges of the ponds in the neighborhood, where his mother sometimes washed dishes if the maid happened not to come, he cupped his hands in turbid water, searching for frogs” (11).

The writer also gives much importance to birds. In Tollygunge, we can able to see different varieties of birds around the pond and some birds lay eggs during summer season, they lay their egg under the earth and they wait for the rainy season. But when human beings become more greedy and selfish, they begin to destroy the nature for their own benefit. The impacts of modernization and industrialization have resulted in breaking and collapsing the beauty of nature. Especially different kinds of birds suffer and the wild trees yielding fruits, shadows to the people are destroyed because of human beings.

Like birds, Lahiri has also given importance for animals. When Subhash and Udayan go to Tollygunge as to Tolly club both hear the sound of jackals Lahiri depicts this in the novel as:

Group of jackals sat erect in packs, their tawny hides mottled with gray. As the light dwindled a few began to search for food, their lean forms trotting in straight lines. Their distraught howling, echoing within the club, signalled that it was late, time for the brothers to go home. They left the two kerosene tins, one on the outside to mark the place. They made sure to hide the one inside the club behind some shrubbery. (8)

Once Subhash finds an egg that drops from a warbler's nest. He carefully takes the egg to his house and keeps it in a terracotta container which he gets from a sweet shop. He covers it with twigs for its safety and he places it in the hole in the garden, behind their house. He waits for the chicks and enjoys by seeing the egg. But at present children spend their time with modern gadgets and they are away from collecting feathers and enjoying the nature.

In the past, people have a close contact with nature. They even predict time by seeing sun and with the sounds of birds. Even Subhash and Udayan are able to comprehend the sunrise by hearing the sounds of jackals. But now the situation has changed a lot, people have no time to spend with nature. Many species of birds and animals are now extinct while some are endangered. People in the Tollygunge sell their land for money and land turns sterile and with garbage.

Impacts of Urbanization

Agriculture is the main source of livelihood all over the universe. If there is no agriculture there will be scarcity of food and wealth. But in the past people depend on nature, but unfortunately agricultural lands are converted into industries. When Subhash and Udayan were children the place was very different with pleasant nature. But now it has become a story for them, a mere reminiscence of their young days.

The main reason in the change in environment is population. Because of the increase of population, people use agricultural land to build houses and to cut the trees to make furniture for them. There is no relationship or bond between human beings and nature. In the beginning of the novel Lahiri portrays the scene and describes the nature with the characters Subhash and Udayan when they are child. They enjoy their days with nature. But when Subhash and Udayan grow into became young men, they see the difference in nature. People turn their face away from nature and they start to give more importance to gadgets and machines. Lahiri says, "The field past the lowland, where they'd taken him. The field is no longer empty. A block of new houses sits on it now, their rooftops crowded with television antennas" (218). Because of the changes in society, there is no relationship with neighbours. They become independent and live in their own life without depending on others. Bijoli, mother of two sons remain inside her house after her husband death and she goes away from people.

In Tollygunge, the place is surrounded with mountains, pond and even lowlands. The place becomes a playground for the young children. But now there is no place for the children to play. In olden days, there were huts and houses here and there. So the road is very wide to travel for the people. But when Gauri come back to Calcutta after forty years, she sees houses which are very close to each other. They are taller and have blocked the road and become so narrow to travel. When Gauri see the lowland, where once Subhash and Udayan spends their time during their childhood. She realizes pathetically that now it has become a wasteland for the industries. Further the place has also lost its natural beauty.

But after the death of Udayan, his mother Bijoli usually sits on the terrace of her balcony. Now and then she adorns Udayan's grave with flowers. It is located near the

two ponds so she cleans the pond by collecting the waste material using the stick. She does not bother about others around her and she does it “with bare hands, she sorts through the empty bottles of Dettol, sun silk shampoo” (228). The act of Bijoli proves her to be a true native woman, who wants to clean the pond because it was, once her son Udayan’s favorite place. By doing this she satisfies herself.

Summation

Nature is a gift from god. Preserving nature is the duty of the humans. Samuel Taylor Coleridge conveys the importance of nature in his poetic language to his readers he says as:

He prayeth well who loveth well
Both man and bird and beast
He prayeth best who loveth best
All things both great and small;
For the dear God who loveth us,
He made and loveth all. (The Rime of the Ancient Mariner 612 – 617)

In the novel, Lahiri gives a clear image the destruction of nature with the death of Udayan. Before the death of Udhayan, the police enquired about him to his parents and wife Gauri, “He was walking toward the lowland, back toward the house, arms raised over his head” (125). At last he is killed by the Police. His death symbolizes the destruction of ponds with waste material where the beauty of nature is lost.

Wordsworth in his poem Tintern Abbey, he says, “Nature never did betray / The heart that loved her “(121-122). The nature will be always true and lovable towards human beings, but when we oppose it, we should be ready to face the consequences. In this novel, Lahiri gives lot of importance to nature especially the lowland, it reflects the life of human being. The two ponds is the source for the agriculture and livelihood, but now it is clogged with waste. In the paddy field, people begin to establish new homes and buildings. Lahiri says:

People have always tossed refuse into these bodies of water. But now the accumulation is deliberate. An illegal practice taking place in ponds, in paddy fields, all over Calcutta. They are being plugged up by the promoters so that the city’s swampy land turns solid, so that the city’s turns solid, so that new sectors can be established, new homes built. New generation bred. (215)

Now Subhash is above sixty and he decides to settle in America by marrying Elise Silva, who is once a teacher for Bela. Even-though he lives in America, he use to think about Tollygunge, and his brother Udayan. He feels “Udayan is beside him. They are walking together in Tollygunge, across the lowland, over the hyacinth leaves. They carry a putting iron, some golf balls in their hands” (405).

Thus Lahiri portrays the significance of nature with the characters Udayan and Subhash. Udayan lives in his own country, but he wishes to change the society by opposing nature. So it leads him to death. In case of Subhash, he wants to leave Calcutta

and live in America. But he loses his identity by marrying Gauri. Both the characters in the novel are unhappy and their failure in life reflects the destruction caused by the nature and also the bad condition of the two ponds in the Tollygunge.

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A STUDY ON SEXUAL HEALTH AWARENESS AMONG WOMEN'S COLLEGE STUDENTS REFERENCE TO TENAKSI DISTRICT

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ABSTRACT

The rapid changes that accompany sexual maturing make adults unsure and insecure of themselves, and their capacities leading to feelings of instability, which get intensified by the irrelevant treatment they receive from parents and teachers and society as a whole. Even school curriculum is devoid of sex education and parents feel shame educating their children especially daughters regarding sex and sexual health. Thus, the present study plans to highlight the awareness of women's college students regards sexual health activities.

Objectives

A study on sexual health awareness among women's college students reference to Tenkasi District. **Methods:** The research design adopted for this study is descriptive design in which sixty respondents were chosen by convenient sampling method. The researcher used Questionnaire to collect research data. **Findings:** Majority of the participants are not aware of the safe sex activities and the reproductive health activities. The lesbian relationship can be a new and accepted trend in the current society, but majority of the participants not agree with lesbian relationship. This paper highlights the women's college students awareness towards sexual health. According to the findings the researcher has given suggestion for prescription of sex education at high school level.

Keywords: Sexual health awareness, Medias ' role in sex education, Importance of sex education.

INTRODUCTION

Sexual health is fundamental to the overall health and well - being of individuals, couples and families, and to the social and economic development of communities and countries. Reproductive health implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when

and how often to do so, It is essential to remember that sexual and reproductive health is about more than just sexually transmitted illnesses and neglecting unwanted pregnancy. Student's sexual health is an important aspect of their overall wellbeing. Adult is a period of transition with a wide range of physical, emotional and psychological development. Having a good knowledge and a positive attitude helps young people to grow in a mature way where they are able to take better decision specially in the matter of sexual health, marriage, family, pregnancy, contraceptive methods and more over they can assertive in getting into risk behaviors.

OBJECTIVES

A Study On Sexual Health Awareness Among Women's College Students
Reference To Tenaksi District

- ❖ To study the demographic profile of adults.
- ❖ To assess the level of awareness on reproductive health among adults. To study the attitude perceived towards sexual and reproductive health among adults.
- ❖ To understand whether the students aware of certain safe sex activities. To study the role of media and environment to educate sexual health awareness.
- ❖ To understand the aspect of using various social media.

METHODOLOGY

The data collected from women colleges in Tenkasi district .The researcher took data collection from the areas of Courtallam and Alangulam women's college. The primary data was collected directly from the students with the help of structured interview schedule. Totally 60 students selected through convenient sampling.

Table 1
Personal Profile of the Respondents

Personal profile of the respondents				Total (%)
Age	Under 18	19-24		100
	35%	65%		
Religion	Islam	Hinduism	Christianity	100
	2%	90%	8%	
Residential Status	Rural	Urban		100
	77%	23%		
Marital Status	Single	Married		100
	98%	2%		

Personal profile of the respondents				Total (%)
Single child	Yes	No		100
	10%	90%		
Family	Nuclear	Joint		100
	83%	17%		
Living	Living Alone	Living with parents	Living with	100
Arrangement			grandparents	
	3%	95%	2%	
	85%	3%	12%	

From the above table shows that 65% of the respondents belong to the age group of 19- 24.90% of respondents belongs to Hindhusim.77% respondents are inhabitants of rural area.98% of respondents are single.90% of respondents is not the single child in their family..83% of respondents are belonging to nuclear family.95%of respondents are living with their parents 85% respondents family income is under 1 lakh.

Table: 2

Knowledge of respondents towards sexual activities

Knowledge of respondents towards sexual activities					Total (%)
Preference of marriage	Love Marriage	Arrange Marriage			100
	23%	77%			
	26%	47%	7%	20%	
Boyfriend wants to develop a sexual relationship	Accept	Complaint is to my parents	Oppose	Break up	100
	2%	60%	17%	21%	
Opinion on love	Mental aspect	Bodily aspect	Both aspect	Foe time bass	100
	34%	3%	25%	38%	
Sex is an important part of life	Yes	No			100
	22%	78%			
Aware of the sexual relationship	Yes	No			100
	33%	67%			

Knowledge of respondents towards sexual activities					Total (%)
Aware of masturbation	Yes	No			100
	12%	88%			
Face sexual abuse during childhood	Yes	No			100
	2%	98%			
	78%	22%			
	7%	93%			
Situation makes you sexually unsafe, your reaction	Inform it your parents	Inform it your friends	Contact a helpline number		100
	88%	5%	7%		
	33%	67%			
Aware of Safe sex Activities	Aware	Unaware			100
Condom Usage	33%	67%			100
Veginal Condom usage	20%	80%			100
STD Related disease	15%	85%			100
Oral Sex	15%	85%			100
State your agreement	Always	Sometimes	Never		100
Ever preoccupied with sexual thoughts	0	3	97		100
Accept with sex before marriage	0	3	97		100
Agree with living together relationship	0	2	98		100

From the above table shows that 77 % of respondents prefer arrange marriage. 60% of respondents are complaint it to their when their boyfriend wants to develop a sexual relationship. 38% of respondents are consider love is only for time pass. 78% of respondents consider sex is not an important part of life. 67% of respondents are unaware of sexual relationship.98% of respondents didn't face sexual abuse during their childhood. 88% of respondents inform to their parents when they face situation which makes them sexually unsafe. 67% of respondents are unaware of condom sex. 80% of respondents are unaware of veginal condom usage.85% of respondents are unaware of sexually transmitted related disease. 85% of respondents are unaware of oral sex. 97% of respondents are never ever preoccupied with sexual thoughts. 97% of respondents are never accept with sex before marriage. 98% of respondents are never agree with lesbian

Table 3
Role of media an environment

Role of media an environment					Total (%)
Habit of using social media	Yes	No			100
	85%	15%			
Hours of using social media	30 Minutes	1-3 Hours	4-6 Hours		100
	2%	86%	12%		
Used the following resources to learn about sexual activities	Social Media	Parents	Friends	Other	100
	34%	12%	42%	12%	
Unknown person develop a sexual chat in social media, your Reaction	Block	Complaint it my parents			100
	67%	33%			
Come across a sexual means, your reaction	Close the Tab	Search related contents	Report the content		100
	54%	3%	43%		

From the above table that 85% of respondents a halving of using social media. 86% of respondents having a habit of using social media for 1 to 3 hours. 42% of respondents are learn sexual activities from their parents. 67% of respondents are block when unknown person from social media develops a sexual chat with them 54% of respondents are close the tab when they come across a sexual content in social media

Table 4
Importance of sex education

Importance of sex education				Total (%)
Sexual education is helps to understand the concept of sex in the life of adults	Yes	No		100%
	27%	73%		
Age range which is suitable for discussing sexual and reproductive health with your people in school/college	Before 11-15	16-17	18 & above	100%
	2%	3%	95%	
In your opinion ,who should discuss sexual and reproductive health with young people	Parents & Caregivers	School teacher & counsellor	Other	100%
	55%	22%	23%	
Ever watch adult content	Yes	No		
movies/memes to gain sexual knowledge	5%	95%		100%

From the above table shows that 73% of respondents consider sexual education helps to understand the concept of sex in the life of adults.95% of respondents consider 18 & above is a suitable age for discussing sexual and reproductive health with people in school & college.55% of respondents have an opinion that parents & caregivers are the right person to discussing sexual and reproductive health with young people .95% of respondents don't have a habit of watch adult content movies or memes to gain sexual knowledge.

CONCLUSION

The research highlights the need for sexual health awareness among women's college students. In many cultures in the world including Indian culture the term ' Sexuality ' is shrouded with secrecy and shame. In order to achieve the sexual well - being, it is necessary to offer comprehensive sexuality education to the young population.

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A STUDY ON ADOLESCENT PERCEPTION TOWARDS CASTE IDENTITY WITH REFERENCE TO GOVERNMENT SCHOOLS IN TIRUNELVELI DISTRICT, TAMILNADU

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ABSTRACT

The caste system in India has long shaped social hierarchies, with caste identity influencing various aspects of life, including education. This study examines the perception of caste among adolescents in government schools in Tirunelveli, focusing on how caste affects their daily lives, social interactions, and educational experiences. Specifically, it explores factors contributing to caste consciousness, the stigma and discrimination faced by students, and the psychological impact of caste-based inequities. A non-probability sampling method was used for this descriptive research. The study found that caste identity remains a significant factor in shaping adolescents' lives, even in the educational environment. Schools should implement awareness programs that educate students and staff about caste discrimination, its harmful effects, and ways to foster inclusion and respect for diversity.

Key words: adolescent student, caste identity and school students

INTRODUCTION

The caste system in India is a hierarchical social structure that has existed for thousands of years, deeply influencing various aspects of life, including social relationships, occupations, and access to resources. Although the Indian Constitution, enacted in 1950, abolished untouchability and provided legal protection against caste-based discrimination, the system's social and cultural influence remains pervasive. Caste continues to shape individuals' identities, access to education, employment opportunities, and social status, particularly in rural and semi-urban areas. The persistence of caste-based prejudice is evident in various forms, from social segregation to economic and educational inequalities. Despite legal and social reforms, caste continues to be a significant factor in shaping social interactions, relationships, and individual experiences in contemporary India. Understanding its impact on young people, especially in educational settings, is crucial to promoting social justice and equality. The caste system's legacy continues to affect the lives of millions, reinforcing the need for sustained efforts to eradicate caste-based discrimination.

OBJECTIVES

A study on adolescent perception of towards caste identity among school students with reference to government schools in Tirunelveli

- ❖ To study the socio- demographic details of the respondent.
- ❖ To know factors, Impact on caste perception towards adolescents.
- ❖ To analyze the role of caste in daily life.
- ❖ To analyze the stigma discrimination and human rights violence due to caste perception towards adolescents.

METHODOLOGY

The data for this study was collected from adolescent students in Government schools in Tirunelveli District, focusing on their perceptions towards caste identity. A convenience sampling method was employed to select a representative sample of 60 adolescent students from four different Government schools in Tirunelveli District. Primary data was collected directly from the respondents through a structured questionnaire, ensuring anonymity and confidentiality.

Table 1 Personal Profile of the Respondents

Socio demographic details						Total (%)
Age	15-16	17-18				100%
	55%	45%				
Gender	Male	Female				100%
	58%	42%				
Religion	Hindu	Muslim	Christian			100%
	78%	0%	22%			
Caste	OC	BC	MBC	DNC	SC/ST	100%
	2%	63%	7%	18%	10%	
Class	11 th	12 th				100%
	55%	45%				
Medium	Tamil	English				100%
	62%	38%				
Group	Bio & maths	Computer science	Pure science	History	Commerce	100%
	45%	37%	2%	13%	3%	

Socio demographic details						Total (%)
Father education	1 to 5	6 to 10	11 to 12	Above		100%
	20%	55%	13%	12%		
Mother education	1 to 5	6 to 10	11 to 12	Above		100%
	15%	65%	15%	5%		
Family size	1 to 2	3 to 4	5 to 6			100%
	3%	67%	30%			
Annual income	Below-50,000	50,000-70,000	70,000-95,000	Above		100%
	7%	33%	58%	2%		

The above table shows that, majority of the respondents (55%) are 15-16. Majority of the respondents (58%) are male. Majority of the respondents (78%) are Hindu. Majority of the respondents (63%) are BC. Majority of the respondents (55%) are class 11th. Majority of the respondents (62%) are studying in Tamil medium. Majority of the respondents (45%) are studying in Bio&maths. Majority of the respondents' father (55%) are 6th – 10th of studied. Majority of the respondents' mother (65%) are 6th – 10th of studied Majority of the respondents (67%) having 3 to 4 members in their family. Majority respondents are (58%) earning 70,000-95,000 per annum.

Table 2 Factors Impact on caste perception towards adolescents

Factors affecting caste consciousness					Total (%)
Respondents according to their feeling off passion on your caste	Yes	No			100%
	28%	72%			
Respondents according to their agree with your caste	Yes	No			100%
	32%	68%			
Respondents according to their caste consciousness	By family	By society	By relatives	By friends	100%
	5%	72%	3%	20%	
Respondents according to their caste pride	Arrogance	Courage	Bravery	None	100%
	5%	72%	3%	20%	
Respondents according to their Caste is necessary	Always	Sometimes	Never		100%
	20%	63%	17%		
Respondents according to their Caste know to other	Always	Sometimes	Never		100%
	13%	67%	20%		
Respondents according to their Caste is your identity	Always	Sometimes	Never		100%
	20%	30%	50%		

From the above table shows that majority of the respondents (72%) having a feeling of passion on their caste. Majority of the respondents (68%) disagree with their caste. Majority of the respondents (72%) are by society conscious of caste. Majority of the respondents are (72%) courage caste pride. Majority of the respondents (63%) are consciousness of caste is necessary. Majority of the respondents (67%) are consciousness of caste know to other. Majority of the respondents (50%) think that caste is their own identity.

Table 3 Role of Caste in Daily Life

Role of caste in daily life					Total (%)
Respondents according to their Necessary in society	Marriage	Work	Education		100%
	48%	17%	35%		
Respondents according to their Relationship with friends from other caste	Good	Very good	Average	Poor	100%
	33%	57%	7%	3%	
Respondents according to their Social media platforns	Instagram reels	Whatsapp Dp &Bio	Youtube video	No	100%
	43%	10%	15%	32%	
Respondents according to their express your caste during in village festival	T- shirt	Caste flags	None		100%
	30%	12%	58%		
Respondents according to their caste certificate in school	Yes	No			100%
	42%	58%			
Respondents according to their Choosing friends	Yes	No			100%
	2%	98%			
Respondents according to their caste among friends	Yes	No			100%
	3%	97%			
Respondents according to their castes in your family	Yes	No			100%
	32%	68%			
Respondents according to their other caste to your home	Yes	No			100%
	87%	13%			
Respondents according to their mottos for your caste	Yes	No			100%
	45%	55%			
Respondents according to their benefited from your caste community	Yes	No			100%
	22%	78%			

From the above table shows that majority (48%) are considering caste is necessary for marriage. Majority (57%) have good relationships with friends who are from other caste. Majority (43%) are representing their caste through Instagram reels. The majority, 58%, do not show their caste during their festival. The majority, 58% are felt

that there is no need for community certificate in the schools. The majority of 98% do not choose their friends based on their caste. Majority of the respondents, 97%, do not see the caste among friends. Majority of the respondents' family members, 68%, do not care about caste. 87% are inviting other caste friends into their family. The majority of 55% have mottos for their caste. Majority 78% are does not benefited by their caste.

Table 4 Stigma, discrimination and human rights violations due to castes towards adolescents

Caste perception among adolescents students					Total (%)
Respondents according to their feelings of being marginalized by caste	Yes	No			100%
	13%	87%			
Respondents according to their teased because of your caste	Yes	No			100%
	8%	92%			
Respondents according to their your opinion about asking other caste	Right	wrong	No opinion		100%
	10%	78%	12%		
Respondents according to their other caste friends	I will accept	I will not accept			100%
	88%	12%			
Respondents according to their caste violence	One times	Two times	Two or more times	No	100%
	5%	0%	0%	95%	

From the above table shows that majority of the respondents are 87% not being marginalized by their caste. Majority of the respondents 92% are does not teased by using their caste name. Majority of the respondents, 78% are felt wrong about asking other's caste. Majority of the respondents 88% were accept their other caste friend when they scored more marks then him. Majority of the respondents (95%) are not affected by the caste violence.

CONCLUSION

In conclusion, the study highlights the persistent influence of caste identity on adolescents in government schools in Tirunelveli, revealing its significant impact on their social interactions, educational experiences, and psychological well-being. The findings underscore the need for comprehensive interventions, including awareness programs, counseling services, and policy measures, to address caste-based inequalities in educational settings. By fostering an inclusive and equitable school environment, it is possible to mitigate the negative effects of caste discrimination and promote the overall

development and well-being of all students. Ultimately, the study calls for a collective effort from educational institutions, policymakers, and society to challenge the deeply ingrained caste prejudices and ensure a more just and supportive educational system for future generations.

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A STUDY ON MENTAL HEALTH EDUCATION AWARENESS AND STIGMA REGARDING MENTAL ILLNESS AMONG CARETAKERS OF MENTALLY ILL PATIENTS WITH REFERENCE TO MIND CARE CENTER IN TIRUNELVELI DISTRICT

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Abstract

Mental health is a fundamental aspect of human well - being, influencing how individuals think, feel and interact with the world around them. It encompasses a broad spectrum of factors, including emotional resilience, psychological stability and social connectedness. A person's mental health influences their ability to cope with stress, maintain fulfilling relationships and navigate life challenges. **Objectives:** To identify prevalent spiritual treatments utilized for mental illness management, assess the current knowledge and awareness of mental health among caretakers and explore the extent of stigma and discrimination faced by this population. **Methods:** Descriptive research design was employed, involving 60 caretakers of mentally ill patients attending the Mind Care Centre. A structured interview schedule was used to collect data on socio - demographic characteristics, mental health education awareness and stigma associated with mental illness. Data were analyzed using descriptive statistics. **Findings:** The study revealed the percentage of mental health education awareness stigma surrounding mental illness was observed among the caretakers with misconceptions and negative attitudes prevailing.

(Keywords: Mental health education, awareness, stigma, caretakers, mentally ill patients, Mind Care Centre)

INTRODUCTION

Mental health awareness is crucial in addressing the stigma and misconceptions surrounding mental illness. It involves educating individuals about various aspects of mental health, including symptoms, treatment options and available support services. Understanding the emotional impact of caregiving is crucial for identifying individuals who may be at risk of mental health issues themselves. The prevalence and impact of stigma and discrimination associated with mental health issues. This includes exploring the attitudes, beliefs and behaviors of caretakers towards individuals with mental illness, as well as the social and cultural factors that contribute to stigma and discrimination.

METHODOLOGY

The study adopts a descriptive research design, aiming to assess mental health education awareness and stigma related to mental illness among the caretakers of mentally ill patients. A non-probability convenience sampling method will be used. This approach is chosen due to its practicality and feasibility in accessing the caretakers who are available and willing to participate at the time of data collection. Data collected directly from the caretakers using a structured questionnaire designed to capture the key areas of mental health education awareness, stigma towards mental illness, and the challenges faced by caretakers.

KEY FINDINGS AND DISCUSSION

Understanding the Respondents

A significant proportion of respondents are aged 58 years and above, indicating a substantial representation of older adults. Most of the respondents are married women. The education qualification of the respondents shows a mixed picture and the largest group of respondents falls under the category of having completed education up to 1st to 7th standard. The majority of respondents occupation among is "Coolie/daily wages", and their monthly income bracket among is "Below 10,000", which constitutes of the total respondents. The family type of the respondents shows that majority belong to nuclear families, while others belong to joint families. The relation with the patient shows that the majority of respondents are parents followed by spouses. The majority of respondents living status among is "Own", while other respondents live in rent or leased residence.

Spiritual treatment followed for mental illness

The respondents' beliefs about the causes of mental illness are diverse and varied. A significant proportion of respondents believe that stress is the primary cause of mental illness. In contrast, a smaller proportion of respondents attribute mental illness to supernatural or mystical factors, such as evil spirits or black magic. However, a significant proportion of respondents believe that mental illness is hereditary or unsure about the causes of mental illness, indicating a lack of knowledge or understanding. The duration of sickness varies widely among the respondents. A significant proportion (40%) of respondents have been sick for more than 5 years while (5%) of respondents have been sick for less than one year. The first actions taken by respondents in response to mental illness vary widely. Majority of the respondents did not take any action. Among those who did take action, the most common responses were visiting a psychiatrist (17%), seeking help from faith healers (15%), and visiting a general doctor (13%). A smaller proportion (8%) of respondents used home remedies initially, while (13%) of respondents sought help from spiritual healers. Respondents' spiritual practices for treating mental illness vary widely. The most common practice (36%) is praying to God Other spiritual practices include using herbal powder, Tabij and other unspecified practices. However, (37%) of respondents do not have any specific spiritual practices for treating mental illness. A significant majority (80%) of respondents believe in the efficacy of psychiatrists in treating mental illness, indicating a strong faith in modern medical practices. In contrast, a smaller proportion (20%) of respondents believe in spiritual

healers, suggesting that some respondents may hold traditional or cultural beliefs about mental health treatment. Overall, these findings suggest that spiritual treatment plays a significant role in many respondents' approaches to managing mental illness.

Knowledge and awareness about mental health among caretakers

A vast majority (75%) of respondents acknowledge that mental illness affects families, highlighting the widespread recognition of its impact on loved ones. Only (8%) disagree, indicating a minority who may not fully understand or acknowledge the effects of mental illness on families. Most respondents (60%) view mental illness as similar to physical diseases, demonstrating an understanding of its medical nature. However, (12%) disagree, suggesting some stigma or misconceptions persist. A significant majority (71%) believe women are mostly affected by mental illness, which may reflect awareness of gender disparities in mental health. Only (2%) disagree, indicating widespread recognition of women's vulnerability. A majority (57%) attribute mental illness to supernatural factors like evil spirits, wrath of God, or black magic, reflecting cultural or traditional beliefs. Most respondents (60%) believe mental illness is inherited, acknowledging the role of genetics. However, 28% are undecided, and 12% disagree.

A slight minority agree that well-educated people can develop mental illness, indicating a divided opinion on the relationship between education and mental health. A majority (54%) believe one should not marry into a family with a mentally ill person, reflecting concerns about genetic or environmental factors. However, when asked about mentally ill patients getting married, only (35%) agree, while (43%) are undecided, and (22%) disagree, indicating uncertainty about the capabilities of mentally ill individuals. A clear majority (64%) agree that special care should be given to mentally ill individuals.

A majority (54%) agree that family members affected by mental illness should not be locked in a room, highlighting a recognition of the importance of dignity, autonomy, and humane treatment. Only (25%) agree that family members should be punished for unacceptable behavior, while (50%) are undecided, and (25%) disagree. This ambivalence suggests uncertainty about how to address challenging behaviors, highlighting a need for education and guidance on supportive care. Respondents are divided on whether affected family members should be allowed to meet new people (40% agree, 48% undecided, 12% disagree). Similarly, opinions are mixed on whether affected family members should be allowed to attend family functions (45% agree they should not, 32% undecided, 23% disagree). However, a plurality (43%) agree that affected family members should be allowed to take food together, indicating some support for social inclusion. A minority (38%) agree that they should listen to unacceptable behavior from affected family members, indicating a willingness to empathize and understand. A clear majority (57%) agree that affected family members should be sent to a mental hospital, reflecting a recognition of the need for professional care and support. However, (35%) are undecided, and 8% disagree, indicating some ambivalence about institutional care. A majority (57%) agree that affected family members should seek treatment from a specialist, highlighting a recognition of the importance of expert care. Only (5%) disagree, indicating a strong consensus on the value of specialist treatment. However, (38%) are undecided, suggesting some uncertainty about accessing or affording specialist care.

A majority (59%) believe they should be free to communicate with neighbors affected by mental illness, indicating openness and empathy. However, when asked about inviting affected neighbors to visit, opinions are more divided (40% disagree, 45% undecided, 15% agree). Similarly, (45%) agree that affected neighbors should not visit their family, while (35%) are undecided, and 20% disagree. - When asked about job responsibilities versus caregiving, (44%) agree that a job should be dismissed to provide caregiving, while (33%) are undecided, and (23%) disagree. A majority (55%) agree that caregivers should be allowed to seek support from social institutions, while (35%) are undecided, and (10%) disagree. Regarding the provision of proper care and treatment, (50%) agree, while (45%) are undecided, and (5%) disagree.

Assess the care givers stress

A majority (57%) agree that caregiving affects family life, indicating a significant impact on household dynamics. Only (13%) disagree, while (30%) are undecided. A minority (22%) report receiving support from family members, suggesting a lack of assistance from relatives. Half (50%) of respondents are undecided, while (28%) disagree. Most respondents (52%) are concerned about patient safety in their absence, highlighting a need for reliable support systems. However, (45%) are undecided, and only (3%) disagree. Over half (53%) of respondents are uncertain about the adequacy of their financial position for caregiving responsibilities. This uncertainty is concerning, as (45%) are undecided, and only (2%) disagree. A significant majority (70%) agree that caregiving prevents patients from participating in social gatherings. This suggests that caregiving can lead to social isolation for patients. Only (15%) of respondents express concerns about social burden in the future. However, (30%) are undecided, and (55%) disagree, indicating varying levels of concern about long-term social implications.

CONCLUSION

The study sheds light on the crucial need for enhanced mental health education and awareness programs among caretakers of mentally ill patients, specifically within the context of the Mind Care Centre in Tirunelveli District. The findings underscore the pervasive stigma surrounding mental illness among caretakers, which impedes access to effective care and support for patients. Addressing this stigma requires multifaceted interventions, including targeted educational initiatives. By fostering a more informed and empathetic understanding of mental health issues, stakeholders can work towards creating a supportive environment that promotes holistic well-being for both patients and their caretakers. Such efforts are essential for fostering a society where mental health is prioritized, and individuals affected by mental illness receive the compassion and assistance they deserve.

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A STUDY ON FACTORS EMPLOYEE RETENTION AND WITH REFERENCE TO MEENAKSHI HONDA SHOWROOM, TIRUNELVELI DISTRICT, TAMIL NADU

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ABSTRACT

Employee retention is a critical issue for organizations, particularly in the competitive environment of two-wheeler showrooms. This study explores the key factors influencing employee retention within such establishments. Drawing on existing literature and empirical research, the study identifies several determinants of employee retention, including competitive compensation packages, opportunities for career advancement, supportive work environments, effective leadership, and recognition of employee contributions. Understanding these factors is vital for two-wheeler showrooms to develop effective retention strategies and maintain a skilled and motivated workforce. The primary objectives of this paper are to assess employee retention in relation to psychosocial issues, evaluate the working environment, and identify factors influencing job satisfaction and work performance. The study surveyed sixty respondents, employing percentage analysis and tabulation for data analysis. The findings reveal the level of employee retention in relation to various organizational factors. Results indicate that one of the biggest challenges organizations face today is not only managing their workforce but also retaining skilled employees. Employees' knowledge and skills are crucial to an organization's competitive advantage, and continuously satisfying employee needs remains a significant challenge for employers.

Keywords: Human resources, Employee retention, Retention factors

INTRODUCTION

Employee retention has become an increasingly important concern for organizations, especially in highly competitive sectors like two-wheeler showrooms. The ability to retain skilled employees is crucial not only for maintaining a stable workforce but also for sustaining organizational growth and competitiveness. In such fast-paced environments, where employee turnover can be costly and disruptive, understanding the factors that contribute to employee retention is essential. This study aims to explore the key determinants influencing employee retention in two-wheeler showrooms, focusing on both the organizational and psychosocial factors that impact employees' job satisfaction and performance. By identifying these factors, organizations can develop targeted strategies to improve retention, enhance employee well-being, and ensure a motivated, skilled workforce. Through empirical research, this paper seeks to provide

valuable insights into the challenges of employee retention, with a focus on compensation, career development opportunities, work environment, leadership, and recognition.

OBJECTIVES

- To study the socio demographic details of respondents.
- To study the working environment of the respondents.
- To examine the retention factors and employees willingness to stay in job.
- To promote suitable suggestions to improve the factors related employee retention.

METHODOLOGY

This study adopts a descriptive research design to investigate the factors influencing employee retention in two-wheeler showrooms. A sample of 60 employees working in two-wheeler showrooms was selected using a purposive sampling method. These participants were chosen based on their experience in the industry, ensuring a diverse representation of roles and perspectives within the organization. Data was collected through structured questionnaires, which included both closed-ended and open-ended questions to capture both quantitative and qualitative data.

Table: 1

Socio-Demographic Details					Total (%)
Gender	Male	Female			100
	58%	42%			
Age	Below 25	26-35	36-45	46 Above	100
	54%	31%	11%	4%	
Work Experience	Less than 3 years	3-5 years	5-10years	10year and above	100
	66%	13%	17%	4%	
Married Status	Single	Engaged	Married		100
	51%	11%	38%		
Education qualification	UG degree	PG degree	Professional	Other(s)sp ecify	100
	47%	34%	11%	8%	

Family members	Less than 2 members	2-5 members	5 members and above		100
	17%	79%	14%		
Income per annum	Less than 2 lakhs	2-5 lakhs			100
	94%	6%			
Residential work	Own house	Rented house			100
	62%	38%			
Working hours	8 hours	8-10 hours	10 more and hours		100
	32%	47%	21%		
Jobs changed so far	Less than 2 members	2-5 members	5 members and above		100
	43%	49%	8%		
Mode of transport	Two wheeler	Car	Bus	Others	100
	38%	2%	49%	11%	

From the above table shows that, Majority of the respondents are (58%) male. Majority of the respondents are (54%) below 25 years old. Majority of the respondents are (66%) have relatively less than 3 years work experience. Majority of the respondents are (51%) singles in their marital status. Majority of the respondents are (47%) hold an undergraduate (UG) degree. Majority of the respondents are (94%) have less than 2laks per annum. Majority of the respondents are (62%) had own house. Majority of the respondents are (49%) have 2-5 earning members in their family. Majority of the respondents are (47%) working between 8-10 hours per day. Majority of the respondents are (49%) changing their work between 2-5 jobs. Majority of the respondents are (49%) chose buses as their preferred mode of transportation.

Retention Strategies of the employees

The majority of respondents (40%) are highly satisfied with their job, while 23% are satisfied. A significant majority (77%) believe employees possess the necessary skills and competencies. The majority (36%) feel organizational development happens sometimes. A majority (32%) feel that attention is paid to employee needs sometimes. The majority (74%) agree that employee competencies are recognized. The majority (57%) feel superior performance is not rewarded. A majority (58%) feel respected by the organization. The majority (51%) believe training and development programs are available. The majority (58%) receive additional welfare benefits. A majority (55%) do not receive non-mandatory benefits. The majority (64%) have a good relationship with their supervisor and subordinates. The majority (51%) have access to mentoring programs. A majority (55%) are satisfied with their compensation. The majority (57%) participate in "stay" interviews.

Satisfaction of the Extrinsic rewards

The findings showed that 42% strongly disagree that salary is very important, while 38% disagree that the remuneration is gratifying. Additionally, 38% disagree that the hierarchical structure is satisfactory for their current stage of career, and 45% disagree that salary and benefits motivate them to stay with the company. 32% of respondents disagree that the company offers flexible working hours, and 30% disagree that they are allowed to take time off from professional activities. Similarly, 30% disagree that they have the freedom to attend conferences during working hours. 34% agree that the company is highly regarded and respected in society, while 25% agree that their friends are proud to work for the company. Additionally, 25% strongly agree that they are more valued in the job market due to their work at this company. 30% agree that they wouldn't leave the company because they are loyal to it, while 28% agree that their work is interesting and challenging. Another 28% agree that the company provides incentives to continue working there, and 30% agree that they have invested a lot in their career at the company. 34% agree that it would be disadvantageous to change jobs at the moment, and 32% disagree that they plan to leave the company. Similarly, 32% agree that they intend to keep working at the company, while 30% disagree that financial commitments prevent them from leaving. Furthermore, 32% agree that the current situation is not favorable for looking for another job. 30% agree that access to the company is easy, and 34% strongly agree that it is easy to travel from home to the company. Another 34% strongly agree that the company's location aligns with their personal interests. 42% agree that the company offers various opportunities to further their career, and 34% agree that there is an opportunity to grow professionally. Additionally, 30% agree that they have a good relationship with their work colleagues, and 28% agree that their relationships with colleagues encourage them to remain with the company. 38% agree that they plan to continue working for at least another three years, while 38% disagree that they would like to spend their entire career with this company. Additionally, 30% disagree that they see any reason to change jobs, and 30% disagree that they would leave the company only if they were dismissed.

Problems faced by employees

The data from the table reveals the following key trends among the respondents: A majority (60%) consider work-life balance to be an important factor, while 64% cite irregular working hours as an influencing factor in their decision-making. Work pressure is a major concern for 68% of respondents. Cultural differences affect 51%, and peer pressure is noted by 57%. On the other hand, 51% disagree with the idea of favoritism, and 55% reject the practice of micromanagement. In terms of health issues, 53% of respondents report backaches as a concern, while 74% do not have earaches, and 76% do not suffer from leg cramps. Additionally, 94% do not experience spondylitis, 83% do not have sleep disorders, and 68% do not report eye strain or headaches.

CONCLUSION

Work-life balance, irregular working hours, and work pressure are significant concerns for the majority of respondents, indicating that these factors play a crucial role in employee satisfaction and retention. Cultural differences and peer pressure also affect

a substantial portion of employees. While issues like favoritism and micromanagement were largely rejected by respondents, health-related concerns such as backaches were noted, though other issues like earaches, leg cramps, and spondylitis were less prevalent. These findings underscore the importance of creating a supportive and balanced work environment to retain employees. Addressing concerns related to work-life balance, providing fair management practices, and considering employees' physical and mental health can contribute to higher retention rates and job satisfaction. Companies that recognize and address these factors are likely to foster a more committed, motivated, and long-term workforce.

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A STUDY ON BODY SATISFACTION AND PHYSICAL APPEARANCE AMONG THE SCHOOL STUDENTS IN TENKASI DISTRICT, TAMILNADU

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ABSTRACT

The Body Satisfaction Scale (BSS) and the Physical Appearance Scale (PAS) were used to assess body satisfaction and physical appearance, respectively. Various studies showed that girls reported lower body satisfaction and physical appearance compared to boys. Body satisfaction and physical appearance are important aspects of an individual's self-concept and self-esteem. Research has shown that body dissatisfaction and negative physical appearance can lead to various mental health problems, including depression, anxiety, and eating disorders. School students are particularly vulnerable to body dissatisfaction and negative physical appearance due to the societal pressure to conform to ideal beauty standards. This study aimed to investigate body satisfaction and physical appearance among school students in Tenkasi district. The data collected from school students at Tenkasi District, Tamilnadu. Totally 60 students selected through convenient sampling. The study also found that students who were overweight or obese reported lower body satisfaction and physical appearance compared to their normal-weight peers. The findings of this study highlight the need for interventions to promote positive body image and self-esteem among school students.

Keywords: body satisfaction and physical appearance among

INTRODUCTION

Body satisfaction and perceptions of physical appearance among school students have become increasingly important topics of study in recent years. Adolescence is a critical period characterized by rapid physical, emotional, and social changes, making it a time when body image concerns often emerge. The influence of societal norms, media portrayals, peer interactions, and family dynamics can significantly impact how adolescents perceive their bodies and their overall satisfaction with their physical appearance. Understanding the factors that contribute to body satisfaction and dissatisfaction among school students is crucial for promoting positive body image and overall well-being during this developmental stage. Research suggests that body satisfaction during adolescence is not only associated with self-esteem and mental health but also plays a role in academic performance, social relationships, and health behaviors.

OBJECTIVES

To assess the psycho social problems among elderly population

- To understand the social demographic details of the school students.
- To identify the influence of media and societal standards on students body image.
- To analyse the psycho social problems faced by the respondents due to physical appearance.

METHODOLOGY

This study will adopt a descriptive research design to assess body satisfaction and physical appearance among school students in Tenkasi District, Tamil Nadu. The population consists of school students (both male and female) studying in various schools within Tenkasi District, Tamil Nadu. Data collected through a structured questionnaire designed to assess body satisfaction and perceptions of physical appearance among students. The questionnaire will include both quantitative (closed-ended) and qualitative (open-ended) questions. A sample of 60 students selected to participate in the study through convenient sampling.

TABLE 1

Personal Profile of the Respondents				Total
Age	15	16	17	
	12%	50%	38%	100
Sex	Male	Female		
	49%	51%		100
Religion	Hindu	Christian		
	72%	28%		100
Educational Status	10 th	11 th	12 th	
	17%	57%	26%	100
Family type	Joint family	Nuclear family		
	25%	75%		100

The above table shows that majority of the respondent are (50%) 16 age group. Majority of respondents are (51%) are female. Majority of respondents are (72%) are Hindu. Majority of respondents are (57%) respondents are 11th. Majority of respondents (75%) are Nuclear family.

TABLE 2 Psychological problem of the Respondents due to physical appearance

Psychological problem	Yes	No	Total
Going out in public	92%	5%	100
Full to buy clothes	74%	26%	100
Appearance in a mirror	87%	13%	100
Very conscious weight	68%	32%	100
Important always look	65%	35%	100
Grooming Products	52%	48%	100
Physical strength	65%	35%	100
Magazines	60%	40%	100
Caring others' opinions	55%	45%	100
Being weight loss and diet	28%	72%	100
Using beauty product online	52%	57%	100
Dressing to be seen by others	43%	57%	100

The table shows that the majority of respondents, 92%, are going out in public. The majority of respondents, 74%, are willing to buy clothes. The majority of respondents, 87%, are checking their appearance in a mirror. The majority of respondents, 68%, are conscious of weight change. The majority of respondents, 65%, are always important in looking good. The majority of respondents, 52%, use grooming products. Majority respondents, 65%, are working on physical strength. The majority of respondents, 60%, are reading health magazines. The majority of respondents, 55%, are caring about others opinions. Majority respondents, 72%, are not being weight loss and diet. The majority of respondents, 57%, are not using beauty products at home. The majority of respondents, 57%, do not dress to be seen by others.

TABLE 3 Influence of media and social standards on body image

Influence of media and societal standards on body image					TOTAL
Satisfaction on body image	Yes	No			100%
	65%	35%			
Skin tone preference	Black	White			100%
	48%	52%			
Idea about body image	Body weight	Body height	Overall appearance	Skin done	100%
	3%	8%	65%	24%	
Media influence	Printed media	Social media	Television		100%
	3%	92%	5%		

Body image on participation	Yes	No			
	70%	30%			100%
Feeling about seeing the image on social media	Yes	No	If no why		
	37%	60%	3%		100%
Usage of beauty products	Yes	No			
	95%	5%			100%
Usage of medicine for their beauty	Yes	No			
	93%	7%			100%
Usage of food products for their appearance	Yes	No			
	40%	60%			100%
Purchasing online dress for their body appearance	Yes	No			
	90%	10%			100

From the above table, it shows that the majority of respondents are (65%) satisfied with their body image. The majority of respondents (52%) prefer skin tone. The majority of respondents are (65%) overall appearance. The majority of respondents (92%) are influenced by social media. The majority of respondents (70%) are body image in participation. The majority of respondents (60%) have no feeling about seeing the image on social media. The majority of respondents (95%) are about beauty products. The majority of respondents (93%) use medicine for their beauty. The majority of respondents are (60%) not using food products for their appearance. The majority of respondents (90%) are purchasing online dresses for their body appearance.

TABLE 4

Social Physique Anxiety				
	Not at all	Slight	Moderately	Very
Appearance phobia \ fitness	78%	22%	0%	0%
Over weight	32%	38%	27%	3%
Uptight Physique \ figure	20%	47%	27%	7%
Developments negative thoughts	20%	47%	27%	7%
Comfortable	13%	22%	17%	48%
Un comfortable	55%	17%	15%	13%
Shy person	18%	57%	22%	3%
Obvious p\f	23%	25%	42%	10%

From the above table, it shows that the majority of respondents, 78%, are not at all comfortable about their appearance. The majority of respondents, 38%, are slightly concerned about being overweight. The majority of respondents, 47%, slightly uptight physique \figure. The majority of respondents, 37%, developed negative thoughts. The majority of respondents, 22%, were slightly comfortable with body fit. The majority of respondents, 55%, are feeling not comfortable. The majority of respondents, 57%, felt slightly shy. The majority of respondents, 42%, consider it moderately obvious physique/figure.

CONCLUSION

A positive body image is associated with better self-esteem, self-acceptance and healthy lifestyle behaviors, including a balanced approach to food and physical activity. Body image issues affect people of all ages, genders and across all cultures. Having more positive body image is strongly associated with better consistently shows that individuals with high life satisfaction tend to have more positive social relationships, receive more social support, and experience greater marital satisfaction compared to those with lower life satisfaction.

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A STUDY ON PSYCHO SOCIAL PROBLEMS OF SCAVENGERS WORKERS IN TIRUNELVELI DISTRICT, TAMILNADU

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ABSTRACT

The quality of working life refers to a combination of workplace strategies, processes, and environments that enhance employee job satisfaction. This study focuses on the psychosocial problems faced by scavenger workers in the Tirunelveli district, specifically addressing the health hazards, occupational challenges, and difficulties encountered by these workers. The study aims to examine the psychosocial issues of scavenger workers in Tirunelveli, with a particular focus on the health risks associated with their work and the challenges they face in their profession. Data was collected from 60 scavenger workers in both rural and urban areas using a convenience sampling method. Manual scavenging in India involves the manual cleaning, handling, or disposal of human excreta in unsanitary conditions such as latrines, open drains, sewers, septic tanks, or pits. Many manual scavengers suffer from a range of health problems, including skin diseases, respiratory issues, and even death from exposure to toxic fumes in septic tanks and sewer lines.

Keywords: psycho social problems, working condition and health hazards

INTRODUCTION

Manual scavenging, a practice primarily prevalent in India, involves the manual removal, handling, or disposal of human excreta from unsanitary latrines, open drains, sewers, septic tanks, and pits. This hazardous occupation exposes workers to a variety of health risks, ranging from skin diseases to respiratory problems, and in some extreme cases, even death due to toxic fumes from septic tanks and sewer systems. Despite various government initiatives and social movements to eradicate this practice, manual scavengers continue to face numerous psychosocial and occupational challenges, largely due to the societal stigma attached to their work and the lack of adequate safety measures.

OBJECTIVES

- ❖ To understand the socio demographic details of the sanitary workers.
- ❖ To study the working condition of the respondents.

- ❖ To study the psycho social problem faced by respondents.
- ❖ To explore the awareness related to scavengers laws.
- ❖ To explore the coping patterns adopted by the respondents.

METHODOLOGY

This study investigates the psycho-social problems faced by scavenger workers in Tirunelveli District, specifically comparing rural and urban areas. The researcher utilized a quantitative approach to gather data, focusing on primary information from scavenger workers. A total of 60 scavenger workers were selected for the study through a convenience sampling method. The interview schedule included questions related to their work environment, mental health, social interactions, and general well-being.

Personal Profile of the Respondents						Total (%)
Age	20-30	30-40	40-50	50-60	Above 60	100
	5%	8%	44%	40%	3%	
Working place	Rural	Urban				100
	45%	55%				
Education Qualification	Illiterate	1 to 5 th	5 th to 10 th	11 th to 12 th	Others	100
	33%	18%	32%	10%	7%	
Gender	Male	Female				100
	27%	73%				
Religion	Hindu	Christian	Muslims			100
	67%	27%	6%			
Community	BC	SC	ST	SCA		100
	12%	57%	3%	28%		
Marital status	Married	Unmarried				100
	98%	2%				
Living Area	Rural	Urban				100
	67%	33%				
Type of Family	Joint	Nuclear				100
	15%	85%				
Monthly Income	Below 5000	5000-10000	10000-15000	Above 15000		100
	5%	22%	28%	45%		

The above table shows that the majority of respondents (44%) belong to the 40-50 age group. A majority of respondents (55%) are from urban areas. The largest group of respondents (33%) is illiterate. The majority of respondents (73%) are female. Most respondents (67%) are Hindu. A majority of respondents (58%) belong to the Scheduled Caste (SC) category. A significant majority (98%) are married. Most respondents (67%) live in rural areas. The majority (85%) come from nuclear families. Lastly, 45% of respondents have a monthly income above ₹15,000.

TABLE -2

Working Environment of the respondents						Total (%)
Type of Cleaning	Road, Street cleaning	Toilets and educational cleaning	Individual householders dry latrine	Community dry latrine	Others	100
	50%	20%	13%	7%	10%	
Process of getting job	From my parents	Government quota	Through private party	Through relatives	Through friends	100
	10%	9%	18%	36%	27%	
Type of Occupation	Temporary	Contractual	Casual	Permanent		100
	70%	10%	2%	18%		
Age at work	Below 18	18 -25	25 - 30	Above 30		100
	4%	8%	18%	70%		
Working hours	Below 8 hrs	Above 8 hrs				100
	75%	25%				
Nature of work	Heavy task	Dangerous	Hazardous	Interesting		100
	57%	12%	3%	28%		
Safety equipment	Yes	No				100
	35%	65%				
Environment status	Full time	Part time				100
	25%	75%				
Generation in occupation	1 – 2	2 -3				100
	93%	7%				
Nature of employer	Government	Private	Contractor	Others		100
	20%	30%	30%	20%		

From the above table, it shows that the majority of respondents (50%) are involved in road and street cleaning. The majority of respondents (36%) got this job through relatives. The majority of respondents (70%) are temporary workers. The majority of respondents (70%) started working at the age of 30 or above. The majority of respondents (75%) work for less than 8 hours a day. The majority of respondents (57%) described their work as heavy. The majority of respondents (65%) reported not using safety equipment. The majority of respondents (75%) are part-time workers. The majority of respondents (93%) belong to 1-2 generations. The majority of respondents (30%) are employed by private and contract employers.

TABLE -3

Hygienic Activities of the Respondent	Never	Sometimes	Always	Total (%)
Soap	3%	5%	92%	100
Gloves	15%	15%	70%	100
Chapels	5%	3%	92%	100
Blood Pressure	58%	5%	37%	100
Vaccination	10%	82%	8%	100
Permanent	78%	8%	13%	100
You Children	85%	12%	3%	100

The data from the table indicates the following trends: The majority of respondents (92%) wash their hands with soap after finishing work. A significant portion of respondents (70%) wear gloves while working, and 92% use chapels during work. Most respondents (58%) do not have high blood pressure. Additionally, 82% of respondents have been vaccinated at least once. The majority (78%) are not employed in permanent jobs, and 85% of respondents believe their children should not pursue this type of work.

TABLE 4

Alcohol Usage of the respondents				Total (%)
Alcohol usage due to occupation	Yes	No		100%
	27%	73%		
Alcohol usage	Before occupation	After occupation	Not consuming	100%
	23%	4%	73%	

Alcohol usage with co- workers	Yes	No			100%
	28%	72%			
Amount spending for alcoholism	1-10%	11-20%	20-50%	Nothing	100%
	5%	2%	13%	80%	
Other castes or communities like to sit along	Yes	No			100%
	87%	13%			
	Yes	No			
Respect of people due to their occupation	92%	8%			100%
Opinion of children about their parent's job	Good	Bad	No children		100%
	68%	27%	5%		

The data from the table reveals the following: A majority of respondents (73%) are opposed to alcohol consumption related to their occupation. Additionally, 73% of respondents do not consume alcohol. The majority (72%) report that they do not use alcohol with co-workers. Most respondents (80%) have no opinion on the amount of money spent on alcohol. A significant majority (87%) responded positively to a related question. Furthermore, 92% of respondents agree that people respect them due to their occupation. Finally, 68% of respondents believe that their children have a positive view of their parents' job.

TABLE 5

Aspects related to welfare facilities	Never	Sometimes	Always	Total (%)
Routine Medical	20%	73%	7%	100
Body Cleaning end of work	55%	25%	20%	100
Training given to work safely	46%	45%	9%	100
Problem faced at the end of work	5%	37%	58%	100

The data from the table indicates the following trends: A majority of respondents (73%) occasionally undergo routine medical checkups. 55% of respondents report that they do not clean their bodies after completing their work. Additionally, 46% of respondents have not received training on how to work safely while on the job. Furthermore, 58% of respondents experience problems during their work.

CONCLUSION

In conclusion, the findings from the study highlight several key aspects of the working conditions and well-being of scavenger workers in Tirunelveli District. The majority of respondents are engaged in physically demanding tasks, such as road and street cleaning, with limited access to safety measures and training. Many face health hazards and psychosocial challenges due to the nature of their work, including exposure to hazardous materials and the absence of proper hygiene practices.

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A STUDY ON EMPLOYEE'S JOB SATISFACTION WITH SPECIAL REFERENCE TO TWO WHEELER VEHICLE WORKERS IN TIRUNELVELI DISTRICT

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ABSTRACT

Job satisfaction refers to the level of contentment and fulfillment an individual feels towards their job. Job satisfaction encompasses various factors such as the nature of the work itself, compensation, working conditions, relationships with coworkers and supervisors, opportunities for growth, and work-life balance. The Study aims to assess the level of employees job satisfaction among two-wheeler vehicle workers in Tirunelveli District. Descriptive research design was adopted. A questionnaire was administered to 60 two-wheeler vehicle workers in Tirunelveli district by convenient sampling method. Data was analyzed using descriptive statistics and inferential statistics. The results show that the overall job satisfaction level among two-wheeler vehicle workers was moderate. Factors such as salary, job security, and working conditions were found to significantly influence job satisfaction.

Key words: employee's job satisfaction, two wheeler vehicle workers.

INTRODUCTION

Job satisfaction is a measure of workers' contentment with their job, whether they like the job or individual aspects or facets of jobs, such as nature of work or supervision. Job satisfaction can be measured in cognitive (evaluative), affective (or emotional), and behavioral components. Researchers have also noted that job satisfaction measures vary in the extent to which they measure feelings about the job (affective job satisfaction). or cognitions about the job (cognitive job satisfaction).

OBJECTIVES OF THE STUDY

- To understand the socio demographic details.
- To analyze the working environment of the respondents.
- To analyze the statutory and non-statutory welfare facilities.
- To assess the psycho social problems of the respondents
- To study the factor influencing job satisfaction.

METHODOLOGY

This study adopts a descriptive research design. It focuses on obtaining a comprehensive understanding of job satisfaction among two-wheeler vehicle workers in the Tirunelveli district. The researcher chooses three two-wheeler vehicle showrooms in Tirunelveli district. The design will allow for a systematic collection and analysis of data to describe the factors influencing job satisfaction in this specific sector. The primary data collected from 60 respondents through convenience sampling technique.

FINDINGS AND DISCUSSIONS

Socio demographic details (78%) respondents belong to the age group of 20 to 40 years. (53%) of the female. (77%) respondents are studied up upper graduate. (52%) respondents are unmarried. (53%) respondents are living in own house. (57%) respondents are living in nuclear families. (63%) respondents belong to the family size 3 to 4 members. (68%) respondents are getting below 10,000 as their monthly income. (42%) respondents are earned below 1,00,000/- as their annual income. (58%) of the respondents choose in not sufficient salary for basic needs.

Table 2

Working Environment					Total (%)
Position In Company	Sales	Non sales			100%
	45%	55%			
Working hours	Below 8 hours	8 – 12 hours	Above 12 hours		100%
	10%	88%	2%		100%
Working experience	Less than 1 year	2 – 4 years	5 – 8 years	Above 8 years	100%
	23%	52%	17%	8%	
Distance from home to company	Less than 2 – 4 km	4 – 8 km	8 – 12 km	More than 12 km	100%
	8%	38%	42%	12%	
Get paid over time	Yes	No			100%
	48%	52%			
Promotion basis	Favouritism	Seniority and performance	Any other means		100%
	12%	55%	33%		

From the above table, 55% of respondents are working in non-sales. (88%) of respondents are working in 8 to 12 hours. (52%) of respondents have working experience of 2 to 4 years. (42%) of respondents have an 8 to 12 km distance from home to company.

(52%) of respondents work in no as they get paid over time. (55%) of respondents are seniority and performance as their promotion basis. (35%) of respondents choose this company for its location.

Table 3 STATUTORY AND NON- STATUTORY WELFARE FACILITIES.

Statutory And non Statutory	Poor	Good	Excellence	Fair	No Opinion	Total (100%)
First aid	17	16	11	4	12	60
	28%	27%	18%	7%	20%	100
Occupational Safety	5	26	21	1	7	60
	8%	43%	35%	2%	12%	100
RESTROOM	12	19	14	5	10	60
	20%	32%	23%	8%	1%	100
UNIFORM	4	22	23	6	5	60
	7%	37%	38%	10%	8%	100
SHIFT	9	11	21	1	18	60
	15%	18%	35%	2%	30%	100
Medical Benefit	4	24	13	2	17	60
	7%	40%	22%	3%	28%	100
Educational Benefit	4	6	13	3	34	60
	7%	10%	22%	5%	56%	100
Transport	6	22	15	1	16	60
	10%	37%	25%	2%	26%	100
ESI	3	21	25	3	8	60
	5%	35%	42%	5%	13%	100
PF	5	17	27	1	10	60
	8%	28%	45%	2%	17%	100

From the above table, (28%) respondents said that the company has poor first aid facilities within the company, 28% respondents are good. (20%) respondents saying poor restroom facilities, (32%) respondents saying good restroom facilities. (38%) of

respondents are excellent in the comfortable uniform dress. (35%) respondents saying excellence working in shifts. (40%) of respondents are good medical benefits within the company. (57%) of respondents have no opinion on the educational benefit provided in the company. (37%) of respondents are good transport facilities within the company. (42%) of respondents are excellence ESI scheme providers in the company. (45%) of respondents are excellence PF providers within the company.

Table 4

Psycho Social Problems						Total
Work Stress	Yes	No				100
	43%	57%				
Poor Communication	Yes	No				100
	17%	83%				
Poor Cooperation	Yes	No				100
	8%	92%				
Maintain Relationship	Yes	No				100
	93%	7%				
Target	Anxiety	Stress	Depression	Fear		100
	23%	30%	12%	35%		
Negative Well being	Never	Rarely	Sometimes	Often	Always	100
	42%	17%	35%	7%	0%	
Work Pressure	Never	Rarely	Sometimes	Often	Always	100
	57%	20%	13%	8%	2%	
Feel Unsafe	Never	Rarely	Sometimes	Often	Always	100
	57%	12%	17%	11%	3%	

From the above table (57%) of respondents are not stressed at work. (47%) of respondents feeling sometimes disrespected in the society this job. (35%) respondents are neutral that the company has a workload at the place of work. (83%) of respondents are not poor communicators in the company. (91%) of respondents are not poor cooperation in the company. (93%) of respondents are having a good relationship with co-workers. (35%) of respondents are feeling fear when the manager pushes to achieve the target.

(35%) respondents feeling sometimes my job is negatively affecting physical or emotional well-being. (57%) of respondents say they are never under work pressure that interferes with their personal life. (57%) of respondents never feel unsafe at work.

Factors influencing for job satisfaction

Majority (63%) of respondents agree on good physical working conditions. (50%) of respondents agree they feel secure in their job. (52%) of respondents are satisfied with the safety of this work. (60)% of respondents are getting proper salaries for their work. (48%) of respondents are satisfied with rest and break leave. (52%) respondents saying weekends spoil their satisfaction. (38.33%) of respondents are financial incentives for their motivation. (50%) of respondents are neutral on their income. (33%) of respondents agree in motivational level as their work performance.

CONCLUSION

The findings reveal that job satisfaction among these workers is affected by various factors, including the nature of the work, working conditions, compensation, relationships with supervisors and colleagues, opportunities for growth, and work-life balance. Employers in the two-wheeler vehicle industry in Tirunelveli must recognize the importance of creating a conducive work environment that supports the well-being of their employees. Offering competitive wages, ensuring better working conditions, fostering a culture of growth and development, and promoting a healthy work-life balance will contribute to increased job satisfaction.

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A STUDY ON STRESS AND COPING STRATEGIES AMONG THE WIVES OF ALCOHOLICS WITH REFERENCE TO TENKASI DISTRICT, TAMILNADU

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ABSTRACT

Wives of alcoholic individuals often face various physical, psychological, and emotional challenges. These issues range from mild emotional distress to severe physical violence. This study focuses on the problems experienced by the wives of alcoholics across five key areas: emotional, health-related, social, financial, and physical violence. **Objectives:** The aim of this study is to identify and analyse the stress, anxiety, depression, and coping strategies of wives of alcoholics. **Methods:** A descriptive research design was used for this study. A sample of 60 respondents was selected using snowball sampling. Data was collected through interviews using an interview schedule method. **Results:** The findings of the study indicate that the majority reported experiencing mild problems and stress. It is recommended that support services be provided for these wives, including emotional and family support. Strengthening coping strategies and social support can help wives adopt healthier coping mechanisms. Additionally, knowledge of adaptive coping strategies can play a vital role in preventing distress and promoting mental health.

Keywords: Alcoholism, Stress, Coping strategies, Wives of alcoholics.

INTRODUCTION

Wives of individuals with alcohol dependency often face a wide range of challenges that affect their emotional, psychological, and physical well-being. These challenges can range from emotional distress and anxiety to more severe issues such as physical violence. The constant exposure to their husband's drinking behaviors can lead to heightened levels of stress, depression, and mental health disturbances. In particular, the wives of alcoholics are vulnerable to a spectrum of problems that affect their personal and family life. These issues often extend beyond the household, impacting their social interactions and financial stability.

OBJECTIVES OF THE STUDY

- To identify the socio-demographic backgrounds of the wives of alcoholics.
- To Study the drinking pattern and behavior of the alcoholic husband.
- To analyze the stress, anxiety and depression of the respondents.
- To identify the coping strategies of wives of alcoholics.

METHODOLOGY

A descriptive research design was employed in this study, as it allows for a detailed examination of the stress levels and coping strategies among the wives of alcoholics. This design helps in understanding the characteristics of the group under study and provides a clear description of their experiences and challenges. A representative sample of 60 respondents was selected for the study through the Snowball sampling technique. This non-probability sampling method was chosen because it is particularly useful for identifying hidden or hard-to-reach populations, such as the wives of alcoholics. Data was collected using an interview schedule method, which facilitated direct interaction with the participants. The interview schedule was designed to capture relevant information regarding the stress experienced by the wives of alcoholics, their coping mechanisms, and the social and psychological factors influencing their experiences. The interviews were conducted in a confidential and non-judgmental environment to encourage honest and open responses.

Table 1 Personal Profile of the Respondents

Personal Profile							Total
Age	20-30	30-40	40-50	50-62			100
	32%	35%	15%	18%			
Religion	Hindu	Muslim	Christian				100
	83%	5%	12%				
Educational Status	Illiterate	Primary level	Secondary level	Higher secondary level	Under graduate	Post graduate	100
	5%	13%	13%	49%	10%	10%	
Occupation	House wife	Government job	Private job	Daily wages	Business		100
	23%	4%	15%	55%	3%		
	53%	30%	17%				
Family type	Joint family	Nuclear family					100
	60%	40%					
Family income	10k- 20k	20k- 30k					100
	92%	8%					
Age at marriage	18-20 years	20-25 years					100
	78%	22%					
Years of marriage	5-20 years	20-30 years	30-50 years				100
	68%	13%	19%				
Nature of marriage	Arrange marriage	Love marriage	Love and arrange marriage				100
	47%	22%	31%				

From the above table shows that, 35% of the respondents belong to 30-40 age groups, 83% of the respondents are Hindu, 49% of the respondents completed higher secondary level education, 55% of the respondents are going for daily wages, 60% of the respondents are living in joint family, 92% of the respondents family income in the range of 10,000 to 20,000, 78% of the respondents are married at the age of 18-20, 68% of the respondents married years are 5-20 and 47% of the respondents belong to arrange marriage.

Table 2 Drinking behaviour of the husband

Drinking behaviour of the husband					Total
Years of alcoholism	After marriage	Before marriage			100
	65%	35%			
Parents know about alcohol usage	Yes	No			100
	60%	40%			
Complaint to parents about husband's drinking habit	Yes	No			100
	74%	26%			
Taking alcohol daily	Yes	No			100
	50%	50%			
Consuming alcohol with	Friends	Neighbours	Relatives		100
	88%	7%	5%		
Find money by himself for drinking	Yes	No			100
	93%	7%			
Have any of the following events occurred during					

	drinking alcohol				
	Always	Sometimes	Never		
Problems with neighbours	28%	10%	62%		100
Problem in his working place	28%	13%	59%		100
Any Police case	13%	52%	35%		100
Fallen in public	27%	38%	35%		100
Giving money for family expenses	Yes	No			100
	70%	30%			
Efforts taken to stop their husband's drinking habit	Yes	No			100
	37%	63%			
Health problems for husband	Yes	No			100
	37%	63%			
Health problems	Blood pressure	Liver problem	Heart disease	Others	100
	12%	23%	2%	63%	

The data from the table shows the following trends: 65% of respondents reported that their husbands started drinking after marriage. 60% of respondents mentioned that their parents are aware of their husbands' alcohol use. 60% of respondents have lodged complaints about their husbands' drinking habits. 88% of respondents stated that their husbands drink alcohol with friends. Half of the respondents (50%) reported that their husbands drink alcohol daily. 93% of respondents said their husbands independently find money to buy alcohol. 62% of respondents indicated that their husbands never create problems with neighbors, while 59% stated that their husbands never cause trouble at the workplace. 52% of respondents mentioned that their husbands have faced legal issues occasionally. 35% of respondents denied that their husbands ever fall in public places. 70% of respondents agreed that their husbands contribute money to the family expenses. However, 72% of respondents have not made any efforts to stop their husbands' drinking habits. 63% of respondents reported that their husbands do not experience any health issues due to alcohol consumption.

Table 3 Psycho Social Problem of the Respondent

Psycho Social Problem of the Respondent				Total
	Economic Problems			
	Always	Sometimes	Never	
No money for education	13%	32%	55%	100
No money for household	17%	28%	55%	100
Debt issues	21%	12%	67%	100
	Psychological problems			
	Always	Sometimes	Never	
Shouting at you	15%	18%	67%	100
Not allowing for family functions	22%	30%	48%	100
Not allowing for meet your family	22%	28%	50%	100
Not allowing you to make decision	20%	28%	52%	100
	Sexual problems			
	Always	Sometimes	Never	
Sex during illness	0%	3%	97%	100
Sexual compulsion	0%	5%	95%	100
Unacceptable sex	0%	10%	90%	100
Forced sex	0%	15%	85%	100

The data from the table reveals the following trends: 55% of respondents stated that their husbands never provide money for educational purposes. Additionally, 55% of respondents reported that their husbands do not engage in certain supportive actions. 67% of respondents mentioned that their husbands do not perform specific actions toward them, while 67% also indicated that their husbands sometimes shout at them. 48% of respondents said their husbands sometimes allow them to attend family functions. 50% reported that they sometimes have the opportunity to leave the house. 52% of respondents mentioned that they occasionally have the chance to make decisions in their household. A significant 97% of respondents reported never facing sexual relations during illness, and 95% stated they never experienced sexual coercion. Furthermore, 90% of respondents have never encountered unacceptable sexual behavior, and 85% have never experienced forced sex.

Table 4 Coping pattern

Coping pattern						Total
Support system	Family members	Friends	Parents	None		100
	35%	8%	55%	2%		
Approach to agencies	Counselling centres	De-addiction centres	Police	None		100
	10%	12%	3%	75%		
Reasons for not seeking agencies	Ashamed	Believe that no one help	Bring bad name to family	Violence is normal	Don't know	100
	7%	21%	7%	15%	50%	

The data from the table shows the following: 55% of respondents receive support from their parents. 75% of respondents do not seek help from any agencies, and 50% of respondents are unaware of the existence of such agencies.

CONCLUSION

The findings of this study reveal the multifaceted challenges faced by the wives of alcoholic individuals. These women endure significant emotional, psychological, and social distress due to their husbands' drinking habits. A majority of respondents reported that their husbands' alcohol consumption has led to financial strain, strained relationships, and issues with decision-making within the household. Many respondents indicated that they do not receive adequate support or intervention from external agencies, and only a small percentage sought help from available resources. Additionally, despite the negative consequences, many wives feel powerless to stop their husbands' drinking behaviors. The study highlights the need for greater awareness and support systems for wives of alcoholics, including access to counseling, financial assistance, and health resources. Strengthening coping strategies and providing family and community

support could greatly improve their mental well-being and help them manage the challenges they face. Furthermore, the study suggests that there is a critical need for increased outreach and education about available services to support these women and help them navigate their difficult circumstances.

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A STUDY ON SMARTPHONE ADDICTION AMONG COLLEGE STUDENTS WITH REFERENCE TO TIRUNVELI DISTRICT, TAMILNADU

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Abstract

Smartphones have become increasingly integral to daily life, with the number of mobile phone users surpassing two and a half billion, and predictions suggesting that it will reach five billion by 2024. This study explores the impact of smartphone applications on the behavior of college students, specifically focusing on smartphone addiction. **Objective:** The aim of this research is to examine smartphone addiction among college students in Tirunelveli. **Methods:** The study utilized a descriptive research design. Data was collected from 60 students across four colleges using Google Forms, employing a convenient sampling method. A questionnaire was used to gather the necessary data. **Findings:** The findings suggest that while students are somewhat addicted to smartphones, they do not typically use them for academic purposes. A significant difference was observed in smartphone addiction across genders, particularly in relation to the usage of various apps. The study also highlighted that smartphone addiction among college students has several negative effects on mental health, contributing to issues such as stress, anxiety, and depression. Additionally, it affects time management and overall well-being.

Key words: Smart phone, addictions, mental health.

Introduction

In today's digital age, smartphones have become an essential part of everyday life, revolutionizing communication, entertainment, and access to information. With the rise in smartphone usage, especially among younger populations, concerns about smartphone addiction have emerged. The global number of mobile phone users has already surpassed two and a half billion and is expected to reach five billion by 2024. College students, who are among the most active users of smartphones, often use these devices for various purposes such as social media, gaming, messaging, and entertainment, which can sometimes lead to addictive behaviours.

Objective of the study

- To study about the socio-demographic details of the respondents.
- To study on smart phone addiction among the college students.
- To understand the students dependency on smart phone for their daily life.
- To study on smart phone addiction including its effects on mental health and overall well-being.

Methodology

Descriptive research design is used in this study. The data was collected from the four government colleges in the Tirunelveli district. Totally sixty students were selected through convenient sampling. The researcher followed a structured interview schedule for collecting primary data.

Table I

Personal profile of the Respondents					Total %
Age	18-19	20-21	22-23		100%
	28%	52%	20%		
Sex	Male	Female			100%
	33%	67%			
Marital status	Married	Unmarried			100%
	7%	93%			
	32%	28%	30%	10%	
Colleges	Rani Anna Government College	St. Johns College	M. D. T. Hindu college	Manur Government Arts&Science college	100%
	52%	28%	30%	10%	
Family income	Below 60,000	Between 60,000 - 1,00,000	Between 1,00,000 - 2,00,000		100%
	37%	52%	11%		
Smart phone addiction					
Age of getting smart phone	15 - 16	17-18	19 - 20	21-22	100%
	13%	39%	40%	8%	
Spending money	200	300	400	500	100%

Personal profile of the Respondents					Total %
for recharge	30%	57%	10%	3%	
Price of Mobile phone	Below 10,000	10,000 - 15,000	15,000 - 20,000	Above 20,000	100%
	33%	42%	20%	5%	
Smart phone before going to bed	Rarely	Often	Sometime		100%
	13%	15%	32%		
To get the information	Smart phone	Television	Radio	News paper	100
	73%	17%	2%	8%	
Mode of Communication	Texting	Voice call	Video call		
	50%	57%	3%		

The data from the table reveals the following trends: 52% of respondents are in the 20-21 age group, and 67% are male students. A significant 93% of the students are unmarried. 32% of the respondents are from Rani Anna Government College. Regarding family income, 52% of respondents report an income between ₹60,000 and ₹1,00,000. 40% of respondents acquired their first smartphone between the ages of 19 and 20. In terms of phone usage, 57% of respondents recharge their phones with ₹300, and 42% use smartphones priced between ₹10,000 and ₹15,000. 40% of respondents use their smartphones frequently just before going to bed. Additionally, 73% of respondents use their smartphones to gather information, and 57% primarily use their phones for voice calls.

Table II

Dependency on smart phone					Total %
Preference of device	Smart phone	Laptop	Desktop		100%
	78%	18%	4%		
Changing their Smart phone	Rarely	Sometimes	Frequently		100%
	77%	20%	3%		
The source of Internet	Wifi	Data card	Mobile internet		100%
	10%	3%	87%		
Purpose of internet Usage in highest to lowest Priority	Education	Entertainment	Social networking		100%
	18%	60%	22%		
Usage of Top	Social media	Purchasing	Transaction	All of	100%

Dependency on smart phone					Total %
Application	apps	apps	apps	the above	
	57%	2%	3%	38%	
Changing their on-line status	Rarely	Sometimes	Always	Never	100%
	28%	40%	25%	7%	
Sharing their pictures in on-line	Rarely	Sometimes	Always	Never	100%
	32%	43%	7%	18%	

The data from the table shows the following trends: 62% of respondents own both a laptop and a smartphone, while 78% prefer smartphones. A majority of 77% of respondents rarely change their smartphones. 87% of respondents access the internet through mobile data or a data card. 60% use the internet primarily for entertainment purposes, and 57% engage with social media applications. 38% of respondents use all available applications on their smartphones. Additionally, 40% of respondents change their online status only occasionally, and 43% share their pictures online from time to time.

Table III

Smart phone features and addiction tendencies					Total 100%
Managing their daily tasks and schedule	Not important	Somewhat important	Very important	Essential	100%
	15%	34%	28%	23%	
Harmful Effects of Using smart phone	Waste of money	Effects of signal on your health	Create problems to the user	Waste of time	100%
	8%	29%	13%	50%	
Empty without smart phone	Always	Sometimes	Often	Never	100%
	15%	38%	15%	32%	
Control of using Smart phone	Frequently	Occasionally	Rarely	Always	100%
	15%	38%	36%	11%	
Social media affects their life	Positively	Negatively	Both a&b		100%
	13%	13%	74%		
Physical problem	Eye pain	Back pain	Neck pain	All of the above	100%
	35%	12%	20%	33%	

The data from the table reveals the following insights: 34% of respondents believe smartphones are somewhat important in their daily lives, while 50% feel that using smartphones is a waste of time. 38% of respondents sometimes feel that their daily lives would feel empty without smartphones. Additionally, 38% of respondents have made an occasional effort to reduce smartphone use. A significant 74% of respondents believe that social media has both positive and negative effects on their lives. Furthermore, 35% of respondents experience eye problems due to smartphone usage.

Table IV

Smart phone addiction scale	Strongly agree	Agree	Agree or Disagree	Strongly Disagree	Disagree	Total %
Missing planned work due to smart phone use	8%	67%	5%	0	20%	100
Having a hard time concentrating class, while doing assignments while working due to smart phone use	10%	60%	7%	2%	21%	100
Feeling impatient and fretful when I am not using phone	3%	40%	10%	5%	42%	100
I'll never give up using smart phone even when my daily life is already greatly affected by it	3%	54%	12%	8%	28%	100
Consonantly checking my smart phone so as not to miss conversation	7%	50%	17%	2%	23%	100

The data from the table shows the following trends: 67% of respondents agree that they feel lost without their smartphones. 60% agree that smartphone use makes it difficult for them to concentrate on assignments or work. 42% of respondents disagree with the feeling of impatience and restlessness when not using their phones. 54% agree that they would never give up using their smartphones, even if it significantly impacts their daily life. Additionally, 50% of respondents agree that they constantly check their smartphones to avoid missing conversations.

CONCLUSION

In conclusion, the findings of this study highlight the significant impact of smartphone usage on college students, particularly in terms of addiction and its effects on behavior, concentration, and social interactions. A large proportion of students rely on smartphones in their daily lives, with many acknowledging the difficulties in focusing on academic tasks due to frequent use. Overall, these results underscore the need for greater awareness about smartphone addiction and its potential consequences, particularly for students' academic performance and mental health. Future interventions should focus on promoting healthier smartphone habits and providing students with strategies to balance technology use with their academic and personal well-being.

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A STUDY ON OCCUPATIONAL HAZARDS AMONG WOMEN BEEDI WORKERS WITH REFERENCE TO ALANGULAM TALUK, TENKASI DISTRICT

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ABSTRACT

This study aims to investigate the occupation hazards among women beedi workers in Alangulam Taluk. Throughout history, women in developing countries have always worked hard, not only as wives, mothers and children but also as workers in the beedi rolling. The result of the study clearly define that the women suffered from socioeconomic and health related problems. The working hours are high but the wages they received by the contractor is not satisfactory and is less than the wages implemented by the government. There should be an instant implementation of government policies and laws related to the women beedi. The Beedi Workers Welfare Cess Act, 1976 and The Beedi Workers Welfare Fund Act 1976.

Keywords: Un-organized sectors, beedi industry, occupational hazards, welfare schemes, nature of work.

INTRODUCTION

Beedi manufacturing is the second largest industry in India. It provides employment to millions of women and children mostly from the poor socioeconomic strata. Beedi rolling causes significant health hazards. The International Labour Organization cites ailments such as exacerbation of tuberculosis, asthma, anaemia, giddiness, postural and eye problems, aches, Numbness's, skin allergy and gynaecological difficulties among beedi workers. Our study also showed similar findings. Apart from the other legal implications the health hazards which the women employees who are rolling the beedis are enormous. This study aims to explore the level of health hazards experienced by the woman beedi rollers in Tenkasi. This study proposes a framework to be implemented with the Government agencies, NGOs and Welfare organizations for the welfare of the beedi rollers.

OBJECTIVES

To study about the occupational hazards among women beedi workers.

- To know about the socio-demographic details of the respondents
- To understand the nature of work of the respondents
- To find the occupational hazards of the respondent
- To analyze the welfare measures of the respondents

METHODOLOGY

The data for this study was collected from a sample of women beedi rollers in the Alangulam Taluk of Tirunelveli district. A representative sample of 60 women beedi rollers was selected for the study. The primary data was primarily collected through direct interactions with the participants, using structured questionnaires and personal interviews. This approach allowed for the collection of first-hand information regarding their socio-economic status, working conditions, health issues, and other related aspects. The data collection process was designed to capture the lived experiences and challenges faced by the women beedi rollers, ensuring a comprehensive understanding of their working and living conditions.

						Total (%)
Age	Below 30	30 - 40	40 - 50	50 - 60	Above 60	100
	3%	13%	42%	23%	18%	
Education	Illiterate	SSLC	HSC	Degrees		100
	28%	38%	27%	7%		
Religion	Hindu	Christian				100
	87%	13%				
Marital Status	Married	Widow				100
	77%	23%				

Monthly income	Below 1000	1000 - 2000	2000- 3000	Above 3000	100
	5%	28%	33%	33%	
Family income	Below 5000	5000-7000	7000-10,000	Above 10,000	100
	40%	25%	13%	22%	
Years of Occupation	Below 10	10 - 15	15- 20	Above 20	100
	6%	57%	32%	5%	
Family type	Nuclear	Joint			100
	93	7			
Family Size	1-3	3-5	5-7	Above7	100
	30%	55%	13%	2%	
Vehicle	Cycle	Bike	Car	No vehicle	100
	13%	58%	2%	27%	

House type	Own	Rent			100
	83%	17%			
No of rooms	1-3	3-5	Above 5		100
	50%	47%	3%		
Drinking water	Public tap	Can tap			100
	98%	2%			
Loan	Yes	No			100
	35%	65%			
Loan	Home loan	Personal loan	Gold loan	Vehicle loan	100
	12%	8%	10%	5%	
Savings	Yes	No			100
	7%	93%			
Savings	Medical expenses	Children education	Basic needs		100
	24%	39%	30%		

From the table shows that 42% of respondents belong to the age group of 40 to 50. 100% of respondents are only in BC community. 38% of respondents have completed education up to SSLC. 87% of respondents were Hindu. 77% of respondents are married. 33% of respondents are earned 2000 - 3000 and above 3000 for their monthly income. 40% of respondents have below 5000 for their family income. 57% of the respondents are 10 to 15 years. 93% of respondents belong to nuclear family. 55% of respondent's have 3-5 family members in the family. 58% of the respondents owned bike. 83% of respondents have own house. 50% of respondents have only 1-3 rooms in their houses. 98% of respondents use public tap in their houses. 65% of respondents did not have loan. 12% of respondents possess home loan. 93% of respondents felt that their savings not sufficient for them. 39% of respondents thought that their savings are not sufficient to manage their children education.

Table 2-Nature of work of the respondents					Total (%)
Work is traditional	Yes	No			100
	92%	8%			
How years engaged in the Beedi Rolling	Below 20	20-30	30-40	Above 40	100
	10%	20%	32%	38%	
Number of beedi rolls per day	Below 500	500-1000			100
	27%	73%			
Amount for 1000 beedi by your employer	243.75	240			100
	65%	35%			
Pay structure	Weekly	Monthly			100

	48%	52%			
Remuneration of 1000 beedi	219.75	240			100
	65	35			
Payment is considered us low wages	Yes	No			100
	92%	8%			
Hours of work	Below 5 hrs	5-6 hrs	6-7 hrs	More than 6 hrs	100
	27%	30%	16%	27%	
Beedi rolls with	Rolls alone	Family	Group		100
	75%	7%	18%		
Receive help for work	Yes	No			100
	35%	65%			
Receive help for work	Neighbour	Relative			100
	28%	7%			
Finished product rejected by the employer	Occasionally	Never			100
	13%	87%			
	Yes	No			100
Assistance of your child in beedi rolling	15%	85%			
Food ate in correct time	Yes	No			100
	52%	48%			
Sleep Early	Yes	No			100
	67%	33%			

From the above table shows that 92% of respondents did their occupation as stated by traditional. 38% of respondents are engaged in beedi rolling over above 40. 73% of respondent's rolls 500- 1000 beedis per a day. 65% of respondents low wages in this sector. 52% of respondents get their salary as monthly basis. 65% of respondents get their remuneration which provides the welfare schemes. 92% of respondents consider this was the low wages. 27% of respondents were working below 5 hours and more than 6 hours per day. 75% of respondents are always rolls alone. 65% of respondents does not receive help from others. 87% of workers beedis were not rejected by the employers. 85% of respondents were omitted their children in their occupation. 52% of respondents take meal at correct time. 67% of respondents go to bed early but the rest. 25% of respondents doesn't go to bed early because of beedi rolling.

Occupational Hazards in Beedi works

Majority 93% of respondents have some health issues. 78% of respondents doesn't take their treatment. 92% of respondents done their treatment by allopathy. 78% of respondents don't take the regular check-up. 88% of respondents doesn't have any skin diseases. 98% of respondents believe that beedi rolling give them mentally stress. 63% of respondents suffered from headache. 83% of respondents suffered from back pain. 60% of respondents suffered from neck pain. 55% of respondents suffered from leg pain. 73% of respondents not get affected from blurred vision 78% of respondents not get affected from dust allergy in the alangulam area. 60% of respondents not get affected

from numbness of finger. no one use the protective equipment in the particular time of rolling the beedis in the alangulam area. 52% of respondents feel moderate for their company's safety measures. 83% of respondents highly aware about their beedi work but their situation of poverty they do the work but the remaining.

Available Welfare Measures

Majority 65% of respondents have the welfare programme provided by the beedi company. 65% of respondents have the statutory benefits provided by the beedi company. 62% of respondents have the ESI provided by the beedi company. 63% of respondents have PF provided by the beedi company. 62% of respondents have the yellow card provided by the beedi company. 42% of respondents have the yellow card provided by the beedi company this card was beneficial to seek medical purposes. 67% of respondents receive bonus provided by the beedi company. 88% of respondents not faced any specific challenges by the company. 65% of respondents get pension scheme provided by the beedi company. 65% of respondents have holidays provided by the beedi company.

CONCLUSION

Earnings from Beedi rolling are one of the major sources of income for the people of Alangulam and women in particular. A Beedi worker tends to quit the job as soon as their standard of living improved after earnings. Women Beedi workers having been facing lot of problems. They do not have any basic facilities. The researcher has identified the socio-economic conditions of women Beedi workers which will help the government to take remedial measures to promote the welfare of Beedi workers and to protect their rights.

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A STUDY ON EMPLOYEE SATISFACTION AMONG ONLINE DELIVERY WORKERS IN TIRUNELVELI DISTRICT

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Abstract

Food delivery aided through digital app play a significant role in food industry. The advent of digital tools helps the customer in getting better service. Customers have the privilege of choosing any kind of food from anywhere at any time. Companies have remodelled their strategy for serving the customer at the par. There is a proverb says "a happy employee is a productive employee". This can be achieved by job satisfaction. When employee feel self-motivated and self-satisfied it increases the productivity. Self-motivation and self-satisfaction can be achieved by job satisfaction. The main objectives of this paper are to assess the job satisfaction to identify the effectiveness of job satisfaction and to find out the several factors like personal and organization factors influence job satisfaction to identify the effectiveness job satisfaction of employees. **Method:** The data was collected from the 60 Online Food Delivery Workers at Vannarapettai block, Tirunelveli District, Tamilnadu through convenient sampling. The attitude of employees and Job Satisfaction is studied using interview schedule method and content analysis Method is used to analysis the data. **Findings:** As the result of this research, online delivery worker's job satisfaction to become a part of in the higher productivity. majority of delivery workers experience moderate levels of job satisfaction. The study also highlights the importance of factors such as compensation, working conditions, and recognition in determining employee satisfaction.

Key words: Job working condition, Factors of the work, Problem and Challenges

Introduction

The rise of e-commerce and online food delivery platforms has transformed the way people shop and dine. With the increasing demand for fast and convenient delivery services, online delivery workers have become an essential part of logistics and supply chain management. However, the job satisfaction of these workers is often overlooked, and their working conditions, wages, and benefits are often inadequate.

Objectives of the study

- To analyse the socio – demographic profile of the respondents.
- To study the physical problems faced by workers

- To understand the working condition of the employees. Factors that impact on job satisfaction
- To find the suitable suggestions to improve the job satisfaction of the employee

Methodology

This study employed a quantitative research design to investigate the relationship between attitude and job satisfaction among online food delivery workers. convenient sampling method was used to select sixty online food delivery workers from Vannarapettai block, Tirunelveli district of Tamilnadu. A structured interview schedule was used to gather information on the attitude and job satisfaction of online food delivery workers. The study ensured the confidentiality and anonymity of the respondents. Informed consent was obtained from each participant before the interview.

Table I

Personal Profile of the Respondents					Total (%)
Age	60-69	65-70	71-75	76-80	100%
	23%	51%	16%	10%	
Sex	Male	Female			100%
	25%	75%			
Educational Status	Illiterate	Below SSLC	SSLC	Graduate	100%
	32%	25%	33%	10%	
Marital status	Unmarried	Married			100%
	25%	75%			
Work experience	1-5	3-5	5-7	Nil	100%
	57%	17%	05%	21%	
Monthly income	10,000	20,000			100%
	37%	63%			
Types of working	Full time	Part time			100%
	67%	33%			
Language	Tamil	English	Others		100%
	88%	8%	3%		
Working hours	5-10	11-20	20-22		100%
	27%	25%	48%		

From the above table shows that 48% of respondents belong to the age group of twenty -thirty.50 % of the respondents are married. 35 % of the respondents are studied in UG. 68 % of the respondents are five -ten years. 63 % of the respondents get a 20,000 monthly income. 67 % of the respondents are full day working of the delivery job. 88 % of the respondents are maximum use in Tamil language speech to public people. 48 % of the respondents are working per day for 20-22 hours.

Table II Physical Problems of the respondents

Physical Problems of the respondents				Total (%)
Headache	Always	Sometimes	Never	100%
	73%	3%	23%	
Anxiety	25%	67%	08%	100%
Neck ache	50%	42%	08%	100%
Irritability	23%	73%	3%	100%
others	25%	67%	8%	100%
Sleeplessness	42%	18%	40%	100%
Stomach disorders	40%	25%	35%	100%
backache	65%	25%	10%	100%

From the above table shows that 73% of the respondents are affected by headaches. 67% of the respondents are sometimes affected by anxiety. 50% of the respondents are not affected by neck ache. 73% of the respondents are sometimes affected by irritability. 67% of the respondents are sometimes affected by others. 42% of the respondents are always affected by sleeplessness. 40% of the respondents are not affected for stomach disorders. 65% of the respondents are always affected by the back ache.

Table III

Financial problems of the respondents				Total (%)
Sufficient breaks	Always	Sometimes	Never	100%
	87%	10%	3%	
Safe equipment	53%	38%	8%	100%
Tips during delivery	75%	18%	7%	100%
Holidays	47%	43%	10%	100%
Monthly Medical	58%	22%	20%	100%

From the above table shows that 87% of the respondents are affected by sufficient breaks in some subject occasionally. 53% of the respondents are occasionally worried about working on safe equipment. 75% of the respondents are affected by any tips during delivery in this work occasionally. 47% of the respondents are affected by worrying about the holidays. 58% of the respondents are most important by the monthly medical always providing this work.

Table IV

Job Satisfaction			Total (%)
Appreciated employees for work	Yes	No	100%
	88%	12%	
Flexibility Work Schedule	88%	12%	100%
Compensation	50%	50%	100%

From above the table shows that 88% of the respondents are opportunity by appreciated employees. 88% of the respondents are always satisfied with flexibility work schedules that are comfortable for employees. 50% of the respondents are satisfied with compensation equally to the online delivery worker.

CONCLUSION

This study aimed to investigate the level of employee satisfaction among online delivery workers in Tirunelveli district. The results of the study indicate that many delivery workers experience moderate levels of job satisfaction. The study also highlights the importance of factors such as compensation, working conditions, and recognition in determining employee satisfaction.

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SYSTEMATIC REVIEW ON WHAT'S THE BACKBONE OF CHILD'S WELL-BEING: FINANCIAL AID OR EMOTIONAL NURTURING?

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ABSTRACT

Whether the child's development solely depends on financial stability alone or, emotional nurturing is the true foundation for thriving? This systematic review tries to answer this question by exploring and focusing on financial aid and emotional care, the primary factors which contributes to healthy child development. The researchers searched thorough across various databases like semantic scholar and PubMed, focusing studies published in a last decade and, included only those that addressed both the factors. Narrative synthesis was used due its heterogeneity of data.

The result of this review suggests that the financial aid is more impactful in providing children an opportunity to build a strong basement of life, while it has less direct impact on emotional and behavioural outcomes. On the other hand, the emotional nurturing is consistently linked to build a meaningful and successful life and many more positive outcomes. While financial security is important to provide basic needs of children's development, the emotional care can mitigate the unfortunate outcomes of financial stress, which implies that both financial and emotional support collaborates to promote over-all child's development.

Keywords: *Financial aid, Emotional nurturing, Child development.*

INTRODUCTION

Child development is, therefore, a certain area of prime importance, which means the foundation of future health, well-being, and productivity in life. Among different determinants of a child's development, financial assistance versus emotional nurturing is often debated with respect to the weight each of these bears in a child's development. Financial assistance meets basic requirements, including food, shelter, and education, but emotional nurturing develops such aspects as resilience, self-esteem, and social competence. Understanding how the determinants function is vital to set up effective policy and intervention measures for healthy child development across the different socioeconomic situations.

Over the years, both financial aid and emotional put into consideration as to how they affect the overall well-being of children. Of late, there have been many differences, with increased poverty and general family stress conditions due to uncertainty stemming from financial difficulties, and therefore it is more crucial to study how the two work interdependently and not exclusively. Though nurturing emotionally has been established as a pillar for child development, it has not been adequately investigated how money supports children's emotional nurturing trends and how that can affect more extended cognitive and emotional outcomes in children.

An exhaustive study of the topic is hereby warranted considering rising levels of interest around it but almost no investigation, which would directly compare both effects of financial contributed support as well as emotional nurturing in the few studies done on either. Importantly, these studies are one-dimensional, exploring a solitary dimension without consideration how these investments can reinforce one another. This leads to gaps in an understanding of how the combined resources of financial stability and emotional support can maximize developmental outcomes. This gap identified will enable the new review to produce such findings in present literature and the future studies, interventions, and policy-making efforts geared towards finding the best support for children's development in different contexts.

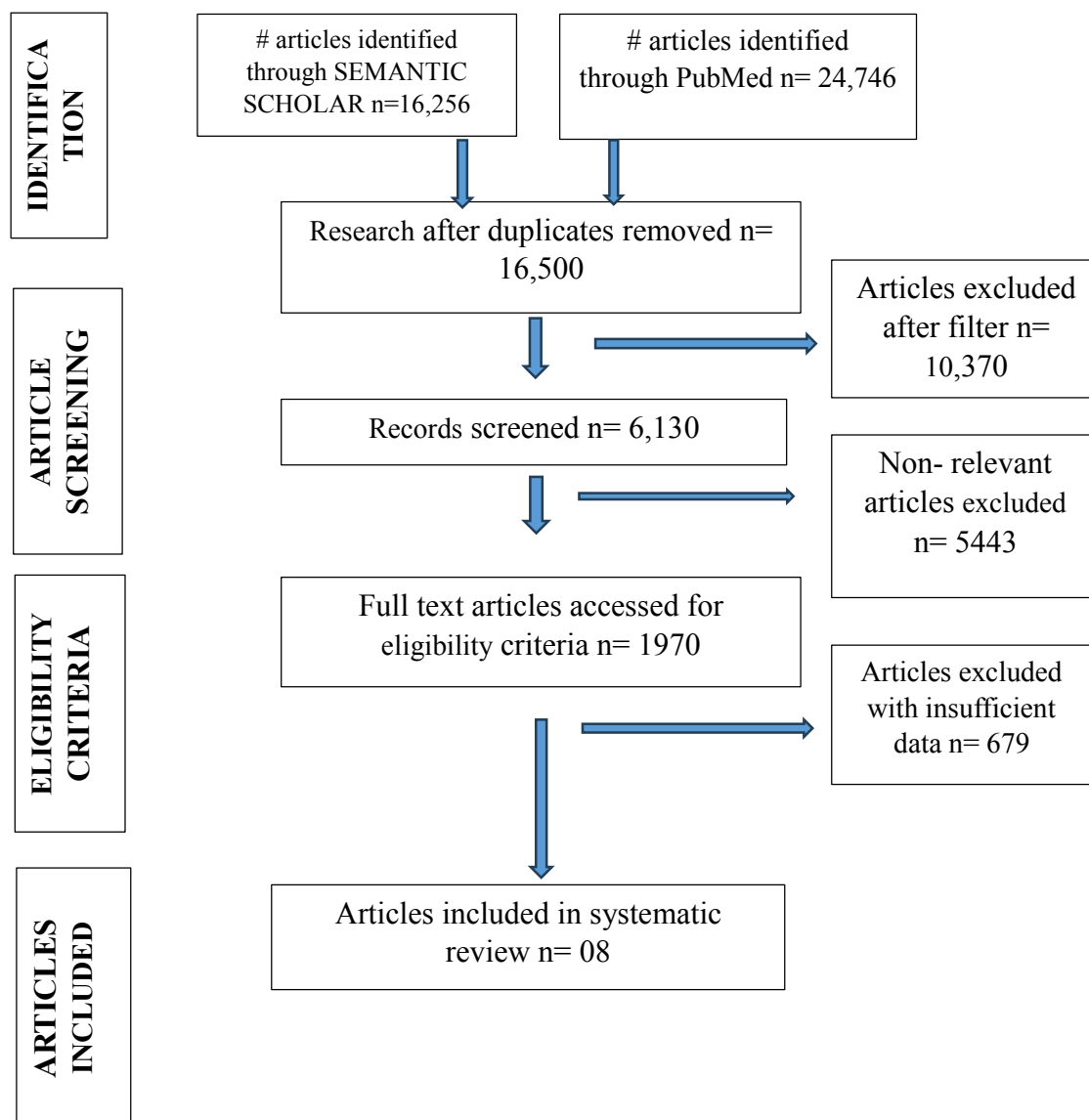
METHODS

DATA COLLECTION: By using PubMed and semantic scholar databases particularly, the relevant articles, reports and studies were collected, and screened. The search strategy that is the keywords “parental support”, “emotional nurturing”, “mental well-being of children”, “financial aid and children’s well-being” were used to identify from the databases. Narrative synthesis was used to synthesis of the data due to its heterogeneity of the content. Considering the heterogeneity of the study, the narrative synthesis was employed to club and summarize the findings.

ELIGIBILITY CRITERIA: A complete search of studies was conducted over multiple databases to associate relative studies. To ensure that the studies were recent one, it was limited to papers published in last 10 years. The systematic review identified 08 articles with the relevant key terms or titles. The studies that don’t specifically focused on children, the outdated empirical studies, the articles which do not addressed the main factors of child’s well-being or the studies that doesn’t has direct results related the topic were excluded.

RESULT

The Role of Financial Aid in Child Development and Financial resources serve as a foundation for children to access the essentials-qualified education, health, and nutrition. Evans and Schamberg (2009) studied the stress caused by financial instability on low-income families and clearly indicated adverse effects on cognitive development and mental health. The effects of poverty on children's mental health disorders, challenges in social-emotional development, were further verified by the Joseph Rowntree Foundation (2016). The existence of a fairly strong correlation between financial hardship and emotional or behavioural problems has been established, as it validates the role of financial interventions in curbing these effects (Luby et al., 2013). These clearly validate a public financial support system that promotes an environment for stable and healthy childhood contexts. Parental involvement, warmth, and positive reinforcement conditions builds building resilience and emotional regulation, along with self-esteem within a child. Such were summed up by the American Institutes for Research (2021) that substantiated such protective effects, particularly in buffering stress and adversities. Conger et al. (2010) indicated that having emotionally supportive parents improve children's value for school and stress management. Shonkoff et al. (2012) examined positive parental engagement in counteracting adverse childhood experiences, finding great benefits in emotional regulation and social competencies. The combination of these studies demonstrated that emotional encouragement is necessary for all-round child development, especially in difficult scenarios. Gassman-Pines (2015) found that assistance programs, including the child tax credit, may tend to alleviate hardship but add benefits in terms of outcomes by reducing parental stress. Evans (2004) counselled the interaction between financial aid and emotional nurturing. Gassman-Pines (2015) found that financial assistance programs such as child tax credits reduce material hardship but improve emotional outcomes through reducing parental stress. Evans (2004) put forward the year's cumulative jeopardy for children with little finance and inadequate emotional support, maintaining that either alone guarantees non-optimal development.



DISCUSSION

The findings of this systematic review, which will serve the dual purpose of establishing the interplay between financial and emotional nurturance in healthy child development. Financial stability should form a base for acquiring all other resources including quality education, nutrition, good health, and safe housing for an individual. Emotional nurturing, however, provides a much more direct impact on the resilience, emotional regulation, and social skills of children. Declarations from nurturing-type programs such as parenting interventions and early childhood education explicitly show significant value in enhancing emotional security, and overall psychological wellbeing. Findings are evident in the same line as the relationship between financial and emotional conditioning, both would ultimately ensure holistic child development, of which emotional nurturing would address the schooling health. This review also offers global evidence. It also bridges some of the major knowledge gaps through looking not only at direct effects but at indirect via parental outcomes as well. Emphasis on emotional nurturing becomes food for thought in the crafting of an intervention that would capitalize on the long-term retention of emotional health plus resilience.

Several limitations should be noted. The diversity of study designs and methodologies of existing literature rendered the results. Many of the studies depend on correlation data, which

does not clearly show relationships among dimensions. The cultural differences in nurturing care and unreliable measures of emotional well-being complicated the review. Because reference secondary sources were used this limited to contextual nuances of each study.

Policies develop dual needs strategies that target the financial dimension and the emotional dimension particularly of low-income families. Parenting workshops, social-emotional learning in schools that enable easy access to mental health services should be recommended. Thus, children not only survive but thrive emotionally, socially, and cognitively in diverse environments.

CONCLUSION

This systematic review develops the significant importance of financial and emotional supports as the major components of child's well-being. This demands for an integrated approaches to intervention that includes emotional components, financial aid, nutrition, education, and healthcare that supports the child's development. There should be integral interventions that combine both factors to foster well-being of children. Heuristic judgment by testing different policies could then be shown in real settings of life where life gets equal opportunities for children bringing up. In the future, research needs to dig deeper into the links so that through means culturally tuned and evidence-based in the ways of building environments, the emotional and material needs of all children can grow organically.

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EXPLORING THE ROLE OF SELF-DISCREPANCY IN PSYCHOLOGICAL DISTRESS: A SYSTEMATIC REVIEW

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ABSTRACT

Self-discrepancy is interrelated to poor mental health, yet its workings are uncharted. Self-acceptance plays a moderating role in the relationship between self-discrepancy and perceived stress among individuals. This review aims to address the impact of self-discrepancy on individual stress in daily life and how self-acceptance plays its role in between. These discrepancies are a significant source of stress as they cause emotional discomfort and frustration among individuals. Now, self-acceptance acts as a catalyst for individuals by helping them to reduce the emotional turmoil inside and thrive for positive outcomes. Three electronic databases (PubMed, Semantic scholar & Google Scholar) are used to search for articles needed for this review. Inclusion criteria encompassed studies within last 10 years and the sample aged between 0-18 years. The Exclusion criteria excluded studies before 10 years and other age group people. The findings highlight major sources of stress and show mixed results of the significance of self-acceptance due to other factors that inflates self-discrepancy.

Keywords: *Self-discrepancy, Self-acceptance, Perceived Stress*

INTRODUCTION

Perceived stress, is identified by feelings of being overwhelmed and unable to cope, is a significant factor affecting mental health and wellbeing. Self-acceptance is the relatively objective sense or recognition of one's abilities and achievements, together with acknowledgment and acceptance of one's limitations. Self-acceptance is often viewed as a major component of mental health (American Psychological Association n.d.) Self-discrepancy refers to the gap between the actual self and the self-guide. According to self-discrepancy theory, the greater an individual's self-discrepancy is, the more discomforts he or she will suffer (Higgins, 1987, 1989). Individuals possess three domains of self-representations that influence motivational and affective behaviour: *the actual self* defined as one's perceptions of the attributes that one actually possesses, *the ideal self* that constitutes an idealized version of oneself and refers to one's aspirations, and *the ought self* represents the version of oneself one feels obligated to be as a function of perceived duties or obligations (Higgins et al., 1985). When individuals face self-discrepancies, the absence of self-acceptance can intensify negative emotions such as anger, guilt and frustration. Conversely, self-acceptance can mitigate these effects by fostering a compassionate perspective toward unsettled expectations. Today, work-family conflicts and academic stress are the primary contributors of psychological strain in majority of individuals. The growing concern of emotional well-being and mental

health awareness leads to uncover the impact of self-discrepancy upon perceived stress. The goal of this systematic review is to emphasize the power of self-acceptance in buffering perceived stress of individuals. This review aims to provide a complete understanding of these relationships and its implications to mitigate stress.

METHODS

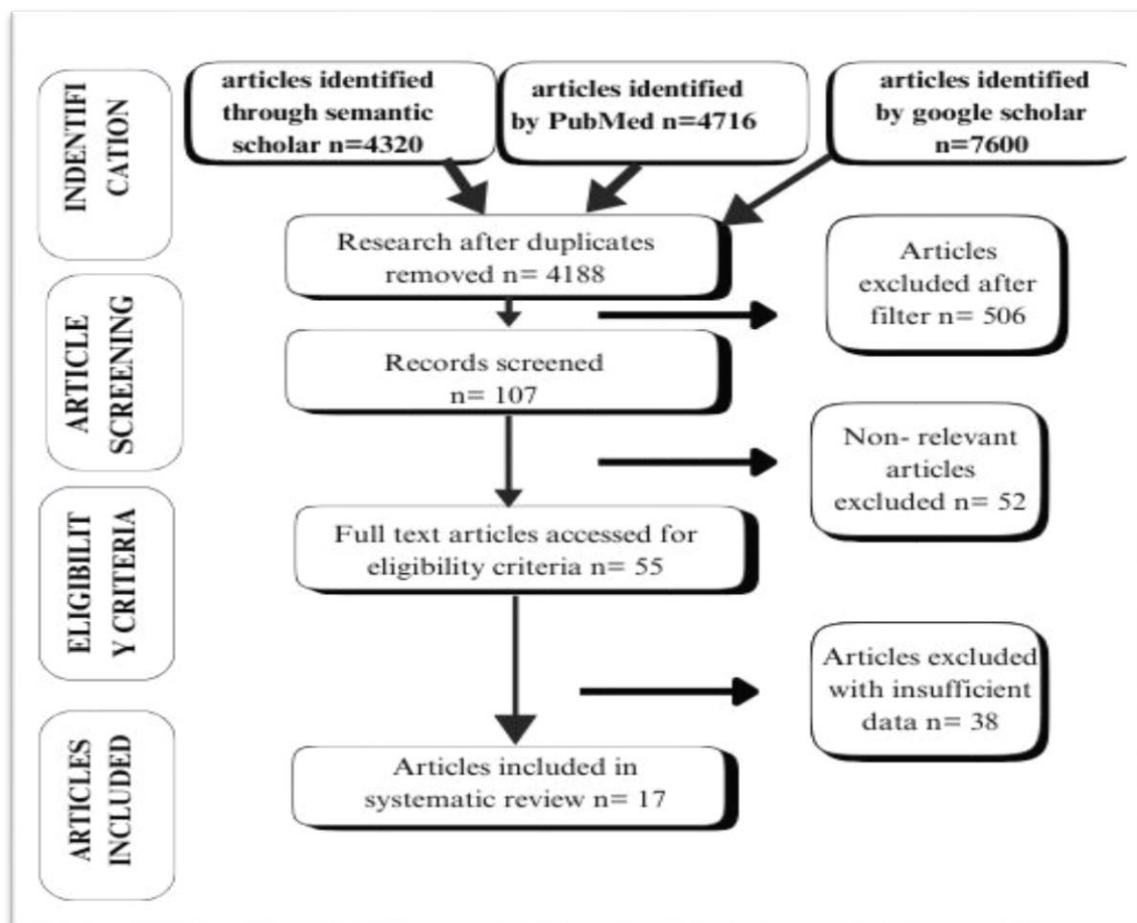
DATA COLLECTION: The research articles, reports and studies were collected and screened by using three databases namely; PubMed, Semantic scholar and Google scholar. The search strategy or the keywords “self-discrepancy”, “self-acceptance”, “perceived stress” was employed to identify information from the databases. This article adopts a narrative rather than a meta-analytical approach to synthesize the data due to its heterogeneity of the content. Further, Baumeister (2013) argues that narrative reviews can be useful for combining different kinds of evidence to formulate a broad theoretical formulation, such as that proposed in the current review.

ELIGIBILITY CRITERIA: A complete search of studies was investigated over multiple databases to associate relevant studies. To ensure that the studies were contemporary, it was limited to papers published in the last 20 years. The systematic review identified 17 studies with the relevant key terms or titles. The studies that specifically focused on children below 18 years of age, the outdated empirical studies, the articles which did not address self-discrepancy were excluded.

RESULT

Existing Literature states that self-discrepancies might evolve when individuals feel they are unsuccessful in achieving their personal or societal expectations. The interplay between self-discrepancies and stress is very pertinent in today’s context of increasing societal pressures and self-comparison driven by social media and other influences. Body image discrepancies moderated the relationship between social comparisons and negative psychological outcomes. Specifically, those with high levels of self-discrepancies reported worse psychological outcomes (Bessenoff, 2006). Self-discrepancies play a crucial role in appearance-related processes and are implicated in the development of eating disorders (Mason et al., 2019). According to Higgins’ self-discrepancy theory (1987), the misalignment between one’s actual and ideal self serves as a key motivational driver in setting personal goals. However, large discrepancies often result in negative affect, such as guilt or disappointment. Control Theory (Powers, 1973) proposes that when conflict occurs within the goal hierarchy, particularly conflict between high-level that persists and is unresolved, this leads to distress. Allen stated that human desire for self-congruence may extend to even the most undesirable aspects of the self. Self-congruence is increasingly being sought after, and achieved, within digital games and online virtual environments (VEs) (Bailenson, 2018). Creating avatars that are totally different from one’s actual self can escalate feelings of self-discrepancy, eventually leading to negative emotional outcomes. A study examining user-avatar discrepancies found that such differences could impact users’ psychological well-being, including self-esteem and social anxiety (Brown et al., 2024). Anxiety is a psychological distress due to expectation of negative outcomes (Epstein, 2013). Straumann (1989) found clinically depressed individuals to have the greatest actual-ideal discrepancies and

socially phobic individuals to have the greatest actual-ought discrepancies. Self-acceptance refers to people taking a positive attitude toward themselves and all their characteristics and reflects the degree of individual acceptance of oneself (Cai et al., 2021). It was the basis of self-esteem (Nathaniel, 1998). A higher level of self-acceptance was associated with a lower level of anxiety, depression, negative affect, and psychological distress (Xu et al., 2016; Jibeen, 2017; Popov, 2019). By cultivating self-acceptance, individuals can reframe discrepancies as opportunities for growth instead of a source of frustration, emotional discomfort or distress therefore reducing the impact on perceived stress. Several studies support that acceptance has a variety of positive correlates, including decreased anxiety and depressive symptoms (Kashdan et al., 2009; Orcutt, Pickett, & Pope, 2005; Plumb, Orsillo, & Luterek, 2004; Roemer, Salters, Raffa, & Orsillo, 2005; Tull, Gratz, Salters, & Roemer, 2004). Studies prove that greater acceptance protects stressed individuals from developing depressive symptoms (Ford et al., *The Psychological Health Benefits of Accepting Negative Emotions and Thoughts*, 2018). A 20-year prospective cohort study found that self-acceptance decreased mortality risk by 19% and added 3 years of life even after controlling for other psychological components and potential confounders, suggesting the influence of self-acceptance on physical health as well as mental health (Ng et al., 2020). Hence, self-acceptance played a protective role in overall health development (Popov, 2019).



DISCUSSION

Self-discrepancies are created when there is a mismatch built by various factors such as societal influences, social media and certain personality traits. Persistent discrepancies create chronic stress as individuals struggle with the perceived gap between where they are and where they want to be. A positive thought process combined with a support of good people helps individual move toward self-acceptance, paving the way for improved mental health and overall well-being. Self-acceptance allows individuals to lessen their harsh self-judgement and criticism. These findings demonstrate that higher levels of self-acceptance are associated with lower levels of stress caused by self-discrepancies. As self-acceptance increases, individuals concentrate on their own thoughts and feelings instead of worrying about other's judgements and criticisms. They now don't have to strive to meet the unrealistic expectations of others as well as themselves. Humans don't need to be perfect; they simply need to embrace their elegance. It is essential for individuals to feel more capable and confident in their abilities and self-acceptance helps in boosting the inner confidence. The results suggest that individuals who cultivate a positive view of themselves and their surroundings, turn toward developing self-love and personal growth. They could also develop perseverance and resilience in their life through mindful practice of self-acceptance. It reduces negative self-talk and self-blame by exploring reality thus reducing self-discrepancy. Self-satisfaction and mental health are important than other's validation. *Instead of chasing on others, one should attract them.* The aura that people carry after developing self-acceptance and mindfulness, can help them develop better relationships. In turn, these relationships help people to accept them as they are and appreciate the life they've earned. The strength of this review article is its focus on a novel and underexplored importance of self-acceptance in influencing self-discrepancy. Nobody has considered this factor in mitigating self-discrepancies. Although many studies have been explored to demonstrate the review, there were only few studies relevant to the subject. Cultural differences may exist, and the findings have been synthesized from multiple papers with diverse research methods which can often be ambiguous. This research is strengthened by its theoretical explanations, providing practical insights for stress management interventions. Awareness programs and self-interest development programs can be implied to enhance personal well-being. Future research could explore the role of cultural or demographic differences in moderating the relationships between self-acceptance and stress related to self-discrepancies.

CONCLUSION

This systematic analysis aimed to explore the relationship between self-acceptance and stress caused by self-discrepancies. The results of these findings consistently demonstrate that higher self-acceptance is connected with lower stress levels, emphasizing its importance as a protective factor against perceived stress. These results not only highlight the practical value of fostering self-acceptance in mental health interventions but also contribute to the theoretical framework of Self-Discrepancy theory. Eventually, fostering self-acceptance plays a pivotal role in enhancing emotional resilience and promoting mental well-being.

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COMPASSION FATIGUE; EXPLORING THE BARRIERS TO SEEK MENTAL HEALTH CARE AND THE SOCIAL SUPPORT AS COPING MECHANISM AMONG HEALTHCARE PROFESSIONALS IN TAMIL NADU: A QUALITATIVE STUDY

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ABSTRACT

BACKGROUND

Unseen, Unspoken but the real struggle that the health care professionals experience. Compassion fatigue is the emotional, psychological distress that the individual experience while helping the person with trauma or pain. It's often seen among the healthcare professionals. Social support refers to the supportive nature of the people around the individual and that helps them to cope with the distress situation. Main Objective of this paper is to explore the barriers among the doctors to seek mental health care while experiencing compassion fatigue. This paper aims to examine the importance of the social support among the doctors to cope with the compassion fatigue. And also surveyed about the long-term consequences of ignoring compassion fatigue according to healthcare professionals.

METHODS

A Qualitative study was taken among the health care professionals. I conducted 13 individual, semi-structured interview with healthcare professionals working at any hospitals in Tamil Nadu. Convenient sampling method is used for data collection. The collected data were analysed through the qualitative content analysis. The Thematic analysis is approached as it allows to understand the different and in-depth perspectives of the subjects.

RESULTS

The analyses showing that with the different experience the individual experiencing compassion fatigue differs. Doctors with experience of more than 13 years are tend to say that all doctors are experiencing compassion fatigue and there are barriers felt by the doctors to approach mental health care. And these doctors tend to say that all type of support is important for them to cope with the compassion fatigue. Companionship support is very important as everything can't be shared among everyone. Doctors with less experience or the junior doctors said that there are not going through compassion fatigue and there is no barrier present to seek mental healthcare. And for them also companionship and emotional support were tended to be more important.

CONCLUSION

From this study, the main barriers for seeking mental healthcare are found to be working schedule, Taboo barriers, not having enough realisation, social barriers, lack of time. Companionship support and emotional support plays a major role as a coping mechanism and other types of support also plays an integral part.

Key words: Compassion fatigue, social support, barriers, coping mechanism,

INTRODUCTION

Mental health is the individual's state of well-being socially, emotionally, psychologically that helps them to cope with the life stressors and distressing situation. Taking care of the mental health is as important as taking care of the physical health. Compassion fatigue is the emotional, psychological impact that individual goes through while helping the people with trauma and pain. By listening to the people's trauma and personal stories, it's often influenced an emotional, psychological distress among the healthcare professionals. It is an exhaustion that experienced when prolonged exposed to the suffering of others. The highest level of compassion fatigue was seen in Asian region and while the America and Europe had the lowest levels of compassion fatigue (Mirutse, A., Mengistu, Z., & Bizuwork, K. (2023)). The individuals with compassion fatigue often feels emotional exhaustion, depersonalization and physical symptoms. Emotional exhaustion includes that they feel emotional drained and finds difficult to engage emotional with others. Depersonalization refers to the detachments. They try to distant themselves emotionally from the people and work. This influence physical symptoms such as sleep disturbances, headaches, fatigue etc... Social support is the unseen strength behind every healer. Social support refers to the support that individual gets by the caring and supportive people around them. It often comes from the family members, friends, colleagues, organisation etc... Social support are of many types such as Emotional, Instrumental, Appraisal, Informative etc... Emotional support refers to empathy, love, care, trust and providing comfort during difficult times. Instrumental support involves helping with tasks or giving material assistance. Appraisal support helps the individuals to assess their situation and to improve perspective by providing them feedback, affirmation etc... Informative support involves sharing of guidance, assistance and advice. Medical support includes psychosocial skills among healthcare professionals (Ommen, O., Thuem, S., Pfaff, H., & Janssen, C. (2010)). Poorly planned shift rotas with less social support can have a negative impact on the healthcare professional's performances (Brown, M., Tucker, P., Rapport, F., Hutchings, H., Dahlgren, A., Davies, G., & Ebden, P. (2010)).

METHODOLOGY

POPULATION AND SAMPLE

The population of this study includes all the working healthcare professionals in Tamil Nadu. The sample was collected through convenience sampling method. 13 physicians were interviewed for this study. Interviews were lasted for 5 - 10 minutes. And at the end of each interview, by summarizing the interviewee's statements the accuracy were checked. All procedures and survey were taken after getting an approval

from the organisation managements and the interview were conducted after getting an individual consent.

DATA COLLECTION AND ANALYSIS

I performed semi-structured individual interviews among the healthcare professionals. Basic professional characteristics were assessed through self-report. Key aspects of this study were surveyed through open-ended questions to get the better understanding of their perceptions. The collected data were analysed through thematic analyses and by checking all the responses, the main codes were developed such as 1) Compassion fatigue 2) Barriers 3) Social support 4) Long-term consequences. Further sub codes are developed while analysing the transcripts and interview questions.

RESULTS

The 4 main codes are divided into sub codes based the participants responses.

1. Compassion fatigue

Doctors with more than 13 yrs of experience said that compassion fatigue are often felt by every doctor and they said that medical students or the junior doctors are not aware more about it. It also correlates with our findings that the junior doctors that we surveyed doesn't had enough idea about compassion fatigue.

Every doctor is experiencing it but they are not aware about it. [D4, D5, D6, D11]

I'm not exposed to that much cases as I'm a junior doctor so I don't have any idea about compassion fatigue. [D1]

2. Barriers to seek mental healthcare

Most of the participants said that the barriers are present among them. That includes lack of time, busy schedules and working condition also plays as a barrier.

I'm the barrier. I won't approach any mental health care as a doctor I feel like it affects the opinion among others about myself. [D11]

A thought of I know everything as a doctor feels like a barrier to approach other mental healthcare. [D6]

Taboo barrier and egoistic barrier are often seen among the doctors. (Taboo means prohibited). And the doctors are not realising that it need mental health care. [D4]

Social barrier are the major barriers. [D5]

Few people responded that there are no barriers to seek the mental healthcare.

Doctors are enough aware about the mental healthcare more than any professions. So, there is no barriers are present. [D2]

3. Social support as coping mechanism

All participants said that the social support is very important for us to keep ourselves motivated, on track and to be confident about ourselves.

Emotional and Companionship Support

Emotional support refers to empathy, love, care, trust and providing comfort during difficult times. Companionship support creates a sense of belonging. Every doctor said that the emotional support from the family and companionship support plays a major role as a coping mechanism.

Spending time with my colleagues, having a day off, outing is the coping mechanism that I have. [D5]

Getting out from this workplace and spending time with friends will make it better. [D9]

Often, emotional support works but as it happens everyday it became a routine. So, there is no coping strategy for me. [D11]

Social media and friends are my escapism tool. [D7]

Family and friends are the primary sources. That getting emotional support from them makes a great difference. [D4]

Appraisal support

Appraisal support helps the individuals to assess their situation and to improve perspective by providing them feedback, affirmation etc...

Appraisal support from management and co-workers tend to motivate us and increase our efficiency and confidence in our work. Sadly, in India we are not getting any appraisal support from anyone. [D4]

Appraisal support creates a space for me to improve myself more. [D6]

Financial support

Financial support involves helping with money or the resources in the time of distress or need.

Finances becomes integral part of our life. So often financial support is helps in the time of distress. [D4]

Professional support

Professional support includes the counselling services and mental healthcare centre.

When all the other social supports don't work, we will at last seek professional support. [D4]

4. Long-term consequences

Long term consequences of ignoring compassion fatigue and not approaching mental healthcare at the right time leads to so many consequences and factors are affected.

Physical and functional capacity decreases, professional competency decreases, substance abuse such alcohol, smoking, drugs can be done. At last, rarely suicide is done. [D3]

Metabolic disorders and obesity may also result. [D2]

Primary consequences involve bad relationship and conflict among family. Secondary, substance abuse is done. At last, some people tend to do suicide whereas some approach spiritual interests. [D4]

Premature aging is seen, I will experience the things that I will have in my 50s are seen in my 30s as a consequence. [D11]

Some other common consequences that said by everyone is communication decreases, lack of empathy, level of concentration in work decreases, dissatisfaction in work, depression, anger and frustration.

DISCUSSION

From our study, it is clear that the doctors with more experience are experiencing compassion fatigue and they are aware about it. Junior doctors are not that much aware about it and even experiencing the compassion fatigue they are tend to conclude that it's part of their job as they are going through it every day. Main barriers are tend to be Taboo barrier, social barrier, working condition, lack of time and realisation. Taboo means prohibited. Taboo barrier and social barrier explains that the society can't accept doctors too need to seek mental healthcare approaches. Most of the doctors are not realising that they need to seek mental healthcare also plays as a major barrier. To avoid these barriers, the working condition for doctors should be improved and the social awareness should be done that every individual needs to take care of their mental health irrespective of their professions. Some doctors said that all the social support are important. Every doctor said that the emotional, companionship support helps to cope with the compassion fatigue. And appraisal support can improve their working efficiency. Long term consequences involve dissatisfaction in work, depression, suicide, conflict relationship, metabolic disorder, substance abuse, professional competency decreases, communication

level decreases, lack of empathy, pre-mature aging are the major consequences of ignoring compassion fatigue when it need help.

LIMITATIONS

The sample of this study includes only physicians and other healthcare professionals are not surveyed in this study. So, the conclusions of this study may vary for other professionals. Limited sample size was obtained. This study doesn't focus on the generalization of the results but rather to explore different barriers and coping strategies for mental well-being.

CONCLUSION

This paper shows the main barriers that healthcare professionals experiencing that includes Taboo barrier, social barrier, realisation, lack of time and busy working schedule. By improving the working condition among healthcare professionals will improve the mental health of an individual. And the awareness about the long-term consequences of ignoring compassion fatigue should be done among the professionals as many are not realising its consequences. Emotional and companionship support are the coping strategy for many doctors. By supporting the healthcare professionals emotionally or even through appraisal can make there day better and increase their self-confidence and improves the work efficiency.

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INVESTIGATE THE INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY AWARENESS ON HIGH SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN TIRUNELVELI CITY

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Abstract

This study is to investigate how high school students in Tamil Nadu's Tirunelveli district use information and communication technology (ICT) knowledge in relation to their academic performance. Assessing academic accomplishment and ICT awareness as well as investigating the connection between ICT awareness and academic performance are the main goals. The kids in grade IX (boys and girls) in government, government-aided, and private (Matriculation and CBSE schools) in Tirunelveli city would be the selected demographic for this research. The research is limited to 500 Standard IX pupils from different Tirunelveli municipal schools. The volunteers for this research will be chosen using the simple random sampling approach. To find out the significant difference, if any, in the awareness about ICT on academic achievement among high school students and in their dimensions with respect to the following variables were Gender (Male/Female), Type of school (Government/Government Aided/Private), Student's locality (Rural/Urban) and Availability of personal smart phone (Yes/No). Furthermore, a substantial relationship between ICT awareness and academic achievement among high school students.

1. Introduction

The field of Information and Communication Technology (ICT) is a dynamic and rapidly evolving domain that plays a crucial role in shaping the contemporary world. ICT encompasses a wide array of technologies and tools designed to acquire, store, process, transmit, and disseminate information. This interdisciplinary realm integrates components of computing, telecommunications, audio-visual processing, and network-based information services. In essence, ICT serves as the backbone of our interconnected and digitized society, influencing how individuals communicate, access information, conduct business, and engage with technology (Beynon-Davies, 2004). Continuous advancements in ICT have transformed the way we live, work, and interact, fostering innovation, efficiency, and global connectivity. From the development of hardware components like computers, smartphones, and networking devices to the creation of software applications and communication protocols, ICT provides the infrastructure that underlies the digital age. It empowers individuals, businesses, and governments to

leverage technology for various purposes, ranging from enhancing productivity and decision-making to facilitating seamless communication and collaboration across geographical boundaries (Kizza, 2013).

In the 21st century, Information and Communication Technology (ICT) has become an integral part of daily life, influencing various aspects, including education. The awareness and understanding of ICT among senior secondary students are crucial in preparing them for the digital challenges of the contemporary world (Smith, 2018). Senior secondary students, being part of a tech-savvy generation, often exhibit a significant level of familiarity with ICT tools. The prevalence of smartphones, access to the internet, and exposure to digital media contribute to baseline awareness among students (Jones et al., 2020). Educational institutions worldwide recognize the importance of incorporating ICT into the curriculum to enhance learning experiences. Many schools introduce ICT-related subjects or integrate technology into various disciplines to promote both digital literacy and subject-specific skills (Brown, 2019).

Teachers play a crucial role in fostering ICT awareness. Professional development opportunities for teachers can ensure they are well-equipped to integrate technology effectively into their teaching methods, thereby influencing students' awareness and proficiency (Harris & Miller, 2022). While high school students generally have a baseline awareness of ICT, on-going efforts are needed to address disparities in access and ensure that students are adequately prepared for the evolving digital landscape. A comprehensive approach that involves both curriculum adjustments and infrastructure improvements can contribute to enhancing ICT awareness among high school students.

ICT and Academic Achievement

The integration of Information and Communication Technology (ICT) into education has become a prominent focus, with potential implications for the academic achievement of senior secondary students. The use of ICT tools and resources in educational settings aims to enhance learning experiences and prepare students for the demands of the digital age (Davis, 2019). Research suggests a positive correlation between ICT use and academic achievement among senior secondary students. For instance, a study by Johnson et al. (2020) found that students who actively engaged with ICT resources demonstrated higher academic performance in subjects where technology was incorporated into the curriculum. The introduction of digital learning environments, facilitated by ICT, has provided students with opportunities for personalized and interactive learning experiences. These environments often cater to different learning styles and abilities, contributing to improved academic outcomes (Smith & Brown, 2018). The integration of Information and Communication Technology has the potential to positively influence the academic achievement of senior secondary students. By providing access to digital learning environments and resources, ICT contributes to a more dynamic and effective learning experience, although addressing challenges related to access remains essential for equitable outcomes.

Need and Significance of the Study

While numerous studies have focused on the utilization of ICT, the majority have centred on Higher Education Students, with none specifically addressing high School students in Tamil Nadu, particularly in the Tirunelveli district. Consequently, there is a necessity to assess the level of ICT awareness and skills among high School Students in this region.

2. Methodology

2.1 Research Model

The research was evaluated with a general survey model. The general survey model is based on the purpose of making generalizations and having ideas about the population through the data gathered from the sample (Simsek, 2012).

2.2 Research group

The research group consisted of the population preferred for this study will be the students those who are studying in standard IX (boys and girls) in government, government aided, Private (Matriculation and CBSE schools) in Tirunelveli city. The study is confined to 500 students studying in Standard IX from various schools in Tirunelveli city. Simple Random Sampling technique will be used for this study to select the subjects. To find out the significant difference, if any, in the awareness about ICT on academic achievement among high school students and in their dimensions with respect to the following variables were Gender (Male/Female), Type of school (Government/Government Aided/Private), Student's locality (Rural/Urban) and Availability of personal smart phone (Yes/No). Furthermore, a substantial relationship between ICT awareness and academic achievement among high school students.

2.3 Data Collecting Tools

The investigator gone through the available literature and had discussions with various experts and his research supervisor before selecting variables. After analyzing the related literature, the researcher decided to continue ahead with the readymade tool such as Attitude Questionnaire invented by S.P. Ahluwalia (1974) seemed to be appropriate. In the present study the instrument employed in this study was a self-structured questionnaire created by the researcher with guidance and standardization to effectively assess the awareness level of high school students. The questionnaire focuses on ICT awareness, utilizing a 5-point scale: 1=Not at all aware, 2=slightly aware, 3=Moderately aware, 4=Aware, 5=Extremely aware. It comprises 32 questions tailored for both male and female participants. For academic achievement of students (Examination Marks) will be utilized.

2.4 Analyzing of Data

In the statistical analyzing of data the SPSS 22.0 package program was used. The results were evaluated at (p-0.05) value and distributed in normal way. For this reason, from parametric tests; t-test and one-way variance analysis (ANOVA) were applied to

the variables. Pearson product moment was to find the relationship between ICT awareness and academic achievement among high school students.

3. Results

In the tables below, details of Mean Scores of ICT Awareness Based on Gender.

Table-1: Inferential analysis of data on ICT Awareness of General Scores of students

	Gender	Number	Mean \pm Standard Deviation	Percent	t-ratio	Sig
ICT	Male	286	84.36 \pm 11.52	57.2	3.087*	0.02
	Female	214	76.34 \pm 10.57	42.8		

The descriptive statistics as presented in table 1 reveals that the mean and standard deviation for male and female were 84.36 \pm 11.52 and 76.34 \pm 10.57 respectively. The percentage score for male was 57.2% and female was 42.8% respectively. The significant level of the male and female groups were 0.02 which was lesser than 0.05 level of significance which determined that there was a significant difference between male and female on ICT awareness of students.

Table-2: Descriptive analysis of data on ICT Awareness of General Scores of students

	Schools	Number	Mean \pm Standard Deviation	Percent
ICT	Government	135	73.56 \pm 10.06	27
	Government Aided	169	78.48 \pm 14.01	33.8
	Private	196	84.67 \pm 9.36	39.2

The descriptive statistics as presented in table 2 reveals that the mean and standard deviation for students from government, government aided and private sectors were 73.56 \pm 10.06, 78.48 \pm 14.01 and 84.67 \pm 9.36 respectively. The percentage score for teacher's working in government school was 27%, students from government aided were 33.8% and those working in private sector were 39.2% respectively.

Table-3: Analysis of Variance on ICT Awareness among high school students

Attitude	Sum of Square	df	Mean Square	F-ratio	Sig.
Between Groups	1091.399	2	545.700	4.47*	.013
Within Groups	27852.797	227	122.700		

(Note= * Significant at 0.05 level. P<0.05).

In according to table 3, the teacher's working sectors status was ($p < 0.05$). The value also confirms that there was significant difference between the high school on government, government aided and private sector schools in relation to ICT.

Table-4: Inferential analysis of data on ICT Awareness of General Scores of student's locality

	Gender	Number	Mean \pm Standard Deviation	Percent	t-ratio	Sig
ICT	Urban	314	82.29 \pm 10.11	62.8	5.19*	0.00
	Rural	286	73.64 \pm 12.34	57.2		

The descriptive statistics as presented in table 4 reveals that the mean and standard deviation for urban and rural were 82.29 \pm 10.11 and 73.64 \pm 12.34 respectively. The percentage score for male was 62.8% and female was 57.2% respectively. The significant level of the urban and rural groups were 0.00 which was lesser than 0.05 level of significance which determined that there was a significant difference between urban and rural on ICT awareness of students.

Table - 5: Inferential analysis of data on Availability of personal smart phone

Smart Phone	Number	Percent
Yes	437	87.4
No	63	12.6

The descriptive statistics as presented in table 5 reveals that the percentage score for using smart personal phone was 87.4% (yes) and 12.6% (no) respectively.

Table-6: Inferential analysis of data on Academic Achievement of General Scores of students

	Gender	Number	Mean \pm Standard Deviation	Percent	t-ratio	Sig
Academic Achievement	Male	286	64.05 \pm 8.43	57.2	6.087*	0.00
	Female	214	73.11 \pm 9.14	42.8		

The descriptive statistics as presented in table 6 reveals that the mean and standard deviation for male and female were 64.05 \pm 8.43 and 73.11 \pm 9.14 respectively. The percentage score for male was 57.2% and female was 42.8% respectively. The significant level of the male and female groups were 0.00 which was lesser than 0.05 level of significance which determined that there was a significant difference between male and female on academic achievement of students.

Table-7: Relationship between ICT Awareness and Academic Achievement

	Number	R value	Sig
ICT Awareness impact on academic achievement	500	0.756	0.001

In Table 7, the computed correlation coefficient 'r' value is reported as 0.756. This 'r' value is then compared to the critical 'r' value from a statistical table, typically associated with the degrees of freedom and the chosen significance level (alpha). The critical significant value, in this case, is mentioned as 0.001. The comparison reveals that the calculated 'r' value (0.612) significantly exceeds at the 5% significance level. This result suggests a strong and statistically significant correlation between the variables under investigation. The decision to reject the null hypothesis aligns with conventional statistical practice, where the rejection indicates that there is a significant relationship between the variables being examined.

Discussion and Conclusion

In this study, 500 high school students from Tamil Nadu's Tirunelveli district participated in a survey. The main goal was to find out how much the students knew about new developments in information and communication technology (ICT) and the many ICT instruments that are available, such as computers, the internet, and mobile phones. Furthermore, the research aimed to investigate the relationship between participants' academic accomplishment and their knowledge of ICT. The results show that high school pupils have a good degree of ICT awareness. The research does, however, point out a gender difference, with men showing greater levels of awareness than women. Additionally, the data shows that kids' overall academic attainment is ordinary. The research reveals a significant correlation between academic success and ICT awareness. This implies that academic performance is often higher among pupils who have a greater understanding of ICT. This finding implies that there is a substantial and statistically significant connection between the variables being studied. A woman's academic success was superior to a man's. The findings highlight the relationship between high school pupils in the Tirunelveli district's technology knowledge and their academic progress.

Recommendations

It is imperative that parents and guardians support their children's early enrolment in ICT programs. The goal of this program is to make it easier for young people to learn and be exposed to ICT. The construction of infrastructure, such as cyber centres, offices, classrooms, and institutional networks (LAN, WAN and WIFI), should be a top priority for the government. The provision of necessary networks and software, such the Internet, e-learning platforms, and education portals, should also be a priority. It is imperative to carry out additional initiatives such as building capacity, creating digital libraries, providing technical support in educational institutions, introducing computer ownership programs for staff and students, encouraging the career development of ICT content, and

setting up International Examination Digital Centres (IDEC). Together, these actions help raise people's knowledge of and competency with ICT.

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A STUDY ON THE WORKING CONDITIONS OF SALT PAN WORKERS IN VEPALODAI, TUTICORIN DISTRICT

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Abstract

Salt industries in Tuticorin is the main occupation for the rural people hailing over there. For non-monsoon months every year, salt pan workers in Tuticorin district, labour under scorching Sun to harvest the most prerequisite kitchen staple in the adversely poor working conditions and paltry wages. The socio-economic status of salt pan workers are in pathetic condition. This study aims to analyse the poor working conditions, health hazards and problems faced by the salt pan workers. The sample size of 50 respondents are selected by simple random sampling methods in Vepalodai, Tuticorin district.

Keywords: Working conditions, health hazards, socio-economic status.

Introduction

Salt industry in tuticorin district is the second largest production area of salt after Gujarat. Owing to the rising population, there is a significant demand for salt. Numerous salt workers are engaged in salt production in Tuticorin which is an inevitable sector. Many people from nearby localities take up this job due to poverty and lack of education. Tuticorin is a major port city in Tamil Nadu and state's salt harvesting terrain. It is a major occupation where salt is manufactured over an area of 25,000 acres on the outskirts of Tuticorin. More than 50,000 workers are involved in this hazardous nature of job. This study aims to explore the health hazards and working conditions undergone by the salt pan workers in Vepalodai, Tuticorin district.

Objectives

1. To know about the Socio- demographic details of the respondents.
2. To study the nature of work of the respondents.
3. To analyse the occupational hazards that the salt pan workers are prone to.
4. To study the working conditions of the salt pan workers.

Methodology

The data required for this study was collected from a sample of salt pan workers in Vepalodai, Tuticorin district. A sample of 50 workers was selected using simple random sampling method. The primary data was the main source for this study this was collected through structured questionnaires and personal interviews of salt pan workers. This study helped to obtain a clear picture of the working conditions, health hazards faced by the salt pan workers

Table 1 Demographic Profile of the respondents.

Demographic Profile of the respondents					Total
Age	Below 30	30 - 40	40 - 50	50 -60	100
	4%	17%	57%	22%	
Community	BC	MBC	SC	Others	100
	76%	3%	17%	4%	
Education	Illiterate	Primary School	High School		100
	67%	31%	2%		
Marital Status	Married	Unmarried			100
	79%	21%			
Monthly income	Below Rs. 5000	Rs. 5000- Rs. 8000	Rs. 8000- Rs. 10,000	Above Rs. 10,000	100
	2%	56%	39%	3%	
Years of Occupation	Below 10	10 - 15	15 - 20	Above	100
	13%	26%	28%	33%	
Working Hours	Below 6 hours	6 - 8	8 - 10	Above 10 hours	100
	2%	15%	64%	19%	

Source: Primary Data

Form the above table it is inferred that, 57% of the respondents belong to the age group of 40-50, majority 76% of the respondents belong to backward community, 67% of the respondents are illiterate, majority 79% of the respondents are married, 56% of the respondents earn Rs. 5,000 – Rs. 8,000 as their monthly income, 33% of the respondents have more than 20 years of experience, and 64% of the respondents work 8 – 10 hours at salt pan in Vepalodai in Tuticorin.

Table 2 Nature of work of the respondents

Nature of work	Number of respondents	Percentage
Field work	23	46
Crushing	6	12
Packing	7	14
Loading	14	28
Total	50	100

Source: Primary Data.

The above table depicts that 46% of the respondents are involved in field work, 12% of the respondents are involved in crushing, 14% of the respondents are in packing work and 28% of the respondents are involved in loading work.

Table 3 Working conditions of the respondents

Working condition of the respondents				Total
Job Security	Satisfied	Neutral	Dissatisfied	100
	32%	14%	54%	
Work load	Satisfied	Neutral	Dissatisfied	100
	37%	11%	52%	
Working hours	Satisfied	Neutral	Dissatisfied	100
	39%	–	61%	
Medical Facilities	Satisfied	Neutral	Dissatisfied	100
	44%	7%	49%	

Source: Primary Data

The table depicts that 54% of the respondents have dissatisfaction towards job security, 52% of the respondents are dissatisfied with the work load, 61% of the respondents have dissatisfaction towards the working hours, and 49% of the respondents are dissatisfied with the medical Facilities.

Table 4 Occupational hazards of the respondents.

Occupational hazards of the respondents				Total
Skin disease	yes	No		100
	83%	17%		
Blurred Vision	Yes	No		100
	68%	32%		
Heat Stroke	Yes	No		100
	64%	36%		
Kidney Problem	Yes	No		100
	27%	73%		

Occupational hazards of the respondents					Total
Back pain	Yes	No			100
	89%	11%			
Safety Measures	Good	Fair	Poor		100
	23%	37%	40%		
Welfare Measures	Good	Fair	Poor		100
	34%	22%	44%		

Source: Primary Data.

Form the above table it is inferred that majority 87% of the respondents suffer from skin disease, 68% of the respondents has stated they have blurred vision, 64% of the respondents suffer from heat stroke, 74% of the respondents has stated that they do not have kidney problem, 89% of the respondents suffer from back pain, 40% of the respondents has stated that the safety measures provided are poor, and 44% of the respondents has stated that the welfare measures are poor.

Suggestions

1. The salt pan workers shall be provided with more protective safety measures like helmets, shoes, and gloves so as to resist from heat.
2. The government shall provide subsistence allowance for the welfare of the salt pan workers as there is no work in monsoon season.
3. Well sanitized rest rooms shall be provided for the workers in particular separate toilets to men and women.
4. As most salt pan workers are migrated, accommodation shall be provided near the working premises.
5. The government shall intervene and provide statutory measures like regulated working hours and fair wages accordingly.
6. The salt pan workers' health is adversely affected, so proper medical facilities shall be provided to ensure their health on a regular basis.

Conclusion

Salt industries in Tuticorin district serves as the livelihood for many people. The working conditions of the salt pan workers are not in a satisfactory manner. As they work in the scorching sun and chemicals their health is affected in the long run. There is no job security for salt pan workers. Basis amenities and welfare measures should be improved, though it is an unorganised sector they render more to the economic growth of the nation.

The working conditions of salt pan workers in Vepalodai, Tuticorin is vulnerable, some workers has reported blurred vision due to the glare from salt crystals, and other major health hazards . The government should protect the salt pan workers from unsafe working conditions, health hazards and unfair labour practices.

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HOW JUSTICE AND EQUALITY CONTRIBUTE TO ECONOMIC SUCCESS

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ABSTRACT

This article emphasizes the negative effects of economic marginalization in economy and equality of opportunity. This paper concludes that the government should permit reasonable level of participation of the people in the national economy in order. The theory of economic justice holds that a more equitable economy will prosper. Regardless of a person's any background. The aim is to provide opportunity for everyone to achieve.

Keywords: Justice, equality, economy and employment opportunity.

1. INTRODUCTION

Economic justice concerns how wealth and income are distributed. Equal distributions are not just, while asymmetrical distributions are, according to Aristotle and John Rawls' ideal views of justice. Aristotle's principle of fairness expects unequal outcomes if merits are unequal, in contrast to Rawls' theory of justice which promotes equal sharing. However, because they recognize that some gaps are necessary for the greater good, democracies allow for significant income and wealth discrepancies. The most widely acknowledged response to this query can be found in Rawls' second principle of justice. Although there are many different kinds of justice, it can be used to promote equity among individuals and communities. For instance, equitable access to the financial system for all members of a society is the goal of economic justice. In order to create a fair market, the economic justice movement seeks to give excluded individuals access to disposable income and liveable salaries. The idea of economic justice requires an understanding of the potential impacts on an economy of a just distribution of labor and capital. Economic justice is a part of social justice, which is the process of guaranteeing that every member of a society has an equal opportunity through institutional restructuring to eliminate bias and privileges offered to specific populations.

One of the earliest organizations advocating for economic justice, the Poor People's Campaign was established in 1967 by Martin Luther King Jr., Jr., who was also a founding member of the Civil Rights Movement. Equality and justice should have the same objective and be complementary to one another. Justice and equality are the symbols of fairness and egalitarianism. Without equality, true justice is impossible to achieve, and equality without a way to make just decisions that ensure equitable treatment is just an unenforced gesture of kindness. From Pericles onward, the idea of "Equal Justice under Law" has influenced Supreme Court justices and statesmen across the ages. However, theory and reality don't always line up perfectly. If our laws, courts,

and procedures all performed as intended, we would live in a society that completely embraced the concept of due process of law. Our new Equality of Opportunity Strategy (EOS) 2021–25 is predicated on the knowledge that an individual's life circumstances may alter the traits that contribute to inequality of opportunity. Although the original Economic Inclusion Strategy 2017–21 of EBRD concentrated on inherent characteristics (such as place of birth and socioeconomic background) and gender-based inequalities, this strategy also addressed gender-based inequalities. External factors that impact them include long-term stresses and shocks, as well as changes in societal norms, prejudices, and legal systems. These features overlap and intersect with a variety of circumstances, such as gender, place of birth or residence, age, handicap, skill sets and levels, displacement, sexual orientation and identity, and life experiences brought on by other external factors. Along with the two broad themes of digital and green, the Bank's Strategic and Capital Framework (SCF) 2021–2025 recognizes the importance of equitable opportunities in leading the transition of our operational countries.

Aim of the research:

- The overall purpose of the research is to look over the Causes of economic inequality.
- And how injustice occurs in economy for various people.
- This research gives the solution on how they can be overcome through various aspects
- Provides various provisions for economic inequality and injustice
- Where it talks about the equal opportunities and equity in economic distribution
- Under this we have many socio-economic aspects which can reduce and avoid economic inequality and injustice from happening

EQUAL DISTRIBUTION OF WEALTH:

Wealth is a major aspect in which it determines the country's economy and GDP. The way a country's wealth is distributed among its citizens or how the world's wealth is distributed across states is known as wealth distribution. Depending on the depth of study being done, it may apply to states or to people. While the term "equal wealth distribution" refers to the distribution of money equally across nations or individuals, it can also be used to describe smaller-scale situations like ownership and control of modest enterprises or sources of income. Additionally, there is often a gendered aspect to wealth, with different men and women having different distributions of wealth. Wealth is, in this case, essentially the total of all assets less all liabilities.

Distribution of wealth so lopsided for several reasons, the distribution of wealth is unequal.

These include things like income, education, and variations in the job market's supply and demand. Wealth distribution a significant issue because wealth affects people's welfare regardless of income, the distribution of wealth is important. This aids in their need-fulfilment.

How does wealth distribution occur is that since a smaller fraction of wealthy individuals and families own about half of the total wealth, there is typically a high degree of inequality in the distribution of wealth typically derived from tax returns. The government must enact many schemes to provide the distribution of wealth for the poor sectors and people who cannot afford it.

Economic mobility:

Instead, as economies grow, mobility should rise if opportunities equalize, which usually calls for more public spending and improved living

Ambar Narayan is one of the report's authors and a lead economist with the World Bank's Poverty and Equity Global Practice. "Despite the depressing state of affairs, there is reason for hope, indicating that policy measures are crucial in enhancing mobility."

Greater the economic mobility faster the economic growth and reduction of poverty

The most common factor taken into account when evaluating someone's economic position is their income and how it varies over time. An individual's standing improves with increasing income. On the other hand, a person's status deteriorates over time if their income remains constant or declines.

Economic mobility is the term used to characterize an individual's opportunities. Economic mobility, however, is frequently more helpful when applied to evaluate the whole opportunities within a state, city, or neighbourhood. For instance, certain communities have a higher rate of upward mobility than others because of historical policy decisions. In light of this, some families may base their relocation decisions on indicators of economic mobility. As an alternative, elected leaders may choose several strategies to enhance financial status.

Diversity inclusion:

Women are not the only employees impacted by workplace diversity and inclusion concerns. The decision of who, where, and how to work has become the individual's responsibility because skill is greatly sought after everywhere. Businesses must prioritize diversity and inclusion to promote equity since these factors will boost employee engagement, inspire individuals to take on new tasks, and provide them with opportunities. Research from all around the world has shown how beneficial a diverse and inclusive workplace is. Myths are dispelled, a variety of viewpoints that encourage originality and creativity are offered, and recruiting and retaining employees is made easier. Organizations may maximize talent pools through diversity, which will improve performance and profitability for long-term economic growth and development. In many organizations that support a range of groups of people, including people of different colors, ethnicities, faiths, abilities, genders, and sexual orientations, the values of diversity, equality, and inclusion are closely related. An economy that does not favour any one group over another and treats everyone equally is said to be varied and inclusive. Numerous financial advantages could result from equal employment and educational opportunities. First of all, it enables any organization to realize its greatest potential.

Progressive taxation:

A more fair distribution of income, increased revenues, decreased financial and economic instability and faster growth are all possible outcomes of progressive income taxation.

The Advantages of Taxation in Gradation

Progressive taxation has become clear as one of the most important solutions as we look for new ways to accomplish social fairness. It's an economic theory that taxes the rich more heavily than the less well-off in an effort to lessen income disparity. Many different people, including politicians, economists, and social justice advocates, have endorsed this tactic. Many see it as a means of establishing a more equal society in which all people, regardless of their financial situation, have access to the same opportunities.

Advantages of progressive taxation:

Reduces Income disparity: By requiring the wealthiest to pay a larger proportion of their income in taxes than those who are less wealthy, progressive taxation aims to minimize income disparity. Because of this, the tax burden is more fairly spread throughout the populace, which may aid in closing the wealth gap.

More and more people are calling for progressive taxation to ensure that the wealthy pay their fair share. However, because they manage their assets to lower their taxable income, billionaires may pay very little in taxes even in jurisdictions with progressive income taxes.

The taxpayers must bear an equal or equitable share of the tax burden. However, since not every taxpayer has the same financial means to pay taxes, this kind of equality robs people of justice.

A progressive tax system has the advantage of reducing taxes for the lowest income earners. This will put more money in the wallets of low-wage workers, who will likely spend it on needs, thus stimulating the economy.

EMPLOYMENT OPPORTUNITIES AND ACCESS TO EDUCATION:

The ability of the impoverished to bargain is a crucial component. The requirement to allocate substantial funds to public health and education. Along with other public services, Oxfam advocates for increasing access to health care and education. Making this a reality will require a lot of political will, even though it is a straightforward idea. India would need to invest both time and money in order to achieve universal healthcare coverage (UHC). The complex legal structure that governs India's public health system differs for each state or Union territory. Distribution channels, insurance coverage, availability, and accessibility vary. Because of inadequate funding for health systems and poor administration, there are stark differences in health between wealthier and poorer states

Poverty and unemployment are strongly related problems in India.

The high unemployment rate in the country has significantly worsened the problem of poverty. Nevertheless, there are workable measures that may be implemented in order to address these issues and create a more equitable society.

Poverty and unemployment are closely related problems in India that have long caused worry. The high unemployment rate in the country has significantly worsened the problem of poverty. Nevertheless, there are workable measures that may be implemented in order to address these issues and create a more equitable society. Entrepreneurship: One of the most effective strategies to address unemployment is to promote entrepreneurship. The government can provide incentives and support to entrepreneurs looking to start their own businesses. Increased economic growth and the creation of new jobs would result from this.

The success of companies like Flipkart, Ola, and Paytm shows that entrepreneurship can provide job opportunities in India.
Increasing the Rural Economy.

Provisions and schemes which are involved:

The National Rural Employment Guarantee Act (MNREGA) has received the lowest funding in budget history, with a 33% decrease as a percentage of GDP. Social security is not supported by the budget, but the needs of the underprivileged cannot be ignored.

The National Education Policy (NEP), which is driving India's educational reform agenda, does a poor job of examining the core problems with the country's educational system. It overemphasizes technology without providing a clear roadmap for digital access and equity, ignores the problems of insufficient funding and marginalized groups' access to education, and remains largely mute on teacher preparation and professional development.

- Article 14
- Article 15
- Article 16

Of the Indian Constitution.

Some aspects of equality and justice which promotes economic success:

- Equal Access to the education
- Fair labour practices
- Legal protection and Property Rights
- Social Safety nets

Conclusion:

Thus, it stands to reason that safeguarding legitimate interests and advancing human welfare are essential components of the idea of justice. It is only felt when each citizen fulfills their obligations in a proper manner.

Every individual is treated equally in terms of the law, politics, society, and economy in a just society. Given their close relationships, equality, justice, and liberty should be properly balanced in a fair society.

- The individual is centered in these ideas.

Achieving economic justice can be facilitated by addressing pay discrepancies and other income inequality. For example, some employees have jobs that don't really make use of their skill set.

The government has an obligation to infer the principle of equality into all of its decisions that impact citizens' freedoms. Nonetheless, the equality criterion is not applied strictly, and the government is free to discriminate in a way that is justifiable. The state has a duty to treat those who are unequally treated differently. The government made an effort to categorize people in a way that was related to the goal it was trying to accomplish.

The classification test was first used in India in the case of Anor Ali Sarkar. In this context, Justices Bhagwati and Chandrachud have provided outstanding views. In summary, equality is not entirely justified in any way.

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STUDIES ON THE IMPACT OF SEASONAL CHANGES IN THE PROTEASE ACTIVITY OF SILKWORM *BOMBYX MORI* L.

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ABSTRACT

Bombyx mori is a model lepidopteran insect of great economic value. Mulberry leaves are its only natural food source. The development of artificial diets can not only resolve the seasonal shortage of mulberry leaves but also enable changes to be made to the feed composition according to need. The mid gut protease plays an important role in influencing the growth as well as silk production in the fifth instar larvae of *B.mori*. In the present study aimed to investigating feeding stimulates the protease production in foregut, mid gut & hindgut tissue of the 5th instar larval and pupal stages of *B.mori* protease activity was more in bivoltine than in multivoltine. Our analysis showed that the maximum protease activity was obtained on 5th instar larval and pupal in three different seasons. This condition can be overcome if farmers rear more of bivoltine hybrids, which produce high quality silk.

Keywords: silkworm, gut region, mulberry leaf, protease, seasonal variation.

INTRODUCTION

The silkworm (*Bombyx mori*) is an important cash crop insect and a model lepidopteran species. Wild silkworms were domesticated more than 5000 years ago (Xia *et al.*, 2009) Silkworms are a typical monophagous insect and eat only mulberry leaves to obtain the nutrients they require. However, ML are only available seasonally, and this has become a major problem in silkworm rearing because the period of availability is short and they are difficult to preserve (Hamamura *et al.*, 1962) The mid gut plays an important role in a silkworm's development and metabolism and is the main site of digestion, absorption, and innate immunity during their growth and development (Jiang *et al.*, 2013) Differing nutrient compositions of an AD greatly affect the mid gut metabolites of silkworms, affecting their growth, development, and silk yield. For example, silk protein has a unique amino acid composition (Cho *et al.*, 2021) in which glycine (Gly) plays an important role in regulating silk protein synthesis (Chen *et al.*, 2022) Amino acid metabolites in the silkworm mid gut can indirectly reflect the rate of silk protein production, and the silk yield can be effectively increased by adding Gly to an artificial diet. The Eri silkworm like other Lepidopterans, undergoes complete metamorphosis passing through four stages namely egg, larva, pupa and adult. It

completes 5-6 life cycles in an year. The environmental factors play a major role in silk production, the prospect of increasing silk production depends more on the food or host plant nutrition. In silkworm the protein synthetic activity of the body wall and the mid gut decreased when the larvae began to moult and increased again from the mid stage to moulting period (Nagota, 1976).

MATERIALS AND METHODS

PROCUREMENT OF *BOMBYX MORI* EGG: The disease free multivoltine silkworm, *B.mori* (PM × CSR2) eggs were purchased from Nannaharam, Tenkasi District, Tamilnadu,

EXPERIMENTAL DESIGNS: Bivoltine and multivoltine silkworm reared cellular in three replications in three seasons i.e., summer, rainy and winter by following the standard rearing techniques (Krishnaswami, 1978). In bivoltine and multivoltine silkworm, the mid gut tissue during 3rd day of 5th instar larvae and pupal stages were collected in three different seasons.

EXTRACTION OF GUT TISSUE: The foregut, mid gut and hindgut tissues were collected randomly from preserved at -20°C for 12 hours to avoid the depletion of protease activity 3rd day 5 instar larvae and pupal stage were utilized for enzyme and protein estimation. The supernatant was collected and used as the enzyme source.

ESTIMATION OF PROTEASE ACTIVITY IN GUT TISSUE: Total gut protease activity was estimated by adopting the method. The reaction mixture 1ml containing 0.4ml of casein 0.3ml of 0.2M tris HCL buffer with 0.3ml of enzyme solution was incubated at 37°C for 60 minutes with constant shaking. The reaction was terminated by adding 1.5 ml of 0.44M TCA, allowed for 30 minutes to precipitate undigested casein, centrifuged at 1500rpm for 15 minutes. To 1ml supernatant, 2.5ml of 0.4M sodium carbonate and 0.5ml of 1:2 diluted Folin's ciocaitau reagent was added, allowed to stand for 20 minutes and color intensity was measured at 660 nm by using spectrophotometer.

RESULTS

Multivoltine : In general the highest mid gut protease activity is shown to increase from the first day of fifth instar to attain the peak level on larval and pupal stages of silkworm *B.mori*. The highest foregut and midgut protease activity 4.10±0.08μ mole/min/mg and 6.50±0.58μ mole/min/mg protein tissue during winter season respectively in 5th instar multivoltine breed. In pupal stage of foregut, mid gut and hindgut protease activity 3.60±0.24μ mole/min/mg, 4.10±0.08μ mole/min/mg & 2.20±0.17μ mole/min/mg protein tissue during winter season.

Bivoltine: The highest protein in 5th instar larval foregut, mid gut and hindgut protease of 4.45±0.36μ mole/min/mg, 7.33±1.32μ mole/min/mg and 4.18±2.11μ mole/min/mg protein tissue was recorded in silkworm during winter season then rainy and summer seasons recorded. In bivoltine breed pupal stage of foregut, mid gut and hindgut protease activity 2.73±0.53μ mole/min/mg, 3.85±0.12μ mole/min/mg & 2.12±0.3μ mole/min/mg protein tissue during winter season.

Table 1: Total gut protease activity (μ mole/min/mg protein) in 5th instar multivoltine breeds

Seasons	Foregut	Midgut	Hindgut
Rainy	2.44±0.27	3.16±0.15	0.95±0.03
Winter	4.10±0.08	6.50±0.58	2.23±0.47
Summer	3.60±0.24	3.43±0.64	2.68±0.41

Table 2: Total pupal gut protease activity (μ mole/min/mg protein) in multivoltine breeds

Seasons	Foregut	Midgut	Hindgut
Rainy	3.54±0.13	3.38±0.96	1.83±0.12
Winter	3.60±0.24	4.10±0.08	2.20±0.17
Summer	2.17±0.24	2.45±0.34	1.96±0.16

Table 3: Total gut protease activity (μ mole/min/mg protein) in 5th instar bivoltine breeds

Seasons	Foregut	Midgut	Hindgut
Rainy	3.80±0.13	3.67±0.23	3.40±0.91
Winter	4.45±0.36	7.33±1.32	4.18±2.11
Summer	2.10±0.18	2.62±2.78	3.30±0.96

Table 4: Total pupal gut protease activity (μ mole/min/mg protein) in bivoltine breeds

Seasons	Foregut	Midgut	Hindgut
Rainy	3.13±0.20	2.23±0.47	1.54±0.11
Winter	2.73±0.53	3.85±0.12	2.12±0.31
Summer	1.96±0.17	2.47±0.16	0.85±0.32

DISCUSSION

The silkworm larvae and pupa seasonal changes in the protease activity of the foregut, midgut and hindgut was observed increase in the enzyme activity before emergence was noticed, the rapid synthesis of the proteolytic enzymes in the gut of the pharate adult reaches a peak. Many attempts are being made to enhance the silk production and improve the silkworm breeds through genetic manipulation. Silkworm breeders on protein polymorphism in different races to provide insight into genetic variability between breeds for hybridization to identify better hybrid. The higher mid gut protease activity in bivoltine compared to multivoltine shows clearly that the bivoltines are not only capable of increased compare to multivoltine breeds then highest value was

obtained in winter seasonal variation the silkworm favourable condition, but also shows higher response to feed supplement. The degree of utilization of leaf protein is more in bivoltine than multivoltine which might lead to differential silk output in both the races of silkworms (Sarangi 2002; Lokesh and Ananthannarayan, 2001). The important to investigate the nature of this enzyme and to know its role in silkworm development. In fifth instar up to 96% ingested protein nitrogen was used for silk protein synthesis (Fukuda 1960). In present aimed to investigating feeding stimulates the protease production in foregut, mid gut & hindgut tissue of the 5th instar larval and pupal stages of *B.mori* protease activity was more in bivoltine than in multivoltine.

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STUDIES ON THE EFFECT OF SALINITY ON MULBERRY GROWTH INTURN TO SILKWORM, *BOMBYX MORI* L.

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Abstract

Some plants grow well in salt affected coastal areas, shores of backwaters lakes and marshy lands. Stress can cause damage at each stage of photosynthesis, thus, reducing the overall photosynthetic capacity, and salinity stress tends to reduce plant wet weight. The economic importance of mulberry is primarily due to its leaf, which is being used for feeding the silk producing insect *Bombyx mori* L. An increase the salt concentration was discovered to cause changes in mulberry growth and phytochemical content. Furthermore, the impact was expressed in the economic traits of *B.mori*. 0.4 percent salinity treated mulberry leaves gave a significant improvement to mulberry plant and cocoon parameters. Maximum and minimum salinity produced notable difference in mulberry as well as silkworm parameters.

Keywords: Silkworm, Salinity, Economic traits, phytochemical components

Introduction

Mulberry leaves are considered to be an excellent food source with high content of proteins, carbohydrates, vitamins, trace elements, and dietary fibre. Stress can cause damage at each stage of photosynthesis, thus, reducing the overall photosynthetic capacity, and salinity stress tends to reduce plant wet weight (Hniličková *et al.*, 2017). However, plants can adapt to this stress, through osmotic regulation, by accumulating compatible solutes, including dissolved sugars, proline, glycinebetaine, and soluble proteins (Meguekam *et al.*, 2014).

Salinity stress can reduce mulberry production by inhibiting growth and photosynthesis, chlorophyll biosynthesis, antioxidant enzymes and to induce morphological, chemical as well as anatomical changes (Vijayan *et al.*, 2008). Salinity stress causes water deficit, resulting in reduced leaf pressure, stomata closure, and stomata conductance, and is a limiting factor for the photosynthesis rate. This stress also causes ionic imbalance due to sodium and chloride ions accumulation, along with decreased absorption of potassium, calcium, and manganese. Photosynthesis is a physiological process involving pigments, photosystems, electron transport systems, as well as carbondioxied reduction (Ashraf and Harris 2013). Hence the study aims to analyze the growth and physiology of mulberry *M.alba* under salinity stress inturn to economic traits of *B. mori*

Materials and Methods

This study was conducted from January to December 2024. Mulberry stems were planted in pot with diameters and heights of 30cm. The growing media used was a mixture of soil and organic manure, and the plants were allowed to grow for experiment. These plants were watered daily 1 L with different concentration of NaCl treatments separately (0.2, 0.4, 0.6 and 0.8 % respectively). Meanwhile, the control plants were watered daily with 1 L without NaCl. Subsequently, the phytochemical components such as chlorophyll (Arnon 1949), carotenoid (Arnon 1949), phenol (Raaman 2006) and growth parameters were recorded.

B.mori (FC₁×FC₂) eggs were collected from the State Government Sericulture Center at Thenkasi and incubated at 27°C in ant proof racks at 70-80% humidity. The incubation time was 8 days, during which time, the young caterpillars hatched out. The emerging caterpillars were transferred to clean bamboo basket (25cm diameter and 5 cm deep) with a scaffolding of paraffin paper (Krishnaswamy, 1978). The third instar larvae separately in to 4 batches for experiments. NaCl treated mulberry leaves were fed to experimental batches separately. Each group consists of 30 silkworms and 3 replications were carried out. The control was maintained with healthy leaves. Economical traits were carried out all the experimental and control groups (Sonwalker 1993). Data were analyzed statistically using t-test (Zar 1984).

Results and discussion

Effect of salinity on the phytochemical components such as chlorophyll, carotenoid and phenol of mulberry plant is presented in Table 1. In the control, chlorophyll content was 1.74±0.13 (mg/gm), carotenoid was 87.32±7.36 (mg/gm) and phenol was 144.38±11.27 (µmol/g). Maximum chlorophyll content (1.85±0.15) and carotenoid (94.82±8.27) were observed when the mulberry plant treated with 0.4 percent salinity but phenol (170.60±15.82) was high in the 0.6 salinity treated groups. These findings are in accordance with Ashraf and Harris (2013), who state that the mechanism of photosynthesis involves various components, including photosynthetic pigments and photosystems, the electron transport system, and CO₂ reduction pathways.

Table 2 shows the salinity accession on growth parameters of mulberry plant. In control plant height, stem diameter, leaf length and width were 168.34±14.32 (cm), 1.64±0.09 (cm), 7.40±0.38 (cm) and 5.90±0.28 (cm) respectively. Plant height (180.46±16.72), stem diameter (1.67±0.13), leaf length (7.94±0.53) and width (6.15±0.52) were increased in the mulberry plant grow under 0.4 salinity. This report was emphasized by Ashraf and McNeilly (2004), who explained most of the *Brassica* species have been categorized as moderately salt tolerant, with a significant interspecific and intraspecific variation for salt tolerance.

The economic traits such as cocoon weight (1640±150.04 mg), pupal weight (1350±91.37mg), shell weight (290±24.73 mg) and shell ratio (17.68±1.06 %) of *B.mori* were recorded in the 0.4 salinity treated group when compared to control. These investigation were emphasized by Mopper *et al.* (2000) who reported on early instar insects as they are particularly vulnerable to reduced plant nutrition. However, detailed

investigation on the effect of leaves from salt affected mulberry on survival, growth and development of silkworms.

Table 1: Effect of salinity on the phytochemical components of mulberry plant

Treatments (%)	Chlorophyll (mg/gm)	Carotenoid (mg/gm)	Phenol (µmol/g)
Control	1.74±0.13	87.32±7.36	144.38±11.27
0.2	1.52±0.14 (-0.019)	74.36±6.49 (-14.90)	169.38±15.91 (17.25)*
0.4	1.85±0.15 (0.009)	94.82±8.27 (8.63)	133.01±12.44 (-7.84)
0.6	1.79±0.13 (0.005)	90.11±7.66 (3.21)	170.60±15.82 (18.09)*
0.8	1.57±0.11 (-0.015)	72.69±6.17 (-16.82)	162.57±14.37 (12.55)*

Percent deviation over control values in parentheses

*significant

All other deviations not significant at $P \leq 0.05$

Table 2: Effect of salinity accession on growth parameters of mulberry plant

Treatments (%)	Plant height (cm)	Stem diameter (cm)	Leaf length (cm)	Leaf width (cm)
Control	168.34±14.32	1.64±0.09	7.40±0.38	5.90±0.28
0.2	153.11±13.80 (-8.98)	1.58±0.14 (-3.65)	7.18±0.41 (-2.97)	4.93±0.37 (-16.94)
0.4	180.46±16.72 (7.15)	1.67±0.13 (1.82)	7.94±0.53 (7.29)	6.15±0.52 (4.24)
0.6	165.02±14.38 (-1.95)	1.51±0.10 (-7.92)	6.82±0.49 (-7.83)	5.57±0.46 (-5.59)
0.8	157.40±14.70 (-6.45)	1.47±0.11 (-10.36)	6.11±0.57 (-17.42)	5.41±0.52 (-8.30)

Percent deviation over control values in parentheses

All deviations not significant at $P \leq 0.05$

Table 3: Effect of salinity on the economic traits of *B.mori*

Treatments (%)	Cocoon weight (mg)	Pupal weight (mg)	Shell weight (mg)	Shell ratio (%)
Control	1350±116.38	1160±92.61	190±16.37	14.07±1.06
0.2	1300±107.67 (-3.5)	1130±100.83 (-2.7)	170±13.62 (-10.4)	13.07±1.21 (-7.11)
0.4	1640±150.04 (20.3)*	1350±91.37 (17.1)*	290±24.73 (52)*	17.68±1.06 (25.66)*
0.6	1320±101.32 (-2.1)	1140±92.68 (-1.8)	180±16.39 (-5.2)	13.64±1.14 (-3.05)
0.8	1230±116.52 (-8.4)	1080±86.21 (-7.2)	150±12.37 (-20.8)	12.19±1.01 (-13.36)

Percent deviation over control values in parentheses

N=30

*significant

All other deviations not significant at $P \leq 0.05$

Conclusion

Unlike many other crops, in mulberry leaf is the primary product with which silkworm is fed, the effect of increased salt concentration in the leaf on the growth and development of silkworm also needs further investigation. Development of salt tolerant varieties can expand mulberry cultivation into the salt affected marginal lands, thereby increasing the availability of leaf for both sericulture and livestock industries in arid and semiarid regions of India and other Asian countries.

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EMPOWERING WOMEN FOR FOOD SECURITY IN INDIA: A CATALYST FOR SUSTAINABLE DEVELOPMENT

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“Ensuring Food and Nutrition Security is fulfilling basic needs and ethical obligations”

- Kofi Anan, Secretary General of the United Nations

Abstract

Women are vital to the food production, resource management, income generation, and maintenance of family food and nutrition security sectors. Just as improvements in women's status and education, over the past 25 years have contributed to more than half of the reduction in the rate of child malnutrition. This article explores the indispensable role of women in achieving food security and sustainability development in India. The contributions of women to increased crop diversity, resilience, and innovation—all vital elements of India food security—come from their active involvement in the agricultural sector. The role of the women and their contributions to ensuring food security at the household level is significant. Furthermore, this article highlights the multiple challenges and disparities that women in the agricultural sector faces in Indian society. These constraints not only hinder women's own potential but also impede overall food security efforts. Recognizing the gender dimensions of food security is essential for creating inclusive and effective agricultural policies and initiatives in India.

KeyWords: Empowering Women, Food Security, Sustainable Development, Food Security.

Introduction

Food security is a critical concern in India, a nation with a vast and diverse population. Achieving food security not only requires effective agricultural practices but also recognizes the pivotal role of women in this endeavor. Indian women have traditionally played an essential role in agricultural activities. They contribute significantly to crop cultivation, animal husbandry, and post-harvest processing. Women's labor is vital for ensuring food production at every stage, from sowing seeds to preparing meals for their families. The four pillars of food security—availability, accessibility, utilisation, and stability—all depend heavily on rural women. However, because of gender stereotype problems, women in rural developing nations have disadvantages as they do not have access to the same resources or opportunities as males. When it comes to access to resources like land, electricity, technology, loans, fertiliser,

and pesticides, there is a gender disparity. In addition, women's access to markets, public services, social protection, information, and training is more restricted.

States' responsibility to end discrimination against women in rural regions are particularly highlighted in Article 14 of "The Convention on the Elimination of All Forms of Discrimination Against Women." Governments are making commitments, but they are not acting quickly enough to meet the needs and priorities of rural women. The FAO estimates that women might raise their yields by 20–30% if they were given identical access to productive resources as males, such as seeds, fertiliser, tools, loans, and so on. This would indicate a rise in the output of aggro-food of 4% to 5%, hence lowering the quantity of individuals who are malnourished by approximately 12–17%.

These eye-opening figures highlight how crucial the gender issue is to accomplish each of the Sustainable Development Goals. It is imperative that immediate action be made to empower rural women holistically and, in all domains, including government execution of sustainable rural development programmes. Improving agricultural and rural development will be a prerequisite for achieving the Sustainable Development Goals. Specifically, agricultural labourers and small farmers comprise the poorest people. Additionally, acknowledging the distinct roles that men and women play in rural communities is a need for any improvements. Several gender-related institutional, political, and legal measures must be introduced within the rural sphere in order to guarantee that rural women obtain equal rights as well as increased involvement and leadership in economic matters.

Physically, they are less sturdy. Even though she shows that women may be competent and skilled workers in linked businesses as well as the agricultural development sector. The literature demonstrates that women have a crucial role in agriculture and are mostly involved in it. Globally, it was observed that women made more contributions to the agriculture industry and food security. In rural parts of the world, women made major contributions to agricultural and food security. Even so, it can be quite challenging to determine the precise amount and type of the problem in different nations and areas.

Literature review:

Empowering women is integral to addressing food security and advancing sustainable development in India, a nation heavily reliant on agricultural livelihoods. Women contribute significantly to agriculture and household sustenance, yet face barriers in resource access, decision-making, and economic participation. Evidence from studies like Das & Singh (2020) highlights how women's involvement in agriculture influences household food security, emphasizing their role in resource allocation and productivity. Similarly, Paroda (2019) notes that despite women comprising a significant portion of the agricultural labor force, their contributions are often undervalued, limiting their access to land, credit, and innovations. Research in Odisha by Ogutu et al. (2024) demonstrates that empowering women in decision-making across agricultural inputs, income, and food purchases significantly enhances household dietary diversity and child nutrition, reducing malnutrition rates.

Women-led initiatives, including microfinance programs and financial education, have proven effective in increasing economic independence and food security. Ramya & Deepak (2024) suggest that tailored interventions, such as accessible banking and government programs, can reduce economic disparities and improve women's agency in food-related decisions. In a broader perspective, examining India and Tunisia, evidence supports that women's empowerment directly impacts children's nutritional outcomes, mitigating intra-household disparities in food distribution (Jagruti et al., 2020). Collectively, these insights underline that prioritizing women's empowerment through targeted policies, capacity-building, and access to resources can transform agricultural productivity, alleviate food insecurity, and promote sustainable development. Addressing systemic barriers and fostering equity in access and participation are critical pathways for achieving these goals.

Research Gap

Despite significant recognition of the role women play in agriculture and food security, a clear understanding of how their empowerment directly impacts sustainable development in India remains under explored. While existing literature highlights women's critical contributions to household nutrition and agricultural productivity, limited research examines the pathways through which empowerment strategies - such as decision-making power, access to resources, and financial inclusion - translate into sustainable outcomes. Furthermore, the intersection of gender equity and food security within the socio - cultural and economic contexts of rural India is insufficiently studied. Empirical evidence often fails to incorporate diverse indicators of empowerment or to address the systemic barriers that perpetuate inequalities. This creates a need for more nuanced investigations into the specific roles and challenges faced by women in achieving food security, particularly in marginalized communities, and how targeted interventions can bridge these gaps to foster sustainable development.

Objectives of the Study

To investigate the role of women's empowerment in enhancing food security and promoting sustainable development in rural India.

To analyze the impact of women's decision-making power on household food security and child nutrition.

To evaluate the effectiveness of existing government and non-governmental initiatives aimed at empowering women in rural communities.

To propose actionable recommendations for integrating women's empowerment into food security and sustainable development policies.

This article aims to shed light on the multifaceted contributions of women to food security in India and emphasizes the need for gender-inclusive policies and initiatives. Women's involvement in farming has a direct impact on the diversity of crops grown. By participating in home gardens and kitchen gardens, women contribute to increased access

to diverse and nutritious foods. This not only enhances food security but also addresses malnutrition and health-related challenges.

Food Security in India

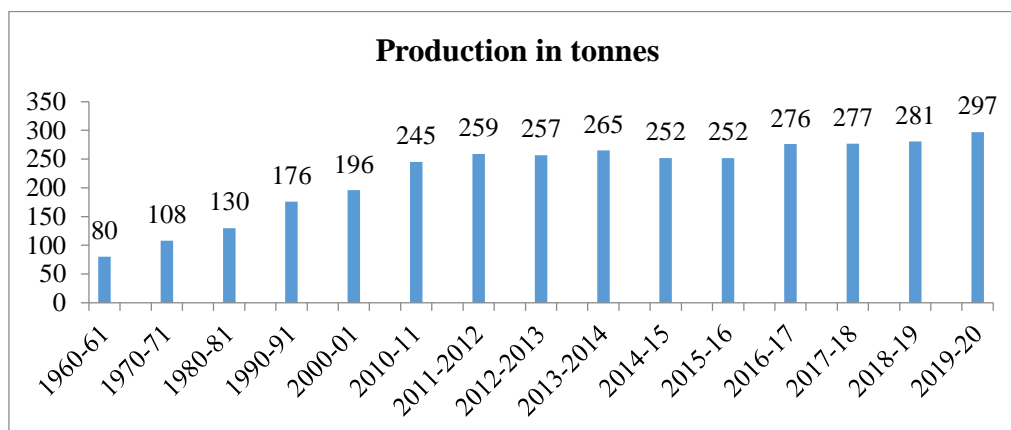
Public-sector research and infrastructure development have been consistently neglected in India's agricultural sector (Rao 2015a; Mitra 2015). There aren't any establishment reactions to the necessity of addressing new issues brought on by climate change and its effects on yields of crops. An increasing number of losses, debt, and the ensuing agrarian crisis have caused the exodus of males to cities and towns in pursuit of employment (Mitra and Rao 2016). More and more women are working in agriculture, additionally, the consequences of this trend for food, even while the NFSA acknowledges women as heads of households. There is a lack of knowledge on household and individual security (Agarwal 2012; Rao 2006).

Over the past few decades, India's overall food output has grown far faster than the country's population. The onset of the Green Revolution in late 1967–1968 was a significant turning point that led to a remarkable rise in agricultural crop productivity, particularly in food grains, which significantly improved India's food security status. Among the food grains, wheat benefited the most from the Green Revolution, which tripled wheat output over the following three to four decades while cereal production doubled during this time, resulting in a 50% reduction in the nation's food insecurity and poverty. In India, the Indian Constitution serves as an example of the Directive Principle of State Policy (DPSP), which embodies food security.

Food Availability in India

“Food security” refers to having access to food on a financial and physical level”. In this context, accessibility refers to both affordability and availability. Food security is described as existing "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" by the World Food Summit of 1996. The WHO portrays Three factors make up food security: "food availability," "food access," and "food use." Amazingly, The United Nations Food and Agriculture Organisation (FAO) introduced a fourth dimension, which is "the stability of the food security is a complex term, as seen by the first three elements of food security over time.

Since its independence government of India has introduced several policies to become self-sufficient in food grains. India achieved self-sufficiency through implementing new strategies in the agriculture sector, which leads to the Green revolution. India's Prime Minister Indira Gandhi officially announce a stamp “Wheat Revolution” in 1968 for the impressive strides of the Green Revolution.



Source: Dept. of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Directorate of Economics and Statistics, 2020-21.

Figure – 1 depicts that the production of food grains consistently increasing since 2000-01 and India reached the production of food grains around 200 million tons per year. During the period 1980-81 to 1990-91 India experienced the highest decade growth in food grains. It was observed that there was a decline in food grains in 2014-2016 from 265 million tons to 252 million tons and raised to 297 million tons in 2019-20. The statistics shows that India's food output has remained at a satisfactory level. However, the output of food grains varies, as the above figure illustrates. It is abundantly evident that production varies, and that variation causes variations in the amount of food grains available percapita.

Accessibility Food in India:

The Indian economist, philosopher, and Nobel laureate Amartya Sen once said, “What really matters with the food is not the overall supply but, individual access” (Kalpana Beesabathuni, 2013). Food access is the availability of food through safety nets of distribution as well as its cost in terms of a person's ability to buy it. The impoverished must have sufficient purchasing power to ensure food security. The Indian government implemented food-based interventions, including the Public Distribution System (PDS), Integrated Child Development Scheme (ICDS), and Mid-day Meal Scheme (MDM), to address the basic requirements of the most marginalised population in the nation.

Utilization of Food in India

Food utilisation is the ability of an individual to absorb nutrients and the appropriate way in which food is consumed by the household. Households' use of food is influenced by two factors:

- (I) the facilities they have for processing and storing food; and
- (II) their knowledge and experience with food preparation.
- (III) How family members divide meals.
- (IV) the state of health of each individual, which can be compromised by illness, unsanitary conditions, contaminated water, lack of access to health facilities, and medical care.

This column ensures that the healthy outcomes of every member of the family are enough. Even after the Integrated Child Development Scheme has been in place for three decades, up to 46% of children in India suffer from malnutrition (ICDS). Inflation has caused every third undernourished woman in India with a low body mass index (35.6%) and every second anaemic woman (55.3%).

Upon examining the aforementioned standards, it appears that India would never be able to achieve food security, despite its self-sufficiency in food grain production.

Role of the Women in Food Security

The percentage of rural women in the world's population and the average workforce in developing countries represent 25 and 43 respectively. As per the estimates of the United Nations, the share of women in raising the food for family is 80, 60 & 40 percent in Africa, Asia & Pacific, and Latin America respectively (Snyder, 1990). Many scholars said that over the year men shifted to cash crop production from food production, and females are carrying the burden of the production of food. The rural females played a crucial role in availability, accessibility, utilization, and stability which are the main pillars of food security. However, due to gender prejudices, women in developing countries especially rural areas facing barriers to access the equal opportunities as males in the society.

Global south suffered from nutrition and food insecurity for the last three decades, even though have experienced an increase in the production of food grains (Bashir and Schilizzi 2011). More than 2 billion people in the world experience nutritional deficiencies (CDC 2015). India is facing a problem of food insecurity, and it became home 1/4th of the world malnourishment people (FAO 2018). In order to increase food security for women, the government has implemented numerous initiatives. In order to increase food security, the government has implemented numerous initiatives which are women centric. The reason behind is that women should be encourage towards decision making, because females will give priority to the family food (Kadiyala 2014, & Rao 2017). Despite the links between food security and women, many scholars have said that women are the important source for reducing the food insecurity (Gates 2014) According to World Bank, 2012, there should maintain the gender equality in policies which are important to ensure the nutrition and food security (Rao, 2017). A woman plays an important task in the food economy and a more dominant role in the non-agricultural sector of the food system. Females are carrying a burden of farm work in many parts of the country (FAO).

Empirical studies said that improvement in living conditions, income, and educational attainment of women is strongly related to food security in the country. Considering the vital role and contributions that women make to food and nutrition security, every initiative aimed at reducing food insecurity should take into consideration the variables and constraints that prevent women from accomplishing these responsibilities and making these contributions. By doing so, the limitations can be lifted, and the capacities of women increased. The acts of women can assist to ease some of these challenges. However, a number of issues, such as the social, cultural, and economic contexts in which they function, frequently impede the position of women.

Given the various ways in which women improve food security within the household, they are frequently referred to as the "key to food security" (Quisumbing 1995). Development professionals and researchers are urging more gender-lens-based approaches to food security because of the close connection between food security and gender equality (Rao et al. 2017). Similar to this, numerous government campaigns and NGO projects are extolling the virtues of "women's economic empowerment" and enticing women to enter the labour in order to increase food security and gender fairness. There is only a minimal impact on men's nonfarm labour when women work nonfarm jobs, which enhances the food security of their home. Food security suffers when women in the homework more jobs in a given month, but it is unaffected by the number of jobs males have. (Jennifer Corine Zavaleta, 2019).

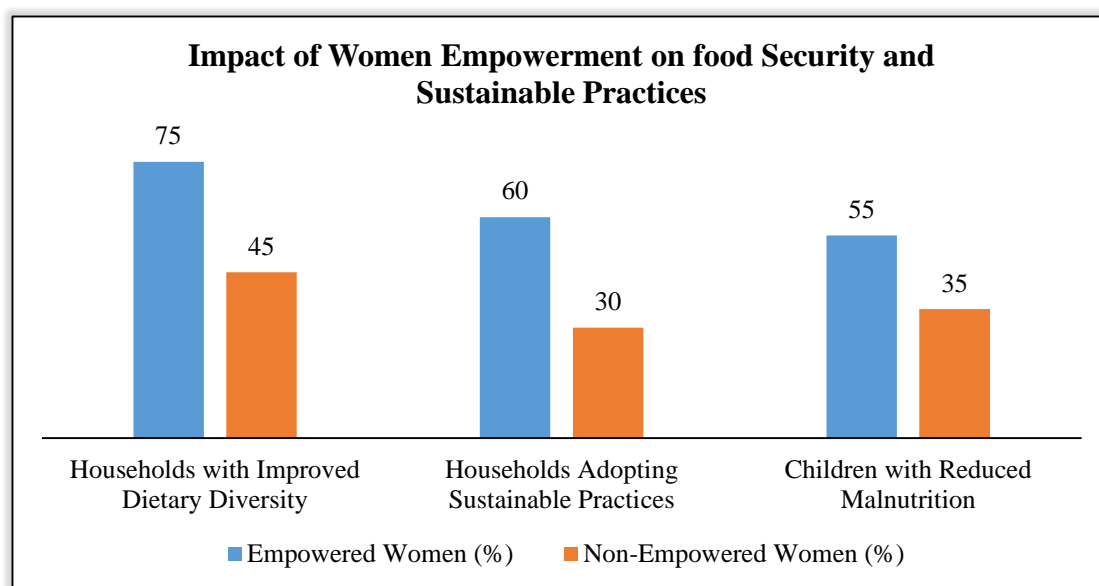
Most of the women-headed households are constituted by widows or divorced, which gives enough evidence that the role of females in food security at the aggregate level as well as household or individual level. It's clear that in India, women's nutrition, health, and economic status have been affected adversely by the social construct in society. The main reason for food security is an unequal distribution of food at the household level. Ensuring food security, it is mandatory to provide equal rights to women on capital assets, land, property, livelihood opportunities, and wages. Eradicating hunger in the country and empowering women is the last and utmost solution. These are the problems that women facing in food and agriculture sector.

Table 1 the impact of women's empowerment on food security and sustainable practices

Indicator	Empowered Women (%)	Non-Empowered Women (%)
Households with Improved Dietary Diversity	75	45
Households Adopting Sustainable Practices	60	30
Children with Reduced Malnutrition	55	35

Source: National Family Health Survey (2020); FAO 2019, Ministry of Women & Child Development, 2022.

The chart highlights the comparison between the percentages of households led by empowered women and those led by non-empowered women across three major indicators. For improved dietary diversity, 75% of households with empowered women show progress, compared to 45% for non-empowered women. Similarly, 60% of households led by empowered women adopt sustainable practices, while only 30% of their non-empowered counterparts do the same. In terms of reducing child malnutrition, 55% of households with empowered women achieve better outcomes, as opposed to 35% in non-empowered households. This visual representation emphasizes the significant role of empowerment in enhancing nutrition and promoting sustainable practices.



Empowered women are more likely to invest in nutrition, education, and sustainable agricultural practices. For instance, evidence from Andhra Pradesh highlights that women-led self-help groups (SHGs) improved food security through collective farming and resource sharing. Similarly, women with access to microfinance were able to implement water-saving technologies, enhancing productivity while conserving resources.

However, barriers such as limited land ownership and access to agricultural extension services persist, constraining women’s potential. Addressing these gaps through policy reforms and community-driven programs is essential for leveraging empowerment as a catalyst for development.

Women’s decision-making power plays a critical role in shaping household food security and improving child nutrition. When women are involved in decisions about income, food purchases, and resource allocation, households are more likely to exhibit better dietary diversity and nutritional outcomes for children. This section investigates the correlation between women’s decision-making authority and key food security indicators, supported by empirical data and visual representations.

Indicator	Households with Empowered Women (%)	Households without Empowered Women (%)
Improved Dietary Diversity	72	45
Reduction in Child Malnutrition (Stunting)	58	37
Income Allocated to Nutritional Needs	65	40

Source: NFHS-5, 2020; Ministry of Women and Child Development, 2021;

Households where women are active decision-makers tend to exhibit enhanced food security and better child health outcomes. For example, evidence from rural India shows that children in these households are more likely to meet their nutritional requirements, reducing rates of malnutrition. Similarly, empowered women allocate a higher percentage of household income to food and health, ensuring overall well-being. Despite these benefits, barriers such as cultural norms and lack of access to resources persist. Women in some regions face resistance when participating in financial or agricultural decisions, limiting their potential impact on household food security.

Evaluation of Existing Initiatives:

Several government and NGO programs focus on improving the welfare of women in rural areas by addressing key aspects such as health, education, economic participation, and environmental sustainability. These initiatives often target: Improved access to education and training for women. Support for women's economic empowerment through entrepreneurship, microcredit, and skills development. Access to resources and information about sustainable agricultural practices. Increased representation of women in decision-making bodies at local and national levels.

Recommendations for Policy Integration:

1. **Strengthening Support for Rural Women's Education and Training:** Governments should enhance access to education and vocational training programs that focus on agricultural techniques, business management, and leadership skills for women in rural communities. The policies should be focused mainly to develop policies that promote gender-sensitive educational frameworks and ensure equitable access to resources for women.
2. **Promoting Gender-Responsive Agricultural Policies:** Integrate women's empowerment into national agricultural policies by ensuring women have access to land, credit, and technology for sustainable farming. Design agricultural programs that provide equal opportunities for women to participate in decision-making processes, implement sustainable practices, and access agricultural finance.
3. **Expanding Access to Health and Nutrition Programs:** Focus on women as key agents of change in improving family nutrition and health by enhancing access to maternal health services, nutrition education, and child health programs. Integrate women's health programs into broader community health policies, ensuring that they are accessible and culturally relevant.
4. **Enhancing Women's Participation in Decision-Making:** Implement policies that encourage and support women's representation in local governance and decision-making bodies, particularly in rural areas where their voices are often marginalized. Strengthen gender quotas, leadership training, and mentorship programs to ensure women have a seat at the table in decisions related to food security, agriculture, and sustainable development.
5. **Encouraging Partnerships with NGOs and Civil Society:** Foster stronger collaborations between the government, NGOs, and rural women's organizations to design and implement gender-responsive programs. Promote public-private

partnerships that involve women in the planning, execution, and monitoring of food security and development projects.

Summary of the Case Studies and Success Stories

In Andhra Pradesh, SHG - led initiatives have transformed women's roles in agriculture and food security. By providing access to microfinance and training, these groups have enabled women to establish small-scale enterprises, improve household incomes, and enhance community food resilience. Similar programs across India, such as the Kudumbashree initiative in Kerala, highlight the potential of collective action in empowering women and ensuring sustainable development.

Challenges

Despite their crucial contributions, Indian women in agriculture face numerous challenges, including limited access to land, credit, and modern farming techniques. Gender disparities in property rights and access to resources hinder women's potential and inhibit progress in food security.

Land is primarily held by men and passed down through generations to men in many emerging nations. Women might therefore not have access to property, water rights, or livestock. Furthermore, lack of ownership makes it difficult for women to devote time and resources to sustainable farming methods, even when they are able to access land. This lowers production, which reduces income and provides less food for the household. Girls and women do not have enough opportunity for training and education. It has been demonstrated that education is a key strategy for raising agricultural productivity while lowering poverty and malnutrition. However, women only receive 5% of agricultural extension services globally, and females frequently have fewer access to basic schooling in developing nations.

For women, time is a huge limitation. Women frequently had to make difficult trade-offs when walking long distances on foot to gather firewood and water, prepare meals for the family, and go between the fields and the home.

Compared to men, women have less control over their financial resources and fewer access to loans. In the agricultural industry, women in Africa only obtain 1% of available financing, partly due to the fact that they frequently lack the collateral required. Their inability to pay for labour hire, seeds, fertiliser, and other agricultural equipment that could boost crop productivity is a result of their credit situation.

Conclusion

In conclusion, women are pivotal in ensuring food security in India. Recognizing their contributions and addressing the challenges they face is imperative for sustainable development. This paper's concise introduction emphasizes the generally agreed-upon notion of food security. The two sub concepts of food availability and food title are at the core of the concept of food security. The former speaks about the food supply that is accessible on a local, national, or worldwide scale. National governments and

international organisations need to implement policy changes in three main areas to enable women to contribute as much as they can to ensuring food security. Increasing the physical and human capital of women is the first step. Encouraging women to have better access to resources, technology, and information will help them produce food. Future and present productivity gains will come from educating more girls and providing literacy training for women. For accountable food security policies that foresee crises and incorporate gender issues utilising evidence based advocacy, develop local leadership and use connections with government ministries and other organisations. To address these challenges, India must focus on empowering women in agriculture. This can be achieved through targeted policies and programs that provide training, credit, and technology to women farmers. Additionally, improving access to markets and promoting women's participation in decision-making processes within farming communities is essential. The empowerment of women in agriculture is not only a matter of social justice but also a strategic move towards a more food-secure and sustainable future for the nation. In addition to agricultural research and development, financing, and infrastructure development, the food policy needs to be changed to address the issues. Technological developments should also be prioritised, as this will eventually lead to increased food production.

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THE EVOLUTION OF ECONOMIC REGIONALISM IN INTERNATIONAL POLITICAL ECONOMY

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Abstract

The evolution of economic regionalism in international political economy (IPE) is a complex and dynamic process that has undergone significant changes over time. Economic regionalism refers to the collaboration and integration of economies within a specific geographic region. This phenomenon is driven by various factors, including economic, political, and strategic considerations. This paper will be analyse on the impact of economic regionalism in international political economy in over the periods of time.

Keyword: Economic Regionalism, Trade Determine Geography, and International Political Economy.

Introduction

Economic regionalism refers to the process of economic integration and cooperation among countries within a specific geographic region. This phenomenon is a key aspect of the broader field of international political economy (IPE), which examines the intersection of politics and economics at the global level. Economic regionalism can take various forms, ranging from preferential trade agreements to more comprehensive economic unions.

The evolution of economic regionalism can be traced through different stages and models:

1. Pre-World War II Period

Limited regional economic cooperation existed before World War II. Colonial relationships and bilateral agreements characterized economic interactions. Before World War II, economic regionalism was not as pronounced as it would later become in the post-war era. During this period, international economic relations were characterized by a lack of comprehensive regional integration initiatives, and most economic interactions were based on bilateral agreements and colonial relationships.

It's important to note that the pre-World War II period laid the groundwork for the post-war developments in economic regionalism. The devastation caused by the war prompted a reevaluation of international relations, leading to the establishment of institutions and agreements that aimed to promote economic stability, peace, and

cooperation on a regional and global scale. The post-war era, particularly from the late 1940s onward, saw a more concerted effort to build economic regionalism, as exemplified by the formation of entities like the European Coal and Steel Community (ECSC) in 1951.

2. Post-World War II Era

The Bretton Woods institutions (International Monetary Fund, World Bank) were established to promote global economic stability. The General Agreement on Tariffs and Trade (GATT) emerged, later evolving into the World Trade Organization (WTO), fostering multilateral trade agreements. The 21st century witnessed a surge in bilateral and plurilateral trade agreements, such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP).

Theoretical Framework on Economic Regionalism

There are several theories substantiated the concept of economic regionalism like as regional integration theory, customs union theories are important theories which elaborated the concept of economic regionalism. They are;

1. Regional Integration theory

Any attempt to explain economic regionalism in theoretic terms during the post war era starts with emergence of regional integration in Western Europe. Regional integration theory includes functionalism and its modified version, neo-functionalism. The logic of functionalism was first developed by David Mitrany. Functionalism attempts to explore regional organizations to deal with common and social problems (Cai, 2010, 32-33). The regional integration theory explored the relevance of the institutional mechanism under the regional organization.

Neo-functionalism modifies functionalism in several important aspects. The primary modification is that makes essentially a theory of supranational state – building and not just an approach to the management of international interdependence through a “working peace system” (Pentland, 1990, 181). Political interdependence made through shared democracy which make substantiated effective peace full mechanism under the regional group. In this context BRICS countries are trying to build up within the concept of shared democracy by modifying the group’s institutional mechanism. Shared democratic decisions are more visible in the form mutual interests and concerns of BRICS member states, which are enhanced to make strong institutional mechanism.

2. Customs Union Theory

Jacob Viner was the eminent economist supporter of economic regionalism and regional trade arrangements (intra-regional trade) during the post war period. Jacob Viner pointed out that regional trade arrangements can lead to trade creation, if due to the formation of regional agreements; regional trade arrangement members switch from in efficient domestic producers and import more from other members of regional trade

agreement. On the other hand, trade diversion take place if, because of regional trade agreement, members switch imports from low-cost production in the rest of the world and import more from higher cost producers in the partner countries. Trade diversion lowers welfare not only the partner countries, but also rest of the world too. Viner's analysis shows that trade creation and trade diversion have opposite welfare implications and the net effect will happen on which of these two effects dominate (Viner, 1937, 28).

His famous book "The Customs Union Issues" published in 1950 is the one undeniable classic in its field. Among contemporary international economist, the work becomes a classic marking off and justifying a field of enquiry. The writings of the classical economist on preferential trading arrangements are the first important influence on Viner's work.

Jacob Viner took a broad view of regional customs union, and his analysis is relevant to most regional preferential trade arrangements. "One of the number of arrangements for reducing tariff barriers between political units while maintaining barriers against imports, from outside the regions" while a 'perfect customs union' defined as an arrangement, which meets the following condition.

Customs union is more likely to operate in the regional free trade direction, whether the assessment is in terms of its consequences for customs union area alone or for the world as a whole. With polarization of Regional Trade Arrangements, the question arises as to how such arrangements benefit world trade, contribute economic development, enhance the welfare of regions (countries) and increase overall global welfare. Regional integration tends to increase trade and FDI. This will result in creating a positive impact on growth in its members through increased trade and investment facilitating economic growth (Willem and Velde, 2011).

Geography Determine in Economic Regionalism

The phrase "geography determines trade" reflects the idea that the physical characteristics and spatial arrangement of geographic features play a crucial role in shaping patterns of trade and economic activities. Geographical factors can have a significant impact on trade flows, transportation costs, and the comparative advantages of different regions. Here are several ways in which geography can determine trade. In summary, geography plays a fundamental role in determining trade patterns by influencing the physical and logistical aspects of economic interactions. The concept highlights the interconnectedness of geographic features and economic activities, emphasizing that the spatial characteristics of regions have a significant impact on their participation in global trade.

Trade Determine Geography in Economic Regionalism

The phrase "trade determines geography" emphasizes the significant impact that trade patterns and economic activities can have on shaping the geographical and geopolitical landscape. This concept underscores the idea that economic considerations, particularly trade relationships and flows of goods and services, can influence the spatial organization of regions, cities, and countries.

In summary, the interplay between trade and geography is a dynamic and reciprocal relationship. Trade influences the spatial organization of economic activities, and in turn, geographical considerations shape the patterns and dynamics of trade. This connection underscores the complex and multifaceted nature of the global economy and its impact on the physical and political geography of regions around the world.

Conclusion

In summary, economic regionalism in international political economy involves the process of countries coming together within a specific geographic region to foster economic integration and cooperation. This can take various forms, each with its unique characteristics, motivations, challenges, and implications for the participating states and the global economy. This phenomenon is a key aspect of the broader field of international political economy (IPE), which examines the intersection of politics and economics at the global level. Economic regionalism can take various forms, ranging from preferential trade agreements to more comprehensive economic unions.

Continued regional integration efforts, with a focus on addressing global challenges like climate change, digitalization, and public health. Potential convergence or competition between regional blocs in shaping the global economic order. The evolution of economic regionalism in IPE reflects a dynamic interplay of political, economic, and historical factors. It has contributed to both regional and global economic governance structures, impacting the landscape of international trade and cooperation.

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A BIRD EYE VIEW ON JUDICIAL ACTIVISM ON CONSUMER PROTECTION ACT 2019 - RECENT TRENDS

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ABSTRACT

This paper highlights the judicial activism of Consumer Protection Act 2019 and recent trends and leading cases on consumer disputes. The Consumer Protection Act (2019) marks a significant advancement in safeguarding consumer rights and interests in India. Enacted to replace the earlier Consumer Protection Act of 1986, this legislation aims to enhance consumer empowerment, protection against unfair trade practices, and timely resolution of consumer disputes. The Consumer Protection Act (2019) aims to create a robust framework for consumer protection in India, addressing modern challenges like e-commerce and ensuring that consumers have effective avenues for seeking redressal of grievances. It represents a significant step towards empowering consumers and ensuring fair and equitable treatment in the marketplace. The Consumer Protection Act (2019) is expected to play a pivotal role in safeguarding consumer interests, promoting fair business practices, and fostering a more equitable marketplace in India. Its proactive enforcement and evolution in response to changing dynamics will be crucial in shaping a consumer-friendly environment in the years to come.

I. Introduction:

In India, protection of consumer rights is primarily governed by the Consumer Protection Act, 2019 (Consumer Protection Act), and the rules and regulations made there under. Some of the rules and regulations made under the Consumer Protection Act include Consumer Protection (E-Commerce) Rules, 2020, Consumer Protection (Mediation) Regulations, 2020, the Consumer Protection (Consumer Dispute Redressal Commissions) Rules, 2020 and the Consumer Protection (General) Rules, 2020. Other than the Consumer Protection Act, there are various other laws and regulations which have been enacted with respect to protection of consumer interests covering specific subject matters such as food, drugs and cosmetics.

II. History of Legal Consumer Protection:

The history of consumer protection in India can be traced through several key legislative milestones:

1. **Monopolies and Restrictive Trade Practices Act (1969):** This was one of the earliest legislative efforts in India to protect consumers against monopolistic and restrictive trade practices. It aimed to ensure fair competition in the market.
2. **Consumer Protection Act (1986):** This landmark legislation replaced the archaic and inadequate provisions of the MRTP Act in terms of consumer protection. The Consumer Protection Act (CPA) of 1986 was enacted to provide better protection of consumers' interests. It established consumer forums at the district, state, and national levels to adjudicate consumer disputes swiftly and efficiently. This Act recognized six rights of consumers: right to safety, right to be informed, right to choose, right to be heard, right to seek redressal, and right to consumer education.
3. **Amendments and Strengthening:** Over the years, the CPA of 1986 underwent amendments to address emerging issues and challenges in consumer protection. These amendments aimed to streamline processes, enhance penalties for unfair trade practices, and expand the scope of consumer rights in line with global best practices.
4. **Consumer Protection Act (2019):** The latest iteration, the Consumer Protection Act of 2019, represents a significant overhaul of the consumer protection framework in India. It was enacted to address contemporary issues such as e-commerce, direct selling, and misleading advertisements more effectively. The CPA 2019 strengthens consumer rights, establishes the Central Consumer Protection Authority (CCPA) for better enforcement, introduces provisions for product liability, and enhances penalties for violations of consumer rights.

Throughout its evolution, the legislative landscape of consumer protection in India has aimed to empower consumers, provide effective mechanisms for redressal of grievances, and ensure fair practices in the marketplace. These efforts reflect India's commitment to safeguarding consumer interests amidst evolving economic and technological landscapes.

III. The Consumer Protection Act (CPA) of 2019:

The Consumer Protection Act (CPA) of 2019 in India is a comprehensive legislation aimed at protecting the interests of consumers by establishing authorities, procedures for redressal of grievances, and mechanisms for enforcement. Here's an introduction to its key features:

1. **Objective:** The CPA 2019 replaces the earlier Consumer Protection Act of 1986, aiming to modernize consumer rights in line with current practices and challenges, including e-commerce and digital transactions.
2. **Rights of Consumers:** The Act defines consumer rights more clearly, including the right to protection against marketing of goods and services that are hazardous to life and property, the right to be informed about the quality, quantity, potency, purity, standard, and price of goods or services, and the right to be heard and redressal in case of consumer disputes.
3. **Consumer Disputes Redressal Mechanism:** It introduces several layers of consumer forums at the district, state, and national levels for speedy resolution of consumer disputes. These forums are designed to handle complaints related to

defective goods, deficient services, unfair trade practices, and misleading advertisements.

4. **Central Consumer Protection Authority (CCPA):** The Act establishes the CCPA to promote, protect, and enforce consumer rights as a regulatory authority. It has powers to investigate, recall unsafe goods, impose penalties, and even initiate class action suits on behalf of consumers.
5. **Product Liability:** Manufacturers, sellers, or service providers can be held liable for any harm caused to consumers due to defective goods or deficient services. The Act introduces provisions for filing claims for compensation for injuries or damages caused by such products or services.
6. **Consumer Awareness and Education:** The CPA 2019 emphasizes the importance of consumer education and awareness programs to empower consumers with knowledge of their rights and responsibilities.
7. **E-commerce and Digital Transactions:** The Act includes provisions specifically addressing e-commerce transactions, ensuring accountability and consumer protection in online purchases.
8. **Penalties and Compensation:** It introduces stringent penalties for misleading advertisements and unfair trade practices. It also provides for enhanced compensation to consumers in case of injury or loss due to negligence of manufacturers or service providers.

Overall, the Consumer Protection Act 2019 aims to strengthen consumer rights and protection mechanisms in India, ensuring a fair marketplace where consumers can confidently engage in transactions while being safeguarded against exploitation and unfair practices.

IV. Procedure for making an appeal

Any consumer who is aggrieved by the order of a commission can make an appeal before the higher commission subject to the timelines prescribed in the Consumer Protection Act. An appeal against the order of district commission can be made before the state commission on grounds of facts or law within a period of forty-five (45) days from the date of the order. Similarly, an appeal against the order of state commission can be made before the national commission within a period of thirty (30) days from the date of such order. The national commission shall also be the competent forum for an appeal against the order of the central authority established under the Consumer Protection Act and such an appeal should be made within thirty (30) days from the date of receipt of such order. An appeal before the state or national commission shall be heard and disposed within a period of ninety (90) days from the date of admission. An appeal against the order passed by the national commission shall be made before the Supreme Court of India within a period of thirty (30) days from the date of the order.

V. Consumer Protection Councils

Consumer Protection Councils (CPCs) are an integral part of the consumer protection framework in India, established under the Consumer Protection Act (CPA) of

1986. These councils play a crucial role in promoting and protecting consumer rights at various levels. Here's a composition overview of Consumer Protection Councils in India:

1. District Consumer Protection Council (DCPC):

- i. **Chairperson:** The District Magistrate of the district concerned.
- ii. **Members:**
 - a. **Officials:** Officials from various government departments and local authorities, such as the Health Department, Food and Civil Supplies Department, and Urban Development Authority.
 - b. **Non-Government Members:** Representatives of consumer organizations, local traders, and industries.

2. State Consumer Protection Council (SCPC):

- i. **Chairperson:** Chief Minister of the State (or Lieutenant Governor in Union Territories).
- ii. **Members:**
 - a. **Officials:** Ministers of concerned departments, such as Finance, Food and Civil Supplies, Industries, Health, and Law.
 - b. **Non-Government Members:** Representatives of consumer organizations, industry associations, and trade unions.

3. Central Consumer Protection Council (CCPC):

- i. **Chairperson:** The Minister of Consumer Affairs, Food and Public Distribution.
- ii. **Members:**
 - a. **Officials:** Secretaries of various central government departments, such as Agriculture, Commerce, Industry, and Finance.
 - b. **Non-Government Members:** Representatives of consumer organizations, industry associations, and experts in consumer affairs.

VI. Functions of Consumer Protection Councils:

- i. **Advisory Role:** They advise on matters relating to promotion and protection of consumer rights.
- ii. **Awareness Generation:** They promote consumer awareness through campaigns, workshops, and seminars.
- iii. **Monitoring:** They monitor the functioning of consumer fora (Consumer Disputes Redressal Agencies) in their respective jurisdictions.
- iv. **Policy Recommendations:** They make recommendations for effective implementation of consumer protection laws and policies.

Consumer Protection Councils act as vital bodies in ensuring that consumer rights are upheld and protected at local, state, and national levels in India. Their composition ensures representation from government officials and diverse stakeholders, fostering

collaboration towards consumer welfare and fair market practices. The Act mandates establishment of Consumer Protection Councils at the Centre as well as in each State and District, with a view to promoting consumer awareness. The Central Council is headed by Minister In-charge of the Department of Consumer Affairs in the Central Government and the State Councils by the Minister In-charge of the Consumer Affairs in the State Governments. It also provides for a 3-tier structure of the National Commission, the State Commissions and the District Commissions for speedy resolution of consumer disputes.

To provide inexpensive, speedy and summary redressal of consumer disputes, quasi-judicial bodies have been set up in each District and State and at the National level, called the District Consumer Disputes Redressal Commissions, the State Consumer Disputes Redressal Commissions and the National Consumer Disputes Redressal Commission respectively. At present, there are 678 District Commissions and 35 State Commissions with the National Consumer Disputes Redressal Commission (NCDRC) at the apex level. The NCDRC has its office at Upphokta Naya Bhawan, 'F' Block, GPO Complex, INA, New Delhi-110 023.

Each District Commission is headed by a person who is or has been or is eligible to be appointed as a District Judge and each State Commission is headed by a person who is or has been a Judge of a High Court. The National Consumer Disputes Redressal Commission was constituted in the year 1988. It is headed by a sitting or a retired Judge of the Hon'ble Supreme Court of India or a sitting or a retired Chief Justice of an Hon'ble High Court, in terms of Rule 3(12)(a) of the Tribunal(Conditions of Service) Rules, 2021. The National Commission is presently headed by Hon'ble Mr. Justice Amreshwar Pratap Sahi, former Chief Justice of Patna and Madras High Courts as President and has nine Members, viz. Hon'ble Mr. Justice Ram Surat Ram Maurya, Hon'ble Mr. Subhash Chandra, Hon'ble Mr. Justice Karuna Nand Bajpayee, Hon'ble Mr. Binoy Kumar, Hon'ble Mr. Justice Sudip Ahluwalia, Hon'ble Dr. Inder Jit Singh, Hon'ble AVM J. Rajendra, AVSM VSM (Retd.), Hon'ble Mr. Bharatkumar Pandya & Hon'ble Dr. Sadhna Shanker.

The provisions of this Act cover 'goods' as well as 'services'. The goods are those which are manufactured or produced and sold to consumers through wholesalers and retailers. The services are in the nature of transport, telephone, electricity, housing, banking, insurance, medical treatment, etc.

VII. Procedure to file complaint:

A written complaint, can be filed before the District Consumer Commission for pecuniary value of upto Rupees Fifty Lakh; State Commission for the value from Rupees Fifty Lakh One upto Rupees Two Crore and the National Commission for value above Rupees Two Crore, in respect of defects in goods and deficiency in service. The service can be of any description and the illustrations given above are only indicative. However, no complaint can be filed for alleged deficiency in any service that is rendered free of charge or under a contract of personal service. The remedy under the Consumer Protection Act is an alternative in addition to that already available to the aggrieved persons/consumers by way of civil suit. In the complaint/appeal/petition submitted under the Act, a consumer is not required to pay any court fees but only a nominal fee.

Consumer Commission proceedings are summary in nature. The endeavor is made to grant relief to the aggrieved consumer as quickly as in the quickest possible time, keeping in mind the provisions of the Act which lay down time schedule for disposal of cases. If a consumer is not satisfied by the decision of a District Commission, he can appeal to the State Commission. Against the order of the State Commission a consumer can come to the National Commission.

VIII. Powers of National Commission

In order to help achieve the objects of the Consumer Protection Act, the National Commission has also been conferred with the powers of administrative control over all the State Commissions by calling for periodical returns regarding the institution, disposal and pendency of cases. The National Commission is empowered to issue instructions regarding:

- (1) Adoption of uniform procedure in the hearing of the matters,
- (2) Prior service of copies of documents produced by one party to the opposite parties,
- (3) Speedy grant of copies of documents, &
- (4) Generally over-seeing the functioning of the State Commissions and the District Commissions to ensure that the objects and purposes of the Act are best served, without interfering with their quasi-judicial freedom. Every matter filed with the Registry is listed within 21 days of its filing for admission before the National Commission. Functioning of District Commission, State Commission and National Commission is consumer friendly; thus, a consumer can file a complaint and also address arguments in person. In genuine cases where the complainant/ appellant/ petitioner before the National Commission is unable to engage the services of an advocate, legal aid is provided by the Commission free of charge.

IX. Pending cases

Consumer cases are to be decided summarily in 90 to 150 days as per consumer law. But cases are dragged for several years in district consumer courts, several years in state consumer commissions and several more years in national consumer commissions. The pendency in the consumer commissions shows a declining trend. Number of cases pending in consumer commission comes down from 5.55 lakhs in December 2022 to 5.45 lakhs in September 2023. Vacancies at these bodies could be one of the reasons for the increasing pendency of consumer cases in the country. Technical and procedural issues, coupled with inadequate benches at district levels, seem to have added to the delay in grievance redressal.

X. Recent cases on Consumer Disputes

1. *Ireo Grace Realtech Pvt. Ltd. Vs Abhishek Khanna & Others, Civil Appeal No. 5785 of 2019 (Supreme Court)*
Bench -Dr Dhananjaya, Y Chandrachud, Indu Malhotra, Indira Banerjee
Decided on –January 11, 2021

Ref. Pioneer Urban Land and Infrastructure Ltd Vs Govindan Raghavan
SC held-“We are of the view that the incorporation of such one-sided and unreasonable clauses in the Apartment Buyer’s Agreement constitutes an unfair trade practice under Section 2(1)(r) of the Consumer Protection Act. Developer cannot compel the apartment buyers to be bound by the one-sided contractual terms contained in the Apartment Buyer’s Agreement.”

2. *Narinder Chopra V/S Jaiprakash Associates (NC)*

Consumer Complaint No 3258 Of 2017 along with IA 330 of 2021&IA 1130 Of 2021
Decided On 16.5.2021

Law point: Whether pending matters are to be transferred to appropriate commission after enhancement of pecuniary jurisdiction .

NC held-There is no provision for transfer of pending cases in the new Act of 2019’ The transitional provisions contained in Sections 31, 45 and 56 expressly indicate that the adjudicatory personnel who were functioning as Members of the District Commission, SCDRC and NCDRC under the erstwhile legislation shall continue to hold office under the new legislation. Previous decisions of the NCDRC which had interpreted after amendments 2002, that enhanced pecuniary jurisdiction, with prospective effect. Ref. Cases Southfield Paints and Chemicals Pvt. Ltd. v. New India Assurance Co. Ltd. & Premier Automobiles Ltd. v. Dr Manoj Ramachandran, where the NCDRC held that the amendments enhancing the pecuniary jurisdiction are prospective in nature.

**3. *M/s Daddy’s Builders Pvt. Ltd. & Another Vs Manisha Bhargava and Another*
(Petition for Special Leave to Appeal (Civil) No. 1240 of 2021)**

Decided on February 11, 2021. Supreme Court of India

SC held- Written statement by opposite party to complaint within 30 days or such extended period, not exceeding 15 days, should be read as mandatory. Commencing point of limitation of 30 days, under the aforesaid provisions, would be from the date of receipt of notice accompanied by a copy of the complaint, and not merely receipt of the notice

4. *Honda Cars India Limited Vs Sudesh Berry CIVIL APPEAL NO.6802 OF 2021 (Arising out of SLP (C) No.11986/2020) SC Decided on 12 November, 2021*

SC held If there be any deficiency in service by the dealer or the authorised centre in rendering assistance for repairs of the vehicle, the manufacturer of the vehicle cannot be held liable.

5. *TATA Motors Ltd Vs Antonio Paulo Vaz & Another, 2021 SCC Online SC 125*

SC held

Manufacturer and dealer have principal to principal relation and not of principal to agent. Manufacturer not held liable for the wrongs of dealer.

6. *Manohar Infrastructure and Constructions Private Ltd Vs Sanjeev Kumar Sharma & Ors.; Citation: LL 2021 SC 714J Decided on December 2021*

SC held NC has discretionary power vested with it to impose any condition while giving stay and rightly ordered to pay entire amount as determined amount by State Commission This condition has to do nothing with mandatory requirement of depositing 50 per cent of determined amount by State Commission.

7. *M/s Sheth M L Vaduwala Eye Hospital Vs Oriental Insurance Company Limited and Others SC Judgment by J. Dr Dhananjaya Y Chandrachud, J. Dt 11 Dec 2021*

SC held An insurance policy taken by doctors for professional indemnity can't be used to make insurance companies pay the liability of compensation to patients on behalf of the hospital which is not insured.

8. *M/S. Newtech Promoters And Developers Pvt. Ltd Vs State Of Up & Ors.*

*Civil Appeal No(S). 6753 Of 2021 (Arising Out Of SLP(Civil) No(S). 3426 Of 2021)
SC Judgment Dt 11 Nov 2021*

SC held To ensure greater accountability towards consumers and in view of the objective of the act, ongoing projects are also brought under the provisions of the act hence retroactive application of RERA Act confirmed. Section 18 confers right upon an allottee to get refund of the amount deposited with the promoter with interest if the promoter fails to give possession by the date specific. Single member of the authority under Section 81 of the Act authorised to order for refund and under Sec 40 can provide for collection of funds as revenue.

9. *Union Bank Of India v/s Rajasthan Real Estate Regulatory*

High Court Of Judicature For Rajasthan Bench At Jaipur D.B. Civil Writ Petition No. 13688/2021 Bench: Akil Kureshi, Uma Shanker Vyas Decided on 14.12.2021

H.C of Rajasthan held that pursuant to taking possession of the project, the bank enters into the shoes of the promoter and becomes the assignee of the promoter and thus, amenable to jurisdiction of RERA. The RERA would prevail over 'SARFAESI Act' 'The rights of the real estate allottees cannot be compromised for the legal rights of Bank.

IX. Conclusion

The Consumer Protection Act empowers consumers by ensuring their rights are protected and providing avenues for redressal. This legislation holds businesses accountable for their products and services, promoting fair trade practices. It promotes fairness in consumer transactions, ensuring consumers are treated justly and equitably. The Act emphasizes transparency, requiring businesses to provide clear and accurate information to consumers. Ultimately, the Consumer Protection Act aims to uphold justice by resolving disputes fairly and efficiently. These words highlight the goals and benefits of the Consumer Protection Act in safeguarding consumer rights and promoting a balanced marketplace.

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MENTAL IMAGERY BETWEEN INDIVIDUAL AND COMBAT SPORTS – AN ANALYSIS

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Abstract

Mental imagery refers to the ability to form images in the mind without external stimulation. This skill can be used to create scenarios, anticipate future events, and visualize complex ideas or concepts. In sports, mental imagery is described as the process where individuals visualize themselves executing skills to prepare for upcoming tasks or enhance performance. Research has consistently shown that imagery enhances motor task performance. This study aims to compare mental imagery abilities between athletes in individual and combat sports. A total of 100 athletes (50 from individual sports and 50 from combat sports), each with a minimum of three years of training experience, were assessed using the Mental Imagery Test (MIT) developed by M. Rajamanickam in 1995. The findings revealed a significant difference in mental imagery capabilities between athletes in individual and combat sports.

Keywords: - *Mental imagery, Individual Sports, Combat Sports.*

Introduction

In today's world, games and sports have become an integral part of our lives. They are essential not only for achieving success but also for contributing positively to various aspects of life. Encompassing both indoor and outdoor activities, as well as recreational games, sports foster a sense of cooperation, discipline, and teamwork among individuals.

Mental imagery involves recreating perceptual experiences (Kosslyn et al., 2001; Pearson, 2018) across multiple sensory modalities, allowing the processing of images without the presence of external stimuli. It plays a crucial role in various aspects of human functioning.

In the context of sports, mental imagery is defined as the mental process where athletes visualize themselves while preparing for a task or striving to improve their performance. Imagery can result from both deliberate and involuntary recall processes, enabling individuals to perceive or experience movements and images mentally without encountering them in reality. This cognitive tool is particularly important for enhancing motor task performance (Di Corrado et al., 2014, 2019).

Despite its significance, the concept of mental imagery is complex. Research has explored both the application of imagery and the ability to generate and manipulate mental images. The skill of creating vivid mental visuals is distinct from the expertise required to control and modify these images (Morris et al., 2005).

Individual sports are those where participants compete independently to achieve a specific goal, typically aiming to win. Unlike team sports, these activities focus on individual performance. Examples of individual sports include tennis, golf, swimming, running, gymnastics, weightlifting, and skiing.

Combat sports present significant challenges, often placing considerable strain on the endocrine system due to a combination of physical contact and intense physiological exertion. These sports, including boxing, karate, judo, and taekwondo, involve direct physical interaction between two competitors. The primary objective is typically to earn points or incapacitate the opponent, with victory awarded to the athlete who achieves this most effectively. Given the inherent physicality of these sports, the risk of injury is high, necessitating the implementation of safety measures during matches. To minimize the likelihood of severe injuries, athletes commonly wear protective equipment such as gloves, headgear, and body armor.

Statement of the Problem

The purpose of this study is to examine the ability of sports players to engage in mental imagery, particularly focusing on tactile and bodily imagery, and to compare these processes between athletes in individual sports and combat sports.

Methodology

For this study, a total of 100 participants were randomly selected, comprising 50 athletes from individual sports and 50 from combat sports, all drawn from various women's colleges in Tirunelveli, Tamil Nadu, India. The participants were aged between 17 and 22 years. The data collected on the chosen variables were analyzed using an independent "t" test, with the level of significance set at 0.05.

Tool used

Mental Imaginary Questionnaire developed by M. Rajamanickam, (1995) tool was used in this study. Mental Imaginary Questionnaire there have a for sub scale (Touching, Bodily, Seeing and Hearing).

Analysis and Interpretation of Data

The Mental Imaginary between Individual sports and Combat sports participants from various women's college in Tirunelveli were computed below Table 1 & 2.

Table I: Mean and Standard deviation value of Mental Imagery (Touching) between Individual sports and Combat sports

Group	N	Mean	S.D	T - Test
Individual sports Touching	50	49.47	16.61	0.530
Combat sports Touching	50	50.91	13.06	

* Significant level 0.05 $T < 1.660$

Table I presents the mean values for Mental Imagery (Touching) among participants from individual sports and combat sports in various women's colleges in Tirunelveli, which are 49.47 and 50.91, respectively. The calculated 't' value of 0.530 for Mental Imagery (Touching) was compared to the critical value of 1.660.

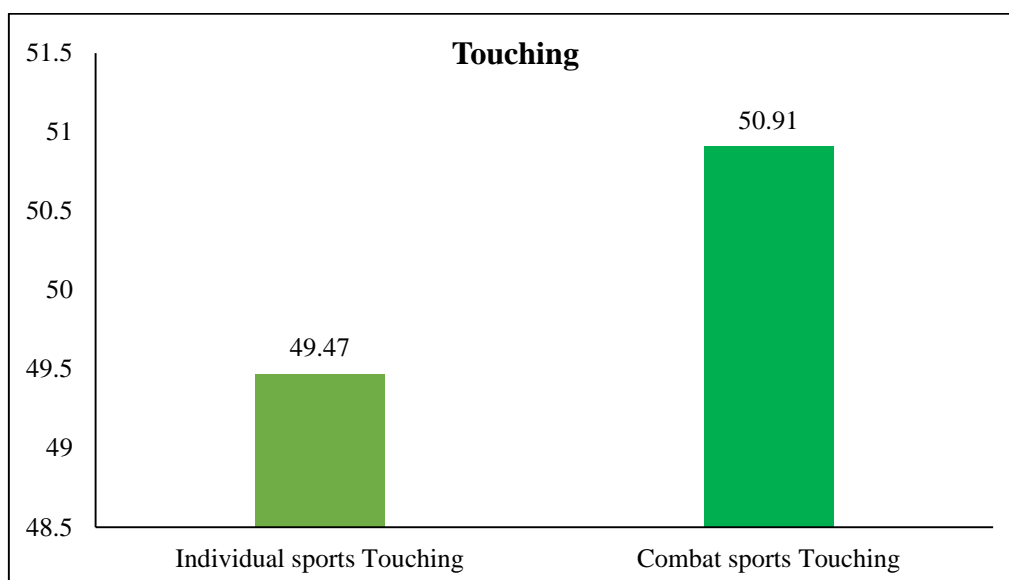


FIGURE 1: MEAN VALUE OF MENTAL IMAGINARY (TOUCHING) BETWEEN INDIVIDUAL SPORTS AND COMBAT SPORTS PARTICIPANTS

Table II: Mean and Standard deviation value of Mental Imagery (Bodily) between Individual sports and Combat sports

Group	N	Mean	S.D	T - Test
Individual sports Bodily	50	54.01	11.46	1.803*
Combat sports Bodily	50	59.36	14.10	

* Significant level 0.05 $T < 1.660$

Table I indicates that the mean values for Mental Imagery (Bodily) among participants from individual sports and combat sports in various women's colleges in Tirunelveli are 54.01 and 59.36, respectively. The calculated 't' value of 1.803 for Mental Imagery (Bodily) was compared to the critical value of 1.660.

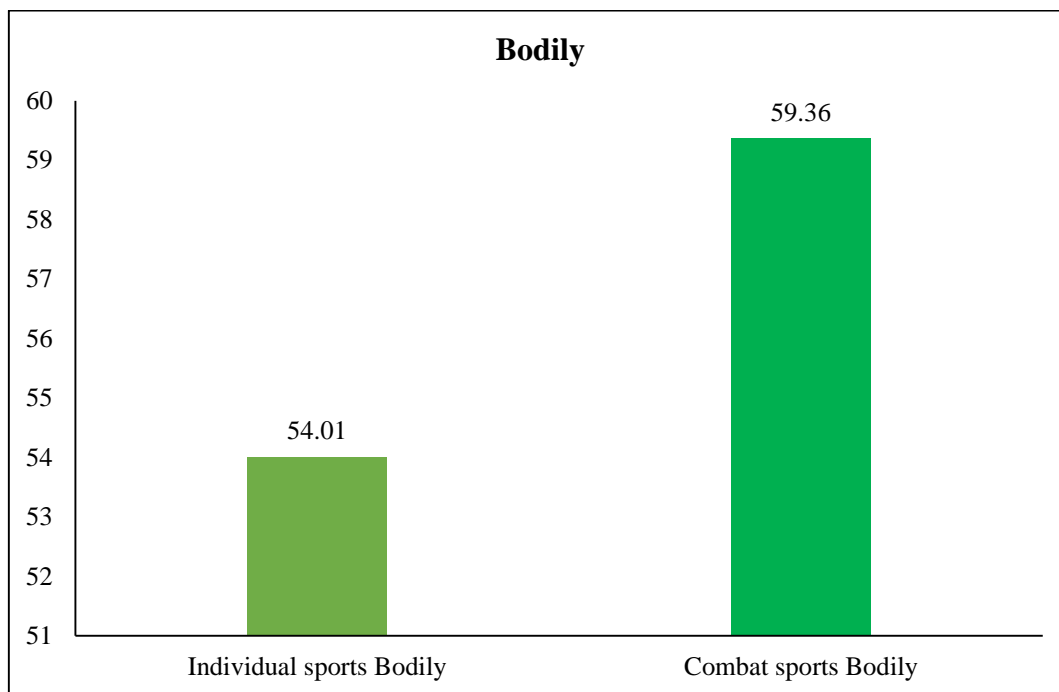


FIGURE 1: MEAN VALUE OF MENTAL IMAGINARY (BODILY) BETWEEN INDIVIDUAL SPORTS AND COMBAT SPORTS PARTICIPANTS

Discussion on findings

The findings of the study reveal no significant difference in Mental Imagery (Touching) between participants in individual sports and combat sports from various women's colleges in Tirunelveli. The analysis showed that the calculated t-value of 0.530 ($t = 0.481, p > 0.05$) was lower than the critical t-value of 1.660 required for significance at the 0.05 level. Although the mean scores for combat sports participants were higher than those for individual sports participants, this difference was not statistically significant. This suggests that combat sports participants may exhibit greater locus of control compared to individual sports participants. A similar study by Kosslyn, S. M., Brunn, J., Cave, K. R., and Wallach, R. W. (1984) also found no significant difference between individual and combat sports participants regarding Mental Imagery (Touching).

In contrast, the results indicate a significant difference in Mental Imagery (Bodily) between the two groups. The analysis showed a calculated t-value of 1.803 ($t = 1.701, p < 0.05$), which exceeded the critical t-value of 1.660 required for significance at the 0.05 level. These findings align with the study by Isaac, A. R., and Marks, D. F. (1994), which also reported a significant difference in Mental Imagery (Bodily) between participants in individual and combat sports.

Conclusions

On the basis of findings of the study following conclusions have been made –

There was no significant difference found in mental imaginary (touching) between individual sport and combat sports participant studying in various women's college, Tirunelveli.

There was a significant difference between the individual sports and combat sports participants in mental imaginary (bodily).

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YOGA FOR ENHANCING FOCUS AND REDUCING DIGITAL DISTRACTION AMONG STUDENTS

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Abstract

In today's digital era, students often struggle to maintain focus amidst constant notifications and distractions. This study highlights yoga as a holistic and non-invasive method to enhance concentration and reduce digital interruptions. Practices like pranayama, meditation, and asanas promote mindfulness, improve cognitive function, and reduce stress, fostering mental clarity. Incorporating yoga into daily routines can help students build resilience and sustain focus. The findings advocate for integrating yoga into educational and personal development programs to boost academic performance and overall well-being in a technology-driven world.

Keywords : Focus Enhancement, Digital Distractions, Mindfulness, Pranayama, Meditation, Asanas, Cognitive Function, Stress Reduction, Academic Performance, Student Well-being.

Introduction

In today's digitally-driven world, students are increasingly finding themselves overwhelmed by distractions from their devices, which impacts their focus, productivity, and overall mental well-being. The constant influx of notifications from social media, messages, and entertainment apps can significantly reduce a student's ability to concentrate on academic tasks. Amidst this digital overload, yoga has emerged as a powerful tool to combat these distractions. Through its focus on mindfulness, deep breathing, and physical postures, yoga offers students an effective way to enhance concentration, reduce stress, and improve overall mental health. This article explores how yoga can help students counteract digital distractions and boost their focus, offering practical insights for its integration into student routines.

The Rise of Digital Distractions

Digital distractions are an ever-growing concern in educational settings, with studies showing that excessive use of electronic devices leads to decreased academic performance and lower attention spans. Research by Rosen et al. (2013) highlights that multitasking with digital devices is linked to poor academic performance and difficulty in maintaining attention. Similarly, a study by Junco (2012) found that social media usage negatively impacts students' academic success by dividing their attention between study tasks and online distractions. The constant presence of smartphones, computers, and tablets has created an environment where students often struggle to stay focused on their studies for extended periods.



How Yoga Can Help Enhance Focus

Yoga offers a holistic approach to managing digital distractions by improving both mental and physical well-being. By practicing yoga, students can learn to cultivate mindfulness, which is the ability to remain present and focused on the task at hand. Mindfulness-based practices, such as meditation and conscious breathing (pranayama), are designed to help individuals develop awareness and control over their thoughts, preventing them from being constantly pulled in multiple directions.

1. **Mindfulness Meditation:** Mindfulness meditation, often incorporated into yoga practices, trains the mind to focus on the present moment. It helps reduce wandering thoughts, a major contributor to digital distractions. Studies have shown that regular mindfulness practice enhances cognitive function, improves concentration, and increases academic performance (Zeidan et al., 2010). A study by Jha et al. (2010) found that mindfulness meditation improves attention and working memory, both of which are essential for students to concentrate on their academic tasks.
2. **Pranayama (Breathing Techniques):** Pranayama, a key component of yoga, involves controlled breathing exercises that help calm the nervous system and reduce stress. These exercises also improve brain oxygenation, leading to improved cognitive function and mental clarity. Research indicates that pranayama can increase focus and attention span, which is crucial for reducing the mental fog caused by digital distractions (Telles et al., 2013).
3. **Asanas (Physical Postures):** Yoga asanas, or physical postures, not only improve flexibility and strength but also promote better circulation and energy flow throughout the body. These physical movements help release tension, which can accumulate from long hours of sitting in front of screens. Studies have shown that physical activity, such as yoga, improves brain function and enhances cognitive abilities, including attention (Gothe et al., 2016).
4. **Reducing Stress and Anxiety:** Digital distractions often lead to increased stress and anxiety, particularly when students feel overwhelmed by competing demands. Yoga's stress-reducing effects are well-documented, with research indicating that yoga can lower cortisol levels and help regulate the body's stress response (Field, 2011). By managing stress effectively, students can maintain better focus and concentration during study sessions.

Practical Yoga Practices for Students

To help students integrate yoga into their busy schedules, it is important to focus on simple yet effective practices that can be done in short sessions throughout the day. Here are some yoga practices that can help enhance focus and reduce digital distractions:

1. **Morning Mindfulness Meditation:** Starting the day with a brief meditation session can set a positive tone for the rest of the day. Just 5–10 minutes of mindfulness meditation can help students center their thoughts, improve concentration, and set clear intentions for the day's work.

2. **Breathing Breaks:** During study sessions, students can take short breaks to practice pranayama. Simple techniques, such as Nadi Shodhana (alternate nostril breathing) or Ujjayi (victorious breath), can calm the mind and refocus attention. These practices can be done at the desk or in a quiet space and take only a few minutes.
3. **Chair Yoga:** For students who spend long hours sitting at a desk, chair yoga provides an accessible way to relieve tension and improve focus without leaving their study area. Chair yoga includes simple stretches and postures that can be performed while seated, promoting physical relaxation and mental clarity.
4. **End-of-Day Restorative Yoga:** To unwind after a day filled with digital distractions, students can engage in restorative yoga practices. This includes gentle poses that promote relaxation and reduce stress, helping to prepare the body and mind for restful sleep. Poses such as Supta Baddha Konasana (Reclining Bound Angle Pose) and Viparita Karani (Legs-Up-the-Wall Pose) are ideal for calming the nervous system and improving sleep quality.

Impact on Academic Performance and Mental Health

Yoga's role in enhancing focus and reducing distractions goes beyond its immediate effects on attention. Regular yoga practice contributes to better mental health, which in turn positively influences academic performance. Studies have found that students who engage in yoga experience lower levels of anxiety, improved mood, and enhanced resilience to stress (Khalsa, 2013). Additionally, yoga has been shown to improve sleep quality, which is essential for cognitive function and memory retention (Chaya et al., 2006). These mental health benefits are key to creating a conducive learning environment, as students are better able to manage academic pressures and stay focused during study sessions.

Conclusion

Yoga offers a simple yet effective solution to the digital distractions that hinder students' ability to focus and perform academically. By incorporating mindfulness practices, breathing exercises, and physical postures into their routines, students can reduce stress, enhance concentration, and improve overall mental clarity. As students face increasing pressure from both academic and digital demands, yoga provides a powerful tool to restore balance, increase productivity, and support mental well-being. Schools and universities can play a crucial role in promoting yoga as part of wellness programs to help students combat distractions and improve their academic outcomes.

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ADDRESSING ANXIETY AND MENTAL HEALTH ISSUES IN STUDENTS THROUGH YOGA PRACTICES

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Abstract

Anxiety and mental health challenges are prevalent among students, impacting their academic performance and overall well-being. This study examines the effectiveness of yoga as a therapeutic practice to address these issues. Yoga combines mindfulness, breath control, and physical postures to promote relaxation, reduce stress, and enhance emotional stability. Incorporating practices such as pranayama, meditation, and asanas into students' routines can improve mental resilience and foster a positive mindset. The findings suggest that yoga is a practical and sustainable approach to supporting mental health, offering valuable insights for educators and policymakers to implement yoga-based interventions in student wellness programs.

Keywords : Yoga, Anxiety Management, Mental Health, Students, Mindfulness, Pranayama, Meditation, Asanas, Emotional Stability, Stress Reduction, Mental Resilience, Wellness Programs.

Introduction

In today's fast-paced academic environment, students are increasingly vulnerable to anxiety and mental health challenges due to factors such as academic pressures, social comparisons, and future uncertainties. Yoga, with its holistic approach combining physical postures (asanas), controlled breathing (pranayama), and meditation, offers an accessible and effective way to manage these issues. By engaging in yoga, students can significantly improve their emotional regulation, reduce stress, and promote overall well-being. This article explores how yoga practices can address the mental health issues and anxiety faced by students, providing a holistic solution to these prevalent challenges.

Mental Health Challenges Among Students

Students, especially in high-stakes academic settings, often face significant mental health challenges. The academic pressure to perform, coupled with the complexity of social interactions, financial strain, and family expectations, creates an environment conducive to anxiety, depression, and other mental health problems. Research has shown that anxiety is the most prevalent mental health issue in students, with consequences that affect academic performance, social interactions, and overall well-being (Eisenberg et al., 2009).

In addition, external factors such as social media usage, body image concerns, and the increasing disconnection from nature contribute to higher rates of mental health challenges among students (Gordon et al., 2018). Addressing these issues requires interventions that are accessible, sustainable, and effective in reducing stress and improving emotional health.

Yoga as an Effective Solution to Anxiety

Yoga's ability to promote relaxation and mental clarity has been widely recognized. It combines physical movement with breath control and meditation, which together reduce stress and enhance emotional regulation. Below are the primary ways in which yoga contributes to alleviating anxiety and mental health issues in students.

Breathing Techniques (Pranayama)

Pranayama, or controlled breathing, is one of the cornerstones of yoga. Techniques such as **Nadi Shodhana** (alternate nostril breathing) and **Ujjayi** (victorious breath) stimulate the parasympathetic nervous system, promoting a state of calm. Pranayama practices help regulate the breath, which in turn reduces the body's fight-or-flight response associated with anxiety. Studies by Telles et al. (2013) have shown that pranayama significantly lowers cortisol levels, the hormone responsible for stress, and improves emotional stability. These techniques help students better manage stress, particularly in exam seasons or during other high-pressure academic moments.

Mindfulness and Meditation Practices

Mindfulness meditation is another yoga practice proven to be effective in reducing anxiety. Meditation encourages students to observe their thoughts without attachment or judgment, helping them detach from negative thought cycles that often fuel anxiety. Research by Khalsa (2013) found that mindfulness techniques improve focus, reduce rumination, and increase resilience to stress. As students practice mindfulness, they become more aware of their mental and emotional states, which helps them manage anxiety more effectively. Regular meditation fosters a sense of calm, providing students with the tools they need to regulate their emotions during stressful academic situations.

Physical Postures (Asanas)

The physical postures in yoga, or **asanas**, promote both mental and physical health. By improving flexibility, strength, and posture, asanas help relieve the tension built up from long hours of studying, sitting, or using electronic devices. These physical benefits, in turn, alleviate the physical symptoms of anxiety, such as muscle tightness and headaches. Asanas like **Child's Pose** (Balasana) and **Cat-Cow Pose** (Marjaryasana-Bitilasana) can relax the body, allowing students to release stress physically and mentally. Moreover, regular yoga practice has been linked to increased serotonin levels, which enhance mood and improve emotional stability (Field, 2011).

Restorative Yoga for Stress Relief

Restorative yoga focuses on relaxation and stress relief, using gentle postures and props like cushions or blankets to support the body in passive poses. Practices such as **Viparita Karani** (legs-up-the-wall pose) and **Supta Baddha Konasana** (reclining bound angle pose) activate the parasympathetic nervous system, allowing students to relax deeply. These poses help counter the mental and physical fatigue that often comes with intense academic work. Restorative yoga provides students with a calming practice that can be incorporated into their daily routines to release accumulated tension.

Empirical Evidence on the Effectiveness of Yoga for Students

Multiple studies have highlighted the benefits of yoga for students' mental health. Gothe et al. (2016) found that yoga significantly reduced symptoms of depression and anxiety, particularly when practiced regularly. The study also noted improvements in students' overall well-being and cognitive function. Similarly, Field (2011) demonstrated that yoga practices lead to lower levels of anxiety, improved focus, and better mood regulation in adolescents and young adults.

Khalsa (2013) also supports the idea that yoga improves students' ability to manage stress, noting that mindfulness-based yoga programs enhance emotional resilience, reduce stress levels, and improve mood, ultimately contributing to better academic performance.

Integrating Yoga into Student Life

Yoga can be easily integrated into a student's daily life, making it an accessible tool for mental health management. Many educational institutions now offer yoga sessions as part of their wellness programs, but students can also practice on their own. Short yoga sessions, lasting only 10 to 20 minutes, can fit into busy student schedules and provide significant mental health benefits.

Incorporating yoga during study breaks or before exams can enhance focus and reduce stress. Even simple practices such as mindful breathing or short stretches can offer students immediate relief from tension. Institutions can support students by providing spaces and resources for yoga practice, and by promoting yoga as an effective strategy for mental health.

Conclusion

Yoga offers a holistic and accessible solution to the anxiety and mental health challenges faced by students. Its combination of physical postures, breath control, and mindfulness practices provides students with effective tools for managing stress, improving emotional well-being, and fostering resilience. As research continues to demonstrate the effectiveness of yoga for mental health, it is essential for educational institutions to integrate yoga programs into their wellness initiatives. By doing so, they can offer students a valuable resource for maintaining mental health and improving academic performance, ultimately helping students thrive in both their academic and personal lives.

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THE ROLE OF YOGA IN ENHANCING SLEEP QUALITY AND MANAGING INSOMNIA AMONG COLLEGE STUDENTS

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Abstract

Sleep disturbances and insomnia are common among college students, often affecting their academic performance and overall health. This study explores the role of yoga in improving sleep quality and managing insomnia. Yoga practices, including pranayama, meditation, and restorative postures, promote relaxation, reduce stress, and regulate the sleep-wake cycle. Regular incorporation of yoga into students' routines has shown to enhance sleep duration and quality while alleviating symptoms of insomnia. The findings highlight yoga as an effective, non-pharmacological approach to improving sleep health, offering practical recommendations for integrating yoga into student wellness initiatives.

Keywords : Yoga, Insomnia, Mental Health, Pranayama, Meditation, Stress Reduction, Sleep-Wake Cycle, Non-Pharmacological Approach.

Introduction

Sleep disturbances and insomnia are common problems faced by college students, primarily due to the pressures of academic workload, social factors, lifestyle habits, and mental health challenges. Insufficient sleep can lead to a myriad of negative consequences, including impaired cognitive function, emotional instability, and physical health issues. Yoga, with its emphasis on physical movement, breath regulation, and mindfulness, has been recognized as a beneficial practice for improving sleep quality. This article examines how yoga can help enhance sleep and manage insomnia among college students by focusing on specific yoga techniques that promote relaxation, stress reduction, and better sleep hygiene.

Sleep Challenges Among College Students

The transition to college life often brings changes to students' routines, and many face challenges such as irregular sleep schedules, high levels of stress, and academic pressures that interfere with quality sleep. According to a study by LeBourgeois et al. (2017), college students are particularly susceptible to sleep deprivation, with 60-70% reporting insufficient sleep during the academic year. This is exacerbated by the increased use of electronic devices, caffeine consumption, and irregular sleep patterns. Chronic sleep deprivation in students has been linked to poor academic performance, mood disorders, and weakened immune function (Chellappa et al., 2016). Given these

concerns, it is essential to explore effective methods to improve sleep quality, with yoga emerging as a promising solution.

Yoga and Sleep Quality

Yoga integrates physical postures (asanas), controlled breathing (pranayama), and mindfulness practices (meditation) to improve both physical and mental health. These elements work together to alleviate the physiological and psychological factors that contribute to poor sleep, including stress, muscle tension, and racing thoughts.

Breathing Techniques for Relaxation

One of the most effective yoga practices for sleep improvement is **pranayama**, or breath control. Techniques like **Nadi Shodhana** (alternate nostril breathing) and **Ujjayi** (victorious breath) activate the parasympathetic nervous system, which triggers the body's relaxation response. Controlled breathing reduces the production of stress hormones like cortisol and helps lower heart rate, promoting a state of calm ideal for falling asleep (Telles et al., 2013). According to a study by Gothe et al. (2016), pranayama practice significantly improved sleep quality and reduced insomnia in participants suffering from stress-related sleep disturbances.

Restorative Yoga and Sleep

Restorative yoga, which focuses on relaxation through gentle postures and long-held poses, can be particularly effective for students struggling with sleep. Poses such as **Supta Baddha Konasana** (reclining bound angle pose) and **Viparita Karani** (legs-up-the-wall pose) help activate the body's relaxation mechanisms. These postures allow the muscles to relax and release built-up tension, signaling the body to prepare for sleep. According to Khalsa (2013), restorative yoga induces deep relaxation and helps students wind down, reducing the physical symptoms of insomnia.

Mindfulness and Meditation

Mindfulness meditation, another core element of yoga, involves focusing attention on the present moment and letting go of distracting thoughts. This practice is particularly beneficial for students who experience racing thoughts or anxiety at bedtime, making it difficult for them to fall asleep. Mindfulness-based practices have been shown to improve sleep quality by reducing rumination and stress, which are common barriers to restful sleep (Kabat-Zinn, 2003). Additionally, regular meditation increases melatonin production, further aiding in the regulation of the sleep-wake cycle.

Empirical Evidence on Yoga and Sleep Improvement

Several studies have highlighted the positive effects of yoga on sleep quality in college students. A study by Gothe et al. (2016) found that participants who practiced yoga regularly reported better sleep quality, fewer instances of insomnia, and improved mood. Similarly, Sharma and Haider (2017) demonstrated that yoga and meditation led

to significant improvements in sleep duration and quality in university students, particularly those with stress-related sleep issues.

In another study, Khalsa (2013) found that a six-week yoga intervention improved sleep quality and reduced anxiety in students, with those practicing yoga reporting better overall well-being. The study concluded that yoga practices could serve as an effective tool for managing insomnia and enhancing sleep quality in student populations.

Yoga for Better Sleep Hygiene

In addition to specific yoga poses, incorporating yoga into a student's overall routine can help improve sleep hygiene. Yoga encourages students to engage in a winding-down routine that supports better sleep, such as practicing yoga before bed to relax both the mind and body. Creating a consistent evening routine, free from distractions like electronic devices or excessive caffeine, can help reinforce healthy sleep habits. Yoga provides a holistic approach, not just for improving the quantity of sleep, but also for fostering an environment conducive to restorative rest.

Conclusion

Yoga offers a comprehensive and effective solution for managing insomnia and improving sleep quality among college students. By incorporating practices such as pranayama, restorative yoga, and mindfulness meditation, students can reduce stress, calm their minds, and promote better sleep hygiene. As the benefits of yoga continue to be supported by empirical research, it is essential that educational institutions and students recognize the importance of incorporating yoga into daily routines to address sleep challenges. Future studies could explore long-term yoga interventions and their effects on sleep quality in college populations, providing further evidence of yoga's effectiveness in promoting mental and physical well-being.

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COMPARING MUSCLE ACTIVATION AND KINEMATIC ANALYSIS IN UNIVERSITY BASKETBALL PLAYERS' NARROW-BASE AND SHOULDER-WIDTH PUSH-UP VARIATIONS

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Abstract

Numerous studies have been conducted on push-up exercises, and the results are widely known. The use of standard shoulder-width push-ups (SWPP) in contrast to narrow-width push-ups (NWPP) in personal fitness training, however, is not well supported by scientific research. The purpose of this study was to compare the triceps brachii's electromyography activity and kinetic analysis during NWPP and SWPP exercises. Method: For this study, one healthy male basketball player from Central University (age = 25 years, weight = 65 kg) volunteered. Both typical shoulder-width push-ups (SWPP) and narrow-width push-ups (NWPP) were completed by the subject five times each, and variables were repeatedly measured. Results: The two exercises were compared in terms of the triceps brachii's mean peak and normalized electromyography (EMG) values. With EMG activity readings of 5.11 ± 1.97 mV and 105.83 ± 18.54 %MVC, the NWPP produced increased activity. The SWPP, on the other hand, generated EMG readings of 74.32 ± 16.9 %MVC and 3.91 ± 1.36 mV. Conclusion: With their increased triceps activation and more effort, narrow-width push-ups can be regarded as a more complex form of the classic shoulder-width push-up.

Introduction

Push-ups are a fundamental exercise in strength and conditioning regimens and are frequently used in gymnastics and other sports. Because their sport incorporates weight-bearing hand moves like handstands and push-ups, gymnasts need to have a high level of upper body strength, stability, and endurance. The shoulder-width (SWPP) and narrow-based (NBPP) push-ups are two popular versions that are frequently used to target various muscle groups and training objectives. One of the most well-liked and frequently performed upper-body exercises in strength and conditioning regimens is the push-up. Push-ups are a bodyweight exercise that helps build strength and endurance in the upper extremities, especially the triceps, shoulders, and chest. However, a number of variables, including hand placement, might affect how effective push-ups are. Although personal trainers, fitness instructors, and physical education (PE) instructors frequently change the hand placement to change the intensity of an activity, little is known about how these hand modifications affect kinematics and electromyography (EMG). There is a dearth of thorough kinetic and EMG data to support the efficacy of various hand

postures, even though push-ups have been employed in fitness evaluations for a long time (An et al., 1992). The majority of push-up biomechanics research has been on upper extremity muscle activation and joint load (An et al., 1990; Donkers et al., 1993). There are, however, few research looking at how differences in hand width affect muscle activation, particularly for the triceps brachii. The purpose of this study is to examine the triceps brachii's electromyographic and kinetic data during shoulder-width push-ups (SWPP) and narrow-base push-ups (NWPP).

Literature Review

In biomechanics, push-ups have been thoroughly examined, with an emphasis on the activation of the muscles in the upper extremities. Wider hand positions emphasize chest activation, while narrower positions recruit the triceps, according to research that shows hand placement has a major impact on muscle recruitment (Donkers et al., 1993). Research on hand placement also points to variations in muscle activation patterns, joint angles, and load distribution (Lear & Gross, 1998; Ludewig et al., 2004). Notwithstanding these conclusions, there are still discrepancies in the literature, with some research indicating that hand posture has little bearing on muscle activation (Leedam & Dowling, 1995).

Because different skills put strain on the shoulders, chest, and triceps, it is essential for gymnasts to develop their upper-body strength. Mankowski et al. (2016) looked into how different push-ups affected college gymnasts' upper-body strength. Throughout a 12-week training phase, the researchers contrasted shoulder-width and narrow-based push-ups. According to their findings, narrow-based push-ups were more successful at targeting the triceps than shoulder-width push-ups because they caused a larger activation of the triceps brachii. However, the shoulder-width variation was more appropriate for upper-body growth overall since it demonstrated greater activation in the pectoralis major (Mankowski et al., 2016).

Adding to this, Simpson and Drury's (2018) study examined how well push-up variations translate to gymnastic skills like the planche and handstand push-up. The researchers discovered that narrow-based push-ups improved triceps strength and shoulder stability, which helped gymnasts perform routines that called for tight arm postures. The iron cross on the rings, on the other hand, benefited from the general strength that shoulder-width push-ups provided (Simpson & Drury, 2018).

In Push-Up Variations, electromyographic activity provides a fuller comprehension of the skeletal muscle reaction. When assessing the degree of muscular activation during exercise, EMG tests are crucial. Numerous studies have looked at the variations in EMG between shoulder-width and narrow-based push-ups, particularly in gymnasts who need to recruit specific muscles. In a 2019 study, Jang et al. investigated the EMG activity of the anterior deltoid, pectoralis major, and triceps during shoulder-width and narrow-based push-ups in professional gymnasts. The triceps brachii were shown to be significantly more activated during narrow-based push-ups, but the pectoralis major and anterior deltoid were found to be more activated during shoulder-width push-ups (Jang et al., 2019).

Materials and Methods

Background

To comprehend how various variations in hand position as a basis during push-up exercises relate to kinematics. Variations in hand position during exercises including internal rotation (IR), external rotation (ER), wide width, shoulder width, and narrow width were included in previous push-up investigations (6, 7, 11, 17, and 21). The current study aims to analyze the movement's impact on the pectoralis major and triceps brachii muscles as well as which hand positions result in a higher EMG response. In contrast to the standard posture from which the exercise is performed, the shoulder width base position (SWPP), we choose to perform with the hands in a narrow width (NWPP). Surface EMG signals at the tricep brachii and pectoralis major were obtained using a surface electrode, and sagittal plane video recording was used to record the motion involved in executing the various push-up exercises. The strength of the EMG generated by the muscle is determined by the motor unit activation pattern.

Procedure

Prior to applying the electrodes, the patients' skin was prepped by shaving, using a scrubbing pad to remove any dead skin, and then cleaning with alcohol. Bipolar electrodes were positioned bilaterally on the sides of the body on the triceps brachial (T) and pectoralis major (PM) muscles, parallel to the path of the muscle fibers. The electrodes were positioned using the procedures outlined by Cram et al. (1998). Bilateral reflective tape markers were positioned at the estimated center of rotation of the middle phalanx of the middle finger, lateral epicondyle elbow, ulnar styloid process of writ, and greater tubercle shoulder.

Testing Procedure

Subjects were placed in a prone position following a static stretching warm-up. NWPP and SWPP hand placements were indicated, with shoulder width beneath the shoulder joint and narrow width just below the sternum. The purpose of base setup was to designate the locations of the hands and feet. Initially, the standard position was assumed in a prone position, with the hands placed shoulder-width apart, narrowly below the sternum, and the torso aligned with the feet on the floor. Following that, tape strips were used to designate the locations of the hands and feet. Strips indicating the locations of the hands and feet were laid out on the floor after the measurements of arm-forearm length and shoulder breadth (interacromial distance). Positions were marked using tape, and measurements including arm-forearm length and interacromial distance were noted. A metronome set controlled cycles for the push-ups, with each repetition lasting two seconds.

Experimental Task

Based on earlier studies by Gouvali and Boudolos (2005), push-up postures and rates were standardized to guarantee uniformity among sessions. This made it possible to compare NWPP and SWPP in a controlled manner. A metronome was used to regulate

the pace at which the push-ups were completed (the entire push-up cycle, starting at the “top” position, was fixed at 2s). We adhered to the workout postures and the rate was standardized based on the findings of Gouvali and Boudolos (2005).

Participants

For this investigation, a single, healthy male gymnast (age: 25; weight: 65 kg) volunteered. The person had previously done push-ups and had no history of upper limb injuries. The study was carried out in accordance with institutional ethics regulations.

Data Reduction

Surface electromyography was used to record the activity of the muscles. Every raw myoelectric signal was preamplified (gain $\times 1,000$) and the sampling frequency was 1,000 Hz. Surface electrodes from Delsys were gathered using a 1000 Hz signal frequency. Following signal correction, each muscle's root mean square (RMS) value was determined during two different kinds of push-up exercises. The RMS values at NWPPV were expressed in relation to the peak value of repetition, while the RMS value of the push-up at the SWPP position served as the reference. Redlake Motion Pro Cameras-SII motion was used to record a high-speed video at 50 frames per second in order to screen the precise movement of each push-up type for 2D analysis. The angle, acceleration, and velocity were then assessed and analyzed using SD and mean difference.

Statistical Analysis

Dynamic variables are calculated using descriptive statistics. The dependent variables were compared between exercise and, when appropriate, bilaterally between the right and left sides using repeated measure analyses of variance (general linear model). Statistical significance was defined as a p-value of less than .05. SPSS software for Windows was used to carry out the statistical procedure. For every kind of push-up activity, the EMG readings were analyzed and expressed in RMS. For results and discussion, the average mean value is utilized.

Results

EMG data process

Flexion and extension are the standard pattern of movements used in push-up exercises. Elbow flexion occurs when the chest gets close to the floor, and extension occurs when the elbows are extended till the starting position is reached. The root mean square (RMS) is used to process the pattern of EMG responses during the test; the mean average of each repetition of either type of push-up is shown in table 1. The EMG response of the triceps brachii in NWPP is somewhat higher than that of SWPP. Despite the subject's left-handed dominance, the results show that the right hand's triceps had a greater EMG response during both exercise variations.

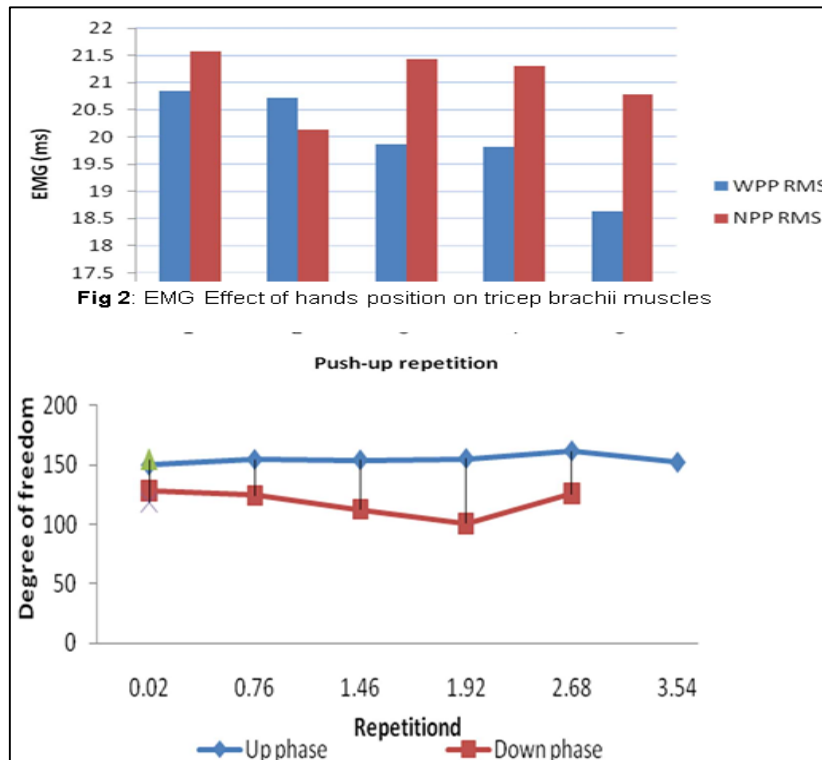
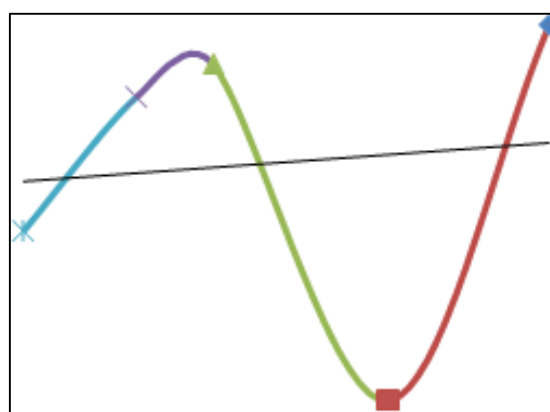


Fig 3: Range of motion during SWPP (top) and NWPP (bottom)

EMG amplitude and elbow joint angle relationship

Joint angle and EMG amplitude change have a linear relationship with a coefficient correlation of 0.099 during NWPP ($F=10.59$) and 0.882 during SWPP (see figure 4).

$$y = 0.0109x + 19.522 \quad R^2 = 0.0098$$



Angle (degrees of flexion)

Fig 4: The relationship between joint angle and rms EMG of tricep brachii, during NWPP. The mean average of repetition presented

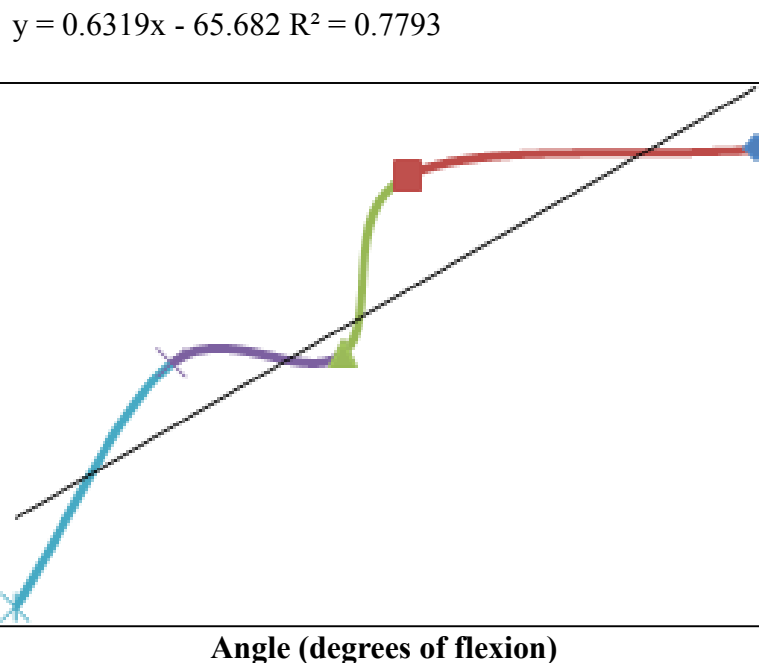


Fig 5: The relationship between joint angle and rms EMG of tricep brachii, during SWPP. The mean average of repetition presented

Discussion

The findings of this study demonstrate that the location of the hands during push-ups has a major effect on muscle activation, especially in the triceps brachii. When compared to shoulder-width push-ups (SWPP), narrow-width push-ups (NWPP) produced higher EMG activity and larger MVC in the triceps, suggesting a more intense contraction in the narrower variety. These results are consistent with earlier research by Donkers et al. (1993), who also noted that closer hand placement increased triceps activation. This study adds credence to the idea that narrower hand postures are better for strengthening the triceps because they target the muscle more efficiently.

The study's kinetic data supported the EMG results by showing that NWPP puts more strain on the elbow joint, which probably explains the increased muscle activity. In contrast, SWPP lessens the involvement of the triceps by distributing the weight more evenly between the shoulders and elbows. These findings are consistent with previous research by Jang et al. (2019), which similarly found that SWPP had a more balanced load distribution while NWPP had more triceps activation. The disparities in load distribution imply that NWPP is better suited for targeted triceps training, whilst SWPP would be more appropriate for overall upper-body conditioning.

Curiously, other research suggested that changing joint angles had minimal impact on EMG activity, as stated by Leedam and Dowling (1995). The results of the current investigation, however, run counter to these conclusions because the hand position and related adjustments to joint angles had a substantial impact on the activation of the pectoralis major and triceps muscles. This discrepancy may result from variations

in subject populations or methodology, underscoring the need for additional study to elucidate the connection between muscle activation during push-ups and joint angles.

Table 3. Range of motion (mean+/-SD) during push-up

	Extension	Flexion
SWPP	164.99 +/- 3.09	96.91 +/- 6.20
NWPP	154.45 +/- 3.96	118.23 +/- 11.51

In comparison to SWPP, NWPP showed a greater flexion angle (118.23 ± 11.51) but a smaller extension angle (154.45 ± 3.96). This increased range of motion in flexion implies that NWPP involves a longer range of elbow movement in addition to improving triceps activation, which may be one of the reasons for its higher muscle demands. These kinematic results are in line with research by Gouvali and Boudolos (2005), who discovered that the mechanical stress on the triceps increases with deeper flexion during push-ups.

Furthermore, the EMG amplitude results of the study lend credence to Decker et al.'s (1999) suggestion that exercises with larger average amplitudes offer more muscle demands. Strength and endurance training may benefit from the higher contractile demand implied by the larger EMG amplitude seen in NWPP. Furthermore, Weede and Kraemer (2002) pointed out that narrow-based push-ups are thought to isolate the triceps more well, and the findings of this study support this notion.

The information also indicates that NWPP is a more difficult workout for building muscle because it uses more motor units in the triceps brachii than SWPP. The results of Donkers et al. (1993), who documented comparable outcomes for triceps activation and motor unit recruitment, corroborate this. According to previous research, the higher activation during NWPP is probably caused by the larger internal moment needed at the elbow joint.

Although the triceps activation was the main focus of this investigation, the results also show that it can be difficult to appropriately quantify pectoralis major activity because of possible electrode positioning issues. The idea that SWPP is beneficial for total chest growth is supported by earlier study by Simpson and Drury (2018), which suggested that SWPP may elicit higher pectoralis major activation. Future research should investigate more accurate techniques for assessing pectoralis major activation during various push-up variations in light of these constraints.

In summary, this study's findings are consistent with other studies that have been done in the last ten years, confirming that SWPP offers a more well-rounded upper-body workout whereas NWPP is better at targeting the triceps brachii. The two push-up variations' distinct strengths are demonstrated by its kinematic and kinetic characteristics, with SWPP providing a wider range of upper-body engagement and NWPP being more suited for triceps isolation. For athletes, especially those participating

in sports like gymnastics, where focused strength training is essential for success, these findings provide insightful information.

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DIGITAL HUMAN RESOURCE MANAGEMENT POLICIES AND INITIATIVES IN PUBLIC SECTOR IN INDIA

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Abstract

This research paper aims to streamline HR processes, improve efficiency, and enhance employee satisfaction by leveraging technology. These policies are in line with the government's broader Digital India initiative. Below are some key aspects of digital HRM policies in the Indian public sector. The development of Human Resource Management (HRM) policies in India has been shaped by the country's socio-economic, technological, and legislative changes. Below is a comprehensive overview of its evolution. HR practices were centered around administrative control and personnel management, primarily influenced by British policies. The focus was on basic labor welfare without employee engagement or development. Initial labor legislation like the Factories Act, 1881, and Trade Union Act, 1926, laid the groundwork for regulating working conditions and labor relations. After independence, HRM in India prioritized worker welfare and industrial relations, reflecting the socialist agenda of the government. Key legislative developments included. The government promoted Public Sector Undertakings (PSUs), where HR policies emphasized employee welfare, union relations, and job security. Economic reforms in 1991 marked a significant shift. HRM policies started integrating global best practices.

Introduction

Recruitment became merit-based with reduced union influence. Focus on performance management and employee development. Early adoption of technology for payroll management and record-keeping began in this period. Efforts to consolidate and simplify labor laws gained traction, aiming for business-friendly regulations. Organizations began recognizing HR as a driver of organizational success. Revisions in labor laws, like the introduction of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, emphasized workplace inclusivity. Launch of eHRMS (Electronic Human Resource Management System) for centralized HR management in public sectors. Employee lifecycle management (recruitment, onboarding, and retirement). Data-driven decision-making using analytics. Consolidation into four codes (wages, industrial relations, social security, and occupational safety) for ease of compliance. HRM policies in India have transitioned from labor welfare to strategic, employee-centric management. The focus has shifted toward leveraging technology, enhancing employee satisfaction, and aligning HR practices with organizational goals in a globalized environment. Future policies are likely to be shaped by technological innovations and evolving workplace dynamics.

1. eHRMS (Electronic Human Resource Management System)

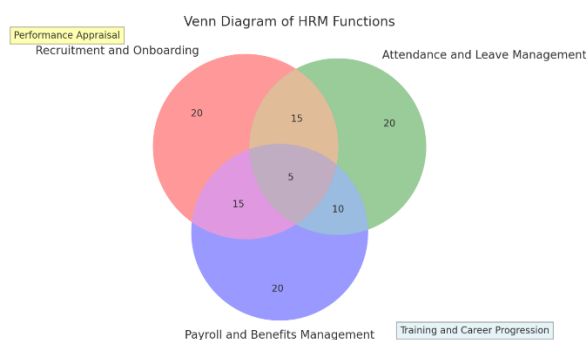
The Government of India has implemented eHRMS to provide a centralized platform for managing employee records.

It includes modules for:

1. Recruitment and onboarding
2. Attendance and leave management
3. Payroll and benefits management
4. Performance appraisal
5. Training and career progression

Example:

The Manav Sampada Portal, developed by NIC (National Informatics Centre), is widely used in state governments for workforce management.



2. Digital Attendance Systems

Public sector organizations use Aadhaar-enabled Biometric Attendance Systems (BAS) to monitor employee attendance effectively.

This ensures transparency and minimizes irregularities.

Example:

Most Central Government offices have adopted BAS for real-time attendance tracking.

3. Online Recruitment Portals

Recruitment processes in the public sector are being digitized to enhance transparency and reduce delays.

Platforms like the Union Public Service Commission (UPSC) and State Public Service Commissions facilitate online applications and examinations.

4. Learning and Development (L&D) Platforms

Initiatives like iGOT (Integrated Government Online Training) provide online training modules for government employees.

These platforms ensure continuous skill development, especially in areas like governance, IT, and public policy.

5. Grievance Redressal Mechanisms

Digital platforms for employee grievance redressal ensure faster resolution of workplace issues. Example:

The CPGRAMS (Centralized Public Grievance Redress and Monitoring System) is used for addressing employee grievances.

6. Digitized Service Books

Employee service records are digitized to eliminate manual paperwork and enable easy access to details like promotions, transfers, and retirement benefits.

Example:

The eHRMS Manav Sampada service book feature is a major implementation in this area.

7. Automation of HR Processes

Use of Artificial Intelligence (AI) and Machine Learning (ML) for predictive analytics in workforce management, identifying training needs, and optimizing resource allocation.

8. Compliance with Data Privacy

Digital HRM policies emphasize compliance with laws like the Information Technology Act, 2000 and ensure employee data protection in line with the proposed Digital Personal Data Protection Act (DPDPA), 2023.

Challenges in Implementation

- a. Resistance to change from traditional methods.
- b. Inadequate digital literacy among employees.
- c. Cybersecurity risks.
- d. Integration of legacy systems with new digital frameworks.
- e. By adopting digital HRM practices, the public sector in India is moving towards greater efficiency, transparency, and accountability in human resource management.

Digital HRM Policies and Initiatives in India

Digital HRM policies in the Indian public sector have significantly transformed traditional human resource practices, enabling efficiency, transparency, and improved governance. Below is an in-depth look into key initiatives and their implementation:

1. eHRMS (Electronic Human Resource Management System)

Centralized management of employee records, including recruitment, attendance, leaves, promotions, and retirement. Modular structure with functions like payroll, performance appraisal, and grievance management. Accessibility through secure web portals. Adopted by central and state governments to streamline HR operations. Example: Manav Sampada Portal, developed by the National Informatics Centre (NIC), serves as a unified platform for HR management in various states like Himachal Pradesh and Uttar Pradesh. Elimination of redundant paperwork and manual errors.

Increased transparency in processes like transfers and promotions. Enhanced decision-making through real-time employee data access.

2. Digital Attendance Systems

Aadhaar-enabled Biometric Attendance Systems (BAS) have been deployed in government offices to ensure accountability. Integration with Aadhaar provides authentication and prevents proxy attendance. Significant improvement in employee punctuality and discipline. Real-time monitoring of attendance data via mobile and web dashboards.

3. Online Recruitment and Talent Acquisition

UPSC Online Portal: Simplifies application processes for civil service and other competitive exams.

State-specific portals like APPSC (Andhra Pradesh Public Service Commission) manage state-level recruitment efficiently. Transparent and merit-based recruitment processes.

Reduced delays and streamlined application handling.

4. Training and Development

Platform: iGOT (Integrated Government Online Training)

A digital platform offering a wide range of online training programs for government employees.

Modules include governance, public service delivery, IT skills, and specialized programs like disaster management. Enhanced employee skills and knowledge base.

Accessibility to training, even in remote locations, through an online medium.

5. Grievance Redressal Mechanisms

Example: CPGRAMS (Centralized Public Grievance Redress and Monitoring System)

A digital platform allowing employees to lodge grievances related to workplace issues, salaries, or benefits. Features tracking and escalation mechanisms for unresolved complaints. Faster grievance resolution, leading to improved employee satisfaction. Real-time monitoring of grievance statistics for policy adjustments.

6. Digitization of Service Records

Conversion of traditional service books into electronic formats to ensure accuracy and accessibility. Example: Manav Sampada's e-Service Book module has been widely implemented across multiple states. Easy tracking of an employee's career history, including promotions, leaves, and retirement benefits. Reduction in discrepancies during service and post-retirement settlements.

Conclusion

Digital HRM initiatives like eHRMS, biometric attendance, and online training have reshaped the way human resources are managed in the Indian public sector. These initiatives have brought transparency, efficiency, and scalability, addressing challenges like manual errors and procedural delays while fostering an environment of accountability and employee engagement.

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INFLUENCE OF SPECIFIC STRENGTH TRAINING ON SELECTED STRENGTH VARIABLES AMONG THROWERS

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Abstract

The purpose of the study was to find out the influence of specific strength training on selected strength variables among throwers. For this purpose, thirty (n=30) male throwers were selected from To achieved this purpose of this study, thirty male throwing athletes were selected from three colleges such as The M.D.T Hindu College, Sadakathullah Appa College and Einstein College of Arts and Science, Seethaparpanallur. The selected subjects were reported at Anna Stadium, Tirunelveli district for the training program. The participant's age ranged between 18 and 23 years. The selected participants were divided into two groups of fifteen each namely experimental group and control group. The experimental group I underwent Bilateral training for duration of six weeks with three days per week and group-II acted as control group. The criterion variables selected for this study were arm strength endurance, abdominal strength, arm explosive strength and leg maximum strength. The selected variables were assessed prior to and immediately after the training period by using the standardized test items. The experimental design used in this study was pre and post-test particular group design involving 30 participants who are divided at random into two groups of fifteen each. No attempt was made to equate the groups in any manner. Hence, to make adjustments for differences among the groups, the analysis of covariance (ANCOVA) was used. In all the cases 0.05 level was fixed as significant level to test the hypotheses. The result of the study indicated that the experimental group namely bilateral training group had shown significant improvement on selected strength variables among throwers. The control group had not shown significant changes in any of the selected variables. The results of the study indicate that the bilateral training had registered significant level difference in arm strength endurance, arm explosive strength when compared to control group among the throwers.

Key Words: Arm Strength, Explosive Strength, Specific Strength Training.

Purpose of the Study

The purpose of the present study was to find out the influence of specific strength training on selected strength variables among throwers.

METHODOLOGY

Selection of Participants

The purpose of this study was to find out the influence of specific strength training on selected strength variables among throwers. To achieve the purpose of the

study, thirty (n=30) male throwers were specifically selected three colleges such as The M.D.T Hindu College, Sadakathullah Appa College and Einstein College of Arts and Science, Seethaparpanallur. The age of participants were ranged from 18 to 23 years. All the participants were informed about the nature of the study and their consent was obtained to cooperate till the end of the experiment and testing period.

Selection of Variables

The research student reviewed the available of books, journals, periodicals, e-sources, unpublished thesis and dissertation. Keeping in mind the opinion of the experts, availability of equipment's acceptability of the participants and the time to be derived the following variables were selected namely:

Dependent Variables

- ❖ Arm Strength Endurance
- ❖ Arm Explosive Strength

Independent Variables

- ❖ Specific Strength Training

Selection of Tests

The present study was undertaken primarily to assess the specific strength training selected strength variables among throwers. The selected variables were tested by using the following standardized test and they are presented in Table 1.

Selection of Test -1

SL.NO	Variables	Test	Measuring Unit
1	Arm Strength Endurance	Pushups	No of counts
2	Arm Explosive Strength	Medicine Ball Throw	meters

Pilot Study

Three months before the commencement of the main study the pilot study was conducted, the reliability of the data was established by using 5 subjects at random. Test and re-test method was executed to ensure reliability. One-day rest was given to all the subjects in between the test and re-test. The same testing method personalized by using the same equipment under identical conditions tested all the variables selected in the present investigation twice on the same subjects.

The intra class co-efficient of correlation was used to find out the reliability of the data.

Table – 2. Intra Class Coefficient of Correlation on Selected Variables

Sl. No	Variables	R –Value
1	Arm Strength Endurance	0.93*
2	Arm Explosive Strength	0.87*

*Significant at 0.05 level of confidence. Table value required for significance at 0.05 level of confidence df was 0.77.

Statistical Technique

The data were statistically analyzed with dependent “t” test and Analysis of Co-Variates (ANCOVA). In all the cases .05 levels will be fixed as level of confidence to test the hypotheses.

Analysis and Interpretation of Data

Table -3. Summary of Mean and Dependent-’t’-test for the Pre and Post tests on Arm Strength Endurance of Experimental Group and Control Group

Tests		Pre Test	Post Test	‘t’ - Value
Experimental Group	Mean	26.33	30.20	14.13*
	SD	2.06	2.03	
Control Group	Mean	25.89	26.42	1.08
	SD	2.14	2.63	

*Significant at .05 level. The table value required for 0.05 level of significance with df 14 is 2.145.

The table 3 shows that the pre-test mean value of experimental group and control group are 26.33 and 25.89 respectively and the posttest means are 30.20 and 26.42 respectively. The obtained dependent t-ratio values between the pre and posttest means of experimental group and control group are 14.13 and 1.08 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.145. Since, the obtained ‘t’ ratio value of experimental group are greater than the table value, it is understood that experimental group had significantly improved the arm strength endurance. However, the control group has not improved significantly. The obtained-’t’ value is less than the table value, as they were not subjected to any specific training.

Table 4. Analysis of covariance on Arm Strength Endurance of Experimental Group and Control Group

Adjusted Post Test Means		Source of Variance	Sum of Square	Df	Means Square	F-ratio
Experimental Group	Control Group					
30.48	26.83	Between	73.62	1	73.62	21.08*
		With in	95.58	27	3.54	

*Significant at .05 level. The table value required for significance at 0.05 level with df 1 and 27 is 4.41.

Table 4 shows that the adjusted posttest means of experimental group and control groups are 30.48 and 26.83 respectively. The obtained F-ratio value is 21.08 which were greater than the table value 4.41 with df 1 and 27 required for significance at 0.05 level. Since the value of F-ratio is greater than the table value, it indicates that there is a significant difference among the adjusted post-test means of experimental group and control groups.

Arm Explosive Strength

The analysis of dependent-'t' test on the data obtained for arm explosive strength of the pre-test and post-test means of experimental group and control group have been analyzed and presented in Table 5.

Table 5. Summary of Mean and Dependent-'t'-test for the Pre and Post tests on Arm Explosive Strength of Experimental Group and Control Group

Tests		Pre Test	Post Test	't' – Value
Experimental Group	Mean	4.31	5.06	7.39*
	SD	0.22	0.27	
Control Group	Mean	4.28	4.33	1.64
	SD	0.26	0.29	

*Significant at .05 level. The table value required for 0.05 level of significance with df 14 is 2.145.

The table 5 shows that the pre-test mean value of experimental group and control group are 4.31 and 4.28 respectively and the posttest means are 5.06 and 4.33 respectively. The obtained dependent t-ratio values between the pre and posttest means of experimental group and control group are 7.39 and 1.64 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.145. Since, the obtained-'t' ratio value of experimental group are greater than the table value, it is understood that experimental group had significantly improved the arm explosive strength. However, the control group has not improved significantly. The obtained-'t' value is less than the table value, as they were not subjected to any specific training.

Table 6. Analysis of covariance on Arm Explosive Strength of Experimental Group and Control Group

Adjusted Post Test Means		Source of Variance	Sum of Square	Df	Means Square	F-ratio
Experimental Group	Control Group					
5.12	4.36	Between	25.41	1	25.41	26.11*
		With in	26.27	27	0.973	

*Significant at .05 level. The table value required for significance at 0.05 level with df 1 and 27 is 4.41.

Table 6 shows that the adjusted posttest means of experimental group and control groups are 5.12 and 4.36 respectively. The obtained F-ratio value is 26.11 which were greater than the table value 4.41 with df 1 and 27 required for significance at 0.05 level. Since the value of F-ratio is greater than the table value, it indicates that there is a significant difference among the adjusted post-test means of experimental group and control groups.

Conclusions

On the basis of the interpretation of the data, the following conclusions were drawn.

1. There was a significant improvement takes place on arm strength endurance due to the influence of six weeks specific strength training programme.
2. There was a significant improvement takes place on arm explosive strength due to the influence of six weeks specific strength training programme.

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EFFECT OF VIDEO MODELLING WITH VIDEO FEED BACK ON HIGH JUMP SKILLS

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Abstract

The Purpose of the present study was to examine the Effectiveness of combining video modelling with video feed back on the development of high jump technique. To achieve this purpose of the study 12 men students were selected at random as subject from the Sadakathullah Appa College, Palayamkottai. The selected participants were under went skill training with video modelling and video feed back for a period six weeks and three alternative days per week. The high jump technique and performance were selected as criterion variables and they were tested by using expert rating method and competitions method respectively .their age ranged from 21 – 25 years. The following variables were selected for this study such as explosive power, High jump performance, High jump techniques and Explosive power, The data collection from the group were statically using dependent t test to find out the significant improvement between the pre and post test means. There was a significant improvement on explosive power due to the effect of skill training with video modeling and video feedback, There was a significant improvement on high jump performance due to the effect of skill training with video modelling and video feedback, There was a significant improvement on high jump technique due to the effect of skill training with video modelling and video feedback.

Key Words: Explosive power, High jump performance, High jump techniques

Introduction

Behavioural procedures have proven to be effective in improving athletics performance across a diverse array of sports including basketball, tennis, swimming, football and gymnastics. To behavioural procedures used for improving skill executions are video feed back and video modelling by experts. Video feed back involves showing an athlete a video clip of his or her own performance of a particular skill (Austin, J. (2004) and video modelling involves presenting the athlete with a video clip of an expert performing the skills. The combined use of video modelling and feedback holds promise for improving the execution of complex athletic skills. Such as high jump fosbury flop techniques that require multiple precise body movement and positions.

Purpose of the study

The Purpose of the present study was to examine the Effectiveness of combining video modelling with video feed back on the development of high jump technique.

Methodology

To achieve this purpose of the study 12 men students were selected at random as subject from the Sadakathullah Appa College, Palayamkottai. The selected participants were under went skill training with video modelling and video feed back for a period six weeks and three alternative days per week. The high jump technique and performance were selected as criterion variables and they were tested by using expert rating method and competitions method respectively .their age ranged from 21 – 25 years.

Selection of variables

The following variables were selected for this study such as explosive power, high jump performance, and high jump techniques.

Table – I : Selection of Tests

SI. NO	VARIABLES	TESTS	UNIT OF MEASUREMENTS
1	Explosive power	Vertical jump	Centimetres
2	High jump performance	Competition method	Centimetres
3	High jump techniques	Expert rating method	Marks

Table – II : Intra Class Co- efficient of Correlation on Selected Dependent Variables

SI. NO	CRITERION VARIABLES	CORRELATION CO- EFFICIENT VALUE
1	Explosive power	0.90*
2	High jump performance	0.91*
3	High jump techniques	0.92*

*Significant at 0.05 level of confidence. (Table value required for significant at 0.05 level of confidence is 0.77)

Statistical procedure

All the subjects were tested on selected dependent variables before and after the treatment. The designed used for this is single group pre and post test random group design. The data collection from the group were statically using dependent t test to find out the significant improvement between the pre and post test means.

Analysis of data Explosive power

Table – III : Summary of mean standard deviation and dependent t test for pre and post tests on explosive power

TEST	NUMBER	MEAN	S.D	T-RATIO
Pre – test	12	40.42	5.07	16.3*
Post - test	12	46.00	4.99	

*significant at 0.05 levels. The table value required for significance 0.05 level for T test with DF 11 is 2.201.

Table III shows that, the obtained dependent t-ratio values between pre and post test mean is 16.3. the table value required for significant improvement with DF 11 at 0.05 level is 2.201. since the obtained t – ratio value is greater than the tabulated value, it is understood that there was significant improvement between pre and post test on explosive power due to the effect of video modelling with video feed back.

High jump performance

Table – IV : Summary of mean standard deviation and dependent t test for pre and post tests on high jump performance

TEST	NUMBER	MEAN	S.D	T-RATIO
Pre – test	12	112.50	14.22	18.8*
Post - test	12	126.08	15.88	

*significant at 0.05 levels. The table value required for significance 0.05 level for T test with DF 11 is 2.201.

Table IV shows that, the obtained dependent t-ratio values between pre and post test mean is 18.8. The table value required for significant improvement with DF 11 at 0.05 level is 2.201. since the obtained t – ratio value is greater than the tabulated value, it is understood that there was significant improvement between pre and post test on High jump performance due to the effect of video modelling with video feed back.

High jump technique

Table – V. Summary of mean standard deviation and dependent t test for pre and post tests on high jump technique

TEST	NUMBER	MEAN	S.D	T-RATIO
Pre – test	12	3.42	0.57	14.1*
Post - test	12	5.92	0.70	

*significant at 0.05 levels. The table value required for significance 0.05 level for T test with DF 11 is 2.201.

Table V shows that, the obtained dependent t-ratio values between pre and post test mean is 14.1. the table value required for significant improvement with DF 11 at 0.05 level is 2.201. since the obtained t – ratio value is greater than the tabulated value, it is understood that there was significant improvement between pre and post test on High jump technique due to the effect of video modelling with video feed back.

Conclusion

The following conclusion has been derived from the present study.

- ❖ There was a significant improvement on explosive power due to the effect of skill training with video modeling and video feedback
- ❖ There was a significant improvement on high jump performance due to the effect of skill training with video modelling and video feedback
- ❖ There was a significant improvement on high jump technique due to the effect of skill training with video modelling and video feedback

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EFFECT OF ASANAS PRACTICES ON PHYSIOLOGICAL VARIABLES AMONG HANDBALL PLAYERS

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ABSTRACT

The purpose of the study is to assess the effect of asanas on the selected physiological variables among Handball players. To achieve the purpose of the study, thirty super senior Handball players were selected as subjects at random. The age of the subjects were ranged from 14 to 17 years. The selected subjects were divided into two groups of 15 each. Group I underwent asanas practices for six weeks and Group II acted as control who did not take part in specific practices. Asanas was selected as independent variables. Resting pulse Rate, Breath Holding Time was selected as dependent variables for this study as criterion variables. Analysis of covariance (ANCOVA) was used and the 'F' ratio was found out. In all the cases to test the significance, 0.05 level of significance was fixed. The experimental group namely Asanas practices group have achieved significant improvement on resting pulse rate and breath holding time when compared to the control group. Significant differences were found between asanas practices and control groups towards improving the selected variables such as resting pulse rate and breath holding time.

Key words: *Asanas Practices, Handball, Breath Holding Time, resting Heart Rate.*

Introduction

Physical education is an educational process that has its aim the improvement of human performance through the medium of physical activities. Selected to realize this outcome. Physical education includes the acquisition and refinement of motor skills, the development and maintenance of fitness for optimal health and well-being, the attainment of knowledge and the growth of positive attitudes toward physical activity (**Charles and Wuest, 1987**). "Sports is our cultural heritage, work and play daily is the best way to me tension free life". Pavlich states sports has many sides. It has been described as phenomenon, which demands complete relaxation and full effort, it can be a casual diversion of a complete fulfillment, it shapes man and shaped by man, whatever else it is, sports is a 'thing' of remarkable power (**Mary Palvich, 1987**). The word yoga is derived from the Sanskrit root yuj. Yoga means to "Yoke", to "Bind", to "Link", to "Connect" or to "Merge". Yoga joins body and mind together. The merger of soul with god, and the experience of oneness with Him-is Yoga. It is possible only through the control over sense organs and through continued practice and detachment. According to the great sage Patanjali, "The withdrawal of sense organs from their worldly objects and their control is Yoga" (**Maratha S, 1992**).

Purpose of the study

The purpose of the study is to assess the effect of asanas practice on selected physiological variables among Handball players

Methodology

To achieve the purpose of the study, thirty super senior Handball players were selected as subjects at random. The age of the subjects were ranged from 14 to 17 years. The selected subjects were divided into two groups of 15 each. Group I underwent asanas practices for six weeks and Group II acted as control who did not take part in specific practices.

Asanas was selected as independent variables. Since Asanas exercise practices causes changes in the above said variables, the following dependent variables were selected for this study as criterion variables.

- 1) Resting pulse Rate
- 2) Breath Holding Time

The data collected from the three groups were statistically analyzed for significance, the analysis of covariance (ANCOVA) was used and the 'F' ratio was found out. Hence to make the adjustments for difference in the initial means and test the adjusted post test means for significant difference, the analysis of covariance was used. In all the cases to test the significance, 0.05 level of significance was fixed.

Analysis and interpretation of data

Table I: Analysis of covariance on resting pulse rate of asanas practices group and control group

Adjusted post test means		Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Asanas Practices Group	Control group					
68.52	72.50	Between	1714.12	1	1714.12	4.70*
		Within	9845.65	27	364.65	

*Significant at .05 level of confidence.

(The table value required for significance at .05 levels with df 1 and 27 is 4.21)

Table I shows that the adjusted post-test means of asanas practices group and control group are 68.52 and 72.50 respectively. The obtained F-ratio value is 4.70 which is higher than the table value 4.21 with df 1 and 27 required for significance at .05 level. Since the value of F-ratio is higher than the table value, it indicates that there is significant difference and improvement exists between the adjusted post-test means of asanas practices and control groups.

Table II: Analysis of covariance on breath holding time of asanas practices group and control group

Adjusted post test means		Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Asanas Practices Group	Control Group					
32.10	25.14	Between	687.45	1	687.45	7.28*
		Within	2548.75	27	94.40	

*Significant at .05 level of confidence.

(The table value required for significance at .05 level with df 1 and 27 is 4.21)

Table II shows that the adjusted post-test means of asanas practices group and control group are 32.10 and 25.14 respectively. The obtained F-ratio value is 7.28 which is higher than the table value 4.21 with df 1 and 27 required for significance at .05 level. Since the value of F-ratio is higher than the table value, it indicates that there is significant difference and improvement exists between the adjusted post-test means of asanas practices and control groups.

Conclusions

From the analysis of the data, the following conclusions were drawn.

1. The experimental group namely Asanas practices group have achieved significant improvement on resting pulse rate and breath holding time when compared to the control group.
2. Significant differences were found between asanas practices and control groups towards improving the selected variables such as resting pulse rate and breath holding time.

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EFFECT OF WATER THERAPY ON TEMPERATURE REGULATION, RESTING HEART RATE AND BODY WEIGHT AMONG EARLY ADULTHOOD

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Abstract

The purpose of the study was to find out the effect of water therapy on temperature regulation, resting heart rate and body weight among adults. To achieve the purpose of the study 10 subjects were selected from the Department of Physical Education and Sports, Manonmaniam Sundaranar University, Tirunelveli. The selected subjects were aged between 21 to 27 years. The selected subjects were underwent water therapy for a duration of 10 working days. Temperature Regulation and Blood Pressure were selected as criterion variables for this study. During the training period, the experimental group took (drink) 1.25 liter of water every day in the morning up to 10 days. All the subjects involved in this study were carefully monitored throughout the training programme to be away from injuries. The training programme was scheduled for the morning between 5.30 am and 6.30 am. The collected data from the experimental group on pre and post experimentation were statistically analyzed by using dependent – t- test. In all the cases .05 level of significance was fixed to test the hypothesis. There was significant reduction on temperature and heart rate due to water therapy and insignificant difference was found on weight.

Key Words: Temperature Regulation, Blood Pressure, Resting Heart Rate

Introduction

Water is an extremely essential part of any healthcare plan. The human body is essentially 75% water. Losing only 1-2% of your body's water can result in dehydration. Water not only suppresses appetite, but the more water a person drinks, the more the body releases the stored water (what we sometimes call 'retaining water'). After drinking cold water, the body will heat that water up to body temperature and expend calories in the process. Water is also an important ingredient in preventing constipation, and helping with diarrhea. Drinking enough water each day will help the digestive system work properly. Water is the human body's most important need. (Karen L Barker. 2003).

By drinking plenty of water each day, you help your body stay hydrated enough, so that it doesn't need to extract much water at all from the solid waste materials that are moving through the colon. Since the waste material keeps its water, it stays soft and pliable so that it's able to move through the colon at a much easier and faster rate. One of the important jobs of water is to help your kidneys remove wastes like uric acid, urea,

and lactic acid. If you do not have enough water to dissolve the wastes then they cannot be removed effectively and you run the risk of kidney damage (Collins English Dictionary, 2003).

Purpose of the Study

The purpose of the study was to find out the effect of water therapy on temperature regulation, resting heart rate and body weight among early adulthood.

Methodology

Subjects

To achieve the purpose of the study 10 subjects were selected from the Department of Physical Education and Sports, Manonmaniam Sundaranar University, Tirunelveli. The selected subjects were aged between 21 to 25 years. The selected subjects were underwent water therapy for a duration of 10 working days.

Variables

Present study the following variables were selected.

Table I: Selection of tests and instruments

S. NO	VARIABLES	INSTRUMENTS	UNIT OF MEASUREMENTS
1	Temperature Regulation	Thermometer	Fahrenheit
2	Resting Heart Rate	Radial Pulse Method	Beats/min
3	Body Weight	Weighing machine	Kilograms

Training Programme

During the training period, the experimental group took (drink) 1.25 liter of water every day in the morning up to 10 days. All the subjects involved in this study were carefully monitored throughout the training programme to be away from injuries. They were questioned about their health status throughout the training programme. None of them reported with any injuries.

The training programme was scheduled for the morning between 5.30 am and 6.30 am. The collected data from the experimental group on pre and post experimentation were statistically analyzed by using dependent –t- test. In all the cases .05 level of significance was fixed to test the hypothesis

Analysis of Data

Temperature

The mean and standard deviation values on temperature of experimental group at three different stages of tests have been analyzed and presented in Table II.

Table II: The summary of mean and dependent 't' - test for the pre and post tests on temperature

Group	Number	Mean (Fahrenheit)	Standard Deviation	t-value
Pre Test	10	99.4	0.78	3.54*
Post Test	10	97.5	0.86	

*Significant at .05 level. The Table value significant at .05 level with df 9 is 2.26.

The table II shows that the table values required for significant difference with df 9 at .05 level is 2.26. Since, the obtained 't'- ratio value 3.54 of experimental group on temperature is greater than the table value 2.26, it is concluded that the water therapy had significantly improved the temperature of experimental group.

Heart rate

The mean and standard deviation values on heart rate of experimental group at three different stages of tests have been analyzed and presented in Table III.

Table III : The summary of mean and dependent 't' - test for the pre and post tests on heart rate

Group	Number	Mean (Fahrenheit)	Standard Deviation	t-value
Pre Test	10	76.20	5.52	4.14*
Post Test	10	64.10	3.45	

*Significant at .05 level. The Table value significant at .05 level with df 9 is 2.26.

The table III shows that the table values required for significant difference with df 9 at .05 level is 2.26. Since, the obtained 't'- ratio value 4.14 of experimental group on heart rate is greater than the table value 2.26, it is concluded that the water therapy had significantly improved the heart rate of experimental group.

Weight

The mean and standard deviation values on Weight of experimental group at three different stages of tests have been analyzed and presented in Table VI.

Table VI: The summary of mean and dependent 't' - test for the pre and post tests on weight

Group	Number	Mean (Fahrenheit)	Standard Deviation	t-value
Pre Test	10	66.80	8.17	0.318*
Post Test	10	66.70	7.42	

The Table value significant at .05 level with df 9 is 2.26.

The table VI shows that the table values required for significant difference with df 9 at .05 level is 2.26. Since, the obtained 't'- ratio value 0.318 of experimental group on Weight is lesser than the table value 2.26, it is concluded that the water therapy had no significantly improved the weight of experimental group.

Discussion on Findings

The result of the study indicates that the experimental group had significantly improved the temperature, resting pulse rate and diastolic blood pressure and also there was no significant improvement on systolic diastolic pressure and weight.

It is inferred from the literatures and from the results of the present study that systematically designed water therapy develops the performance standard as the selected dependent variables are very important qualities for better performance in almost all sports and games. Hence, it is concluded from the results of the study that systematically and scientifically designed water therapy may be given due recognition and be implemented properly in the training programmes of all the disciplines in order to achieve maximum performance.

Conclusions

From the analysis of the data, the following conclusions were drawn.

- ❖ There was significant difference on temperature regulation of adults due to the effect of water therapy.
- ❖ There was significant difference on heart rate regulation of adults due to the effect of water therapy.
- ❖ There was no significant difference on weight regulation of adults due to the effect of water therapy.

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IMPORTANCE OF CORE MUSCLES FOR SPORTS AND EDUCATION AT THE SCHOOL LEVEL

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Abstract

Core strength, encompassing the trunk and hip muscles that support the spine and abdominal organs, is essential for overall body stability, balance, and movement efficiency. The core includes key muscles such as the rectus abdominis, transverse abdominis, multifidus, obliques, diaphragm, and pelvic floor, which work together to stabilize the pelvis, spine, and hips. A firm core offers numerous advantages, including reduced strain on the lower back, enhanced flexibility, improved posture, and injury prevention. For athletes, a strong core is crucial for performance, injury prevention, and balance. In children, core strength plays a vital role in academic and physical development, aiding in proper posture, coordination, attention, and fine motor skills. Strengthening core muscles not only improves physical health but also contributes to academic success by supporting focus, posture, and movement control. Emphasizing core strength in children can lay the foundation for both physical well-being and enhanced academic performance.

Introduction

Core muscles, consisting of the trunk and hip muscles surrounding the spine and abdominal viscera, play an essential role in maintaining balance, stability, and strength throughout the body. Together, these muscles support the pelvis, hips, and spine, allowing for efficient force transmission and movement. The rectus abdominis and other minor muscles like the glutes, lats, and traps are among the 29 core muscles, which include major muscles like the transverse abdominis, multifidus, obliques, erector spinae, diaphragm, and pelvic floor muscles.

Advantages of a Firm Core

There are several benefits to having a strong core for everyday activities as well as sports performance:

1. Reduces strain on the spine by stabilizing the lower back.
2. Increases Flexibility: Makes movement simpler.
3. Enhances Balance: Facilitates enhanced coordination.
4. Improved Posture: Promotes appropriate alignment.

5. Promotes Exercise Form: Guarantees proper body alignment.
6. Lessens Pain: May help avoid joint and back problems.
7. Encourages Daily Movements: Facilitates daily chores.
8. Encourages Strength Training: Makes weightlifting and other exercises more efficient.
9. Improves Running: Increases the efficiency of running.
10. Lowers the risk of injury, especially to the lower body.

The Advantages of a Stable Core for Sports

For athletes, having a strong core is essential:

1. **Injury Prevention:** By absorbing stresses after movement, powerful abdominal muscles assist shields the joints and spine.
2. **Improved Balance and Stability:** Allows for more fluid, well-coordinated movement patterns.
3. **Better Athletic Performance:** Stronger core muscles produce stronger, more efficient motions, which improve performance all around.
4. **More Power:** During physical exercise, a solid core translates into greater explosive strength.

School children and Core Strengths

Although it is frequently disregarded when getting kids ready for school, core strength is essential to both their academic and physical performance. Children who have a strong core are better able to sit up straight, focus, and play through physical activities like running and leaping. Children with strong cores benefit in a number of important ways:

1. **Sitting Upright:** This aids kids in keeping good posture throughout class.
2. **Writing and Fine Motor Skills:** The hand-eye coordination and control required for writing and drawing are facilitated by core strength.
3. **Coordination and Physical Play:** Better movement control and coordination are made possible by strong core muscles.
4. **Attention and Focus:** Children who have a strong core are better able to sustain their energy levels and concentrate in class.

In conclusion

For a child to be prepared for school, core strength is essential. It interferes with their ability to sit up straight, concentrate in class, move, and practice fine motor skills. In addition to promoting physical health, strengthening the core muscles enhances

posture, focus, and coordination—all of which are critical for academic achievement. Parents and teachers may assist kids in developing a solid foundation for academic and physical health by emphasizing basic strengths.

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INFLUENCE OF HEIGHT AND WEIGHT ON SELECTED FUNDAMENTAL MOVEMENT SKILLS AMONG SCHOOL CHILDREN

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ABSTRACT

The purpose of the study was to influence of height and weight on selected fundamental movement skills among school children. To achieve the purpose, 50 Subjects were randomly selected from krishthuraja Higher secondary school, Tirunelveli, Tamilnadu, India. They are age ranged between 6-10 years. selected fundamental skills (Running, Jumping, Throwing) were selected as dependent variables. Data were collected by using Test of Gross Motor Development (TGMD) second edition by Dale A. The collected data was statistically analyzed by using independent 't' test at 0.05 level of confidence. The results of study indicated that there there was a significant difference on selected Fundamental movement skill due to the influence of height and weight on selected fundamental movement skills, among school children.

Key word: Height, Weight, Running, Jumping, Throwing

Purpose of the Study

The purpose of the study was to find out the influence of height and movement skills, among school children.

METHODOLOGY

SELECTION OF SUBJECTS

To achieve the purpose of this study, (50) Fifty students were selected from various schools of Tirunelveli, Tamilnadu, India were selected the subjects at random and their age is ranged between 6 to 10 years.

3.3 SELECTION OF VARIABLES

The present study was to influence of height and weight on selected fundamental skills, among school children.

The researcher had gone through the available literature and had discussions with various experts and with his guide before selecting variables. The following variables are selected for this study.

SELECTED FUNDAMENTAL SKILLS

- ❖ Running
- ❖ Jumping
- ❖ Throwing

3.4 SELECTION OF TESTS

Table I : Tests selection

S. No	Criterion Variables	Test items	Unit of Measurement
1	Running	50 feet Run	In points
2	Jumping	Horizontal jump	In points
3	Throwing	Over hand throw	In points

STATISTICAL PROCEDURE

The collected data were analyzed by using the Independent t-test with the help of SPSS software. All of the analysis tests were computed at 0.05 level of significance ($p < 0.05$).

ANALYSIS AND INTERPRETATION OF THE DATA

Weight

Table 2. The summary of descriptive test on Weight category

Weight	Mean
Underweight	27.31
Normal	33.40

From the table above, the obtained mean value in weight category among children were 27.31 and 33.40.

Running ability

Table 3. The summary of Independent t -test value on Running ability among underweight and normal weight category among school children

Running	Mean	SD	T- test
Underweight	6.89	.58	.70
Normal	6.70	.43	

Significant at 0.05 level. The table value $t_{48} = 2.00$

From the table above, the obtained mean value on Running ability between underweight and normal weight category children were 6.89 and 6.70 respectively. The obtained t-value is 0.70, which is lesser than the tabulated 't' value of 2.00 with df 48 at

.05 level of confidence. It was concluded that there was no significant difference between the selected dependent variables.

Jumping ability

Table 4. The summary of Independent t -test value on Jumping ability among underweight and normal weight category among school children

Jumping	Mean	SD	T- test
Underweight	6.49	1.07	.95
Normal	6.00	1.22	

Significant at 0.05 level. The table value $t_{48} = 2.00$

From the table above, the obtained mean value on Jumping ability between underweight and normal weight category children were 6.49 and 6.00 respectively. The obtained t-value is .95, which is lesser than the tabulated 't' value of 2.00 with df 48 at .05 level of confidence. It was concluded that there was no significant difference between the selected dependent variables.

Throwing

Table 5. The summary of Independent t -test value on Throwing ability among underweight and normal weight category among children

Throwing	Mean	SD	T- test
Underweight	7.16	.92	-1.04
Normal	7.60	.54	

Significant at 0.05 level. The table value $t_{48} = 2.00$

From the table above, the obtained mean value on Throwing ability between underweight and normal weight category children were 7.16 and 7.60 respectively. The obtained t-value is -1.04, which is lesser than the tabulated 't' value of 2.00 with df 48 at .05 level of confidence. It was concluded that there was no significant difference between the selected dependent variables.

CONCLUSIONS

The following conclusions were drawn from the present study.

1. There was no significant mean difference between Height and weight among school children aged 6-10 years.
2. There was no significant difference between running ability among school children aged 6-10 years.
3. There was no significant difference between jumping ability among school children aged 6-10 years.

4. There was no significant difference between throwing ability among school children aged 6-10 years.

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EFFECT OF YOGA AND BREATHING EXERCISES ON BMI FOR M.S. UNIVERSITY HOSTEL STUDENTS

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ABSTRACT

The purpose of this study was to investigate the effect of yoga and breathing exercises on body mass index (BMI) among M.S.University Hostel Men students. The subjects were 30 students aged 20 to 22 years. BMI was measured using a digital height and weight machine before the commencement of the yoga sessions. After eight weeks of yoga, which included standing, sitting, and lying postures, as well as breathing exercises, BMI measurements were repeated. Data analysis employed paired t-tests and descriptive statistical techniques using IBM-SPSS version 20, with a significance level set at 0.05. The findings revealed that yoga sessions and breathing exercises significantly reduced BMI in the students.

Keywords: Body Mass Index, Yoga Session, Breathing Exercise, Cosmetology Students

INTRODUCTION

Yoga, a 5000-year-old tradition, is now recognized in the Western world as a holistic health approach and is classified by the National Institutes of Health as a form of Complementary and Alternative Medicine (CAM) (Williams et al., 2003). The word “yoga” originates from the Sanskrit root “yuj,” meaning union or to join, reflecting its emphasis on harmonizing mind and body (Lasater and Raub, 2002). Regular yoga practice promotes strength, endurance, flexibility, self-control, and a sense of calmness, while also fostering self-awareness and life perspective changes (Desikachar & Atkinson).

Yoga’s impact on the stress response produces a physiological state counteracting the fight-or-flight mechanism, achieving balance and unity between mind and body (Arora & Bhattacharjee, 2008). Its principles involve a holistic view of the body, individual customization, self-empowerment, and the influence of positive mind-states on healing (Desikachar, 2005).

In the West, Hatha yoga—focusing on physical postures (asanas) and breathing exercises (pranayama)—is the most commonly practiced form. It enhances physical capacity, improves body alignment, and balances the body’s energy system by clearing energy channel blockages. The Iyengar style, emphasized in this study, uses props and techniques to adjust poses and address stress-related ailments.

PURPOSE OF THE STUDY

The purpose of the study is to find out the effect of yoga and breathing exercises on body mass index (BMI) among M.S.University Hostel Men students

METHODOLOGY

This study aimed to evaluate the impact of yoga sessions and breathing exercises on BMI among M.S.University Hostel Men students. Thirty students aged 20–22 years were randomly selected. BMI was measured using a digital height and weight machine before the intervention. Participants underwent eight weeks of yoga sessions, including standing, sitting, and lying postures, as well as breathing exercises. Post-intervention BMI measurements were taken.

The data were analyzed using paired t-tests and descriptive statistical techniques, including product-moment correlation to calculate mean (M), standard deviation (SD), and other parameters. IBM-SPSS version 20 was employed, with a significance level set at 0.05.

RESULTS AND FINDINGS

Table 1: Computation of t-Test for BMI of Cosmetology Department Students

Test	Mean	SD	DM	DM Error	t
Pre-Test	21.095	1.55	2.89	1.02	2.83*
Post-Test	18.200	1.72			

*Significant at 0.05 (df = 29, table value = 1.98)

The pre-test mean BMI was 21.095 (± 1.55), and the post-test mean BMI was 18.200 (± 1.72). The t-value of 2.83 exceeded the table value of 1.98, indicating a statistically significant reduction in BMI after the yoga intervention.

DISCUSSION ON FINDINGS

The results demonstrate that yoga practices significantly reduced BMI among M.S.University Hostel Men students. These findings align with prior research, such as Suchetha Kumari et al. (2011), which showed significant BMI reductions in obese male students following yogic therapy. Similarly, Benounis et al. (2008) observed BMI reductions in obese adolescent boys after an eight-week physical endurance and diet-restriction program. Wong et al. (2008) also reported BMI improvements following exercise training. This study reaffirms the efficacy of yoga, particularly asanas and pranayama, in influencing BMI (Ramesh and Subramaniam, 2011).

CONCLUSION

Statistical analysis supports the conclusion that yoga and breathing exercises significantly reduce BMI among M.S.University Hostel Men students.

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COMPARATIVE ANALYSIS OF SPEED, AGILITY AND EXPLOSIVE POWER AMONG BASKETBALL, HANDBALL AND VOLLEYBALL PLAYERS

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Abstract

The purpose of the study was to compare the speed, agility and explosive power among Basketball, Handball and volleyball players. To achieve the purpose of the study twelve subjects from athletes, hockey and volleyball were selected from Sports Hostel, SDAT, and Tirunelveli District. The selected subjects were divided into three groups such as Group I consist of 12 athletes, Group II consist of 12 hockey players and Group III consist of 12 volleyball players who were participated in the interschool/ Intercollegiate tournaments during the year 2023-2024. The following criterion variables were selected for the study such speed, agility and explosive power. All the subjects were tested on the selected variables. The experimental design used for this study was static group comparison design. The collected data were statistically analysed for significant difference using analysis of variance (ANOVA). In this cases .05 level of significance was used to test the hypothesis. The study shows that there is no significant difference on all selected physical fitness components such as speed, agility and explosive power among Basketball, Handball and volleyball.

Key Words: Speed, Agility, Explosive Power

Statement of the Problem

The purpose of the study was to compare the speed, agility and explosive power among Basketball, Handball and volleyball players

METHODOLOGY

Selection of Subjects

The purpose of the study was to compare the speed, agility and explosive power among Basketball, Handball and volleyball players. To achieve the purpose of the study twelve subjects from Basketball, Handball and volleyball were selected from various colleges of Tirunelveli District. The selected subjects were divided into three groups such as Group I consist of 12 Basketball, Group II consist of 12 Handball players and Group III consist of 12 volleyball players.

Selection of Variables

Physical fitness variables are the ideal indicators of sports performance of an individual hence. Speed, agility and explosive power are major factors of the component of fitness.

The investigator reviewed the available scientific literature and on the basis of discussion with experts, feasibility criteria, availability of equipments and the relevance of variables to the present study, the following variables were selected for this study.

1. Speed, 2. Agility, 3. Explosive Power

Selection of Tests

Table I : Tests selection

S. No	Criterion Variables	Test Items	Unit of Measurement
1	Speed	50 mt Dash	In Seconds
2	Agility	Shuttle Run	In Seconds
3	Explosive Power	Standing Broad Jump	In Meters

Table II. Intra class co-efficient of correlation on selected variables

S. No	Criterion Variables	Correlation Coefficient 'R'
1	Speed	0.92*
2	Agility	0.87*
3	Explosive Power	0.97*

* Significant at .05 level of confidence.

(Table value required for significance at 0.05 level of confidence is 0.77).

Since the obtained 'R' values were much higher than the required value, the data were accepted as reliable in terms of instrument, tester and the subjects.

Statistical Techniques

To compare the selected physical variables among intercollegiate men Basketball, Handball and volleyball players' static group design was used as an experimental design. The following statistical procedure was followed to compare the speed, agility and explosive power among Basketball, Handball and volleyball players. Analysis of variance (ANOVA) was used to find out the significant difference among the groups. Significant was fixed at .05 level of confidence.

ANALYSIS DATA

Speed

Table III. Analysis of variance on speed among basketball, handball and volleyball players

Mean \pm SD			Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Basket ball	Hand ball	Volley ball					
7.41 \pm 0.27	7.54 \pm 0.33	7.53 \pm 0.24	Between	0.13	2	0.065	0.80
			Within	2.68	33	0.081	

Speed scores are in seconds. The table value required for significance at .05 level with df 2 and 33 is 3.26.

Table III shows that, the mean values of Basketball, Handball and volleyball players are 7.41, 7.54 and 7.53 respectively. The obtained F-ratio between the groups is 0.80. The table value required for significant difference with df 2 and 33 at .05 level is 3.26. Since the value of F-ratio is lower than the table value 3.26. Since the value of F-ratio is lower than the table value it indicates that, there is no significant difference among the mean values of Basketball, Handball and volleyball players on speed.

Agility

Table IV. Analysis of variance on agility among basketball, handball and volleyball players

Mean \pm SD			Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Basket ball	Hand ball	Volley ball					
10.36 \pm 0.39	10.25 \pm 0.61	10.45 \pm 0.60	Between	0.249	2	0.124	0.419
			Within	9.81	33	0.297	

Agility scores are in seconds. The table value required for significance at .05 level with df 2 and 33 is 3.26

Table IV shows that, the mean values of Basketball, Handball and volleyball players are 10.36, 10.25 and 10.45 respectively. The obtained F-ratio between the groups is 0.419. The table value required for significant difference with df 2 and 33 at .05 level is 3.26. Since the value of F-ratio is lower than the table value 3.26. Since the value of F-ratio is lower than the table value it indicates that, there is no significant difference among the mean values of Basketball, Handball and volleyball players on agility.

Table V : Analysis of variance on explosive power among basketball, handball and volleyball players

Mean \pm SD			Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Basket ball	Hand ball	Volley ball					
1.90 \pm 0.14	1.86 \pm 0.12	1.92 \pm 0.12	Between	0.026	2	0.013	0.834
			Within	0.505	33	0.015	

Explosive power scores are in meters. The table value required for significance at .05 level with df 2 and 33 is 3.26

Table V shows that, the mean values of Basketball, Handball and volleyball players are 1.90, 1.86 and 1.92 respectively. The obtained F-ratio between the groups is 0.834. The table value required for significant difference with df 2 and 33 at .05 level is 3.26. Since the value of F-ratio is lower than the table value 3.26. Since the value of F-ratio is lower than the table value it indicates that, there is no significant difference among the mean values of Basketball, Handball and volleyball players on explosive power.

Conclusions

The study shows that there is no significant difference on all selected physical fitness components such as speed, agility and explosive power among Basketball, Handball and Volleyball players.

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INFLUENCE OF MUSCULAR WORK ON DIVISION OF ATTENTION AMONG KHO KHO PLAYERS

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Abstract

The purpose of the study was to find out the influence of Muscular work on division of attention among Kho Kho players. To achieve the purpose of this study, 15 male Kho Kho players were randomly selected as subjects from the Department of Physical Education and Sports, Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, India. Division of attention was selected as criterion variable for this study. The selected participants were undergone muscular work in the form of weight training for 30 mins approximately. The data on Division of attention were collected by administering by psychomotor instrument. The pre and post tests data were collected on selected criterion variable prior and immediately after the muscular work. The collected data were statically analyzed by using "dependent `t` test. The level of significance was fixed at 0.05 level of confidence. The result of the study indicated that significant differences exist among the pre-post test means of experimental group on Division of attention.

Key words: Muscular work, Fatigue, Division of Attention and Kho Kho.

Introduction

Sport psychology is the application of psychological ideas and concepts to coaching and teaching, among other sports-related activities. Sport psychologists try to help people perform at their best by using psychological evaluation methods and intervention tactics. Sports psychology focuses on the mental components of performance in addition to examining human behaviour in a variety of sporting contexts.

As a behavioral science, psychology has contributed to bettering athletic performance. It has aided coaches in helping more effective athletes perform more skillfully and effectively. Sports administrators are paying more and more attention to this psychological side of sport. According to Bucher and Wuegt (1987), the application of stress management techniques, including biofeedback and relaxation training, to improve athletic performance by lowering stress is a quickly expanding field of study in sports psychology.

The majority of scientific data gathered from various studies has shown that, in addition to physical and physiological factors, strategies, and tactics, a sportsman's psychological makeup determines his ability to perform at a high level. Achieving elite performance in track and field athletics requires a variety of psychic skills. As a result,

exceptional psychological health and “individual” training are crucial components that contribute to exceptional performance.

The ability to pay attention is highly valued. Anybody who wants to achieve, whether on a little or large scale, in the material or spiritual realms, must have it. To succeed, you must be able to concentrate and reduce your mind’s restlessness and propensity to jump around from one topic to another.

For any act to be performed successfully, it requires concentration. Attention is necessary for working, speaking, interacting, studying, and playing. It is even necessary for cooking, cleaning, and washing to be done effectively. Attentional power is not innate in humans. It needs to be created. As the kids get older, they must focus on anything they read or study. Its training and growth begin at a very young age. To a certain degree, each of these exercises aids in the development and concentration of attentional power, yet they are insufficient. This ability must be controlled by will in order to be beneficial. According to Moore (1945), you should be able to control and utilize your attentional power whenever you need it.

Purpose of the Study

The purpose of the study was to find out the influence of Muscular work on division of attention among Kho Kho players.

Methodology

To achieve the purpose of this study, Fifteen male Kho Kho players from St. Joseph College of Arts & Science in Vaikalipatti, Mettur, Tenkasi, India, were chosen at random to serve as subjects. For this study, the criteria variable of division of attention was chosen. For about thirty minutes, the chosen volunteers engaged in weight training to strengthen their muscles. There are twelve stations with two sets of exercises using multigym equipment, separated by three to five minutes of relaxation.

A psychomotor instrument was used to administer the Division of Attention data. Before and right after the muscular work (weight training), data on a chosen criteria variable were gathered for the pre and post testing. The “dependent {t} test” was used to statistically assess the gathered data. At the 0.05 level of confidence, the significance level was set. The study’s findings showed that the experimental group’s pre- and post-test means on division of attention differed significantly.

Analysis of Data

The collected data were statically analyzed by using “dependent `t` test and the results are presented in table I.

Table I. Summary of mean and dependent ‘t’ test for pre and post test on division of attention

Group	Number	Mean	Standard Deviation	‘t’ value
Pre test	15	0.90	0.26	7.10*
Post test	15	1.02	0.24	

*Significant at .05 level. (Table value required for significance at .05 levels for ‘t’- test with df² 13 is 2.16).

From the table – I, the obtained value of ‘t’ – value for Division of attention for adjusted post test means was more than the table value of 2.16 for df 14 required for significant at 0.05 level of confidence. The result of the study indicated that significant differences exist between the pre-post test means of experimental group on Division of attention level.

Discussion on Findings

Although there is some room for stimuli-driven control, attention benefits from a strong goal-driven control in highly tactical sports like games and sports (Araújo D, Davids K, Hristovski R., 2007). This dedication makes it possible to carry out tactically conscious acts while being open to the identification of unforeseen engagement components. Selective attention tends to improve performance because of the information overload that is typically present (Corbetta M., 1998), which lowers the number of possible indications that need to be taken into account while making decisions. However, an external focus tends to improve performance by allowing for greater awareness of work restrictions and involvement, which is a crucial component of games and sports (Memmert D, Furley P., 2007).

People need a support system to help them focus their attention and predict the outcomes of their actions. Memory (Dodds P, Griffin L, Placek J., 2001) is an active, reconstructive, diffuse process that is highly sensitive to learning (Pieters R, Baumgartner H, Bagozzi R., 2006), which informs how we should or could run our actions. Concisely, it is the memory that embodies the knowledge of situational probabilities and, thus, facilitates the emergence of attention and anticipation. The potentiating effect of memory is only evident in particular tasks within a given domain due to its great specificity (McPherson S, MacMahon C., 2008). Still, intuitive (Kibele A., 2006), and strategic thinking (Lames M, McGarry T., 2007) are all derived from memory. The first embodies absorbed knowledge, which become implicit; the second links each decision taken into a coherent whole. Therefore, it would appear reasonable to support a practice primarily on the basis of the requests’ specificity, which would only allow for the realistic and adaptable stimulation of attention and anticipation. The current study came to the conclusion that Kho Kho players’ attentiveness was significantly impacted by physical fatigue.

Conclusions

There was a significant difference on division of attention among Kho Kho players due to the effect of muscular work (weight training).

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EFFECT OF PLYOMETRIC TRAINING PROGRAM ON SELECTED PHYSIOLOGICAL VARIABLES AMONG COLLEGIATE WOMEN HANDBALL PLAYERS

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ABSTRACT

The purpose of the present study was to determine the effect of plyometric training on selected physical variables among collegiate women handball players. To achieve the purpose of the present study, thirty handball players were selected from the Madurai Kamaraj University, Madurai and TamilNadu, India. The subjects were randomly selected and their age ranged from 18-25 years. The selected groups were divided into two groups, experimental and control group. The experimental group under the plyometric training and the control group was not have any specific training. The duration of the training period was restricted to six weeks and the session for six days in a week. Plyometric training program is considered as the independent variables. The Program physiological variables such as breath holding time and vital capacity were known as dependent variables. The statistical technique Analysis of Covariance (ANCOVA) was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that the Plyometric Training Program group had significant improvement ($P \leq 0.05$) in the level of the selected criterion variables such as Program physiological variables such as breath holding time and vital capacity

Keywords: Plyometric Training, breath holding time and vital capacity.

INTRODUCTION

The term “Plyometrics” was first used by Fred Wilt, former Olympic runner in 1975. The term “Plyometrics” itself originates from the Greek words, “plio” and “metric,” which mean, “more” and “measure”, respectively (Chu, 2000). Most coaches, until now believed that it hindered, not helped performance. This could be because they did not know how to apply it to training. Over the years, Plyometrics has been used more and more by several coaches due to its significant increase in speed and explosiveness.

STATEWOMENT OF THE PROBLEM

To determine the attributes which could determine the handball players’ potentiality, the researcher took this study and entitled present study as “Effect of Plyometric Training Program on Selected Physiological Variables among Collegiate Women Handball Players”.

HYPOTHESIS

It is hypothesized that:

1. There would be significant improvement due to plyometric training program on breath holding time among collegiate women handball players.
2. There would be significant improvement due to plyometric training program on vital capacity among collegiate women handball players.

METHODOLOGY

In this chapter, selection of subjects, selection of variables, rationale for selecting the variables, selection of tests, experimental treatment, reliability of data, instrument reliability, tester reliability, orientation reliability, collection of data, training program, administration of the test, statistical technique for the analysis of data has been described.

ANALYSIS OF DATA Breath Holding Time

The analysis of dependent-'t' test on the data obtained for breath holding time of the pre-test and post-test means of experimental and control groups have been analyzed and presented in Table I.

Table – I : The summary of mean and dependent-'t' test for thepre and post tests on breath holding time of experiwomental and control groups

Mean Experimental Group Controlgroup		
Pre Test Mean	45.33	43.6
Post Test Mean	50.33	42.07
Adjusted Post Test	47.79	41.141

*Significant at .05 level

(Breath holding time performance in Numbers)

(The table value required for .05 level of significance with df 14 is 2.045).

The table-I shows that the breath holding time pre-test means experimental group and control group were 45.33, 43.6 and50.33, 42.07and47.79 41.141 respectively.

Table – II : Analysis of covariance of the data of breath holding time of adjusted post test scores on experiwomental and control groups

Sum of variance	Sum of square	Df	Mean square	‘F’ Ratio
Between	202.29	1	202.29	279.105
within	19.57	27	0.725	

*significant at 0.05 level of confidence

Table-iv shows that the leg explosive power of adjusted post-test between, within of experimental and control groups were 202.29 and.725 respectively. The obtained „f” ratio of 279.105 for adjusted post-test means was greater than the table value for df 1 and 27 required for significant and 0.05 level of confidence.

The mean values of experimental and control groups breath holding time were graphically represented in the figure-1.

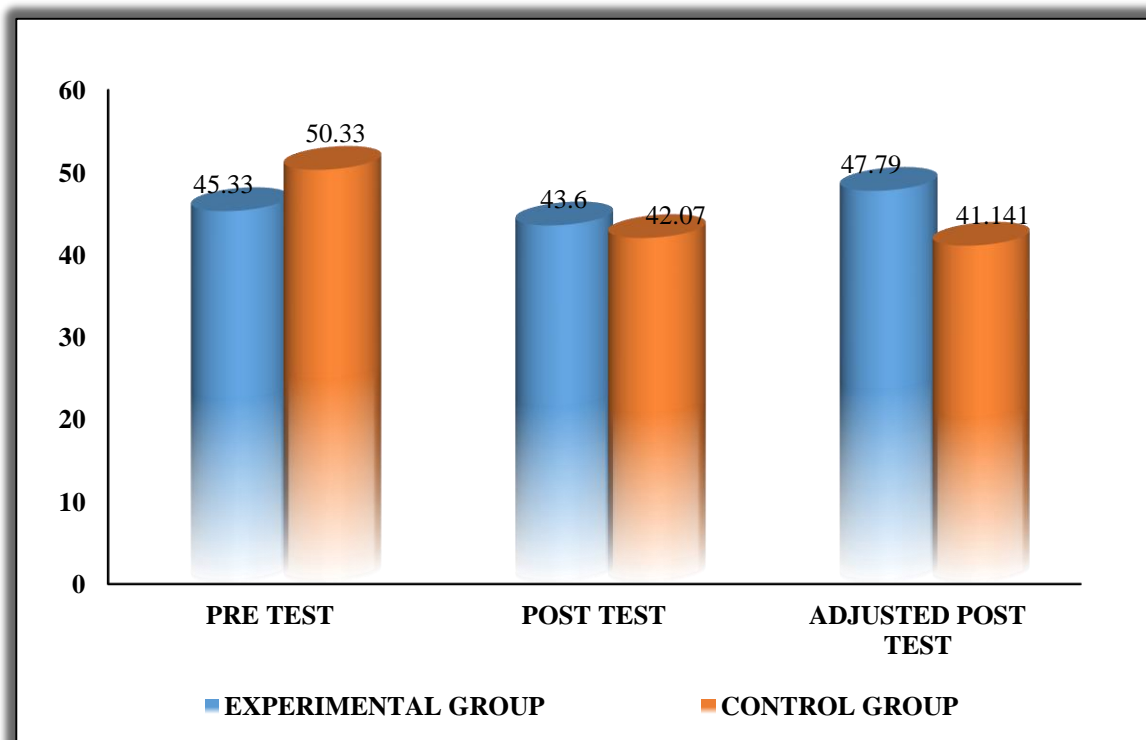


Figure - 1: Mean values of experiwomentalandcontrol groupson breath holding time

VITAL CAPACITY

The analysis of dependent-”t” test on the data obtained vital capacity of the pre-test and post-test means of experimental and control groups have been analyzed and presented in Table-II.

Table – II : The summary of mean and dependent-’t’ test for the pre and post tests on vital capacity of experiwomental and control groups

Mean Experimental Group Controlgroup		
Pre Test Mean	2053.33	1946.67
Post Test Mean	2600	1846.67
Adjusted Post Test	2664.25	1898.752

*Significant at .05 level

(Vital capacity performance in Numbers)

(The table value required for .05 level of significance with df 14 is 1.96).

The table-II shows that the vital capacity pre-test means experimental group and control group were 2053.33, 1946.67 and 2600, 1846.67 and 2664.25, 1898.752 respectively.

Table-XII : Analysis of covariance of the data of vital capacityof adjusted post test scores on experiwomental and control groups

Sum of variance	Sum of square	Df	Mean square	‘F’ Ratio
Between	525524.08	1	525524.08	45.89
within	309226.49	27	11452.833	

*significant at 0.05 level of confidence

Table-iv shows that the leg explosive power of adjusted post-test between, within of experimental and control groups were 525524.08 and 11452.833 respectively. The obtained ‘f’ ratio of 45.89 for adjusted post-test means was greater than the table value for df 1 and 27 required for significant and 0.05 level of confidence.

The mean values of experimental and control groups vital capacity were graphically represented in the figure 2.

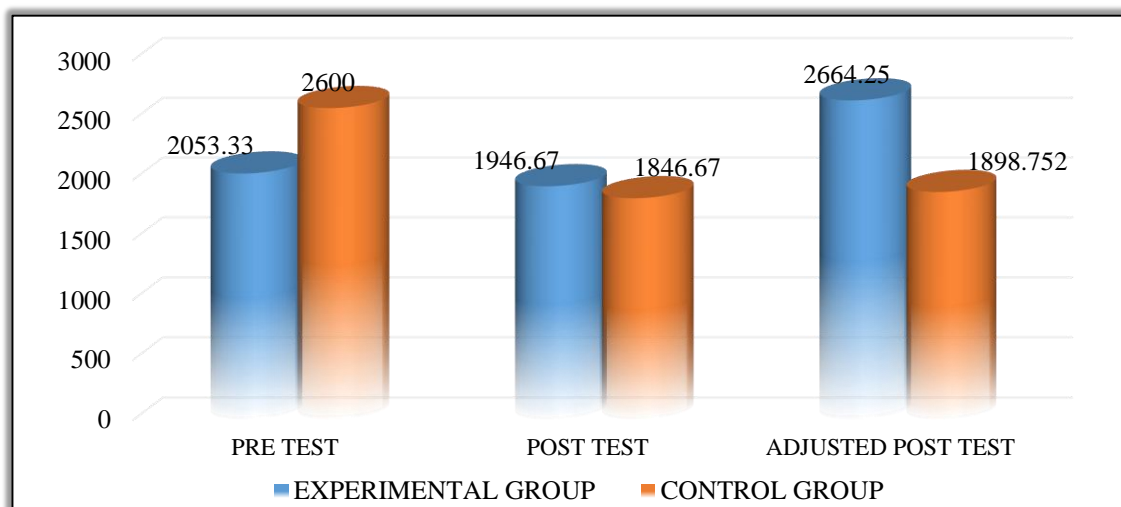


Figure-2: Mean values of experiwomental and control groups on vital capacity

DISCUSSION ON THE FINDINGS

The results of the study indicate that the plyometric training were significantly improved the performance such as on selected physiological variables such as breath holding time and vital capacity it may be due to the nature of the plyometric training which have influenced to increase the performance of handball players. The results of the study indicate that there is a significant improvement on as breath holding time and vital capacity of the plyometric training group when compared to the control group. This study is supported by **booth mark and orr rhondaet al. (2016)** who found acquisition of plyometric training are important predictor of skill acquisition. The findings were further in agreement with the findings of **karim chamari and bianca miarka (2016)** who found perceptual training group (PTG) and perceptual training physical variables such as leg explosive power and leg strength training group had shown significant improvement in ($P < 0.05$) the selected plyometric training and physical variables.

CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The experimental group namely plyometric training group had achieved significant improvement on selected physiological variables such as breath holding time and vital capacity.
2. The control group had no shown significant changes in any of the selected variables.
3. The selected collegiate women handball players shown significant different in all the selected variables due to the six weeks of plyometric training.

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IMPACT OF BATTLE ROPE TRAINING ON PHYSICAL VARIABLES AMONG VOLLEYBALL PLAYERS

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ABSTRACT

The analysis of data and results of the study was discussed in this chapter. This study was designed to find out the impact of Battle rope on selected physical variables among male volleyball players. To achieve the purpose of the study thirty male volleyball players (N=30) were randomly selected from various colleges in and around Madurai, Tamil Nadu state, India. The age of subjects ranged from 18 to 25 years. The subjects were randomly divided into two equal groups of twelve each such as experimental groups and control group. Such as Group-I underwent Battle Rope Training, Group-II acted as Control. Fifteen male volleyball players (N=30) were divided at random and assigned them into two groups of Fifteen each (n=15). The experimental groups participated in the Battle rope training for 3 days a week, one session per day and for 12 weeks each session lasted 60 minutes, control group was not exposed to any training other than their daily routines activities. The dependent variables selected for this study were explosive strength. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. The data collected from the two groups before and after the experimental period. Were statistically analyzed for significant improvement by dependent 't' test. In all the cases 0.05 level was fixed as level of significance to test the hypotheses.

KEYWORDS: Battle rope & physical variables (Explosive Strength).

INTRODUCTION

Battle rope training

John Brookfield is view of the Battling Ropes spread like wildfire into different areas of strength training and conditioning, and since "Battling Ropes" is a trademarked system, the ropes themselves had to take on new names which is why you'll hear them called battle ropes, workout ropes, or heavy ropes. While John Brookfield focused on perfecting the workout which we are extremely grateful for, Muscle Ropes has focused on perfecting the ropes Josh (2013).

STAMENT OF THE PROBLEM

The purpose of the study was to find out the impact of Battle rope training on selected physical variables among male volleyball players.

HYPOTHESES

It has been scientifically accepted that any systematic training over a continuous period of time would lead to improvement in performance. Based on this concept and research questions the following research hypotheses were formulated and it was tested at 0.05 level of confidence.

1. There would be significant improvement on selected physical, variables due to the effect of Battle rope training among male Volleyball players.

METHODOLOGY

In this chapter the procedures adapted for the selection of subjects, classification of groups, selection of variables, Justification of criterion variables, selection of test, pilot study, training programme, experimental design, reliability of data, instrument reliability, reliability of test, tester's reliability, subject reliability, orientation of subjects, administration of tests, collection of data and statistical techniques for the analysis of the data have been explained.

STATISTICAL TECHNIQUES

The data collected from the three groups before and after the experimental period were statistically analyzed for significant improvement by dependent 't' test. Thirty male volleyball players (N=30) were divided at random and assigned the min to two groups of fifteen each (n=15). No attempt was made to equate the groups in any manner. In the cases 0.05 level of significance to test the hypotheses.

Table – 4.4 : The summary of mean and dependent 't' test for the pre and post tests on explosive strength of experimental and control groups (In Centimeter)

Mean	Battle rope training Group–(I)	Control Group–(II)
Pre- test	58.43	58.49
SD(±)	0.29	0.30
Post-test	61.06	58.86
SD(±)	0.62	0.89
't'-test	13.05*	1.48

*Significant at 0.05 level.

(Table value required for significance at 0.05 level for 't'-test with df 11 is 2.20).

The paired sample 't' was computed on selected dependent variables. The results are presented in the above Table- I. The 't' test value of Battle rope training group and

control group are 13.05 and 1.48 for explosive strength performance. The experimental 't' values are significantly higher than the required table value of 2.20 with degrees of freedom 11 at 0.05 level of confidence. The 't' test value of control group is 1.48 which is less than the required table value, it indicates that there was not significant improvement on explosive strength performance due to they were not subjected to any specific training. The result of the study shows that Battle rope training group has significantly improved the performance of explosive strength.

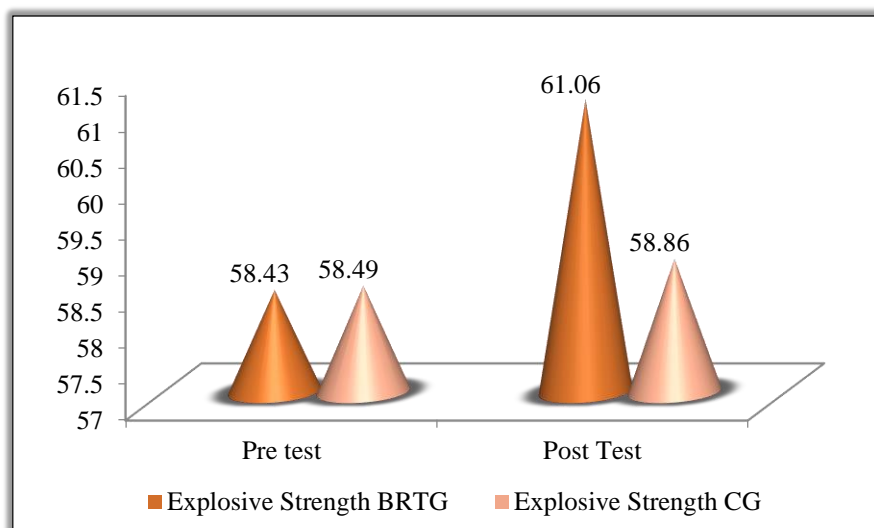


Figure - 1: The graphical representation of the pre, post mean values of explosive strength on battleropetraininggroup and control group

DISCUSSING ON FINDINGS

The results of the study indicated that the experimental groups namely Battle rope training group had significantly influenced on the performance of the selected variables such as explosive strength of experimental groups had undergone systematic training over 12 weeks duration. The control group had not shown significant improvement on selected variables as they have not subjected to any of the specific training conditioning similar to that of experimental groups. Hence it is understood that the selected training means had influenced on the criterion variables. The results of the study are in conformity with the findings of Parasuraman & Mahadevan (2018), Chen, et al., (2018), Chen, et al., (2018), Trecroci, et al., (2018), Giboin (2018) Mildren, et al., (2018), Ringhof, et al., (2018) Kaba Rosario (2018).

CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The control group had not shown significant change in any of the selected variable.
2. The Experimental groups namely Battle rope training ad significantly improved the physical variables such as explosive strength.

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EFFECT OF COMPLEX TRAINING ON SELECTED ANTHROPOMETRIC VARIABLE AMONG COLLEGE MEN FOOTBALL PLAYERS

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ABSTRACT

The purpose of the present study was to determine the “effect of complex training on selected anthropometric variables among college men football players” To achieve the purpose of this study, thirty footballplayers were selected from (RLKA) Reserve Line Football Academy, Madurai District, Tamilnadu, India. The subjects were randomly selected and their age group ranged from 18 -23 years. The selected groups were divided into two groups, an experimental group and a control group. The experimental group (eg) underwent the medium of complex training. The control group (cg) was not exposed to any training. Complex trainingis considered as the independent variable. The anthropometric variables (Chest Girth) are dependent variables. The statistical technique covariance ANCOVA was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that the complex traininggroup had significant improvement ($p \leq 0.05$) in the level of the selected anthropometric variables such as Chest Girth) compared to the control group.

Keywords: Complex Training and Anthropometric Variables.

INTRODUCTION

One of the most advanced forms of sports training, integrates strength training, plyometric and sport-specific movement. It consists of an intense strength exercise followed by a plyometric exercise. Complex training activates and works the nervous system and fast twitch muscle fibers simultaneously. The strength exercise activates the fast twitch muscle fibers (responsible for explosive power). The plyometric movement stresses those muscle fibers that have been activated by the strength training movement. During this activated state, the muscles have a tremendous ability to adapt. This form of intense training can teach slow twitch muscle fibers to perform like fast twitch fibers. The logic behind these matched pair of exercises is that the resistance work gets the nervous system in to full action so that more Type IIb fibers are available for the explosive exercise, hence a better training benefit. Strength work has been shown to improve sports performance particularly for sprinters, jumpers and throwers but it is not beneficial in developing rate of force – the speed with which force is achieved in a movement. For example, it takes around 400 msec to develop maximum force during a squat exercise, but the foot-ground contact time in sprinting in around 90 msec so there is not enough time to produce maximum force in sprinting. Therefore, for speed strength event, like sprinting, it is the rate of force development that becomes more important than

absolute strength. Complex training is a workout comprising of a resistance exercise followed by a matched plyometric exercise e.g.; squats followed by squat jumps and bench press followed by plyometric press up.

STATEMENT OF THE PROBLEM

The purpose of this study was to find out effect of complex training on selected anthropometric variables among college men football players.

HYPOTHESIS

The hypothesis is formulated in the present study were as follows

1. It was hypothesized that complex training would have significant difference in anthropometric of football players.

METHODOLOGY

In this chapter selection of subjects, selection of variables criterion measures orientation of subjects, Reliability of data, Instrument reliability, Testers reliability, collection of data, administration of test, Training programmer, and statistical technique procedure adapted to analyze the data were presented.

ANALYSIS OF DATA

The purpose of the study was to find out effect of complex training on selected anthropometric variables among college men football players. To achieve the purpose of this study, thirty football players were selected from (RLFA) reserve line football academy, Maduraidistrict, Tamilnadu, India. The subjects were randomly selected and their age ranged from 18 to 23 years. The selected subjects were divided into two equal groups of fifteen each namely experimental group and control group. The group I is the experimental group which underwent the complex training and Group II acted as a control group. Data were analyzed by using the covariance (ANCOVA). Statistical significance was fixed at 0.05 levels. The variables and tests used are presented below.

Table -1 : Analysis of Covariance for the Pre, Post and Adjusted Post Test Means Values for Complex Training Group and Control Groups on Chest Girth

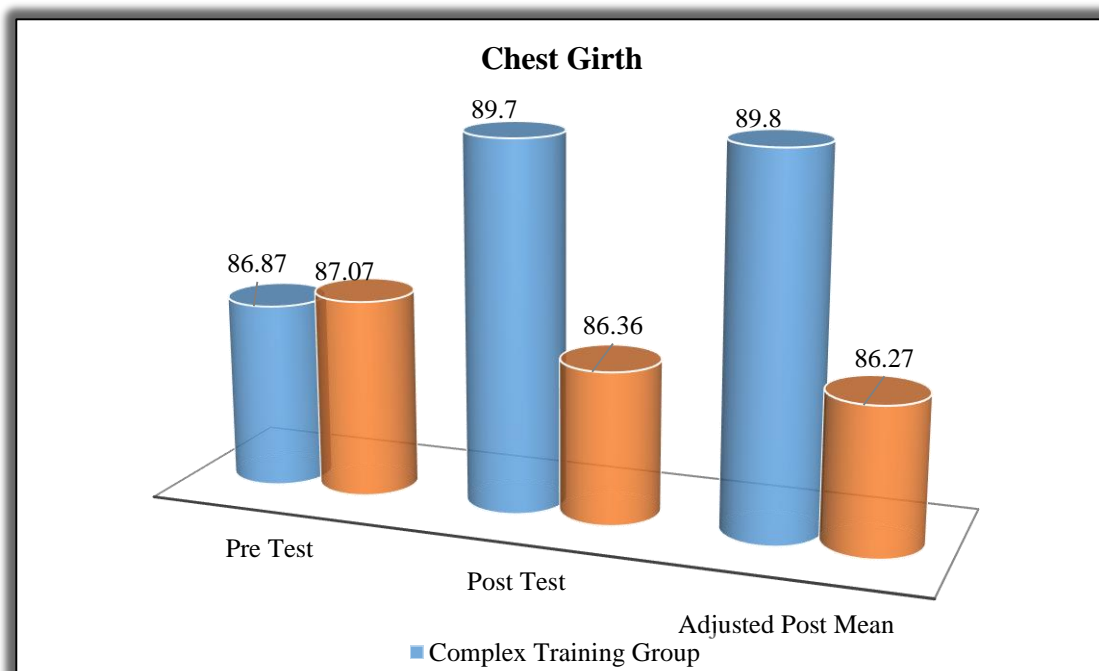
Test	Complex Training Group	Control Group	Source of Variance	Sum of square	df	Mean Square	'F' ratio	Table Value
Pre Test Mean	86.87	87.07	Between	.30	1	.30	.21	4.20
			With in	409.67	28	14.63		
Post Test Mean	89.70	86.36	Between	83.33	1	83.33	5.46*	4.20
			With in	428.13	28	15.29		
Adjusted Post Test Mean	89.80	86.27	Between	93.31	1	93.31	66.31*	4.21
			With in	38.0	27	1.41		

*Significant at 0.05 level of confidence.

The table-1 showed that the pre-test mean values on chest girth of complex training group and control group are 86.87 and 87.07 respectively. The obtained 'F' ratio 0.21 for pre-test mean was less than the table value 4.20 for df 1 and 28 required for significance at 0.05 level of confidence on chest girth. The post-test mean values on chest girth of complex training group and control group are 89.70 and 86.36 respectively. The obtained 'F' ratio 5.46* for post-test mean was greater than the table value 4.20 for df 1 and 28 required for significance at 0.05 level of confidence on chest girth. The adjusted post-test means of complex training group and control group are 89.80 and 86.27 respectively. The obtained 'F' ratio 66.31* for adjusted post-test mean was greater than the table value 4.21 for df 1 and 27 required for significance at 0.05 level of confidence on chest girth.

The adjusted post means values of complex training group and control group on chest girth are graphically represented in the Figure -1.

Figure -1 : Bar Diagram for Showing the Pre, Post and Adjusted Mean Value of Complex Training Group and Control Group on Chest Girth



Discussion on Findings

The goal of the investigation is to find whether there is any effect on those selected variables in the effect of complex training and further to find improvement on training group. The obtained 'f' ratio showed that there was significant difference between experimental groups and control group in performance of chest girth. It indicates that experimental groups significantly improved the variables better as compared to control group. This may be due to the experimental group under gone a systematic progressive training and the control group have not take part in any formal training in the period of six weeks.

Discussion on Chest Girth

The results of the study indicates that chest girth is improved by 3.26% in Complex training (three sessions per week) the training shows a better improvement than the control group. This is due to the training adapted by the subjects in the training period, this clearly shows the complex training is a suitable training to improve the chest girth.

Conclusions

Based on the research findings the following conclusions were drawn.

1. There was a significant difference between experimental groups and control group on anthropometric variables such as relaxed chest girth.
2. There was a significant improvement on selected criterion variables such as chest girth due to complex training programme.

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IMPACT OF BATTLE ROPE AND SLACKLINE TRAINING ON PHYSICAL VARIABLE AMONG VOLLEYBALL PLAYERS

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ABSTRACT

The analysis of data and results of the study was discussed in this chapter. This study was designed to find out the impact of Battle rope and Slackline training on selected physical physiological and performance variables among male volleyball players. To achieve the purpose of the study thirty six male volleyball players (N=36) were randomly selected from various colleges in and around Erode, Tamil Nadu state, India. The age of subjects ranged from 18 to 25 years. The subjects were randomly divided into three equal groups of twelve each such as experimental groups and control group. The experimental groups participated in the Battle rope training and Slackline training for 3 days a week, one session per day and for 12 weeks each session lasted 60 minutes, control group was not exposed to any training other than their daily routines activities. The dependent variables selected for this study were explosive strength Volleyball performance. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. The data collected from the three groups before and after the experimental period were statistically analyzed for significant improvement by dependent 't' test. Thirty six volleyball players were divided at random and assigned them into three groups of twelve each. No attempt was made to equate the groups in any manner. In all the cases 0.05 level was fixed as level of significance to test the hypotheses.

KEYWORDS: Battle Rope Training, Slackline Training & physical variables (Explosive Strength).

INTRODUCTION

Battle rope training

“Battling Ropes” is a trademarked system, the ropes themselves had to adopt new names, which is why you may hear them referred to as battle ropes, workout ropes, or heavy ropes. John Brookfield’s idea of the Battling Ropes quickly spread throughout various strength training and conditioning domains. Muscle Ropes has concentrated on honing the ropes Josh (2013), while John Brookfield concentrated on developing the workout, for which we are incredibly thankful.

Slacklinetraining

A new school take on tight-rope walking, slacklining is the practice of walking down nylon webbing that is an inch wide. From the beaches to the highest alpine peaks, slacklining, a sport that originated along chain link fences in Yosemite Valley, has become a global phenomenon.

STATEMENT OF THE PROBLEM

The study's goal was to determine how certain physical variables among male volleyball players were affected by combat rope and slackline training.

HYPOTHESES

It has been scientifically accepted that any systematic training over a continuous period of time would lead to improvement in performance. Based on this concept and research questions the following research hypotheses were formulated and it was tested at 0.05 level of confidence.

1. There would be significant improvement on selected physical, variables due to the effect of Battle rope training among male volleyball players.
2. There would be significant improvement on selected physical, variables due to the effect of slackline training among male volleyball players.

METHODOLOGY

The methods modified for subject selection, group classification, variable selection, justification of criterion variables, test selection, pilot study, training program, experimental design, data reliability, instrument reliability, test reliability, tester's reliability, subject reliability, subject orientation, test administration, data collection, and statistical techniques for data analysis have all been described in this chapter.

STATISTICAL TECHNIQUES

The data collected from the three groups before and after the experimental period were statistically analyzed for significant improvement by dependent 't' test. Thirty male volleyball players (N=36) were divided at random and assigned the min to three groups of twelve each (n=12). No attempt was made to equate the groups in any manner. In the cases 0.05 level of significance to test the hypotheses.

Table– 4.4. The summary of mean and dependent ‘t’ test for the pre and post tests on explosive strength of experimental and control groups (In Centimeter)

Mean	Battle rope training Group–(I)	Slackline training Group – (II)	Control Group–(III)
Pre- test	58.43	58.50	58.49
SD(±)	0.29	0.31	0.30
Post-test	61.06	60.12	58.86
SD(±)	0.62	0.61	0.89
‘t’-test	13.05*	8.57*	1.48

*Significant at 0.05 level.

(Table value required for significance at 0.05 level for ‘t’-test with df 11 is 2.20).

The paired sample ‘t’ was computed on selected dependent variables. The results are presented in the above Table 4.4. The ‘t’ test value of Battle rope training group, Slackline training group and control group are 13.05, 8.57 and 1.48 for explosive strength performance. The experimental ‘t’ values are significantly higher than the required table value of 2.20 with degrees of freedom 11 at 0.05 level of confidence. The ‘t’ test value of control group is 1.48 which is less than the required table value, it indicates that there was not significant improvement on explosive strength performance due to they were not subjected to any specific training. The result of the study shows that Battle rope training group and Slackline training group has significantly improved the performance of explosive strength.

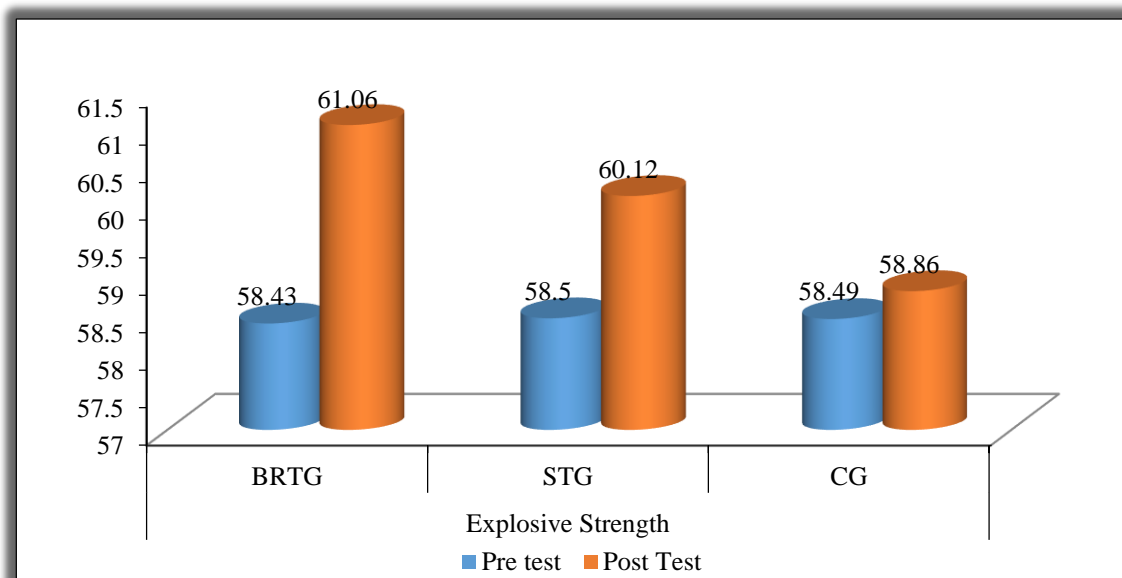


Figure - 1: The graphical representation of the pre, post mean values of explosive strength on battleropetrainingandslacklinetraining group and control group.

DISCUSSING ON FINDINGS

The study's findings showed that after undergoing systematic training for 12 weeks, the experimental groups the Battle Rope Training Group and the Slackline Training Group had a significant impact on the performance of the chosen variables, including explosive strength. Since the control group was not exposed to any of the particular training conditioning that the experimental groups were, they did not demonstrate a discernible improvement on a few chosen criteria. Therefore, it is known that the criteria variables were impacted by the chosen training means. The study's findings are consistent with those of **Giboin (2018)**, **Parasuraman & Mahadevan (2018)**, **Chen et al. (2018)**, **Trecroci et al. (2018)**, **Ringhof et al. (2018)**, and **Mildren et al. (2018)**. **Kaba Rosario**

CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The control group had not shown significant change in any of the selected variables.
2. The Experimental groups namely Battle rope training and Slackline training groups had significantly improved the physical variables such as explosive strength.
3. The Experimental groups namely, Battle rope training and Slackline training group had significantly improved the performance.

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IMPACT OF HILL AND SAND TRAINING PACKAGES ON SELECTED PHYSICAL VARIABLE AMONG SOCCER PLAYERS

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ABSTRACT

This chapter presents the results of the study from the data analysis of the experimental study. The purpose of the study was to find out the impact of hill training packages on selected physical variables among Soccer players. To achieve the purpose of the study, forty five (30) Soccer players were selected randomly as subjects from the (RLKA) Reserve Line Football Academy, Madurai district, Tamilnadu, India. The selected subjects were randomly assigned into one of two groups of fifteen (n=15) each, such as Hill Training and Control Groups. Group I (n=15) underwent Hill training for a duration of 12 weeks and the number of sessions per week was confined to three alternative days, in addition to the regular schedule of the curriculum. Group III (n=15) acted as control, who was asked to refrain from any special training except their leisure time pursuit as school students. Among the physical and performance variables, the following dependent variables were selected for this study such as pure speed. As per the available literatures, the standardized tests were used to collect relevant data on the selected dependent variables. The following independent variables were selected for this study such as Hill training programmes. The level of significance was fixed at .05 levels, which was considered to be appropriate. The pre and post- test randomized control group design was used as experimental design. No attempt was made to divide the groups in any manner. The collected data from the three groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with dependent 't' test to find out the significant improvement between pre and post- test means of both groups. In all the cases 0.05 level of significant was fixed to test the hypothesis.

Keywords: Hill Training, physical variables (pure speed)

INTRODUCTION

Hill Training

Hill training has the ability to strengthen necessary ligaments and tendons, reduce the risk of injury, and improve your running form. This occurs as a result of your muscles in your hips, legs, ankles, and feet contracting together to propel your body up and down hills. Your muscles must contract powerfully in order to move our body weight against gravity up and over the hill, which requires more energy than running on flat terrain. In turn, your running muscles gain strength, power, and your stride will lengthen and

quicken. These are all crucial when looking to gain speed and decrease your race times. Many scientists believe that hill running also has the ability to “improve elasticity of muscles, tendons and ligaments, allowing these tissues to carry out more work with less effort and fatigue” (Everything You Need to Know about Hill Training, 2002). This is your body’s way of working efficiently to carry you through the entire race.

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the impact of hill training packages on selected physical variables such as pure speed among Soccer players.

HYPOTHESES

It has been scientifically accepted that any systematic training over a continuous period of time would lead to produce changes in the performance. Based on this concept, the following hypotheses were drawn.

1. There would be significant improvement on the selected physical variables such as pure speed due to the effects of hill and sand training among Soccer players.

Analysis of Data Acceleration

Table- I presents pre and post-test means, standard deviations and dependent t-test values on pure speed of hill training and control groups.

Table-I : Means, standard deviation and dependent t- test values on pure speed of hill training, sand training and control groups

Tests	Hill Training Group		Control Group	
	Mean	SD	Mean	SD
PreTest	4.01	0.20	4.07	0.16
PostTest	3.77	0.14	4.05	0.19
T-Test	4.55*		0.64	

*Significant at .05 level. The table value required at .05 level with df 14 is 2.14.

From the table-I shows that the obtained dependent t-test values between pre-test and post-test means of Hill training and control groups are 4.55 and 0.64 respectively. The table value required for significant difference with df 14 at .05 level is 2.14. Since, the obtained t-test value of Hill training groups is greater than the table value, it is understood that training programme had significantly improved the performance of pure speed and the control group has not improved as the obtained t-test value lesser than the table value because they were not subjected to any specific training.

Pre and posttest means of Hill training and control groups on pure speed were graphically represented in figure 1.

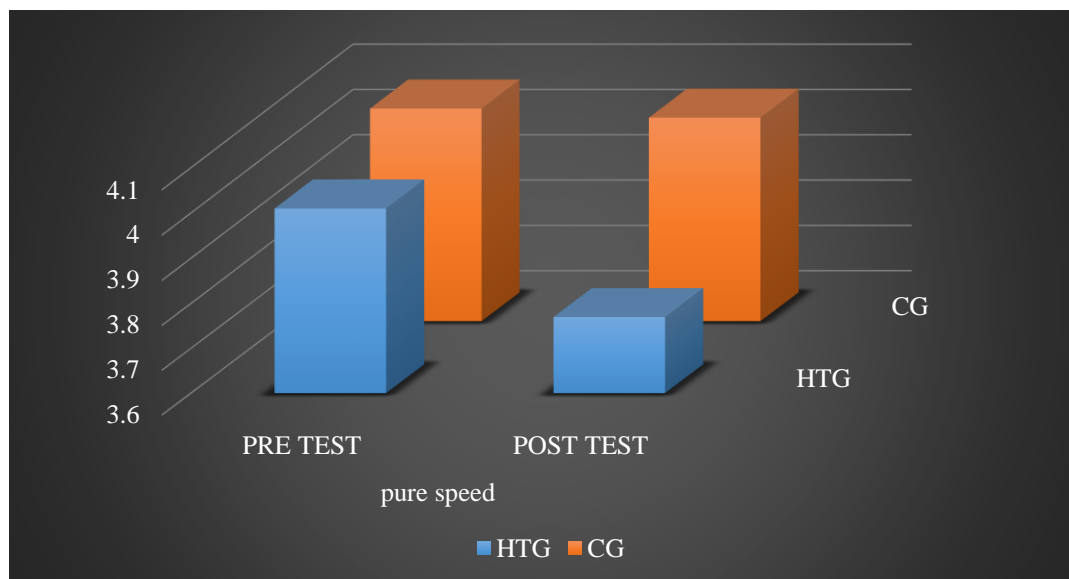


Figure - 3: Pre and post test means of hill training and control groups on pure speed among soccer players

DISCUSSION ON FINDING

From the statistical results, it was concluded that hill training groups had significant improvement in the performance of pure speed. However, control group has no significant improvement in the performance of pure speed as because they were not subjected to any specific training other than their regular routine. The results also showed that hill training had outperformed than and control groups on pure speed. The studies conducted by the following authors were proved that the selected physical fitness variables have improved due to effect of hill training. Soccer involves repeated powerful movements like kicking, passing, and shooting, running and jumping. Measures of power generation including sprinting ability (Chamari K, Chaouachi A, Hambli M, Kaouech F, Wisløff U and Castagna C., 2008) and jumping height and distance (Jullien H, Bisch C, Largouet N, Manouvrier C, Carling CJ and Amiard V., 2008)

CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. Hill training had significantly improved the performance of pure speed among Soccer players.
2. Control group had not shown significant improvement on the performance of pure speed among Soccer players.

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EFFECT OF AEROBIC TRAINING ON SELECTED SKILL PERFORMANCE VARIABLES AMONG VOLLEYBALL PLAYERS

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ABSTRACT

The purpose of this study was to examine the effect of aerobic training on selected skill performance variables among women volleyball players. To achieve this, thirty volleyball players were selected from Madurai Kamaraj University, Madurai, Tamil Nadu, India. The participants were randomly selected, and their ages ranged from 18 to 25 years. The subjects were divided into two groups: an experimental group and a control group. The experimental group underwent aerobic training, while the control group did not participate in any specific training program. The training period lasted for six weeks, with sessions conducted six days a week. In this study, the aerobic training programs was treated as the independent variable, while the skill performance variable agility was considered the dependent variable. The statistical technique of paired t-test analysis was used to compare the pre-test and post-test data for both the experimental and control groups. The results indicated that the aerobic training program led to a significant improvement ($P \leq 0.05$) in the agility levels of the experimental group compared to the control group. This demonstrates the effectiveness of aerobic training in enhancing selected skill performance variables among women volleyball players.

Keywords: Aerobic Training, Agility.

INTRODUCTION

AEROBIC TRAINING

Aerobic Exercise

Aerobic exercise refers to physical activity that involves or enhances the body's oxygen consumption. The term "aerobic" means "with oxygen" and relates to the use of oxygen in the body's metabolic or energy-generating processes. Aerobic exercises are typically performed at moderate intensity levels for extended periods.

An effective aerobic session includes A warm-up period to prepare the body. At least 20 minutes of moderate to intense exercise engaging large muscle groups. A cool-down period to gradually reduce heart rate and muscle activity. Common examples of aerobic exercises include running, walking, swimming, and cycling. These activities became more structured with the advent of scientific exercise programs. The publication of key works, such as those by **Cooper (1985)**, coincided with a growing awareness of

physical inactivity in the general population. These works provided a scientific foundation for modern aerobics programs, which largely rely on data regarding oxygen-consumption equivalency. Characteristics of Aerobic Exercise Aerobic exercises typically involve sustained moderate intensity over long durations. For instance: Running a long distance at a steady pace qualifies as aerobic. Sprinting, by contrast, is not, as it involves short bursts of intense activity. Singles tennis, with near-continuous motion, is generally aerobic, while doubles tennis or golf, which include more frequent breaks, are less so. Some sports are inherently aerobic, while others, like fartlek training or aerobic dance, are designed specifically to enhance aerobic capacity and overall fitness. By combining scientific principles with practical application, aerobic exercise continues to play a critical role in improving health and fitness worldwide.

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effect of aerobic training on selected skill performance variables among women volleyball players.

HYPOTHESIS

1. It is hypothesized that there would be a significant improvement on skill performance variables among women volleyball players due to the effects of aerobic training.
2. It is hypothesized that there would be significant difference on skill performance variables (agility) among aerobic training.

METHODOLOGY

This chapter discusses various essential components of the study, including the selection of subjects and variables, criteria for measuring outcomes, orientation of participants, and the reliability of data. Additionally, it covers aspects such as instrument reliability, tester reliability, data collection procedures, test administration, training programs, and the statistical techniques employed for data analysis. Each of these elements is presented in detail to provide a comprehensive understanding of the methodology.

ANALYSIS OF DATA

The data collected on selected physical fitness variables due to aerobic training were statistically processed and discussed in this chapter. Thirty women volleyball players were divided into two equal groups such as aerobic training [N=15] and control group [N=15]. To test the significance change made from the baseline to post test on the all groups in dividedly 't' test was applied. The significant of the means of the obtained test results was tested at 0.05 level of confidence.

Table – I : Computation of ‘t’-ratio between pre and post test means of aerobic training and control groups on agility

Group	Pre- Test Mean	Post- Test Mean	Mean Difference	Std. Dev. (±)	σ DM	‘t’ Ratio
Aerobic Training	12.16	11.72	0.44	0.25	0.06	6.76*
Control Group	12.18	12.15	0.02	0.16	0.04	0.66

*Significant at 0.05 level of confidence

Table-I reveals that the obtained mean values of pre test and post - test of aerobic training group for agility were 12.16 and 11.72 respectively and the obtained ‘t’ ratio was 6.76*. The obtained mean values of pre - test and post test scores of control group were 12.18 and 12.15 respectively and the obtained ‘t’ ratio was 0.66. The required table value is 2.14 of 0.05 level of confidence for the degree of freedom 14. The calculated ‘t’ ratio of aerobic training was greater than the table value. It is found to be significant change in agility of the volleyball players due to six week of aerobic training. The obtained ‘t’ ratio of control group lesser than the table value. It is found to be insignificant changes in agility of the volleyball players.

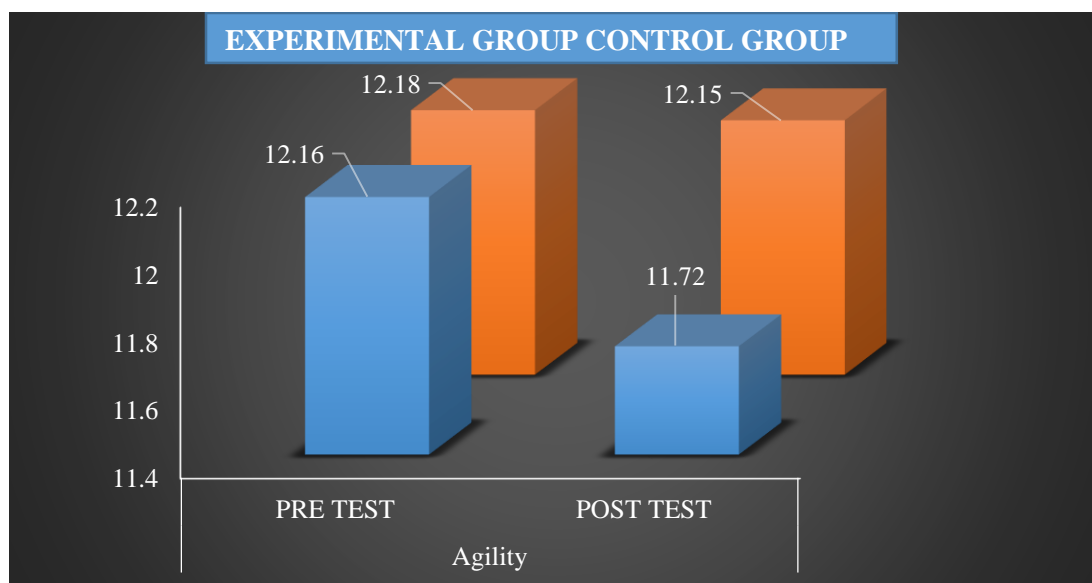


Figure - 2: Bar dgram shows the mean values of pre and post test on agilty of aerobic training and control groups (Scores in seconds)

DISCUSSIONS ON FINDINGS

The results of the study indicate that the experimental group, specifically those who underwent aerobic training, demonstrated significant improvement in all selected skill performance variables among women volleyball players. In contrast, the control group showed no significant changes in any of the selected variables. The analysis further reveals that the aerobic training group achieved a significant improvement in agility

among women volleyball players. Based on the literature and the findings of this study, it can be inferred that systematically designed training programs play a critical role in developing key performance variables. These variables are essential for enhanced performance across almost all sports and games. Therefore, it is concluded that systematically designed training programs should be implemented across various disciplines to maximize performance. Such programs must be recognized for their importance and applied effectively during training sessions. These findings align with those of **Rashiti (2016) and Kumar (2013)**, further supporting the importance of structured training in sports performance enhancement.

CONCLUSIONS

Based on the findings and within the limitation of the study

1. It was noticed that practice of aerobic training helped to improve skill performance variables of women volleyball players.
2. It was also seen that there is progressive improvement in the selected criterion variables of experimental group of women volleyball players after six weeks of aerobic training programme.

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IMPACT OF KALARIPAYATTU TRAINING ON SELECTED PHYSICAL FITNESS AMONG MEN KABADDI PLAYERS

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ABSTRACT

The purpose of the present study was to determine the impact of kalaripayattu training on selected physical fitness among menkabaddiplayers. To achieve the purpose of this study, thirty kabaddiplayers were selected from (RLKA) Reserve Line Kabaddi Academy, Maduraidistrict, Tamilnadu, India. The subjects were randomly selected and their age group ranged from 18 -23 years. The selected groups were divided into two groups, an experimental group and a control group. The experimental group (eg) underwent the medium of physical exercise training. The control group (cg) was not exposed to any training. Physical exercise is considered as the independent variable. The physical fitness (shoulder strength) are dependent variables. The statistical technique covariance ANCOVA was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that the physical exercise group had significant improvement ($p \leq 0.05$) in the level of the selected physical fitness such as shoulder strength compared to the controlgroup.

KEYWORDS: Kalaripayattu Training, Shoulder Strength

INTRODUCTION

KALARIPAYATTU TRAINING

“Kalaripayattu” is a cultural martial art form of Kerala. Its function is scientifically designed and it is also called the heritage of Kerala. It makes a positive impact on the body through which the self, power and behaviours develops in the right manner. In Malayalam the word kalari means pen paceand “payattu” means to exercise with “arms”. Kalaripayattu is one of the mostancient martial arts in the world. The fundamentals of theKalaripayattu are derived from the Dhanurveda. This cultural martial art form of Kerala has a long history. The kalariguru, the teacher of this art is considered as the sage Parasurama, the creator of Kerala. “Kalaripayattu” is considered as a martial art which cultivates mental, physical and spiritual benefits. The Kalaripayattu sporting form is a scientifically ordered system of physical activity which benefits the practitioners to maintain better health in terms of body and mind. Previously, Kerala that kalaripayattu martial art from claiming may be viewed concerning illustration the most seasoned and the vast majority experimental its physicalexecution.

Kalaripayattu has a bright and possible future for placing it in global sporting event. Most of the techniques used in kalari system could be implemented as a sporting exercise for improving the physical and mental fitness of the sportsman in general and athlete in particular. By using the karali skills the sporting performance of the volleyball, basketball and handball players could be developed. Some of the techniques of Kalaripayattu could be used to improve the skills in the basketball, volleyball and other sportsactivities.

METHODOLOGY

The purpose of the study was to find out the effect of kalaripayattu training on selected physical variables among men kabaddi players. To achieve the purpose of this study, thirty kabaddi players were selected from (RLKA) Reserve Line Kabaddi Academy, Madurai district, Tamilnadu, India. The subjects were randomly selected and their age ranged from 18 to 23 years. The selected subjects were divided into two equal groups of fifteen each namely experimental group and control group. The group I is the experimental group which underwent the kalaripayattu training and Group II acted as a control group. Data were analyzed by using the covariance (ANCOVA). Statistical significance was fixed at 0.05 levels. The variables and tests used are presented below.

SELECTION OF THE VARIABLE

Sl. No	Variables	Test /Instruments	Unit of Measure
1	Shoulder Strength	Pull Ups	Numbers

Table I : Analysis of covariance of shoulder strength of both kalaripayattu group and control group

Variables	Variance	CG	EG	Source of Variance	Sum of Squares	df	Mean Square	F
Shoulder Strength	Pre-test Mean	12.47	12.60	BG	0.13	1	0.133	0.009
				WG	401.33	28	14.333	
	Post-test Mean	12.00	15.07	BG	70.53	1	70.533	6.23
				WG	316.93	28	11.319	
	Adjusted Mean	12.06	15.01	BG	65.36	1	65.361	76.38
				WG	23.10	27	0.856	

*Significant at 0.05 level of confidence.

The table value required for significant at the 0.05 level confidence for 1 to 28 & 1 to 27 are 4.30 and 4.20 and 4.21, respectively.

The table I shows that the pre-test mean values on shoulder strength of the physical exercise group and the control group were 12.47 and 12.60, respectively. The obtained 'F' ratio value 0.009 for pre- test score on shoulder strength was less than the required table value 4.20 for insignificant with df 1 and 28. The post-test mean value on shoulder strength of the physical exercise group and the control group were 12.00 and 15.07 respectively. The Obtained 'F' ratio value 6.23 for a post-test score on shoulder strength which was more than the required table value 4.20 for significance with df1 and 28 at 0.05 level of confidence. The adjusted post mean values of shoulder strength for the physical exercise group and the control group were 12.06 and 15.01, respectively. The obtained 'F' ratio value 76.38 for adjusted post-test score on shoulder strength which was more than the required table value 4.21 for significance with df 1 and 27 at 0.05 level of confidence. The results of the study showed that there was a significant difference among the kalaripayattu trained group and the control group on shoulder strength.

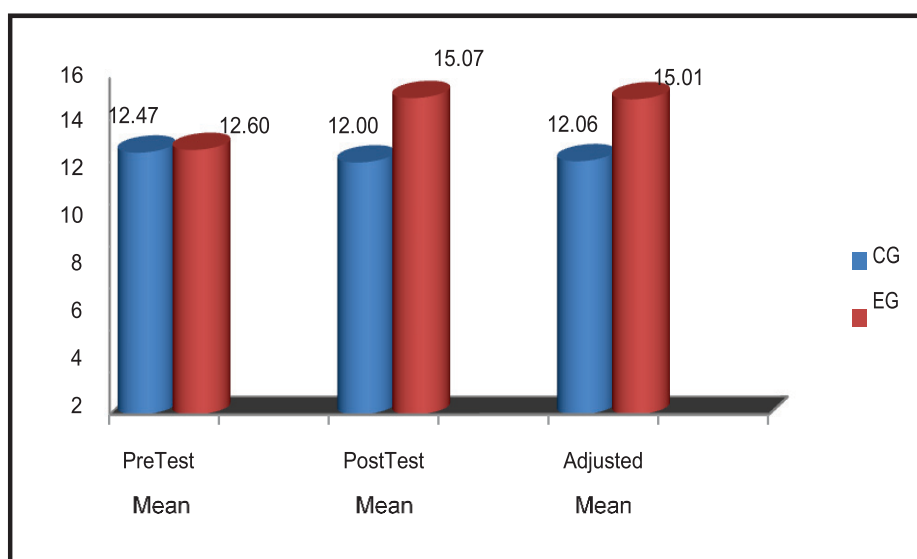


Figure 1: Means Values Of Kalaripayattu Training And Control Group On Shuolder Strength

DISCUSSION ON FINDINGS

The results of the study indicate that the kalaripayattu traininggroup were significantly improved the shoulder strength it may be due to the nature of the kalaripayattu trainingwhich have influenced to increase the physical variables level and performance of kabaddi players. The results of the study indicate that there is a significant improvement on physical variables of the kalaripayattu traininggroup when compared to the control group. This study is supported by **(Suneeta Devi (2016))** which resulted that the effect of selected exercises significantly increased the shoulder strength among the Soccer Players and Singh (2016) had shown the increase in the shoulder strength among goal keepers of kabaddi of **Himachal Pradesh. MantuBaro, et.al., (2017)** was about the relationship between explosive leg strength and speed of inter college level sprinters. **Kumar (2017)** that Effect of three month yoga asana practice improved the on shoulder strength of cricketers. **Trikha (2017)** was about the relationship between shoulder strength and coordinative ability variables of school level kabaddiplayers.

CONCLUSIONS

- ❖ The results of the study reveal that there is a significant improvement on physical variables such as shoulder strength in the kalaripayattu training group when compared to the control group.
- ❖ These changes are due to training as well as due to participating in kalaripayattu training.
- ❖ The training inspires changes in physical variables such as shoulder strength of the kabaddi players.
- ❖ The unique profile should be taken in to consideration while administering training to the kabaddi players.

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EFFECT OF PROPRIOCEPTIVE TRAINING ON SELECTED MOTOR FITNESS AND SKILL PERFORMANCE VARIABLES OF HOCKEY PLAYERS

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ABSTRACT

The purpose of the present study was to determine the effect of proprioceptive training on selected motor fitness and skill performance variables of hockey players. To achieve the purpose of the study was formulated as random group design. Fifty eight (58) boys were randomly selected from the Madurai Kamaraj University, Madurai, TamilNadu, India. The subjects were randomly selected and their age ranged from 18-25 years. The selected groups were divided into two groups, experimental and control group. The experimental group under the Proprioceptive Training and the control group was not have any specific training. The duration of the training period was restricted to six weeks and the session for six days in a week. Proprioceptive Training program is considered as the independent variables. The Program physical variables such as Dynamic Balance and skill performance variable control and driving the ball. Were known as dependent variables. The statistical technique Analysis of 't' test was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that proprioceptive training on selected motor fitness and skill performance variables of hockey players Program group had significant improvement the selected criterion variables such as Dynamic Balance, control and driving the ball compared to the control group.

Keywords: Proprioceptive Training, Motor Fitness and Skill Performance Variables.

INTRODUCTION PROPRIOCEPTIVE TRAINING

Proprioception taking a balanced approach to sport, when it comes to sport performance, power, strength and endurance can only take you so far. Whether a footballer dribbling the ball, a gymnast on the bars, or a rugby player diving for the line while fending off tackles, balance is critical for performance. Balance in sport involves complex interplay between numerous factors. A number of these are conscious such as deciding to move limb to prevent falling at the same time as performing a skill. a basketball shoots – while many more are unconscious play. The unconscious element involves the use of in-built sensory mechanisms and programmed responses. This is known as proprioception. Proprioception has been called the sixth sense and is a mechanism that keeps track and control of muscle tensions and movement in the body. The Central Nervous System, is a broadcasting powerhouse of all sensory stimuli received from

outside. As soon as joints, muscles and ligaments acquire an external impulse, the message is sent through the CNS, which relays this information to the rest of the body, giving it "instructions" on how to react. The brain receives some of these messages and acts on these messages unconsciously. The spinal cord also receives some of these messages and automatically responds to them. This is how proprioception is achieved (Ives and Shelley, 2006)

STATEMENT OF THE PROBLEM

To determine the attributes which could the hockey players. The researcher took this study and entitled present study as effect of proprioceptive training on selected motor fitness and skill performance variables of hockey players.

HYPOTHESIS

Taking into the account of theoretical considerations, revived literatures, discussions with experts in the field of proprioception, the following hypotheses were formulated.

1. Proprioceptive training would bring significant improvement on motor fitness and performance variables of hockey players.
2. There would be significant difference between control and experimental groups for trained and novice players after administration of proprioceptive training.

METHODOLOGY

In this chapter, selection of subjects, selection of variables, orientation of subjects, experimental design, training schedule, test administration and statistical analysis have been explained.

Table- I: Pre and post test mean, standard deviation, standard error, mean difference and 't' ratio for experimental and control groups on dynamic balance for novice players

	Group	N	Pre-test Mean±SD	Post-test Mean±SD	M.D	S.E	t-Ratio	Sig (p)
Dynamic Balance	Exp	15	85.67±7.04	92.0±9.41	2.15	6.33	2.15*	0.01
	Con	15	80.38±7.21	78.85±7.12	1.54	1.19	1.3	0.21

* Significant at 0.05 level of confidence

The table 4.23 shows that the mean of pre and post test scores on dynamic balance for experimental group (novice players) are 85.67 and 92.00 respectively with standard deviations (SD) 7.04 and 9.41. For control group the pre and post test scores are 80.38 and 78.85 with SDs 7.21 and 7.12. The calculated „t“ ratio between pre and post test scores of experimental group are 2.15 with df 14 ($P \leq 0.05$), there is a statistical significance difference between pre and post scores of experimental group due to the

proprioceptive training. The obtained „t” ratio between pre and post test scores of control group are 1.3 with df 12($P \geq 0.05$), there is no statistical significance difference between pre and post scores of control group. The result shows that the proprioceptive training significantly improves the performance of dynamic balance of experimental group than the control group.

BAR DIAGRAM SHOWING THE MEAN OF EXPERIMENTAL AND CONTROL GROUPS ON DYNAMIC BALANCE FOR NOVICE PLAYERS

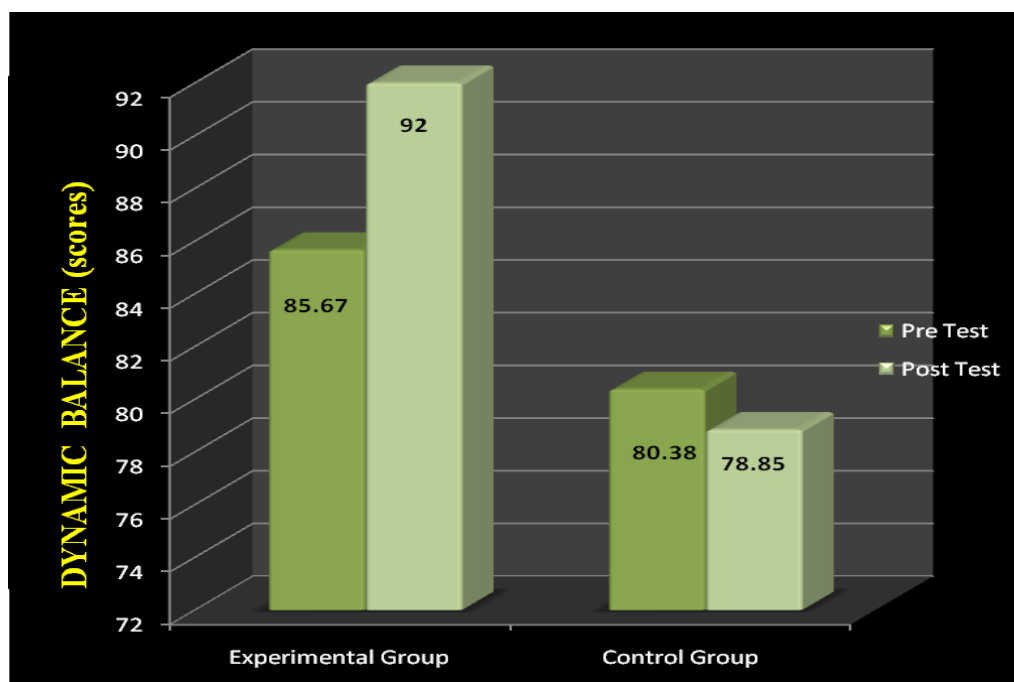


Table – II : Pre and post test mean, standard deviation, standard error, mean difference and ‘t’ ratio for experimental and control groups on receiving, ball control, driving the ball for novice players

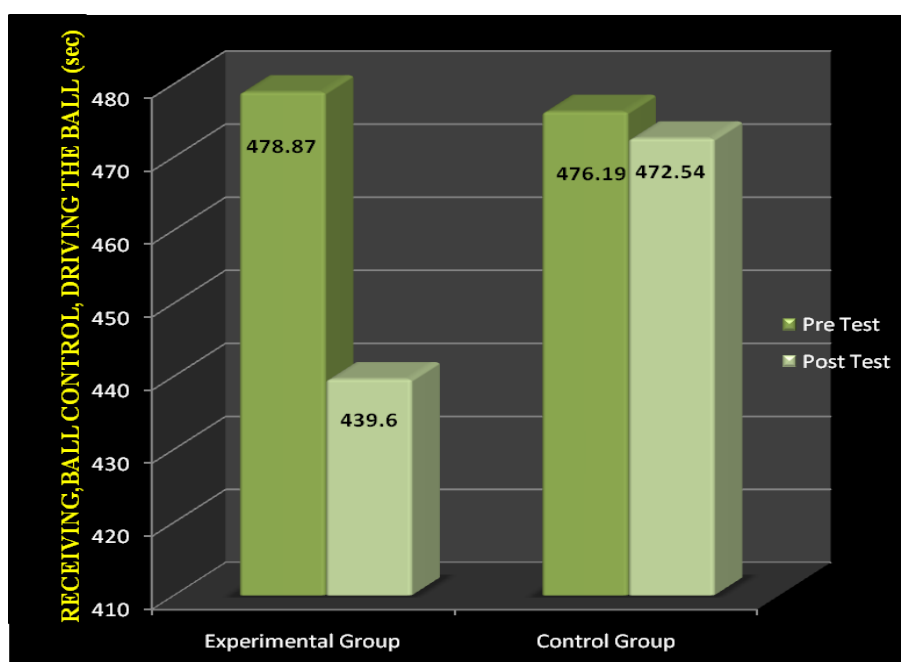
Receiving, Ball control, Driving the ball	Group	N	Pre-test Mean±SD	Post-test Mean±SD	M.D	S.E	t-ratio	Sig (P)
	Exp	15	478.87±57.66	439.60±44.14	3.93	13.63	2.88*	0.012
	Con	13	476.19±57.47	472.54±47.42	3.65	16.66	0.22	0.830

* Significant at 0.05 level of confidence

The table 3.32 indicated the mean of pre and post test scores on receiving, ball control, driving the ball for experimental group are 478.87 and 439.60 respectively with standard deviations (SD) 57.66 and 44.14. For control group the pre and post test scores are 476.19 and 472.54 with SDs 57.47 and 47.42. The calculated „t” ratio between pre and post test scores of experimental group are 2.88 with df 14 ($P \leq 0.05$), there is a statistical significance difference between pre and post scores of experimental group due to the proprioceptive training. The obtained „t” ratio between pre and post test scores of control group are 0.22 with df 12 ($P \geq 0.05$), there is no statistical significance difference

between pre and post scores of control group. The result shows that the proprioceptive training significantly improves the performance of receiving, ball control, driving the ball of experimental group than the control group.

BAR DIAGRAM SHOWING THE MEAN OF EXPERIMENTAL AND CONTROL GROUPS ON RECEIVING, CONTROL AND DRIVING THE BALL FOR NOVICE PLAYERS



DISCUSSION ON THE FINDINGS

The purpose of the present study was to find out the effect of proprioceptive training on select motor fitness and skill performance variables of hockey players. In this study the result proves, difference exists between the two groups namely trained and novice players. There were significance changes in both experimental and control groups. The mean gain difference to the proprioceptive training does not improve the selected variables of except in motor fitness variables dynamic balance. Compared to the trained players the variables were improved except control and driving the ball. The following reviews supported and similar to the findings. **James (2004)** suggested that Proprioceptive training is not only for rehabilitation but also for improvement of skills and sport performance. **Shields et al., (2005)** concluded that the nervous system processes kinesthetic input related to joint rotation of the ankle with central mechanisms to execute a planned coordinated task with upper extremity.

CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The experimental group namely Proprioceptive Training group had achieved significant improvement on selected physical variables such as Dynamic Balance.

2. The experimental group namely Proprioceptive Training group had achieved significant improvement on selected skill performance variables such as control and driving the ball.
3. The control group had no shown significant changes in any of the selected variables.
4. The selected collegiate men hockey players shown significant different in all the selected variables due to the six weeks of Proprioceptive Training.

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PSYCHOMOTOR DRILLS WITH YOGIC PRACTICES ON SELECTED SKILL PERFORMANCE VARIABLES AMONG HOCKEY PLAYERS

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ABSTRACT

The purpose of the present study was to determine the psychomotor drills with yogic practices on selected skill performance among hockey players. To achieve the purpose of the present study, thirty on hockey players were selected from the Bharathidasan University and Anna University BIT campus, Tiruchirappalli, Tamil Nadu, and India. The subjects were randomly selected and their age ranged from 18-25 years. The selected groups were divided into two groups, experimental and control group. The experimental group consisted of fifteen Hockey players and they underwent the psychomotor drills with yogic practices. Fifteen hockey players acted as the control group. The duration of the training period was restricted to six weeks and the session for six days in a week. Psychomotor drills with Yogic practices are considered as the independent variables. The Pushing and Scooping were known as dependent variables. The statistical technique Analysis of 't' test was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that psychomotor drills with yogic practices Program group had significant improvement the selected criterion variables such as Pushing and Scooping compared to the control group.

Keywords: Psychomotor Drills with Yogic Practices, Pushing and Scooping

INTRODUCTION

Psychomotor fitness plays an important role in everyday life activities of human begin. It depends on mental processes as well as on peripheral elements of the movement system. Psychomotor fitness plays a significant role in hockey since during the game great changes in workload as well as frequent changes in game situations occur. In this form of fitness it is necessary to evaluate particular game situations thought fast, precise and valid cognition, reaction and anticipation of player's own activities with those of his partners and opponents. Psychomotor fitness is also necessary for information processing that enters the Central Nervous System and provides efficient decision making ability especially under conditions of incassating fatigue. The application for all these psychomotor abilities during a competitive game situation is related to optimal steering and regulation of motor activates of players.

The term “Psychomotor” is concerned with voluntary human movement, which is observable. Psychomotor variables are the variables bearing direct association with muscular skill, some manipulation of materials and objects and some act requiring neuromuscular coordination.

STATEMENT OF THE PROBLEM

The purpose of this study was to find out the psychomotor drills with yogic practices on selected skill performance variables among hockey players.

HYPOTHESIS

The hypothesis is formulated in the present study were as follows

It was hypothesized that psychomotor drills with yogic practices would have significant difference in skill performance of hockey players.

METHODOLOGY

In this chapter selection of subjects, selection of variables criterion measures orientation of subjects, Reliability of data, Instrument reliability, Testers reliability, collection of data, administration of test, Training programmer, and statistical technique procedure adapted to analyze the data were presented.

ANALYSIS OF DATA

The purpose of the present study was to find out the psychomotor drills with yogic practices on selected skill performance among hockey players. To achieve the purpose of this study, thirty hockey players were selected from the Bharathidasan University and Anna University BIT campus, Tiruchirapalli, Tamil Nadu, India. The subjects were randomly selected and their age ranged from 18-25 years. The selected subject was divided into two equal groups of fifteen each. Group I (YPG) was considered as an experimental group who underwent for six weeks psychomotor drills with yogic practices for six days in week and group II (CG) as a control group without any specific training. Pushing and scooping were selected as variable for the study. The Data was collected from the selected criterion variables before and after a training programme as pre and post test respectively. The analysis of ‘t’ test was used to find out the significant difference between the groups of selected criterion variable separately.

TABLE – 1 ANALYSIS OF ‘T’ RATIO FOR THE PRE AND POST-TESTS OF EXPERIMENTAL AND CONTROL GROUP ON SPEED

Variables	Group	Mean		Mean Difference	Standard Error Mean	t-Ratio
		Pre Test	Post Test			
Skill Performance Variables						
Pushing	Experimental	7.07	8.27	1.2	0.312	3.85*
	Control	6.13	6.20	0.067	0.182	0.367
Scooping	Experimental	7.40	8.33	0.93	0.206	4.52*
	Control	6.67	6.73	0.67	0.153	0.435

**Significance at .05 level of confidence.*

Shows the obtained 't' ratios for the selected variables are 3.85* (Pushing), 4.52* (Scooping). The obtained 't' ratios were tested at 0.05 level of significance. From the results it was inferred that the mean gains losses made from pre to post-test were statistically significant, since the t- ratio reached the significant level 2.14 at 0.05 for degree of freedom. The obtained results confirm the effect of yogic practices positively on Skill Performance variables. The changes observed from pre-test to post-test mean on the selected variables are as follows;

In the yogic practices the changes made from pre to post-test means are; 1.2 (Pushing), 0.93 (Scooping). As the changes in yogic practices on selected skill performance variables were found to be statistically significant the formulated hypothesis related to this was accepted. Following this, to have visual presentation on changes made from pre-test to post-test means yogic practices on selected skill performance variables of yogic practices group were presented in tables. The obtained 't' ratio was 0.21, since the obtained 't' ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant.

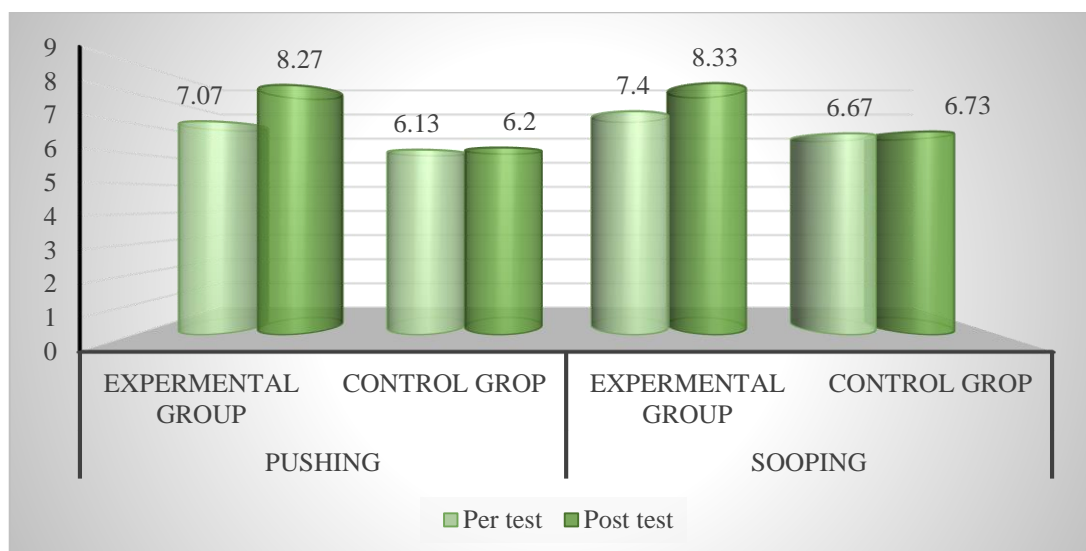


FIGURE- 4: DIAGRAM SHOWS THE MEAN VALUES OF PRE AND POST-TESTS OF EXPERIMENTAL AND CONTROL GROUP ON PUSHING ANDSCOOPING

DISCUSSION ON THE FINDINGS

The results of the study indicate that the psychomotor drills with yogic practices were significantly improved the performance such as on selected skill performance such as psychomotor drills with yogic practices, pushing and scooping. It may be due to the nature of the psychomotor drills with yogic practices which have influenced to increase the performance of hockey players. The results of the study indicate that there is a significant improvement on pushing and scooping. Of the Experimental group when compared to the control group. This study is supported by **Arambula, et al., (2001), Borg-Olivier, et al., (2005), Harold M. et al., (1989), Alpert B, (1990), Sangeetha, B. and A. Pushparajan (2014).**

CONCLUSION

1. Based on the findings and within the limitation of the study it is noticed that practice of psychomotor drills with yogic practices helped skill performance variables among hockey players.
2. It was also seen that there is progressive improvement in the selected criterion variables of experimental group of hockey players after six weeks of training program. Further it also helps to improve other psychomotor drills with yogic practices on selected skill performance factors i.e. pushing and scooping.

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IMPACT OF SLACKLINE TRAINING ON PHYSICAL VARIABLES AMONG VOLLEYBALL PLAYERS

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ABSTRACT

The analysis of data and results of the study was discussed in this chapter. This study was designed to find out the impact of Slackline training on selected physical variable among male volleyball players. To achieve the purpose of the study thirty male volleyball players (N=30) were randomly selected from various colleges in and around Madurai, Tamil Nadu state, India. The age of subjects ranged from 18 to 25 years. The subjects were randomly divided into two equal groups of twelve each such as experimental groups and control group. Such as Group-I underwent Slackline Training, Group-II acted as Control. Fifteen male volleyball players (N=30) were divided at random and assigned the min to two groups of Fifteen each (n=15). The experimental groups participated in the Slackline training for 3 days a week, one session per day and for 12 weeks each session lasted 60 minutes, control group was not exposed to any training other than their daily routines activities. The dependent variables selected for this study were explosive strength. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. The data collected from the two groups before and after the experimental period. Were statistically analyzed for significant improvement by dependent 't' test. In all the cases 0.05 level was fixed as level of significance to test the hypotheses.

KEYWORDS: Slackline& physical variables (Explosive Strength).

INTRODUCTION

Slackline training

Slacklining, the art of walking along one-inch wide nylon webbing, is a new school variation of circus style tight-rope walking. Born along chain link fences in Yosemite Valley, the sport of slacklining has become a recreational phenomenon enjoyed worldwide, from the beaches to the highest alpine spires.

STAMEN OF THE PROBLEM

The purpose of the study was to find out the impact of Slackline training on selected physical variables among male volleyball players.

HYPOTHESES

1. It has been scientifically accepted that any systematic training over a continuous period of time would lead to improvement in performance. Based on this concept and research questions the following research hypotheses were formulated and it was tested at 0.05 level of confidence.
2. There would be significant improvement on selected physical, variables due to the effect of Slackline training among male Volleyball players.

METHODOLOGY

In this chapter the procedures adapted for the selection of subjects, classification of groups, selection of variables, Justification of criterion variables, selection of test, pilot study, training programme, experimental design, reliability of data, instrument reliability, reliability of test, tester's reliability, subject reliability, orientation of subjects, administration of tests, collection of data and statistical techniques for the analysis of the data have been explained.

STATISTICAL TECHNIQUES

The data collected from the three groups before and after the experimental period were statistically analyzed for significant improvement by dependent 't' test. Thirty male volleyball players (N=30) were divided at random and assigned the min to two groups of fifteen each (n=15).No attempt was made to equate the groups in any manner. In the cases 0.05 level of significance to test the hypotheses.

TABLE– 4.4 THE SUMMARY OF MEAN AND DEPENDENT 't' TEST FOR THE PRE AND POST TESTS ON EXPLOSIVE STRENGTH OF EXPERIMENTAL AND CONTROL GROUPS (In Centimeter)

Mean	Slackline training Group – (I)	Control Group–(II)
Pre- test	58.50	58.49
SD(±)	0.31	0.30
Post-test	60.12	58.86
SD(±)	0.61	0.89
't'-test	8.57*	1.48

**Significant at 0.05 level.*

(Table value required for significance at 0.05 level for 't'-test with df 11 is 2.20).

The paired sample 't' was computed on selected dependent variables. The results are presented in the above Table- I. The 't' test value of Slackline training group and control group are 8.57 and 1.48 for explosive strength performance. The experimental 't'

values are significantly higher than the required table value of 2.20 with degrees of freedom 11 at 0.05 level of confidence. The 't' test value of control group is 1.48 which is less than the required table value, it indicates that there was not significant improvement on explosive strength performance due to they were not subjected to any specific training. The result of the study shows that Slackline training group has significantly improved the performance of explosive strength.

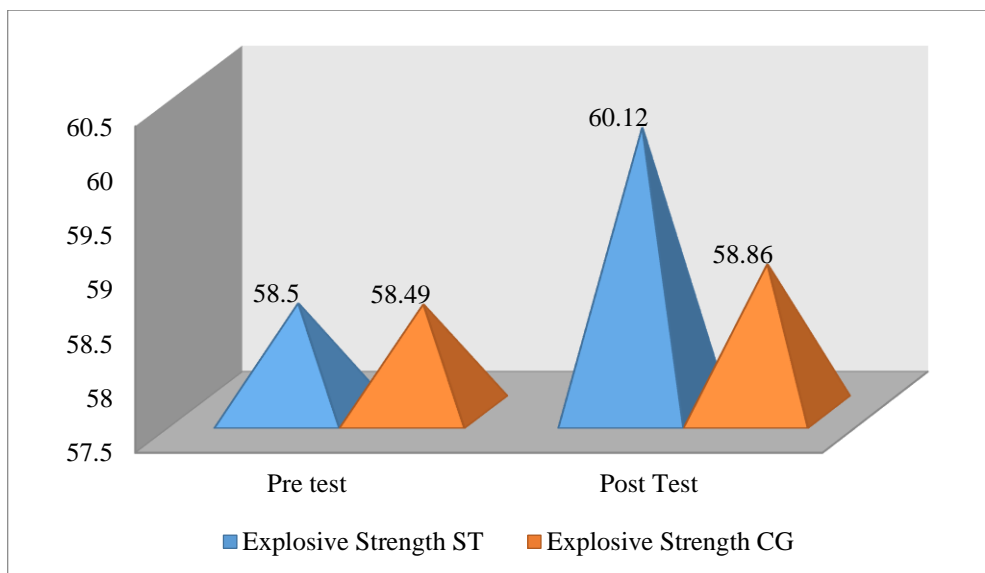


Figure - 1: THE GRAPHICAL REPRESENTATION OF THE PRE, POST MEAN VALUES OF EXPLOSIVE STRENGTH ON SLACKLINETRAINING GROUP AND CONTROL GROUP.

DISCUSSING ON FINDINGS

The results of the study indicated that the experimental groups namely Slackline training group had significantly influenced on the performance of the selected variables such as explosive strength of experimental groups had undergone systematic training over 12 weeks duration. The control group had not shown significant improvement on selected variables as they have not subjected to any of the specific training conditioning similar to that of experimental groups. Hence it is understood that the selected training means had influenced on the criterion variables. The results of the study are in conformity with the findings of Parasuraman & Mahadevan (2018), Chen, et al., (2018), Chen, et al., (2018), Trecroci, et al., (2018), Giboin (2018) Mildren, et al., (2018), Ringhof, et al., (2018) Kaba Rosario (2018).

CONCLUSIONS

1. From the analysis of the data, the following conclusions were drawn.
2. The control group had not shown significant change in any of the selected variables.
3. The Experimental groups namely Slackline training had significantly improved the physical variables such as explosive strength.

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EFFECT OF FOOTBALL SPECIFIC AEROBIC TRAINING ON MOTOR FITNESS COMPONENTS AMONG FOOTBALL PLAYERS

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ABSTRACT

The purpose of the present study was to examine the effect of football-specific aerobic training on motor fitness components among football players. To achieve this objective, thirty football players were selected from the Reserve Line Football Academy (RLFA) in Madurai district, Tamil Nadu, India. The participants, aged between 14 and 16 years, were randomly selected and then divided into two groups: an experimental group and a control group. The experimental group (SAT) underwent a specific aerobic training regimen, while the control group (CG) did not receive any specialized training. The aerobic training program for the experimental group consisted of specific aerobic exercises designed for football players, conducted three times a week (on Mondays, Wednesdays, and Fridays) during evening sessions. The training program lasted for six weeks. In this study, the **specific aerobic training** was considered the independent variable, while **explosive strength** was chosen as the dependent variable for evaluation. Explosive strength was measured before and after the intervention using appropriate fitness tests. The data collected from the pre-tests and post-tests were statistically analyzed using **Analysis of Covariance (ANCOVA)** to compare the effects of the intervention between the experimental and control groups. This technique was used to account for any potential initial differences between the groups and to assess the significance of the changes observed in the dependent variable. The results of the study indicated that the specific aerobic training group showed a significant improvement in explosive strength ($P \leq 0.05$) compared to the control group. This suggests that football-specific aerobic training is an effective method for improving motor fitness components, specifically explosive strength, in young football players. The findings highlight the importance of incorporating aerobic training tailored to the specific needs of football players, as it can lead to enhanced physical performance and contribute to better athletic outcomes.

Keywords: Aerobic Training and Explosive Strength.

INTRODUCTION

Aerobic training specifically targets the aerobic energy system and the cardiovascular system, leading to improved oxygen delivery and utilization. This type of

training is crucial for athletes as it enhances their overall endurance and stamina by increasing the efficiency of oxygen transport to the muscles. Aerobic training should be done at least three times a week, with the intensity ranging between 70% and 80% of the individual's maximum heart rate, and typically lasts for 30 minutes or more. By improving cardiovascular capacity, aerobic training helps athletes perform longer and recover faster between bouts of exertion. Aerobic training is suitable for virtually all sports, as it provides the foundational fitness needed for optimal performance. It is essential for enhancing cardiovascular health, which is a key factor in an athlete's ability to sustain performance and recover effectively. As oxygen delivery is vital for the recovery of all energy systems, athletes trained aerobically are able to perform at higher intensities for longer periods. This is especially beneficial in sports requiring sustained effort over extended periods, as the body's ability to clear waste products such as carbon dioxide and lactic acid is improved. This leads to better overall energy efficiency and performance.

Some specific sports where aerobic training is highly beneficial include long-distance events such as marathons, triathlons, and long-distance cycling races like the Tour de France. Other endurance sports such as Iron Man events, cross-country skiing, and Australian Rules football also greatly benefit from an aerobic-focused conditioning program. In these sports, aerobic training helps improve the athlete's ability to maintain high levels of performance over extended periods, reducing the onset of fatigue and enhancing recovery.

STATEMENT OF THE PROBLEM

The purpose of the present study was to find out the "Effect of Football Specific Aerobic Training on Motor Fitness Components among Football Players".

HYPOTHESIS

It is hypothesized that:

1. There would be a significant improvement on selected motor fitness components due to the effect of Football specific aerobic training programme.
2. There would be significant differences on selected motor fitness components between experimental and control groups.

METHODOLOGY

In this chapter, selection of the subjects, classification of groups, selection of the variables, justification for selecting variables, selection of the test, pilot study, training programme, reliability of data, instrument reliability, tester's competency & reliability of test, subject reliability, orientation of the subjects, administration of the tests, collection of data, experimental design and statistical techniques for the analysis of data has been described.

Table – 4.3 ANALYSIS OF COVARIANCE OF PRE, POST AND ADJUSTED POST TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON EXPLOSIVE STRENGTH

Test	Experimental group	Control group	SOV	SS	df	MS	F-ratio
Pre test							
Mean	1.73	1.74	B.M	6.53	1	6.53	0.02
Sd(±)	19.39	19.33	W.G.	10498.3	28	374.93	
Post test							
Mean	1.91	1.74	B.M.	2133.63	1	2133.63	5.06*
Sd(±)	21.34	19.69	W.G.	11813.3	28	421.9	
Adjusted post test							
Mean	1.73	1.91	B.S.	2387.04	1	2387.04	247.28*
			W.S.	260.64	27	9.65	

*Significant at 0.05 level of confidence

SOV – Source of Variance

df – Degrees of Freedom

B.M. – Between Mean

B.S. – Between Sets

SS – Sum of Square

MS – Mean Square

W.G. - Within groups

W.S. – Within Sets

(The table values required for significance at 0.05 level of confidence for 1 & 28 and 1 & 27 is 4.20 and 4.21 respectively).

Table - 1 and Figure 4.3 display the pre-test mean values for explosive strength in the experimental and control groups, which are 1.73 and 1.74, respectively. The calculated 'F' ratio for the pre-test means is 0.02, which is lower than the critical value of 4.20 (with degrees of freedom 1 and 27) required for significance at the 0.05 level of confidence. This suggests no significant difference between the pre-test explosive strength scores of the two groups. For the post-test, the mean values for explosive strength in the experimental and control groups are 1.91 and 1.74, respectively. The obtained 'F' ratio for the post-test means is 5.06, which is greater than the table value of 4.20 (df = 1, 27), indicating a significant difference at the 0.05 level of confidence for explosive strength between the two groups.

The adjusted post-test mean values for explosive strength are 1.91 for the experimental group and 1.73 for the control group. The calculated 'F' ratio for the adjusted post-test means is 247.28, which significantly exceeds the critical value of 4.21 (df = 1, 27) at the 0.05 level of confidence. This indicates a statistically significant difference between the experimental and control groups in terms of explosive strength

after adjusting for any potential pre-test differences. In conclusion, the results of the study revealed a significant improvement in explosive strength in the experimental group, as evidenced by the significant difference in the adjusted post-test mean values between the experimental and control groups.

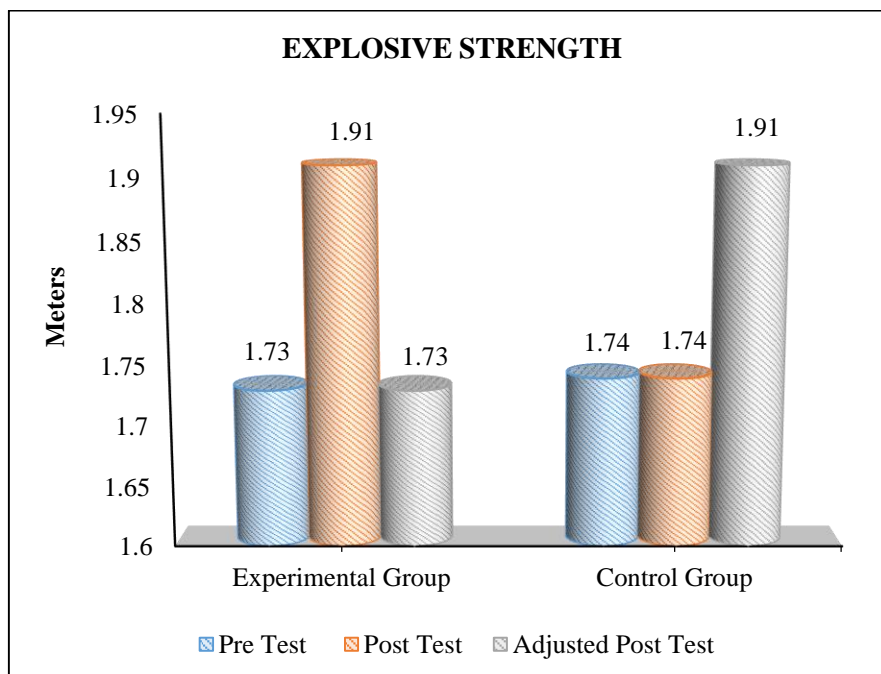


Figure – 1: The Pre, Post and Adjusted Post-Test Mean Values of Experimental and Control group on Explosive Strength

DISCUSSION ON FINDINGS

The results of the study demonstrate that the experimental group, which participated in football-specific aerobic training, showed significant improvements in all selected motor fitness components. These components included speed, agility, explosive strength, and **endurance**. In contrast, the control group did not exhibit any significant changes in the selected variables. The analysis clearly indicates that football-specific aerobic training led to substantial improvements in the physical performance of the experimental group, emphasizing the importance of this training method for enhancing key motor fitness variables in football players. The findings suggest that systematically designed training programs targeting specific fitness components are crucial for improving performance in football and other sports. It is evident from both the literature and the present study that structured and well-designed training routines play a vital role in developing physical qualities that are essential for high-level performance in sports. Thus, it is concluded that all athletic disciplines should incorporate systematically designed training programs to achieve optimal performance and ensure sustained improvement over time. These training interventions, when implemented effectively, can lead to significant advancements in athletic capabilities.

The results of this study align with the findings of **Rashiti (2016)** and **Kumar (2013)**, who also emphasized the positive effects of specific training on motor fitness components for athletes.

Conclusions

From the analysis of the data, the following conclusions were drawn.

1. The Football players of control group had not shown significant changes in any of the selected variables.
2. The Football specific aerobic training group shown significant improvement in selected motor fitness components among Football players.
3. There Football players who had undergone 6 weeks of specific aerobic training showed significant improvement in explosive strength when compared with control group.

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EFFECT OF PROPRIOCEPTIVE TRAINING ON SELECTED MOTOR FITNESS AMONG VOLLEYBALL PLAYERS

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ABSTRACT

The purpose of the present study was to determine the effect of proprioceptive training on selected motor fitness among volleyball players. To achieve the purpose of the study was formulated as random group design. Fifty eight (58) boys were randomly selected from the Bharathidasan University and Anna University BIT campus, Tiruchirapalli, TamilNadu, India. The subjects were randomly selected and their age ranged from 18-25 years. The selected groups were divided into two groups, experimental and control group. The experimental group under the Proprioceptive Training and the control group was not have any specific training. The duration of the training period was restricted to six weeks and the session for six days in a week. Proprioceptive Training program is considered as the independent variables. The Program physical variables such as Dynamic Balance. Were known as dependent variables. The statistical technique Analysis of 't' test was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that proprioceptive training on selected motor among volleyball players Program group had significant improvement the selected criterion variables such as Dynamic Balance compared to the control group.

Keywords: Proprioceptive Training, Motor Fitness Variables.

INTRODUCTION

Proprioceptive Training

When it comes to sport performance, attributes like power, strength, and endurance can only take an athlete so far. Whether it's a footballer dribbling the ball, a gymnast navigating the bars or a rugby player diving for the line while fending off tackles, balance plays a critical role in achieving peak performance. Balance in sport involves a complex interplay of numerous factors. Some of these factors are **conscious**, such as the deliberate movement of a limb to prevent a fall while simultaneously performing a skill—like a basketball player making a jump shot. Many more, however, are **unconscious**, relying on in-built sensory mechanisms and pre-programmed responses. This unconscious aspect is governed by **proprioception**. Often referred to as the “sixth sense,” proprioception is a vital mechanism that monitors and controls muscle tension and movement throughout the body. It ensures seamless coordination and balance

by integrating sensory inputs and motor responses. The **Central Nervous System (CNS)** acts as a communication hub, processing sensory information received from external stimuli. When joints, muscles, and ligaments detect an impulse such as pressure or movement a signal is sent through the CNS. This information is relayed to the rest of the body, providing “instructions” on how to react. **Brain’s Role** some of these messages are processed by the brain, which responds accordingly, often without conscious effort. **Spinal Cord’s Role** other messages are handled by the spinal cord, which initiates automatic responses, such as reflexes. Together, these systems ensure efficient and immediate adjustments to maintain balance and coordination, a process that embodies proprioception. **As Ives and Shelley (2006)** explain, proprioception is the body’s built-in system for tracking and controlling movement, making it an indispensable element of athletic performance.

STATEWOMENT OF THE PROBLEM

To determine the attributes which could the volleyball players. The researcher took this study and entitled present study as effect of proprioceptive training on selected motor fitness and skill performance variables of volleyball players.

HYPOTHESIS

1. Taking into the account of theoretical considerations, revived literatures, discussions with experts in the field of proprioception, the following hypotheses were formulated.
2. Proprioceptive training would bring significant improvement on motor fitness of volleyball players.
3. There would be significant difference between control and experimental groups for trained and novice players after administration of proprioceptive training.

METHODOLOGY

In this chapter, selection of subjects, selection of variables, orientation of subjects, experimental design, training schedule, test administration and statistical analysis have been explained.

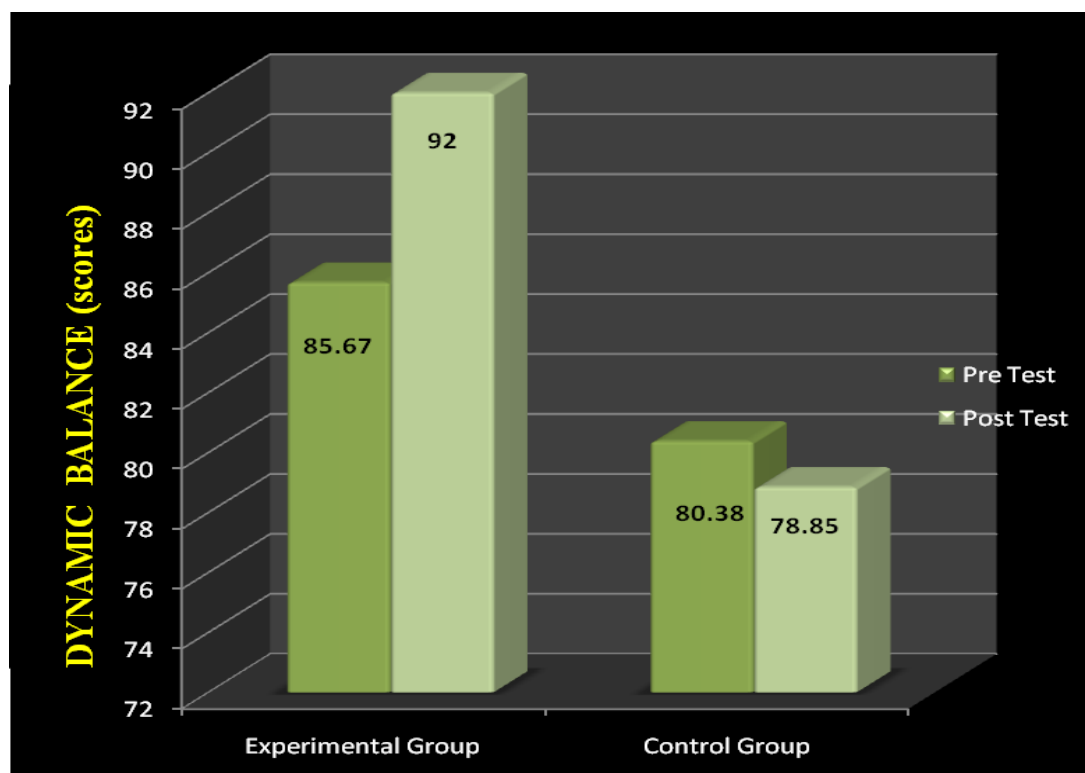
Table- I PREANDPOSTTESTMEAN, STANDARD DEVIATION, STANDARDError, MEAN DIFFERENCE AND ‘t’ RATIO FOR EXPERIMENTAL AND CONTROL GROUPS ON DYNAMIC BALANCE FOR NOVICE PLAYERS

Dynamic Balance	Group	N	Pre-test Mean±SD	Post-test Mean±SD	M.D	S.E	t-Ratio	Sig (p)
	Exp	15	85.67±7.04	92.0±9.41	2.15	6.33	2.15*	0.01
	Con	15	80.38±7.21	78.85±7.12	1.54	1.19	1.3	0.21

* Significantat0.05 level of confidence

The table 4.23 shows that the mean of pre and post test scores on dynamic balance for experimental group (novice players) are 85.67 and 92.00 respectively with standard deviations (SD) 7.04 and 9.41. For control group the pre and post test scores are 80.38 and 78.85 with SDs 7.21 and 7.12. The calculated „t” ratio between pre and post test scores of experimental group are 2.15 with df 14 ($P \leq 0.05$), there is a statistical significance difference between pre and post scores of experimental group due to the proprioceptive training. The obtained „t” ratio between pre and post test scores of control group are 1.3 with df 12 ($P \geq 0.05$), there is no statistical significance difference between pre and post scores of control group. The result shows that the proprioceptive training significantly improves the performance of dynamic balance of experimental group than the control group.

BARDIAGRAMSHOWINGTHEMEANOFEXPERIMENTALAND CONTROL GROUPS ON DYNAMIC BALANCE FORNOVICEPLAYERS



DISCUSSION ON THE FINDINGS

The purpose of the present study was to find out the effect of proprioceptive training on select motor fitness variables of volleyball players. In this study the result proves, difference exists between the two groups namely trained and novice players. There were significance changes in both experimental and control groups. The mean gain difference to the proprioceptive training does not improve the selected variables of except in motor fitness variables dynamic balance. Compared to the trained players the variables were improved. The following reviews supported and similar to the findings. **James (2004)** suggested that Proprioceptive training is not only for rehabilitation but also for improvement of skills and sport performance. **Shields et al., (2005)** concluded that the

nervous system processes kinesthetic input related to joint rotation of the ankle with central mechanisms to execute a planned coordinated task with upper extremity.

CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The experimental group namely proprioceptive training group had achieved significant improvement on selected physical variable such as dynamic balance.
2. The control group had no shown significant changes in any of the selected variables.
3. The selected collegiate men volleyball players shown significant different in all the selected variables due to the six weeks of Proprioceptive Training.

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A STUDY ON INDIVIDUAL AND COMBINED EFFECTS OF FARTLEK WEIGHT AND PRANAYAMA TRAINING ON BIOMOTOR ABILITIES AMONG FOOTBALL PLAYERS

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ABSTRACT

This study aimed to investigate the **A Study on Individual and Combined Effects of Fartlek, Weight and Pranayama Training on biomotor abilities among Football Players**. To achieve this objective, a total of 80 male football players (N = 80), aged 18 to 23 years, were selected from (RLFA) Reserve Line football Academy, Madurai district, Tamil Nadu, India. The participants were divided into four equal groups (N = 20 per group) Group I: Weight Training, Group II: Fartlek Training, Group III: Pranayama Training, Group IV: Control Group (no specialized training, only daily routines) dependent variables and testing methods. The following physical variables were selected as dependent variables and assessed using standard tests Agility: measured using the 50-yard dash test. Training protocol the experimental groups underwent their respective training programs for a period of 12 weeks, three days per week on alternate days. Statistical analysis the data collected from the pre- and post-tests of the three experimental groups and the control group was analyzed using analysis of covariance (ANCOVA). A significance level of 0.05 was set for testing the hypotheses.

KEYWORDS: Weight Training, Fartlek Training and Pranayama Training, Agility.

INTRODUCTION

Fartlek training is running with intensity according to the requirement of the athlete and the dictates of the terrain. The athlete will use at erra in which is undulated and makes varying demands upon him (ex. Hills, woodland, ploughed land, sand) like the alternating pace method with anaerobic period that provides a string stimulus for the improvement of VO₂max. In addition, the demands of terrain stimulate strength, endurance, development, and proprioceptive balance adjustment of ankles, knees and hip (Doyle, (2017)).

Yoga is an exact science. It is a perfect, practical system of self-culture. It is the discipline of the mind, senses and the physical body. It helps the student to attain perfect concentration of the mind, ethical perfection, moral excellence and spiritual calmness. Yoga had its genesis in the wandering ascetics who sought the solitude of the forests to practice this ancient science and then imparted their knowledge to the ardent students

(mumuksu) who lived in their ashrams. The ancient yogi's been possessive about this art form and did not make any effort to popularize yoga. The yogic postures and the subsequent stage of yoga were handed down only to the deserving students. Hence, this science remained limited to the confines of the forests or remote caves (Mohan, 2002).

Weight training program is one of the fine decisions to make for your health, well-being, physical, and mental performance. Weight training on an everyday foundation improves your strength, endurance, confidence, appearance, health, longevity and pleasant of daily living. Consistent weight training help slim it your stress, control your weight, support your bones, decrease your chance of injury, and, gives you an aggressive aspect in all components of life (Narasimham, 2009).

STATEMENT OF THE PROBLEM

The eminent objectives of this study intended to find out “**A Study on Individual and Combined Effects of Fartlek, Weight and Pranayama Training on biomotor abilities among Football Players**”.

HYPOTHESES

The following hypotheses were out lined for the study

1. It was hypothesized that, there might be significant improvement biomotor abilities of **football players** due to **of fartlek, weight and pranayama training**.
2. It was hypothesized that **fartlek, weight and pranayama** training group might show better improvement the skill related biomotor abilities than the control group.

METHODOLOGY

To fulfill the objectives of this study, a total of 80 male football players (N = 80) were chosen as participants. These athletes were selected from (RLFA) Reserve Line football Academy, Madurai district, Tamil Nadu, India. The participants, aged 18 to 23 years, were randomly divided into four equal groups of 20 members each (N = 20 per group). Group I underwent Fartlek training. Group II underwent weight training. Group III participated in Pranayama training. Group IV served as the control group, following only their regular daily routines without any specialized training intervention. The study focused on four physical variables, which were assessed using specific test Agility: Assessed with the shuttle run test.. The training programs for the experimental groups were conducted over duration of 12 weeks, with sessions scheduled three times a week on alternate days. Pre- and post-intervention data were collected for all groups on the selected biomotor abilities. The data were statistically analyzed using Analysis of Covariance (ANCOVA) to determine the significance of differences among groups. A confidence level of 0.05 was set to test the hypotheses.

TABLE -1 ANALYSIS OF COVARIANCE OF MEANS OF FARTLEK WEIGHT AND WITH PRANAYAMA TRAINING AND CONTROL GROUP ON AGILITY. (IN SECONDS AND NUMBERS).

Variables	Test	Fartle Training	Weight Training	Pranayama Training	Control Group	Source of Variance	Sum of Square	df	Mean Squares	'F' Ratio
Agility	Pre Test	15.53	15.51	15.51	15.52	Between	0.0040	3	0.0013	0.03
						Within	2.3520	76	0.0420	
	Post Test	14.93	15.21	15.41	15.50	Between	2.8193	3	0.9398	20.40*
						Within	2.5800	76	0.0461	
	Adjusted Post Test	14.92	15.22	15.41	15.50	Between	2.9705	3	0.9902	215.03*
						Within	0.2533	75	0.0046	
						Within	82.91	75	1.51	

*Significant at 0.05 level of confidence. (Table value with df 3 and 76 and 3 and 76 are 2.77 respectively).

The pre, post-test and adjusted post-test mean values of agility fartlek training group (FTG), weight training group (WTG), pranayama training group (PTG) and control group (CG) were 15.53, 14.93, 14.92; 15.51, 15.21, 15.22; 15.51, 15.41, 15.41 and 15.52, 15.50, 15.50 respectively.

The adjusted post-test 'F' ratio values of agility were 215.03 respectively. The obtained 'F' values of adjusted post-test were greater than the table value of 2.77. Hence it was proved that there were significant improvements on agility, agility, explosive strength and muscular endurance among men football players.

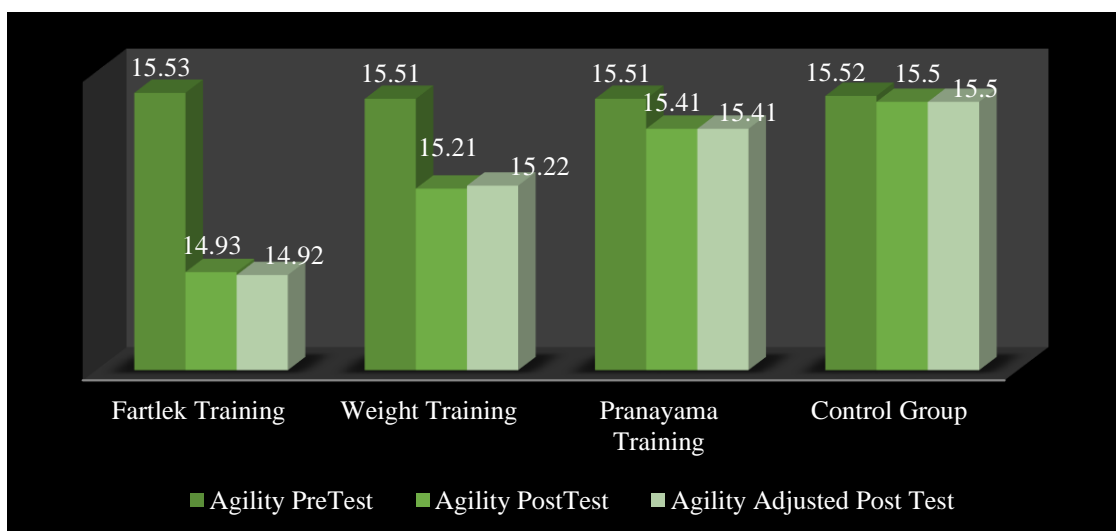


Figure-1: PRE, POST AND ADJUSTED POST TEST MEANS OF FARTLEK AND WEIGHT TRAINING WITH PRANAYAMA TRAINING AND CONTROL GROUP ON AGILITY

DISCUSSION ON FINDINGS

The result of the study indicates that the experimental group namely as fartlek, weight and pranayama training packages groups had significantly improved in the selected dependent variables such as agility. The improvement caused by fartlek and weight training with pranayama training packages. The results of the studies are in line with the studies of **Vallimurugan, (2019), Sureshkumar, (2023)**.

CONCLUSIONS

The experimental groups namely as fartlek, weight and pranayama training packages groups had achieved significant improvement on selected the physical variables such as agility, when compared to control group.

It was concluded that fartlek training shown better improvement when comparing to the weight training and pranayama training groups on selected the physical variables.

It is recommended that college-level football players incorporate Fartlek training, weight training, and Pranayama training into their routines to achieve positive enhancements in their performance.

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EFFECT OF PLYOMETRIC TRAINING ON SELECTED PHYSICAL VARIABLES AMONG KABADDI PLAYERS.

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ABSTRACT

The purpose of the study was to find out the effects of plyometric training on physical and skill performance variable among kabaddi players. Thirty school level boys kabaddi players were selected from (RLKA) Reserve Line Kabaddi Academy, Madurai District, Tamilnadu, India. Their age ranged between 13 to 16 years. The selected subjects were divided into two equal groups plyometric and control group consisting of 15 each. The plyometric group was given training for a period of six weeks of plyometric training and the control group has not undergone for any specific training. Experimental and control group. Plyometric training program is considered as the independent variables. The motor components such as agility were known as dependent variables. The statistical technique Analysis of 't' test was used to analyze the pre-test and post-test data of experimental group and control group. The results showed that the plyometric training Program group had significant improvement ($P \leq 0.05$) in the level of the selected criterion variables such as program motor components such as agility.

Keywords: Plyometric Training, Agility.

INTRODUCTION

Kabaddi, a dynamic and engaging body contact sport, unfolds on the playing field between two teams, each comprising seven players. At its core, the game revolves around the objective of a designated player, commonly known as the "raider," who ventures into the adversary's half of the court. The raider's mission is to swiftly touch as many opponents as possible and make a safe return to their own half—all within a brisk 30-second time frame. Points are garnered for each successful tag made by the raider, constituting a testament to their agility and strategic prowess. Conversely, the opposing team gains appointment for thwarting the raider's mission. The intricate balance of offense and defense is accentuated by the temporary sidelining of players upon being touched or tackled. Speed and flexibility are two crucial attributes for success in Kabaddi players. Speed is essential for both offense and defense in Kabaddi. Collegely a fast raider can enter the opponent's half, touch an opponent, and return quickly, scoring points for their team. Defensively, speed helps in chasing down and tagging raiders before they can return to their half. A quick defender can cover ground faster, making it challenging for the raider to escape. Flexibility is vital for both raiders and defenders. Raiding requires agility and the ability to change direction rapidly to evade opponents. Defenders need flexibility to get low and

make quick lunges or dives to tag raiders. Being able to move in various directions and angles is critical. (Plyometric Training, (Agility). The study focused on analyzing several key fitness attributes, with Agility identified as the primary criterion variables. Through this investigation, the aim was to evaluate the efficacy of these training modalities in improving motor fitness among participants. Sharma, R. K., (2017).

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effect of plyometric training on selected physical variables among kabaddi players.

HYPOTHESIS

1. It is hypothesized that there would be a significant improvement on physical variables among kabaddi players due to the effects of plyometric training.
2. It is hypothesized that there would be significant difference on physical variables (agility) among plyometric training.

METHODOLOGY

In this chapter selection of subjects, selection of variables criterion measures orientation of subjects, Reliability of data, Instrument reliability, Testers reliability, collection of data, administration of test, Training programmer, and statistical technique procedure adapted to analyze the data were presented.

ANALYSIS OF DATA

The data collected on selected physical fitness variables due to plyometric training were statistically processed and discussed in this chapter. Thirty adolescent boys kabaddi players were divided into two equal groups such as plyometric group [N=15] and control group [N=15]. To test the significance change made from the baseline to post test on the all groups in dividedly 't' test was applied. The significant of the means of the obtained test results was tested at 0.05 level of confidence.

TABLE-I COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF PLYOMETRIC AND CONTROL GROUPS ON AGILITY

(Scores in seconds)

Group	Test	Mean	Std. Dev	't' values
Plyometric Group	Pre Test	20.61	0.42	13.16*
	Post Test	20.58	0.42	
Control Group	Pre Test	20.77	0.36	1.75
	Post Test	22.34	1.46	

*Significant at 0.05 level of confidence

Table-I reveals that the obtained mean values of pre test and post - test of Plyometric group for agility were 20.61 and 20.58 respectively and the obtained 't' ratio was 13.16*. The obtained mean values of pre - test and post test scores of control group were 20.77 and 22.34 respectively and the obtained 't' ratio was 1.75. The required table value is 2.14 of 0.05 level of confidence for the degree of freedom 14. The calculated 't' ratio of plyometric group was greater than the table value. It is found to be significant change in agility of the kabaddi players due to six week of plyometric training. The obtained 't' ratio of control group lesser than the table value. It is found to be insignificant changes in agility of the kabaddi players.

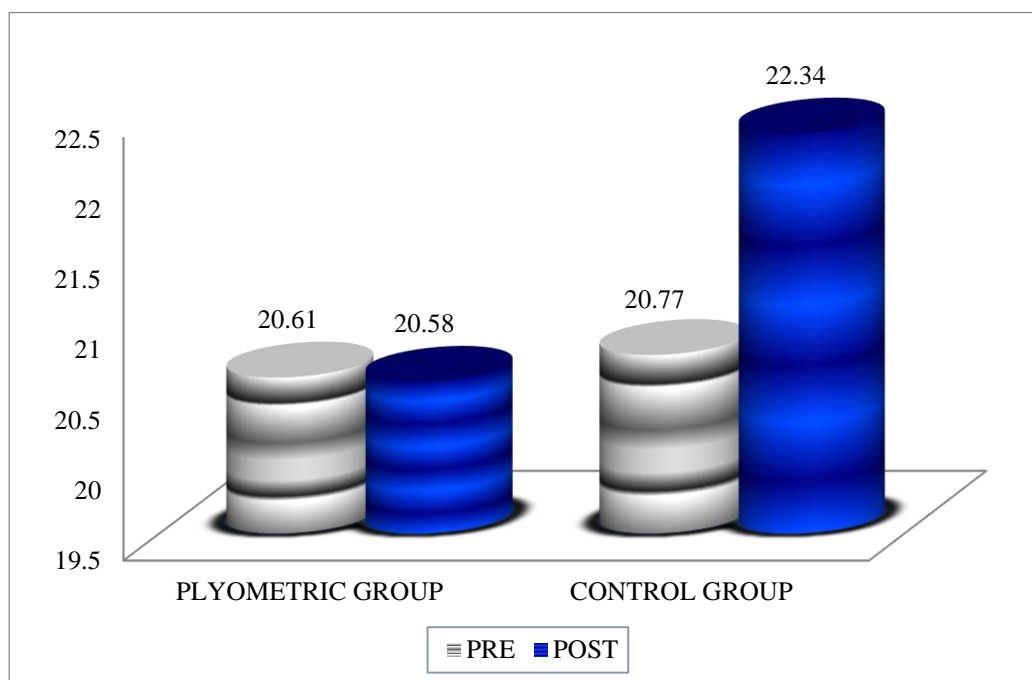


FIGURE - 2: BAR DGRAM SHOWS THE MEAN VALUES OF PRE AND POST TEST ON AGILTY OF PLYOMETRIC AND CONTROL GROUPS (Scores in seconds)

DISCUSSIONS ON FINDINGS

The results of the study indicated that the selected physical fitness variables such as agility were improved significantly after undergoing plyometric training. The changes in the selected parameters were attributed the proper planning, preparation and execution of the training package given to the players. The findings of the present study had similarity with the findings of **Annadurai (2014)**, **Vladan (2008)**, **Veeramani (2015)**, However, the subjects participated in the control group did not improve their agility. The results of the present study indicates that the plyometric training methods is appropriate protocol to agility of school level boys kabaddi players. From the result of the present study it is very clear that the physical variables such as agility, improvement significantly due to plyometric training.

CONCLUSIONS

Based on the findings and within the limitation of the study

1. It was noticed that practice of plyometric training helped to improve physical fitness of school level boys kabaddi players.
2. It was also seen that there is progressive improvement in the selected criterion variables of experimental group of school level boys kabaddi players after six weeks of plyometric training programme.

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EFFECT OF KETTLEBELL TRAINING ON SELECTED PHYSICAL FITNESS COMPONENTS AMONG FOOTBALL PLAYERS

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ABSTRACT

The rationale of this study was to discover the impacts of kettlebell training on selected physical fitness components among football players. To achieve this purpose of the study thirty men footballplayers were selected from (RLFA) Reserve Line Football Academy, Madurai District, Tamilnadu, India. Were randomly selected as subjects. Their age ranged in between 18 and 23 years. The subjects were separated into two groups namely kettle bell group and control group. The kettlebell group was subjected to kettlebell training (for weekly three days monday, wednesday, friday) at evening session for six weeks. muscular strength was selected as dependent variable. After the compilation of proper data, it was statistically analyzed by using paired't' test. The level of significance was set at 0.05. The result of the present study showed that the kettlebell training has significant enhancement on muscular strength of football players.

Keywords: Kettlebell Training, Muscular Strength, football Players.

INTRODUCTION

Kettlebell is a cast-iron or cast steel weight (resembling a cannonball with a handle) used to perform all types of exercises, including but not limited to ballistic exercises that combine cardiovascular, strength and flexibility training. They are also the primary equipment used in the weight lifting sport ofkettlebell lifting. It's well-known that compound, whole body movements typical of kettlebell exercises are superior to machines that isolate muscles for improving muscle tone, body composition, and strength. Further, kettlebells strengthen the tendons and ligaments, making the joints tougher and less-susceptible to injury. Strengthens every muscle from head-to-toe. Kettlebell training consists of whole-body movement exercises. It's well-known that compound, whole body movements typical of kettlebell exercises are superior to machines that isolate muscles for improving muscle tone, body composition, and strength. kettlebell training should be implemented in the condition program of all sports, not just strength sports. The increase in leg strength, muscular strength and muscular endurance will advantages of every sport. As football game involves more of muscular contraction. Which build the components for the game, as a research scholar special planned kettlebell training programme for the college level men football players.

STATEMENT OF THE PROBLEM

The purpose of this study was to find out impacts of kettlebell training on selected physical fitness components among football players.

HYPOTHESIS

The hypothesis is formulated in the present study were as follows

- It was hypothesized that kettlebell training would have significant difference in muscular strength, of football players.

METHODOLOGY

The rationale of this study was to discover the impacts of kettlebell training on selected physical fitness components among football players. To achieve this purpose of the study thirty men football (RLFA) Reserve Line Football Academy, Madurai district, Tamilnadu, India. Were randomly selected as subjects. Their age ranged in between 18 and 23 years. The subjects were separated into two groups namely kettlebell group and control group. The kettlebell group was subjected to kettlebell training (for weekly three days monday, wednesday, friday) at evening session for six weeks. Muscular strength was selected as dependent variable. After the compilation of proper data, it was statistically analyzed by using paired 't' test. The level of significance was set at 0.05.

RESULTS

TABLE-II RELATIONSHIP OF MEAN, SD AND 't'-VALUES OF THE MUSCULAR STRENGTH BETWEEN PRE & POST TEST OF THE KETTLEBELL AND CONTROL GROUPS OF FOOTBALL PLAYERS

Physical Fitness Variable	Groups	Test	Mean	S.D	't' Values
Muscular Strength	Control Group	Pre Test	25.46	6.42	0.48
		Post Test	25.33	6.52	
	Kettlebell Group	Pre Test	27.66	5.16	3.19*
		Post Test	31.8	5.73	

*Significant at 0.05 level of confidence

Table-II reveals that the mean values of per test and post-test of control group for muscular strength were 25.46 and 25.33 respectively; the obtained t ratio was 0.48 respectively. The tabulated t value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated t ratio was lesser than the table value. It is found to be

insignificant change in muscular strength of the football players. The obtained mean and standard deviation values of pre-test and post test scores of kettlebell group were 27.66 and 31.80 respectively; the obtained t ratio was 3.19. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The obtained t ratio was greater than the table value. It is found to be significant changes in muscular strength of the football players. The mean values on kettlebell group and control group are graphically represented in figure-2

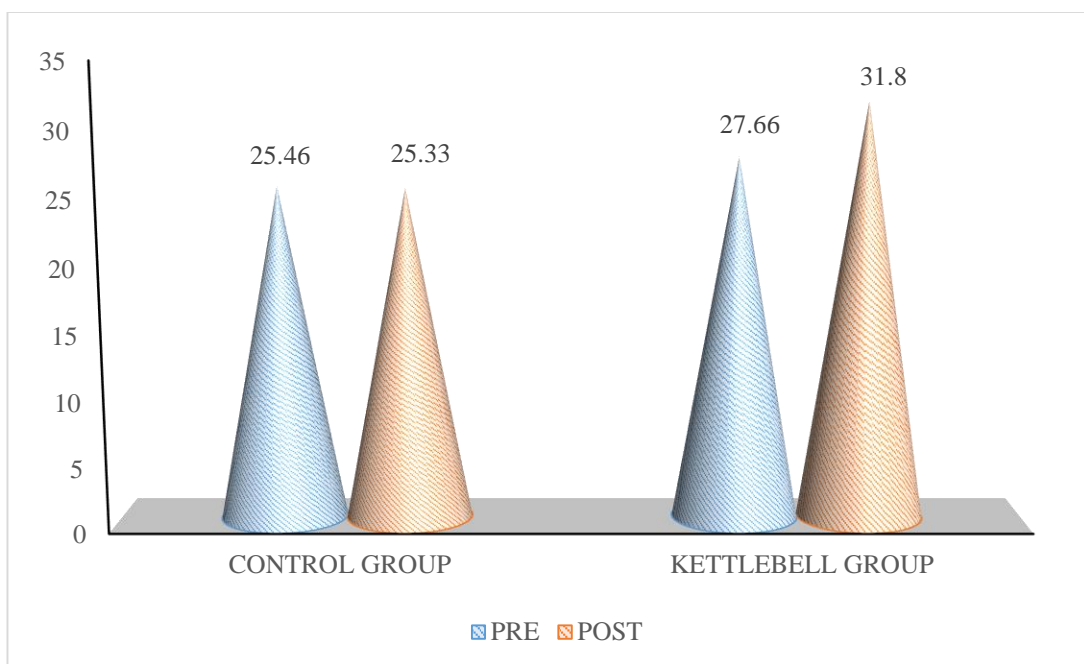


FIGURE-2: BAR DIAGRAM SHOWING THE PRE TEST & POST TEST ON MUSCULAR STRENGTH OF CONTROL AND KETTLEBELL GROUPS

DISCUSSION ON FINDING

The kettlebell training is an incredible training which has been found to be beneficial of the Football players. To study the kettlebell training on selected physical fitness components of college level men football players, it was tested under to difference between kettlebell group and control group. The kettlebell training includes on selected physical fitness components. The kettlebell exercises are namely pistol squat, biceps curl, row and front raise. It also improves the muscular strength, muscle size and other than some physical fitness components are namely speed, agility, and power. The obtained result proved positively the kettlebell group significantly improved. The result of the present study showed that the kettlebell training has significant improvement on muscular strength of football players. The results of the study are in line with the studies of **Manocchia, P et al., (2015)&Joe girard et al., (2014)** The result of the study showed that the control group was not significantly improved kettlebell training on muscular strength of college level men football players.

CONCLUSION

Based on the findings and within the limitation of the study it is noticed that practice of kettlebell training helped to improve selected physical fitness components of football players at college level. It was also seen that there is progressive improvement in the selected criterion variables of kettlebell group of football players after six weeks of kettlebell training programme. Further, it also helps to improve muscular strength.

The results of comparative effects lead to conclude that kettlebell group had better significant improvement on muscular strength of college level men football players as compared to their performance with control group.

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IMPACT OF WEIGHT FARTLEK AND PRANAYAMA TRAINING INDIVIDUALLY AND COMBINED ON PHYSICAL PERFORMANCE IN FOOTBALL PLAYERS

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ABSTRACT

This study aimed to investigate the impact of weight training, fartlek training, and pranayama training, both individually and in combination, on the physical performance of football players. To achieve this objective, 80 male football players (N = 80), aged 18 to 23 years, were selected from the Reserve Line Football Academy (RLFA) in Madurai district, Tamil Nadu, India. The participants were randomly divided into four equal groups (N = 20 per group) **Group I** Weight Training **Group II**: Fartlek Training, **Group III**: Pranayama Training, **Group IV**: Control Group (no specialized training, only daily routines) dependent variables and testing methods. The following physical performance variables were selected as dependent variables and assessed using standard testing methods **Speed** Measured using the 50-yard dash test. The experimental groups underwent their respective training programs for a duration of 12 weeks, three days per week, on alternate days. Statistical Analysis Data collected from the pre- and post-tests of the three experimental groups and the control group were analyzed using analysis of covariance (ANCOVA). A significance level of 0.05 was set for testing the hypotheses.

KEYWORDS: Weight Training, Fartlek Training and Pranayama Training, Speed.

INTRODUCTION

Fartlek Training

Fartlek training involves running with intensity according to the requirements of the athlete and the dictates of the terrain. The athlete trains in an area with undulated terrain, which places varying demands upon them (e.g., hills, woodland, ploughed land, sand). This method alternates pace with anaerobic periods, providing a strong stimulus for improving VO₂max. Additionally, the demands of the terrain stimulate strength, endurance, and proprioceptive balance adjustment of the ankles, knees, and hips (Doyle, 2017).

Pranayama Training (Yoga)

Yoga is an exact science and a perfect, practical system of self-culture. It disciplines the mind, senses, and physical body, helping individuals achieve perfect

concentration, ethical perfection, moral excellence, and spiritual calmness. Yoga originated with wandering ascetics who sought solitude in forests to practice this ancient science and imparted their knowledge to ardent students (mumukshu) living in their ashrams. Ancient yogis were possessive about this art form and did not attempt to popularize it widely. The yogic postures and subsequent stages of yoga were shared only with deserving students, keeping this science confined to forests or remote caves (Mohan, 2002).

Weight Training

A weight training program is an excellent choice for enhancing health, well-being, and physical and mental performance. Regular weight training improves strength, endurance, confidence, appearance, health, longevity, and quality of daily living. Consistent weight training helps reduce stress, control weight, strengthen bones, and decrease the risk of injury.

STATEMENT OF THE PROBLEM

The eminent objectives of this study intended to find out the **impact of weight, fartlek and pranayama training, individually and combined on physical performance in football players.**

HYPOTHESES

The following hypotheses were outlined for the study

1. It was hypothesized that, there might be a significant improvement skill related physical fitness parameters of **football players** due to **of weight, fartlek and pranayama training.**
2. It was hypothesized that, **weight, fartlek and pranayama** training group might show better improvement over the skill related physical fitness parameters than the control group.

METHODOLOGY

To achieve the objectives of this study, 80 male football players (N = 80) were selected as participants. These athletes were chosen from the Reserve Line Football Academy (RLFA) in Madurai district, Tamil Nadu, India. The participants, aged 18 to 23 years, were randomly divided into four equal groups of 20 members each (N = 20 per group).

- ❖ **Group I** underwent weight training.
- ❖ **Group II** participated in Fartlek training.
- ❖ **Group III** engaged in Pranayama training.
- ❖ **Group IV** served as the control group and continued with their regular daily routines without any specialized training intervention.

The study focused on assessing one key physical variable: **Speed**, which was measured using the 50-yard dash test. The training programs for the experimental groups were conducted over a period of 12 weeks, with sessions held three times a week on alternate days.

Pre- and post-intervention data were collected for all groups on the selected physical variable. The data were analyzed statistically using Analysis of Covariance (ANCOVA) to determine significant differences among the groups. A confidence level of 0.05 was used to test the hypotheses.

Table 1 Computation of Analysis of Covariance of Means of Weight and Fartlek Training with Pranayama Training and Control Group on Speed.

(In Seconds and Numbers).

Variable	Test	Weight Training	Fartlek Training	Pranayama Training	Control Group	Source of Variance	Sum of Square	df	Mean Squares	'F' Ratio
Speed	Pre Test	8.25	8.21	7.94	8.20	Between	0.0325	3	0.0108	1.67
						Within	0.3640	76	0.0065	
	Post Test	8.04	7.94	8.10	8.19	Between	0.4840	3	0.1613	25.86*
						Within	0.3493	76	0.0062	
	Adjusted Post Test	8.01	7.94	8.12	8.20	Between	0.5736	3	0.1912	103.02*
						Within	0.1021	75	0.0019	
Within						82.91	75	1.51		

*Significant at 0.05 level of confidence.

(Table value with df 3 and 76 and 3 and 76 are 2.77 respectively).

The pre, post-test and adjusted post-test mean values of speed on weight training group (WTG), fartlek training group (FTG), pranayama training group (PTG) and control group (CG) were 8.21, 7.94, 7.94; 8.25, 8.04, 8.01; 8.19, 8.10, 8.12 and 8.20, 8.19, 8.20 respectively.

The adjusted post-test 'F' ratio values of speed, was 103.2 respectively. The obtained 'F' values of adjusted post-test were greater than the table value of 2.77. Hence it was proved that there were significant improvements on speed among men football players.

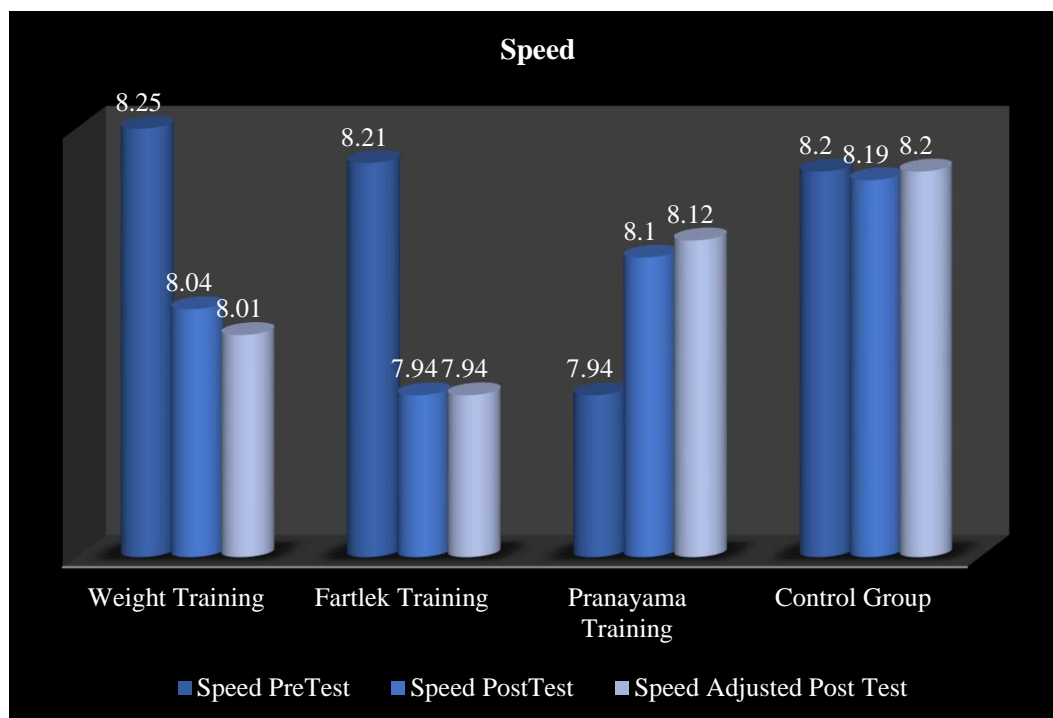


Figure-1: Pre, Post and Adjusted Post Test Means of Fartlek and Weight Training with Pranayama Training and Control Group on Speed.

DISCUSSION ON FINDINGS

The results of the study indicate that the experimental groups, namely the weight training, Fartlek training, and Pranayama training groups, showed significant improvements in the selected dependent variable, **speed**. These improvements were particularly evident in the groups that underwent weight training, Fartlek training, and Pranayama training, suggesting that each of these training packages had a positive impact on enhancing speed performance.

Among the experimental groups, both **weight training** and **Fartlek training** demonstrated notable improvements, highlighting the effectiveness of these training methods in improving physical fitness. **Pranayama training**, though different in its approach, also contributed positively to enhancing speed, supporting its potential benefits in improving athletic performance.

These findings are consistent with previous studies conducted by **Vallimurugan (2019)** and **Sureshkumar (2023)**, which also observed significant improvements in performance variables like speed following similar training interventions. The alignment of the present results with these prior studies reinforces the idea that structured training, whether aerobic, strength-based or breath control techniques, can effectively enhance speed and overall athletic performance.

CONCLUSIONS

The experimental groups namely as weight, fartlek and pranayama training packages groups had achieved significant improvement on selected the physical variables such as speed, when compared to control group.

It was concluded that fartlek training shown better improvement when comparing to the weight training and pranayama training groups on selected the physical variables.

It is recommended that college-level football players incorporate Fartlek training, weight training, and Pranayama training into their routines to achieve positive enhancements in their performance.

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IMPACT OF PERFORMANCE ENHANCING DRUGS IN SPORTS

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Abstract

Since the beginning of sports competition, athletes have always looked for some kind of an edge over their competitors. They will do whatever it takes to be one of the elite and that includes injecting supplements into their bodies to make them bigger, stronger, and faster. Drug abuse occurs in all sports and at most levels of competition. Athletic life may lead to drug abuse for a number of reasons, including for performance enhancement, to deal with stressors, such as pressure to perform, injuries, physical pain etc. The World Anti-Doping Agency was constituted to address these issues as well as publishing a list of, banned substances in athletes. Despite continuing methodological developments to detect drug use and associated punishments for positive dope tests, there are still many athletes who choose to use performance and image enhancing drugs. This paper discusses concerns associated with the benefits and risks associated with the use of performance enhancement drugs. Since the potential side effects of doping drugs are not satisfactorily familiar to the most users, the education of athletes on the matter must be a top priority.

Keywords: Performance enhancing, drug abuse, athletes

Introduction

We all recognize that engaging in physical activities allows us to improve our tidal volume, vital capacity, and muscle development, which subsequently fortifies our bodies. In a world filled with ongoing changes and considerable stress, participating in sports like soccer, rugby, swimming, and cycling can truly serve as an escape for relaxation. By embracing sports in this manner, it can be seen as a way to rejuvenate ourselves, ultimately enhancing our productivity and uplifting our mental well-being. Moreover, sports can help strengthen our resilience and determination. Through competing with others, we push our limits and, importantly, the entire experience teaches us the necessity of completing any chosen endeavor, regardless of its difficulty. As one prominent figure from the American Sports Organization remarked, “Sports provide numerous benefits and they are undoubtedly endless.” Nevertheless, despite the multitude of advantages that come with playing sports, there remain individuals who undermine the integrity of the games through the use of insidious substances—drugs. Have you ever felt that restless sensation stemming from deceiving others in competition? This is precisely the sentiment experienced by an athlete who triumphs through doping. Indeed, achieving victory in such a manner may bring them fame and riches, earning them great respect—if the truth goes undiscovered. Yet, they will never

truly enjoy the authentic thrill of winning; instead, they will be burdened by remorse for not having played fairly. Once they've crossed that line, and if they go unchallenged, they are likely to repeat the act. This fosters a misguided belief that success in sports can be attained by any means. Achieving victory in such an improper way tarnishes fairness and contradicts the true essence of sports. As we are aware, the Olympic Games embody fairness and integrity, making the inclusion of drugs entirely unacceptable. In addition to the detrimental effects on fairness, doping in competitions poses severe health risks. Many substances available to athletes carry numerous side effects, particularly the performance-enhancing drugs. They can result in hypertension, rapid heart rate, strokes, seizures, hormonal imbalances, infertility, birth defects, and even fatalities; thus, deaths of athletes during competitions due to doping are unfortunately common. Worse still, athletes who resort to doping not only face the peril of death but also severely tarnish their countries' reputations.

Prohibited Substances

List The prohibited substances list is a list of all drugs, supplements and other substances and methods which are banned from use in sports. WADA (World Anti-Doping Agency) is responsible for maintaining and updating this list.

Diuretics

Diuretics (sometimes called water pills) are drugs including Frusemide, Chlorothiazide and Hydrochlorothiazide. Their purpose is to remove excess water from the body although each type of diuretic does this in a different way.

Amphetamines

Amphetamines are stimulants which act on the central nervous system to delay fatigue and increase alertness.

ACTH

Adrenocorticotrophic hormone is a polypeptide hormone produced by the pituitary gland. It is sometimes also known as Corticotrophin or Adrenocorticotrophin. ACTH stimulates the release of corticosteroids, glucocorticoids and steroid hormones (or androgens) from the adrenal glands.

Human Growth Hormone (HGH)

Human Growth hormone (HGH) is also sometimes known as somatotrophic hormone or somatotropin. It is produced by the pituitary gland and is essential for normal growth and development. HGH is anabolic, meaning it accelerates protein synthesis and also aids the metabolism (breaking down) of fat stores.

Narcotics

Narcotics are derived from the opium poppy and include the commonly known painkillers morphine, diamorphine and pethidine.

Caffeine

Caffeine is a naturally occurring substance, found in over 60 different plants and is a stimulant and mild diuretic. It is the most commonly used drug in the world as it is found in coffee, tea, chocolate (and chocolate based drinks) and many carbonated and energy drinks.

Ephedra

The shrub known as Ephedra is native to the northern regions of China and Mongolia. It thrives in dry, desert-like environments. Historically, it has been utilized in weight loss supplements. However, in the USA, it has been taken off the market since 2004 due to mounting health concerns. Ephedra encompasses different species, some of which are more potent and contain higher levels of ephedrine alkaloids, which are responsible for its pharmaceutical effects.

Erythropoietin (EPO)

Erythropoietin (often shortened to EPO) is a naturally occurring hormone, secreted by the kidneys, whose function is to regulate red blood cell production. The use of EPO started in the 1980's as a quicker, cleaner alternative to blood doping.

Beta-2-Agonists

Beta-2-Agonists are dilators which cause dilation (widening) of vessels by relaxing the smooth muscle surrounding them.

Anabolic Steroids

Sometimes also known as anabolic androgenic steroids (AAS's), these are derivatives of the hormone testosterone. There are two types of AAS: Exogenous: Synthetic versions of testosterone. Common examples include Nandrolone and Danazol.

Cocaine

Cocaine is a stimulant which is more commonly used as a recreational drug for performance enhancement. Cocaine produces feelings of euphoria and wellbeing, which are usually followed by feelings of anxiety and depression when the effects of the drug wear off.

Tetrahydrogestrinone (THG)

Tetrahydrogestrinone (THG) is what's known as a designer steroid. In this case the steroid has been manipulated in a lab so that it is not detected by normal steroid testing procedures. After its discovery in 2003 a highly sensitive test has been developed to detect its presence in urine samples.

Insulin-like Growth Factor (IGF-1)

Insulin-like growth factor is the most predominant somatomedin or growth factor hormone, with a very similar structure to insulin although it is released by the liver. It plays an important role in growth and development in children and is thought to have anabolic effects in adults.

Cannabinoids / Cannabis

Cannabinoids are a compound contained in the Marijuana plant and its products. The cannabinoid compound contains a substance called THC which has psychoactive properties. Due to the fast absorption rate of THC by the lungs, cannabinoids have a rapid onset, with the effect on the central nervous system being obvious within 20 minutes with duration lasting 4-6 hours.

Glucocorticosteroids

Glucocorticosteroids are anti-inflammatory steroid hormones produced in the adrenal glands. Examples are Hydrocortisone, Prednisolone and Prednisone.

Effects of performance enhancing drugs in sports

In the world of sports there is much competition. There is so much that many sport players try to cheat their way through by using performance enhancing drugs. The players use steroids, human growth hormones and many more. Here is my quick pros and cons list of PEDs drug categories.

Anabolic agents Exogenous

Anabolic Androgenic Steroids (AAS) Examples: Androstendione, Testosterone
Pros: Increases endurance, fat loss, muscle recovery, increases strength and muscular size. Helps to treat anemia, asthma, bone pain, muscle loss and helps balance other hormones. Cons: May cause menstrual cycle irregularities, aggressiveness, baldness, brain tissue damage, breast enlargement, fever, hypertension, liver dysfunction, muscle pain, nausea, sexual appetite increase and vomiting

Hormones and chemically related substances

Examples: Erythropoietin (EPO), Growth Hormone (HGH) Pros: Endurance enhancement during exercise efforts, faster muscle recovery, used to treat anemia of kidney failure, HIV and certain cancers. Cons: Death, clots known as deep vein thrombosis in the lower legs, heart attack, hyper viscosity (thickening) of blood, heart attack (myocardial infarction), stroke, thrombosis and pulmonary embolism.

Beta-2 Agonists

Examples: All beta-2-agonists excluding Formoterol, Salbutamol, Salmeterol, etc. Pros: Improves aerobic exercise performance, enhances muscle growth and fat

reduction, used medically for asthma and COPD (chronic obstructive pulmonary diseases). Cons: Anxiety, heart arrhythmias, dizziness, headache, insomnia, mood disorders, muscle cramps, nausea, palpitations, tachycardia, sweating and tremors (usually of the hands).

Hormone antagonists and hormone modulators

Examples: Aromatase inhibitors including Aminoglutethimide, Tamoxifen, Clomiphene Pros: Enhancing muscle buildup and dramatically slows muscle breakdown (anabolic), increases muscle strength, used medically for breast cancer and infertility in females. Cons: Abdominal pain or discomfort, can cause certain cancers, hot flushes, slurring of speech, reduction of libido.

Diuretics and other masking drug agents

Examples: Acetazolamide, Amiloride Pros: Helps to hide banned substances, dramatically improves urine excretion reducing the concentration and therefore the detection of banned substances, promotes weight loss, used to treat heart failure and hypertension (high blood pressure). Cons: Can cause dramatic drops in blood pressure, death, cramps, dizziness, dehydration, headaches, heart failure, muscle cramps, nausea, potassium depletion, overall fluid volume depletion in the body.

Stimulants

Examples: Adrafinil, Adrenaline Pros: Increases generalized aggressiveness, stimulates overall mental alertness, increases competitiveness and competitive response (reaction time), reduces fatigue and promotes weight loss. Used medically to treat allergies, asthma, ADHD (attention deficit disorder), headache, nasal congestion and the common cold. Cons: Addictive, aggressiveness, anxiety and hyperalertness, heart arrhythmias, brain hemorrhage (bleeding), confusion, dehydration, death, hand tremors, heart attack, heat stroke, insomnia, stroke, sweating, weight loss and tremor.

Narcotics

Examples: Buprenorphine, Dextromoramide Pros: May promote a generalized feeling of invincibility, acts as a pain killer, increases overall pain threshold, and creates a sensation of euphoria. Used medically to treat pain from a variety of sources. Cons: Addictive, can cause coordination and balance difficulties, death, reduced ability to concentrate, increases injury risk, nausea, respiratory depression, vomiting and sleepiness.

Cannabinoids

Examples: Cannabinoids (i.e., Marijuana, Hashish) Pros: Creates a sensation of euphoria and is a sedative. Used medically for pain in cancer patients. Cons: Addictive, can cause anxiety, apathy, stimulate appetite, bronchitis, cancer of the mouth, throat, lung and tongue, loss of concentration, drowsiness, heart rate increases, hallucinations, dry mouth, reflex loss and weight gain, panic and paranoid attacks/thinking, loss of motivation, mood swings and learning impairment.

Glucocorticosteroids

Examples: Glucocorticosteroids Pros: Act as anti-inflammatory agents and used medially for asthma, arthritis, inflamed tissues such as nerves, tendons, cartilage and muscles and used for allergies. Cons: Can cause fluid retention, hyperglycemia (raise blood sugar levels), mood alteration, musculoskeletal dysfunction and disease, immune alterations and increase risk of systemic infections.

Alcohol

Example: Ethanol Pros: Anti-anxiety effect enhances/maximizing the effects of other medications taken simultaneously. Cons: Addictive, can cause B-vitamin losses and permanent central and peripheral nervous system problems including dementia and neuropathy (nerve problems). May also cause liver failure, cirrhosis, death, depression, incontinence, double vision and heart disease.

Beta-Blockers

Examples: Acebutolol and Alprenolol Pros: Reduces muscle tremors that would otherwise negatively impact precision sport skills, sedative effects.

Banned approaches

Examples: blood doping methods, tampering physically or chemically with samples and gene doping Pros: Enhances general sports performance and enhances the ability to perform at higher altitudes. Cons: Can cause autoimmune allergic reactions if incorrect blood type is used, death, blood poisoning, reduces cardiac output, may promote infectious disease transfer, hypertension, promotes clot formation and stroke, iron overload (hemosiderosis), kidney damage, reduces platelet count, can cause sexual dysfunction and transient fevers.

Conclusion

o conclude, the undeniable use of performance-enhancing drugs by some professional athletes highlights the need for prevention. Many athletes resort to drugs to enhance their performance, but there are various measures that can be taken to address this issue. The presence of drugs in sports undermines fairness and jeopardizes the athletes' well-being. Once it becomes known that they rely on drugs to achieve their goals, their reputation and respect diminish. Only by participating in sports without the aid of drugs can athletes truly experience the joy of competition and provide a thrilling spectacle for the audience. It is crucial that you take the first step by informing your friends and family about the harmful effects of performance-enhancing drugs. If we all join forces, we can strive towards a future where sports are nearly free from drugs. The power is in your hands!

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THE SUN SALUTATION PRACTICES ON BODY MASS INDEX AMONG RURAL SCHOOL BOYS

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Abstract

The purpose of the present study was to investigate the effect of sun salutation practices on body mass index among rural school boys. To achieve the purpose of the study thirty rural school boys were selected from Tirunelveli, Tamilnadu, India during the year 2023. The subject's age ranges from 15 to 17 years. The selected students were divided into two equal groups consists of 15 students each namely experimental group and control group. The experimental group underwent a sun salutation programme for six weeks. The control group was not taking part in any training during the course of the study. Body mass index was taken as criterion variable in this study. The selected subjects were tested on Body mass index was measured through body mass index analyzer method. Pre-test was taken before the training period and post- test was measured immediately after the six week training period. Statistical technique 't' ratio was used to analyse the means of the pre-test and post test data of experimental group and control group. The results revealed that there was a significant difference found on the criterion variable. The difference is found due to sun salutation practices given to the experimental group on Body mass index when compared to control group. Keywords: sun salutation practices, body mass index and 't' ratio.

Introduction

The objective of yoga is to achieve solidarity of the body, mind, and soul through focusing on body posture, breathing, and meditation. Various forms of yoga exist to cater to different lifestyles and personalities. Yoga is a powerful force in the universe, promoting social well-being through various yoga practices such as asanas, pranayama, kriyas, mudras, and meditations. Regular practice of yoga can lead to a healthy body and mind. It is a cost-free and permanent treatment for many diseases. Yoga is a practical holistic philosophy that aims to bring about profound transformation and considers the individual as a whole. One can start practicing yoga at any given moment, whether by starting with meditation or directly with pranayama, without necessarily doing the asanas (postures). The science of Yoga Nidra is based on consciousness receptivity. When consciousness is engaged with the intellect and all the senses, it can make an individual believe they are awake and aware, but the mind is actually less receptive and more critical. Yoga training is a continuous process that helps individuals achieve their goals. In the world of sports, physical education is crucial as it enhances performance and effectiveness. Sports have now become an integral part of our lives.

Research Methodology

Selection of subjects

The purpose of the study was to find out the effect of Sun salutation practices on Body mass index among rural school boys. To achieve this purpose of the study, thirty rural school boys were selected as subjects at random. The age of the subjects were ranged from 15 to 17 years.

Selection of variable

Independent variable Sun Salutation Practices

Dependent variable

Body mass index

Experimental Design and Implementation

The selected subjects were divided into two equal groups of fifteen subjects each, such as a Sun salutation practices group (Experimental Group) and control group. The experimental group underwent Sun salutation practices for six days per week for six weeks. Control group, which they did not undergo any special training programme apart from their regular physical activities as per their curriculum. The following physical variable namely Body mass index was selected as criterion variable. All the subjects of two groups were tested on selected criterion variable Body mass index was measured through body mass index analyzer method at prior to and immediately after the training programme.

Statistical technique

The 't' test was used to analysis the significant differences, if any, difference between the groups respectively.

Level of significance

The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

Analysis of the Data

The significance of the difference among the means of the experimental group was found out by pre-test. The data were analysed and dependent 't' test was used with 0.05 levels as confidence.

Body mass index

Table 1: Analysis of t-ratio for the pre and post-tests of experimental and control group on Body mass index (Scores counts in number)

Variables	Group	Mean		SD		df	't' ratio
		Pre	Post	Pre	Post		
Body Mass Index	Control	27.46	27.66	2.03	1.83	14	0.89
	Experimental	27.20	25.53	1.93	1.64		

*Significance at.05 level of confidence.

The Table-I shows that the mean values of pre-test and posttest of the control group on Body mass index were 27.46 and 27.66 respectively. The obtained 't' ratio was 0.89, since the obtained 't' ratio was less than the required table value of 2.14 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of the experimental group on Body mass index were 27.20 and 25.53 respectively. The obtained 't' ratio was 13.22* since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in Body mass index. It may be concluded from the result of the study that experimental group improved in Body mass index due to six weeks of sun salutation practices.

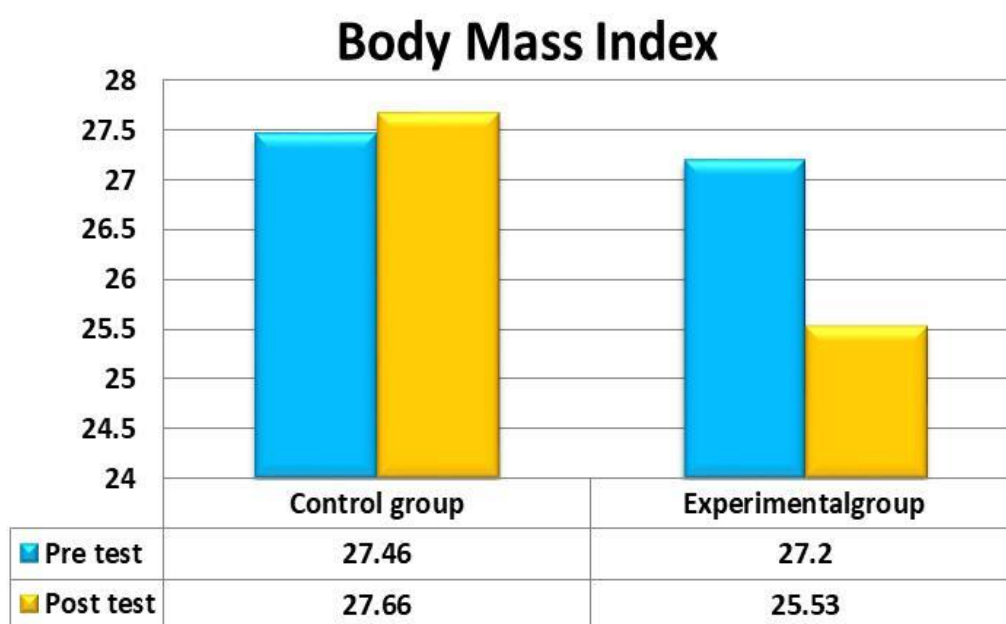


Fig. 1: Bar Diagram Showing the Pre and Post Mean Values of Experimental and Control Group on Body mass index

Discussions on Findings

The result of the study indicates that the experimental group, namely sun salutation practices group had significantly improved the selected dependent variable, namely Body mass index, when compared to the control group. It is also found that the improvement caused by sun salutation practices when compared to the control group.

Conclusion

On the basis of the results obtained the following conclusions are drawn,

1. There was a significant difference between experimental and control group on Body mass index after the training period.

2. There was a significant improvement in Body mass index. However the improvement was in favor of experimental group due to six weeks of sun salutation practices.

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SCIENTIFIC BENEFITS AND EFFECT OF YOGA ON HUMAN LIFE

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Abstract

The main purpose of yoga has to keep good health and positively in human life. Since Ancient times yoga have played major role in human society. The practice of yoga in believed to have started with the vary down of civilization yoga on a long history of human culture and has been preserved for thousands of years. Today, yoga in practiced worldwide by millions of people in many forms and variations. Yoga prefaces a complete system of physical. Mental, social and spiritual development and improves strength, balance and flexibility. It also helps in keeping our mental and physical health and maintained good relation with nature. Every should be take benefits from yoga for in peace of mind.

Keywords: - *Human, Society, Mental, Health, Yoga, Benefits*

INTRODUCTION

Man is social animal he cannot live without society; he has to develop by living in society. Good health in essential for living a good life and yoga in very important for achieving that. The mind in always wondering and being rebellious never focusing on the moment stress builds up in our daily lives, endangering our health and it affects your health as well as your family. (Gharote, 2008). The art of practicing yoga helps in controlling on individuals mind body and soul; It helps manage stress and anxiety and keeps you relaxing. Yoga is not a religion, it's you relaxing. Yoga is not a religion its way to life that purpose towards a healthy mind a healthy body.

History of Yoga

Yoga is a five thousand year old style of knowledge in India IT is mentioned in the RigVeda and still used today by people for their mental and physical health in origin of the word yoga in found in Sanskrit word. The word yoga was first mentioned in the oldest sacred task, the revved (Singh, 2010). Mahathir patanjali, who was developed yoga, is said to be the father of yoga, In miler times, yoga has gained a lot of importance and in accepted globally, If a person wants to have a mental and physical well being and a stress free life. He has no choice but to practice yoga (Burley, 2000).

Scientific Benefits of Yoga

The scientific of yoga is a psychology of a philosophical nature. The very introduction of the system of yoga by pandonjali in by way of an in suction that the mind has to be controlled yoga has child vation niordhan. (Singh SP. Healthy 2010). Yoga is an experimental science. The most important benefit of yoga is it balances our physical and mental conditions. The aim of yoga has facilitating the development and integration of body, mind and breath to produce structural, physiological and psychological effects. The science of yoga in the scientific basis of modern yoga as exercise in human sciences such as a anatomy, physiology, and psychology yoga's effects are to some tent shared other form of exercise (Shrivastav & Chavan 2009). Yoga has been studded scientifically since 19th century physiology experiments of N.C Paul Yoga helps to maintain bone strength, hint mobility, and joint stability to improves posture muscle strength coordination and confidence in turn reducing the risk of injury and bone fracture. Now in modern times yoga in also used directly as therapy especially for psychological conditions such as post traumatic stress disorder, but the evidence for their remains weak early in the 20th century, two pioneers of yoga an exercise in India, yogendra and kuvalayahanda, worked to makes healthy yoga acceptable, seeking scientific evidence for the health benefits of yoga postures (ashes) and yoga breathing (Pranayama). (Galore, 2003) Yoga in a great scientific gift to human society & everyone should take advantage of it.

EFFECT OF YOGA ON HUMAN BODY

Yoga has been very important in human society since ancient times today yoga has a special place in the world and has been accepted at the scientific level. Yoga's incorporation of meditation and breathing can help improve a person's mental well being Every day yoga practice creates mental clarity and calmness, increases ably awareness, relaxes the mind and sharpens concentration (Yogeshwar, 2004). The goal of yoga in unity of the body, mind and spirit with the toes on body posture, breathing and meditation several forms of yoga exist to meet the needs of varying lifestyle and personalities each yoga style emphasized there or believes. Doing yoga offer many benefits for the body and spirit and over all wellbeing.

Yoga for all

Yoga is useful for everyone. Yoga children adults Old people sick people can all benefit from it and can led a batter life everyone should take advantage of this (Bhatt Krishna 2008).

Yoga Promotes mental Health

Yoga practices suggest they can reduce the impact of exaggerated stress sponges and may be helpful for both anxiety and depression in their respect yoga functions life other self soothing technique, such as meditation relaxation exercise or exam so ionizing with friends there, in turn, decreases physiological carousal for example segueing the heart rate, lowering blood pressure, and easing respiration (Sechdva IP. 1978).

Health benefits of Yoga

Doing yoga everyday helps a pension of stay healthy and lives a stress free life without and mental or physical problems. Today, globally many people in our daily lives suffer from versionailments like diabetes, high blood pressure etc. yoga can helps improve flexibility and strength yoga stretchy your muscles and stand up straighter many pons in yoga can strengthen the core muscle in your stomach and back (Blind Mice. 1969).

Improve Heart Health

For pumping blood throughout the body to supplying issued with importantnutrients, the health of your heart in an essential component of overall health. High blood pressure is one of the major causes of heart problems, such as heart attacks and stroke. Lowering your Blood pressure can Helps reduce the risk of these problems (Disgusts SN 1974)

Improves Duality of tube

Yoga Bring peace to a person and at the same time he does everything well and improves his way of life. He creates a different place in society. Yoga in becoming increasingly common as an adjust therapy to improve quality of life for many in indiduals practicing yoga significantly improved quality of life (Pandy Raj Kumar 2008).

CONCLUSION

Since the ancient time, Yoga has been physiological or psychosocial variable that has a key impact on health or quality of life. In modern times man has been orbited with many diseases has which has made it difficult for him to live he has no choice but to do yoga to get rid to all these stress and live a drug free life.

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THE RULES FOR PROPER NUTRITION IN SPORTS

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Abstract

The present review aims to make a comprehensive view on the nutritional needs and habits of athletes in different sports. With this review we would like to take into consideration and comment on the various trends in sports nutrition, making a summary of the various situations that arise for those who do sports, even competitive. First the basic principles for proper nutrition will be listed, then some aspects of pre-race nutrition and which foods to prefer for the speedy recovery of energy. The need for some athletes to maintain their weight, both for better performance and for the needs of the type of sport practiced, when athletes are divided into categories based on weight, will also be taken into consideration. Finally, the metabolic pathways important for athletic performance will be examined in detail, evaluating the properties and validity of the individual nutrients and some supplements, for their best efficiency.

Keywords: proper nutrition, Sports, various, individual

Introduction

Many people ask themselves the question: to do sports, what should I eat? The answer is not simple, but it must take into account a large list of factors. In order to define the correct nutrition of those who want to engage in a sports activity, first of all one must know their physical characteristics, the type of sports activity they intend to carry out and whether they have already practiced this or other sports activities: in a nutshell their metabolic status and training. Even more so, for those who play a sport at a competitive level (both amateur and professional), a preventive visit is essential to define the correct dietary pattern to follow before and after sporting activity and also in the interval periods. It is, however, possible to give some general indications, valid for knowing how to follow proper nutrition in many situations, provided that there are no pathologies requiring special conditions. The Principles All the energy we need, both for living and for exercise, comes from the food we eat and the liquids we drink. The foods we consume consist of simple nutrients: carbohydrates, fats, proteins, which are made available to the body through the digestion process. Each category is important for health and we must consume foods so that all three categories are represented. The relationship in which we must consume these categories of nutrients must not be casual and must be defined according to the activity that takes place, in particular for sports. The use of carbohydrates or fats by the body as the main source of energy depends on the intensity and duration of the exercise. The main energy source of athletes is carbohydrates; regardless of the type of sport that takes place, they provide the energy that feeds the

muscles in contraction. Fats also provide energy for exercise, indeed, they provide the highest concentration of energy of all nutrients and represent the main source of energy for endurance sports, but are less accessible for quick and intense exercise. Athletes need proteins mainly to rebuild and repair muscle losses that occur during exercise and to optimize the storage of carbohydrates in the form of glycogen; however, it is necessary to check what amount of protein the athlete actually needs for power and duration exercises, because carbohydrates also serve this purpose. Furthermore, high protein diets have not proven particularly useful for athletes. But do power sports athletes really need special diets to build muscle and, if so, how to increase it? Power sports athletes need only a moderately greater amount of protein than other athletes, mainly to repair and rebuild their muscles, but the increased need is often overestimated. Carbohydrates are certainly the main source of energy for athletes, even for those who need strength and power, because they provide the energy that feeds muscle contraction. Not only food, but also drinks are important in sport.

Pre-competition nutrition

Nutritional care is essential for the athlete, in particular the so-called “competition regimen”, which starts the evening before the athletic effort closing at the end of the same. Obviously, in relation to the type of sport practiced, specific needs and requirements arise, so a marathon runner will certainly feed in a different way from a jumper. A rational diet must in any case avoid the loss of shape and minimize the fatigue reactions that follow the effort. During the competition, the athlete will use the calories accumulated with the balanced diet of the previous days; therefore, the pre-competition diet aims to maintain the energy level obtained previously. The sportsman must have a sufficient supply of glycogen in the muscles and liver, especially if he is preparing to participate in a competition relating to a sport of endurance. In this sense, the most suitable foods for the eve will be those rich in starches (rice, bread, pasta, potatoes); particular attention must be paid to hydrating the body. The last meal before the competition must consist of easily digestible foods, must have a modest volume and must be consumed at least 3-4 hours before. If the competition is in the morning, it will be necessary to have breakfast at least 2 hours before and the diet of the previous evening will have particular importance. If the race is in the afternoon, breakfast must be particularly abundant and light lunch must be eaten at least 3 hours in advance.

Food for prompt recovery

After a race, a match or a hard training, the athlete feels fatigued, has accumulated a significant amount of metabolites that cause an acidic situation. In addition to replenishing, post-intensive nutrition must help detoxification and reconstruction processes. In fact, the body may experience loss of water, salts, accumulation of acid substances, emptying of sugar reserves, tissue usury. Therefore the different intake of liquids, minerals, vitamins, sugars, proteins, fats will serve to bring the body back to normal conditions. Each intense effort is followed by a state of acidosis; therefore it will be useful, immediately after this effort, to take an alkaline drink, enriched with salts to rematerialize the body and glucose to help the mechanism of glycogen synthesis. Subsequently, to start filling the glycogen deposits, 200-250 grams of malt dextrin will be ingested in plenty of liquid.

The regulation of body weight in athletes

Compared to the sedentary individual, considering that the athlete has different dietary needs especially in quantitative terms, in the daily energy calculation, in addition to quality, it is necessary to consider the additional caloric expenditure that sports activity requires. During the day (24 hours), the energy needs (calories consumed) of the athlete is calculated taking into account a) the activity normally carried out, such as washing, getting dressed, walking, driving, reading, watching television, afternoon rest and night, etc; b) the type of training carried out, therefore the extent and duration of physical exertion; c) the thermo genesis induced by the food consumed, also called the specific dynamic action of the food, which represents the calorie consumption necessary for the digestion and assimilation of food and corresponds to about 10% of the calories ingested. In particular, proteins require 10-35% of the total, while glycidides 5-10% and fats 2-5%. Basal metabolism, which represents the energy expenditure deriving from the development of the body's vital processes (Respiration, activity of the cardiovascular system, digestion, excretion, maintenance of body temperature at around 37 °, growth and repair of cellular tissues, must also be considered etc). The basal metabolic rate varies according to age, gender, race, climate, type of activity carried out. The cold enhances the basic calorie consumption as the body sustains an additional effort to keep the body temperature constant; anxiety states can increase it by up to 50%. After the age of 30, the metabolism undergoes a constant decrease that reaches up to 30% with the passing of 70 years. This fact constitutes one of the causes of weight gain for those who, over the years, keep certain eating habits unaltered. During sleep it drops by about 7%. A simple and approximate calculation of the basal metabolism can be made in 24 hours considering that the body, in a state of rest, consumes about 1 calorie per kg of body weight (0.9 for women) every hour. Here are some examples of the calories needed per kg of body weight and for each hour in the various activities: sleeping 0.93; walking fast 4.28; drive the car 1.90; calm dance 4.3; calcium 11.7; gymnastics 5.9; recreational swimming 9.1; competitive swimming 25; single tennis 5.2; double tennis 4.1. As can be seen, there are large differences in energy consumption (caloric) between the various activities, in relation to the efforts made. Of particular interest is the difference between recreational and competitive swimming, which requires more than double the energy.

Energy metabolism

The body does not have an ATP reserve, and what little is deposited is used in seconds; it is therefore necessary to continue generating ATP even during the exercise. In general, the two main ways of converting nutrients into energy (ATP) are: aerobic metabolism (which takes place in The presence of oxygen) and anaerobic metabolism (in the absence of oxygen). These two metabolic pathways can be further divided. Most of the time there is a combination of the energy systems that supply the fuel necessary for operation; it is the intensity and duration of the exercise that determines which system is used and when. The ATP-CP (Creatine phosphate) pathway this route, also called the phosphate system, provides about 10 seconds of energy and is used for explosive exercises, such as the sprint of 100 meters. This metabolic pathway does not require oxygen to generate ATP. It first uses the ATP present in the muscle (generally for a period of 2-3 seconds) then uses creatine-phosphate (CP) to re-synthesize ATP until the CP ends (about 6-8 seconds). When both ATP and CP are exhausted, the body shifts to aerobic

metabolism or anaerobic metabolism (glycolysis) to continue generating ATP and provide energy for exercise. Anaerobic metabolism - Glycolysis The anaerobic metabolic pathway, or glycolysis, generates ATP exclusively from carbohydrates, with the formation of lactic acid. Anaerobic glycolysis generates energy from the partial demolition of glucose, which takes place without the intervention of oxygen. Anaerobic metabolism produces energy for short and intense bursts of activity; this lasts only a few minutes before the lactic acid produced reaches the level known as the lactate threshold, when muscle pain, burning and fatigue make it difficult to maintain its intensity.

Aerobic metabolism

Aerobic metabolism provides most of the energy necessary for long-term activity, using oxygen to convert nutrients into ATP. This system is a little slower than the anaerobic one because the circulatory system must transport oxygen to the muscles before they generate ATP; it is mainly used in Lower intensity but long lasting exercises. During exercise, the athlete moves through all the metabolic Pathways described. At the beginning, ATP is produced by the anaerobic route; as the respiratory and heart rate increases, oxygen becomes more available, so that aerobic metabolism can begin and continue until the lactate threshold is reached. If this level is exceeded, the body cannot release oxygen quickly enough to generate ATP and aerobic metabolism comes into play. Since this mechanism is short-lived and the level of lactic acid rises, an intense workload can no longer be sustained and the athlete must decrease the intensity of the exercise to remove the lactic acid produced

The nutrients are converted into ATP based on the intensity and duration of the activity, with carbohydrates providing the main source of energy for both short and long-term exercises and fats for less intense exercise. Fats are an important source of energy for endurance events but are not suitable for high intensity exercises such as jerks or repetitions. If you exercise at low intensity (or in any case below 50% of the maximum cardiac capacity) there are still enough fats deposited to continue the exercise for hours or days.

Nutrition for the recovery

Athletes know the importance of nutrition before exercise; but, once physical exercise is over, what you eat and when it is equally important, especially in situations of close races that occur in some sports. While the meal before exercise ensures adequate glycogen deposits to be used for the best performance, nutrition after exercise is essential for recovery and to increase the ability to return to training and therefore to be able to best express one's potential in the following competitions. We already mentioned this need, but now is the time to go into detail. What should we eat after exercise to restore muscle glycogen? The nutritional priority, after exercise, is the recovery of lost fluids. In general, the best way to evaluate how much to drink (water or other specific drinks) is to weigh yourself before and after exercise and compensate for the loss of liquids by taking about 500ml for every 500gr lost. It is also important to consume carbohydrates (fruit or juice) within 15 minutes after exercise to help restore glycogen. Scientific research has shown that the introduction of 100-200 grams of carbohydrates within two hours after a resistance exercise is essential for the reconstruction of adequate glycogen stores, which

allow the resumption of training. If the two hour period is exceeded, the glycogen that is regenerated in the muscle is reduced by 50%; in fact, the consumption of carbohydrates stimulates the production of insulin, which, in turn, helps the production of muscle glycogen. In any case, it is useless to take higher quantities of carbohydrates, because their effect on the glycogen storage reaches a plateau. Combining a moderate amount of protein with carbohydrates in the two hours following exercise can double the insulin response, resulting in a greater amount of glycogen deposited. The optimal ratio of carbohydrates to proteins for this effect is 4: 1 (four grams of carbohydrates per gram of protein). It has been proven that athletes who feed on carbohydrates and proteins have 100% more reserve glycogen than those who only eat carbohydrates. Insulin is also higher in those who consume a liquid mixture of carbohydrates and proteins. Be careful, however, because consuming more protein than necessary has a negative impact because it slows down rehydration and glycogen recovery. Consuming the correct amount of protein after exercise also has other functions: it provides the amino acids necessary to rebuild the muscle tissue that is consumed during exercise and the amino acids themselves can stimulate the immune system making it more resistant to colds and infections in general. The best choice to restore energy reserves after a long resistance exercise is therefore a mixture of carbohydrates: proteins in a 4: 1 ratio. Solid foods work as well as drinks, but a drink can be easier to take and digest by respecting the correct ratio and the two-hour window. It is not only necessary to take the right amount of calories, but also the right source of them; in fact, calories can derive from the demolition of carbohydrates (4.1 / g), proteins (4.1 / g), lipids (9.0 / g).

Carbohydrates

The correct source of energy to give energy to training is carbohydrates. Deposited in the muscle in the form of glycogen, they constitute the fuel used for short, intense explosions of force. The stronger and longer you work, the more glycogen your muscles need. Once the glycogen stores run out, the energy level drops and there will not be enough fuel for muscle contraction. For this reason, athletes who train to build muscle mass must have an adequate intake of carbohydrates. Experts recommend at least 5-600 grams of carbohydrates per day to keep glycogen stores at the right level. A simple formula indicates the quantity of carbohydrates needed: 6.5gr carbohydrates x weight in kg = grams of carbohydrates per day. For a 70Kg person the quantity is about 500 grams (equivalent to about 2000 calories); for a person of 100Kg, 720 grams of carbohydrates or 2900 calories.

Proteins

Protein is the basic material for building muscle tissue and those who train must take more than those who do not exercise. In any case, many athletes overestimate their protein needs. The recommendations are 1.2 - 1.6 grams per kg of body weight, which means 90-115 grams for an athlete of 70 kg and 128-164 grams for those of 100 kg. The Fats after reaching the necessary amount of carbohydrates and proteins, there is room for fats. They are an essential nourishment but a minimum quantity is needed.

Conclusion

Diet is of great importance to athletes, the key to achieving an optimal sports diet in relationship to peak performance and good health is balance. Athletes must fuel their bodies with the appropriate nutritional foods to meet their energy requirements in competition, training and recovery. If these nutritional needs are not met, there is an increased risk of poor performance and health issues. The use of a nutritional supplement within established guidelines is safe, effective and ethical. Hundreds of studies have shown the effectiveness of creatine monohydrate supplementation in improving anaerobic capacity strength and lean body mass in conjunction with training, but still there is sports specific variation in the food fads and practices indicating the strong influence on coaches and peers. It is vital to educate the sportsmen about the dietary pattern. Failure to consume right diet during competition due to false belief in markets and constant fear of eating prohibited foods may hamper performance. Finally the future of nutritional supplement looks bright in regard to the areas of transport mechanism, improved muscle retention as well as treatment of numerous clinical maladies through supplementations.

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IMPACT OF SPEED AGILITY AND QUICKNES TRAINING ON SPEED AND REACTION TIME AMONG KABADDI PLAYERS

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Abstract

This study aimed to examine the effect of SAQ training on speed and reaction time among Kabaddi players. A total of 24 Kabaddi players, aged between 18 and 24 years, were selected from St. John's College of Physical Education, Veeravanallur, Tirunelveli. The participants were randomly divided into two groups: an experimental group and a control group, each consisting of 12 players. The experimental group participated in an SAQ training program for 12 weeks, with sessions held three alternate days per week. Speed and reaction time were chosen as the dependent variables, assessed using the 50-meter sprint test and the snatch card drop test, respectively. A pre- and post-test randomized control group design was implemented to evaluate the effects. Data analysis was performed using dependent t-tests and analysis of covariance. The findings revealed a significant improvement in speed and reaction time for the experimental group following the training period, while no changes were observed in the control group. The experimental group demonstrated a statistically significant difference from the control group at a 0.05 level of significance.

Keywords: SAQ, speed and reaction time, Kabaddi

Introduction

SAQ training, which stands for Speed, Agility, and Quickness, is a widely adopted method among athletes, ranging from novices to professionals. Mario et al. (2011) highlight that SAQ emphasizes transitional skills involving speed, agility, and quick reflexes. According to Palaniswamy and Velmurugan (2012), incorporating SAQ exercises into modern training regimens can simultaneously enhance multiple physical abilities within a single program. Similarly, Remco, Jonathan, and Andrew (2009) suggest that SAQ-based systems aim to improve hand-eye coordination, explosive power, and reaction speed. These exercises not only enhance acceleration and compatibility between hand-eye coordination but also optimize physical responsiveness. Additionally, Sharma and Dhapola (2015) note that SAQ drills, which range from low to high intensity, are effective for teaching movement skills, warming up, and improving athletes' overall physical condition.

Purpose of the study

The aim of this study is to examine the effect of SAQ training on speed and reaction time in Kabaddi players.

Methodology

To achieve the purpose, 24 Kabaddi players aged between 18 and 24 years were selected from St. John's College of Physical Education, Veeravanallur, Tirunelveli. The participants were randomly assigned to two groups of 12 each: an experimental group and a control group. The experimental group underwent a 12-week SAQ training program, conducted on alternate days, three times a week. Speed and reaction time were chosen as the dependent variables, assessed using the 50-meter run and the snatch card drop tests, respectively. A pre-test and post-test randomized control group design was implemented for the experiment. Data collected from the participants were analyzed using the dependent t-test and analysis of covariance (ANCOVA), with the level of significance set at 0.05.

Analysis of Data

Table 1: Summary of the Mean, Standard Deviation and Dependent t-test on speed and reaction time between experimental and control groups among Kabaddi players

Variables	Test	Experimental Group		Control group	
		Mean	Std. Deviation	Mean	Std. Deviation
Speed	Pre test	7.86	0.12	7.86	0.13
	Post test	7.46	0.12	7.83	0.12
	T-test	9.38*		0.67	
Reaction time	Pre test	50.25	1.60	50.83	1.75
	Post test	44.67	2.61	51.00	1.81
	T-test	17.85*		0.25	

*Significance level at 0.05 with df t11 is 2.20

The table indicates that the t-test values for the experimental group regarding speed and reaction time are 9.38 and 17.85, respectively. These values are greater than the critical t-test value of 2.20 at the 0.05 level of significance with 11 degrees of freedom. This demonstrates a significant enhancement in speed and reaction time due to the 12-week SAQ training program for Kabaddi players. Conversely, the control group showed no notable improvement.

Table 2: Summary of the adjusted mean value and F-ratio on speed and reaction time between experimental and control groups among Kabaddi players

Variable	SS	df	MS	F Ratio
Speed	3.25	1	3.25	232.93*
	0.29	21	0.01	
Reaction time	1550.92	1	1550.92	465.07*
	70.03	21	3.33	

*Significance level at 0.05 with df f (1,21) is 4.32

The table shows that the F-values for speed and reaction time are 232.93 and 465.07, respectively, both surpassing the critical F-value of 4.32 at the 0.05 level of significance with degrees of freedom 1 and 21. These results indicate a significant difference between the experimental and control groups concerning speed and reaction time among Kabaddi players.

Discussion on findings

The results of the studies indicated that there is a significant improvement on speed and reaction time due to the effects of 12 weeks of SAQ training among Kabaddi players. Also there is a significant difference between experimental and control groups on speed and reaction time.

The findings of this study align with several previous studies. Jovanovic, Sporis, Omrcen, and Fiorentini (2011) examined the impact of the Speed, Agility, and Quickness (SAQ) training method on power performance in soccer players. Similarly, Milanovic et al. (2014) investigated the effects of a 12-week SAQ training program on speed and flexibility in young soccer players. Azmi and Kusnanik (2018) analyzed the influence of SAQ training on improvements in speed, agility, and acceleration. Walker et al. (2010) explored how replacing traditional linear running with agility training affects both physiological and cognitive performance. Karthick, Radhakrishnan, and Kumar (2016) studied the effects of SAQ training on specific physical fitness parameters and kicking ability among high school male football players. Additionally, Mohamed and Larion (2018) examined the impact of SAQ training on selected physical variables and performance levels in sabre fencers.

Conclusions

1. The 12-week SAQ training program resulted in a significant enhancement in speed and reaction time among Kabaddi players.
2. A significant difference was observed between the experimental and control groups in terms of speed and reaction time among Kabaddi players.
3. The control group showed no significant improvement in speed and reaction time.

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COMPARATIVE STUDY ON COGNITIVE ANXIETY, SOMATIC ANXIETY AND SELF-CONFIDENCE OF FOOTBALL GOALKEEPERS DURING THE MATCH AND AT THE TIME OF PENALTY KICK

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Abstract

Introduction: The present study examined the differences in football goalkeepers' cognitive anxiety, somatic anxiety, and self-confidence during the match and at the time of the penalty kick. Through analysing these psychological states, the study aims to comprehend how they affect decision-making and performance. Better mental preparation techniques for goalkeepers will result from the findings, boosting their capacity to manage pressure and perform better overall at crucial game moments. **Method:** This study examined cognitive anxiety, somatic anxiety, and self-confidence in 50 intercollegiate football goalkeepers (aged 18-28) during matches and penalty shootouts using the CSAI-2R questionnaire by Cox et al. (2003). Descriptive statistics, including mean and standard deviation, were used for analysis, and a T-test identified significant differences in anxiety and self-confidence between match and penalty situations, offering insights into their impact on performance. **Result:** The study revealed a significant difference in cognitive anxiety, somatic anxiety, and self-confidence experienced by football goalkeepers during matches and penalty shootouts. The dependent t-test results for cognitive anxiety among football goalkeepers (N = 50) revealed significant differences between during the match and penalty kicks, with the mean cognitive anxiety score during the match being 20.36 (SD = 5.580), compared to 22.60 (SD = 6.667) during penalty kicks. The t-tests revealed significant differences in anxiety and self-confidence among football goalkeepers during penalty kicks compared to matches. Cognitive anxiety increased from 20.36 (SD = 5.58) during matches to 22.60 (SD = 6.67) during penalty kicks ($t = 2.958, p = 0.005$). Somatic anxiety rose from 18.11 (SD = 5.15) to 19.94 (SD = 6.75) ($t = -2.226, p = 0.031$). Self-confidence decreased from 28.56 (SD = 4.277) to 27.10 (SD = 3.442) ($t = -2.296, p = 0.026$), all statistically significant at the 0.05 level.

Keywords: Football, Penalty Kick, Anxiety & Self-confidence

Introduction

Over the past decade, especially with the advent of mobile gaze trackers, there has been increasing research interest in soccer penalty kicks. In highly regulated and competitive environments, the football penalty kick provides a well-defined situation that

allows researchers to investigate the precise impacts of constraint manipulation on interpersonal interactions (Navia et al., 2019). Anyone familiar with soccer understands the significance of penalty kicks. In some championships, penalty kicks can be used during play or following a tied game (Bar-Eli & Azar, 2009). Penalties are like a fight between the goalie and the kicker, with both trying to predict the other's move in order to win (Wilson et al., 2009). The likelihood of successfully scoring a penalty kick is around 80 % (Navia et al., 2019). A goalkeeper often has insufficient time to dive and intercept the ball, so the high success rate primarily highlights the challenging spatiotemporal demands of the situation (van der Kamp et al., 2018). The penalty kicker holds a clear advantage, as penalty kicks were originally introduced as a disciplinary measure. Given the high probability of success, this position inherently favours the kicker. However, such expectations can create significant psychological challenges, including heightened anxiety and pressure, which may hinder performance.

The stress is amplified when players face evaluation or social criticism, further impacting their mental resilience and execution under pressure (Hill et al., 2010). Consequently, anxiety is a range of stress reactions to an aversive situation that triggers avoidance mechanisms. It is characterised by worry, fears about potential physical or psychological harm, and heightened physiological arousal in response to threat evaluation. The perception and evaluation of competition can evoke this emotion, potentially resulting in negative reactions, heightened anxiety, and thoughts that may alter attention and other cognitive functions (Mercader-Rubio et al., 2023). To put it briefly, competition is a response to a circumstance that creates uncertainty about the competition's outcome; hence, the higher the expectations for those outcomes, the higher the risk of failure and the higher the anxiety level.

According to the particular sports psychology literature on evaluating athletes' anxiety, the State-Trait Anxiety Inventory (STAI) has been one of the most popular tools for measuring anxiety trait states. But it's also important to evaluate anxiety's physical and cognitive aspects (Mercader-Rubio et al., 2023). Retrospective interviews with top soccer players who had taken part in a shootout for national teams during the European Championship were done in relation to penalty kicks. According to the results, penalty takers who believed they had less competence and control over their performance—that is, who put more credit on luck than talent for their success—had higher levels of cognitive distress. Furthermore, compared to players who felt highly competent and in control of the outcome, these players were more likely to perceive their bodily discomfort as a negative influence on their performance. (Jorden et al., 2006).

In the realm of sports, the examination of anxiety relates to a topic that is now the focus of a lot of research. Competitive anxiety is a negative emotional reaction to competition pressures that manifest both before and during sports performance (Mojtahedi et al., 2023). Cognitive (such as negative performance worries) and somatic (such as limb tremors) symptoms are what define Competitive anxiety (Grossbard et al., 2009). The many symptoms of Competitive Anxiety can be linked to the decline in performance. Disrupted cognitive-motor performance has been associated with anxiety in connection to somatic anxiety symptoms. Excessive Competitive Anxiety can also negatively affect other aspects of the sport, including motivation, confidence, enjoyment, perceived risk of injury, and sport cessation, in addition to performance-based outcomes

(Mojtahedi et al., 2023). High levels of competitive anxiety in children and adults are also associated with poor performance and diminished enjoyment of participation (Grossbard et al., 2009).

Sports psychologists have created methods to assist athletes with moderate to severe Competitive anxiety. A significant factor in evaluating competitive pressures is self-confidence. Maintaining mental health, developing social skills, increasing resilience, and realising one's full potential all depend on having enough self-confidence. (Jekauc et al., 2023). Although athletes frequently use sports psychology techniques to boost their confidence, there is conflicting data regarding the link between self-confidence and athletic performance. Several studies have demonstrated the significant benefits of self-confidence for athletes (Lochbaum et al., 2022). Sports psychologists have regularly examined the relationship between confidence and performance because self-confidence is intuitively appealing as a factor in effective sports performance (Woodman & Hardy, 2003). Self-confidence is a psychological state (also known as "a transitory emotional condition") as well as a personality attribute (also known as "a relatively stable predisposition"). This implies that certain athletes are naturally more self-assured than others. But even the most self-assured athlete might feel insecure in some situations (like after a surprising loss) or in new situations (Lochbaum et al., 2022).

Examining earlier studies shows that the impact of skill and other tactics, like kicking motion, ball contact area, and penalty strategy, are the key factors preventing football players from succeeding when penalised. Nonetheless, comparatively little study has been done on the impact of psychological variables on football players' penalty performance. This gap is especially significant for football goalkeepers, who face unique psychological challenges during penalty kicks compared to regular match play. Goalkeepers are not only expected to remain calm and focused. This study will enhance the understanding of factors contributing to anxiety in football goalkeepers during matches and penalty kicks, offering valuable insights for coaches, trainers, and sports psychologists to develop effective anxiety management strategies. Its findings have practical implications for improving goalkeepers' performance in high-pressure situations and serve as a foundation for further research, identifying areas requiring deeper exploration of immense pressure and anticipating and responding quickly to penalty taker's strategies.

Methods

Study design

This study examined the differences in cognitive anxiety, somatic anxiety, and self-confidence experienced by football goalkeepers during matches and during penalty shootouts. The study's comparative design facilitated the identification of both differences and similarities in the impact of cognitive anxiety, somatic anxiety, and self-confidence on goalkeepers during matches and penalty shootouts. The CSAI-2R questionnaire, created by Cox et al. (2003), was used in the study to assess football goalkeepers' levels of somatic anxiety (physical symptoms of anxiety), cognitive anxiety (mental symptoms such as worry or negative thoughts), and self-confidence. These measurements were taken during regular gameplay and specifically during penalty kick situations.

Participation and Procedure

The study involved 50 football goalkeepers aged 18 to 28 years, randomly selected without restrictions on gender, state, or region, all with intercollegiate-level experience. Using the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) questionnaire, the research aimed to measure their cognitive anxiety, somatic anxiety, and self-confidence. Data were collected in two scenarios: during regular gameplay and during penalty kicks. Participants first completed a demographic survey, followed by the CSAI-2R based on their psychological state in both scenarios. Simulated penalty situations or reflections on past matches were used to capture high-pressure states. The data were analysed statistically to compare anxiety and self-confidence levels across the scenarios, providing insights into psychological performance under varying competitive conditions. Ethical considerations ensured voluntary participation, confidentiality, and the option to withdraw at any stage.

Instrument

To measure anxiety, we used CSAI-2R constructed by Cox et al. (2003), which evaluates self-confidence, cognitive anxiety, and physical anxiety and is made up of just 17 statements on a Likert scale (1-4). These statements were used to assess the levels of cognitive anxiety, somatic anxiety, and self-confidence. Read each statement and determine whether you feel "Not at all," "Somewhat," "Moderately," or "Very much so" when participating in sports and games. Participants are asked to select a term that best captures their typical feelings when participating in sports and games. A 4-point Likert scale is used for each CSAI-2R item: 1 = "Not at all," 2 = "Somewhat," 4 means "Very much so," while 3 = "Moderately so."

Statistical Analysis

Descriptive statistics like mean and standard deviation will be calculated to comprehend the nature of the data distribution. To determine whether there are any significant differences in cognitive anxiety, somatic anxiety, and self-confidence levels of football goalkeepers during the match and at the time of penalty kick. The T-test examined the distinctions between these two football goalkeeping scenarios. The significance level was set at 0.05 levels.

Results

Result of cognitive anxiety

The dependent t-test results for cognitive anxiety among football goalkeepers (N = 50) revealed significant differences between during the match and during penalty kicks. The mean cognitive anxiety score during the match was 20.36 (SD = 5.580), compared to 22.60 (SD = 6.667) during penalty kicks. The standard error mean for cognitive anxiety was 0.789 during the match and 0.943 during penalty kicks. The t-test yielded a t-value of 2.958 and a p-value of 0.005, which is statistically significant at the 0.05 level. This indicates a significant increase in cognitive anxiety during penalty kicks compared to the match.

Table 1. Comparison of cognitive anxiety of football goalkeepers during the match and at the time of penalty kick

Variable	N	Mean	S.D	S E M	t-ratio	p-value
During match	50	20.36	5.580	0.789	2.958	0.005
During penalty kick	50	22.60	6.667	0.943		

Result of somatic anxiety

The dependent t-test analysis for somatic anxiety among football goalkeepers (N = 50) revealed significant differences between the match and penalty kick situations. The mean somatic anxiety score during the match was 18.114 (SD = 5.15), while during penalty kicks, it increased to 19.943 (SD = 6.749). The standard error of the mean was 0.728 during the match and 0.955 during penalty kicks. The t-test resulted in a t-value of -2.226, yielding a two-tailed p-value of 0.031, which is statistically significant at the 0.05 level. These findings indicate a significant increase in somatic anxiety among football goalkeepers during penalty kicks compared to the match.

Table 2. Comparison of somatic anxiety of football goalkeepers during the match and at the time of penalty kick.

Variable	N	Mean	S.D	S E M	t-ratio	p-value
During match	50	18.11	5.15	0.72	-2.226	0.031
During penalty kick	50	19.94	6.49	0.955		

Result of self-confidence

The dependent t-test analysis for self-confidence among football goalkeepers (N = 50) indicated significant differences between the match and penalty kick scenarios. The mean self-confidence score during the match was 28.56 (SD = 4.277), which decreased to 27.10 (SD = 3.442) during penalty kicks. The standard error mean was 0.605 during the match and 0.487 during penalty kicks. The t-test produced a t-value of -2.296 and a two-tailed p-value of 0.026, which is statistically significant at the 0.05 level. These results demonstrate a significant reduction in self-confidence among football goalkeepers during penalty kicks compared to during the match.

Table 3. Comparison of somatic anxiety of football goalkeepers during the match and at the time of penalty kick

Variable	N	Mean	S.D	S E M	t-ratio	p-value
During match	50	28.56	4.27	0.605	-2.296	0.026
During penalty kick	50	27.10	3.44	0.487		

Discussion

This study examined the differences in cognitive anxiety, somatic anxiety, and self-confidence experienced by football goalkeepers during matches and during penalty shootouts. Given the large stakes involved, the performance may be affected by the considerable rise in cognitive and bodily anxiety levels that occurs during penalty scenarios. However, the observed drop in self-confidence during penalty kicks highlights the negative impact of increased pressure on concentration and mental preparedness.

Cognitive anxiety, Somatic anxiety & self-confidence during the match and a penalty kick

Our study explores cognitive anxiety, somatic anxiety and self-confidence among football goalkeepers during a match and a penalty kick. Our finding revealed there is a significant increase in cognitive anxiety and somatic anxiety among football goalkeepers during the penalty kick compared to the match. Previous studies within similar contexts have consistently highlighted high-pressure situations in sports. Studies have shown that participants under pressure experienced increased levels of both cognitive and somatic anxiety before and after taking penalty kicks, in contrast to those in a no-pressure group (Navia et al., 2019; Ellis & Ward, 2021). This increased anxiety was linked to reduced performance when under pressure (Horikawa & Yagi, 2012). High-pressure scenarios substantially elevate cognitive anxiety and breathing rates in players, which adversely affect their penalty performance (Ellis & Ward, 2021).

Previous studies also highlight that self-confidence is a key factor in football performance, especially during penalty kicks. Studies show that self-confidence affects players' cognitive, emotional, and behavioural states, influencing their performance in penalty shootouts (Filho & Rettig, 2019). Research has shown a strong correlation between self-confidence and the outcome of penalty kicks (Supriadi, 2022). Studies have shown that participants under pressure experienced increased levels of both cognitive and somatic anxiety before and after taking penalty kicks, in contrast to those in a no-pressure group (Navia et al., 2019; Ellis & Ward, 2021) also, self-confidence is reduced during the high-pressure situation like penalty kick (Filho & Rettig, 2019). These findings emphasize the critical role of psychological factors in soccer performance, especially in high-pressure situations such as penalty kicks and propose potential approaches for enhancing performance in these challenging moments. The researchers discovered that heightened anxiety led players to exhibit changes in gaze behaviour, including faster initial fixations and extended focus on the goalkeeper, which could impair attentional control and hinder performance (Wood & Wilson, 2010). These findings show that, compared to normal match play, penalty kicks cause higher levels of cognitive distress in both goalkeepers and outfield players, impacting their performance and decision-making.

Limitations

This study has several limitations that should be considered when interpreting the findings. It relies on self-reported measures of anxiety, which may not fully capture the actual anxiety experienced by the goalkeepers. Additionally, the limited sample size may not represent all football goalkeepers, restricting the generalizability of the results. The

study is conducted within a specific context, making it less applicable to other settings or situations. Furthermore, as the research is conducted realistically, external factors beyond the researchers' control may influence the outcomes.

Conclusion

In this study, researchers examined differences in cognitive anxiety, somatic anxiety, and self-confidence experienced by football goalkeepers during matches and during penalty shootouts. The findings reveal significant psychological variations among football goalkeepers during match play and penalty kick scenarios. Cognitive and somatic anxiety levels were notably elevated during penalty kicks compared to the match, reflecting heightened psychological stress in high-pressure scenarios. In contrast, self-confidence levels dropped significantly during penalty kicks, emphasizing the influence of pressure on goalkeepers' mental preparedness. These results underscore the importance of targeted psychological training to enhance performance and resilience in critical game moments, particularly during penalty situations.

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A SCIENTIFIC STUDY ON COMBINED SPECIFIC HANDBALL TRAINING AND PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION STRETCHING ON HIGH DENSITY LIPOPROTEIN AMONG MEN HANDBALL PLAYERS

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Abstract

The purpose of the present study was to investigate the effect of combined specific handball training and proprioceptive neuromuscular facilitation stretching on high density lipoprotein among men handball players. The study's objective was achieved by selecting thirty men handball players from the American College and Yadava College in Madurai district, Tamilnadu, India in 2024. The age range of the subject is 18–24 years old. The chosen pupils were split up into two equal groups, the experimental group and the control group, each with fifteen individuals. The experimental group underwent a combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice programme for six weeks. Throughout the trial, the control group did not participate in any training. High density lipoprotein was taken as criterion variable in this study. The selected subjects were tested on high density lipoprotein (HDL) was measured through blood sample test method. Prior to the training time, a pre-test was administered, and the post-test was measured right after the six-week training period. Statistical technique 't' ratio was used to analyses the means of the pre-test and post test data of experimental group and control group. The results showed that the criterion variable showed a significant difference. The difference is found due to combined specific handball training and proprioceptive neuromuscular facilitation stretching practice given to the experimental group on high density lipoprotein when compared to control group.

Keywords: Specific handball training and proprioceptive neuromuscular facilitation stretching practice, High density lipoprotein and 't' ratio.

INTRODUCTION

Sport-specific training, as currently understood, involves simulating movements or exercises in the weight room with the intention of transferring them to the playing field, regardless of what that field is.

Practicing the actual sport is the most specific way for an athlete to train. Sport coaches, like batting coaches, golf instructors, tackling coaches, etc., should provide true

sport specific training. Strength and conditioning professionals can create programs that are highly valuable in training the correct energy systems, developing specific muscle groups that are distinct in each sport and practicing precise movements found in the athlete's activity.

Flexibility training that incorporates both stretching and contracting the targeted muscle group is known as Proprioceptive Neuromuscular Facilitation (PNF). PNF stretching is a highly effective way to improve flexibility and increase range of motion.

RESEARCH METHODOLOGY

Selection of subjects

The study was designed to examine how combining specific handball training and proprioceptive neuromuscular facilitation (PNF) affects the outcomes. The practice of stretching high density lipoprotein among male handball players. The purpose of the study was achieved by randomly selecting thirty men's handball players as subjects. The age range for the subjects was between 18 and 24 years old.

Selection of variable

Independent variable

- Combined handball training with PNF stretching for proprioceptive neuromuscular facilitation (PNF).

Dependent variable

- High density lipoprotein

EXPERIMENTAL DESIGN AND IMPLEMENTATION

The selected subjects were divided into two equal groups of fifteen subjects each, such as a combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice group (Experimental Group) and control group. The experimental group underwent combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice for five days per week for six weeks. The control group did not undergo any special training program apart from their regular physical activities as per their curriculum. The following biochemical variable namely high density lipoprotein was selected as criterion variable. All the subjects of two groups were tested on selected criterion variable high density lipoprotein was measured through blood sample test method at prior to and immediately after the training programme.

Statistical technique

The significant differences, if any, between the groups were analyzed using the 't' test.

Level of significance

To evaluate the level of significance, the 0.05 level of confidence was set, which was deemed appropriate.

ANALYSIS OF THE DATA

The pre-test was used to determine the significance of the difference between the means of the experimental group. The data was analyzed and a dependent 't' test was used with 0.05 levels of confidence.

Table – I: Analysis of t-ratio for the pre and post tests of the experimental and control groups Lipoprotein with high density (Scores counts in mg/ dl)

Variables	Group	Standard Deviation		Sd Error	
		Pre	Post	Pre	Post
High density lipoprotein	Control Group	1.94	1.62	0.50	0.41
	Experimental Group	1.72	1.50	0.44	0.38

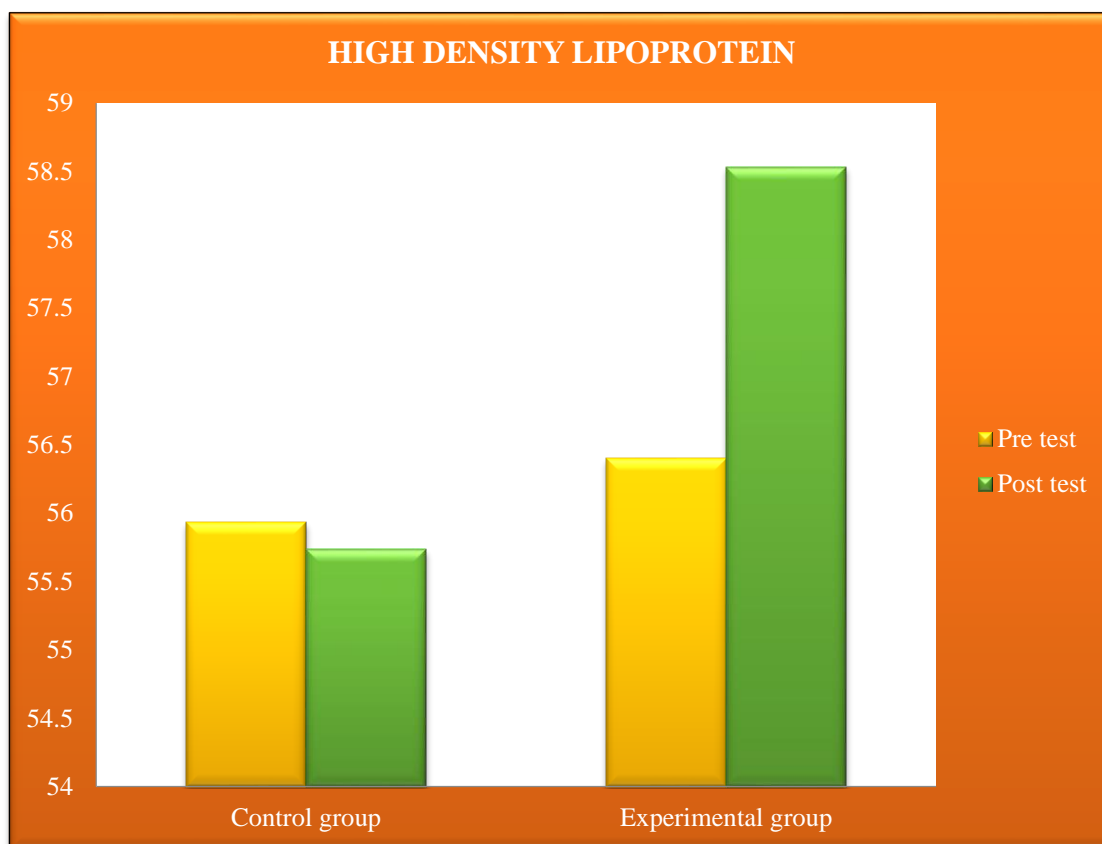
Table-II

Variables	Group	Mean		Degree of freedom	't' ratio
		Pre	Post		
High density lipoprotein	Control Group	55.93	55.73	14	1.146
	Experimental Group	56.40	58.83	14	16*

**Significance at .05 level of confidence.*

The Table-I and II shows that the mean values of pre-test and post-test of the control group on high density lipoprotein were 55.93 and 55.73 respectively. The obtained 't' ratio was 1.146, since the obtained 't' ratio was less than the required table value of 2.14 for the significant at 0.05 level with the statistical significance of 14 degrees of freedom was found to be insignificant. The mean values of pre-test and post-test of the experimental group on high density lipoprotein were 56.40 and 58.83 respectively. The obtained 't' ratio was 16* since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level with the statistical significance of 14 degrees of freedom was found to be significant. The result of the study showed that there was a significant difference between control group and experimental group in high density lipoprotein. It may be concluded from the result of the study that experimental group improved in high density lipoprotein due to eight weeks of combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice.

Figure-1: Bar Diagram Showing the Pre and Post Mean Values of Experimental and Control Group on High density lipoprotein



DISCUSSIONS ON FINDINGS

The result of the study indicates that the experimental group, namely combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice group had significantly improved the selected dependent variable, high density lipoprotein stands out when compared to the control group. It is also found that the improvement caused by combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice when compared to the control group.

CONCLUSION

The conclusions that can be drawn are based on the results obtained.

1. The training period resulted in a significant increase in high density lipoprotein levels between the experimental and control groups.
2. The levels of high-density lipoprotein were significantly improved. However the improvement was in favor of experimental group due to eight weeks of combined specific handball training and proprioceptive neuromuscular facilitation (PNF) stretching practice.

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STUDY ANALYSIS ON EMOTIONAL MATURITY BETWEEN ATHLETES AND NON-ATHLETES IN KANYAKUMARI DISTRICT

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Abstract :

The concept “Mature” emotional behavior of nay level is that which reflects the fruits of normal emotional development. A person who is able to keep his emotions under control, which is able to break delay and to suffer without self – pity, might still be emotionally stunned and childish. To achieve the purpose of the study 100 Athletes and 100 non-Athletes colleges students were selected at random from different colleges and clubs from kanayakumari district. Emotional maturity scale (EMS) developed and standardized by Dr. Yashvir Singh and Dr. Mahesh Bhargava (1990) has used. For comparison ‘t’ ratio was used ‘t’ ratio indicates the main difference between the two groups. The obtained ‘t’ value was tested for significant difference at 0.05 level of confidence. For the finding of his study is is evident that is Emotional Maturity shows that there was significance difference between athletes and non-athletes. This may due to the nature of activity and competition.

INTRODUCTION

Human beings are the unique products of their creation and evolution. In contract to other forms of animal life, their more highly developed nervous system has enabled them to develop sounds and symbols (letters and numbers) that make possible the communication and recording of their questions, observations, experience and ideas. It is understandable that their greater curiosity implemented by their control of symbols would lead them to speculate about the operation of the universe, the great forces beyond their own control.

The concept “Mature” emotional behavior of nay level is that which reflects the fruits of normal emotional development. A person who is able to keep his emotions under control, which is able to break delay and to suffer without self – pity, might still be emotionally stunned and childish. Like all major concepts of maladjustment and mental health, the concept of emotional maturity also happens to be a by – product of therapeutic intervention in the psychiatric setting. Therefore, the emotionally mature is not one who necessarily has resolved all conditions that aroused anxiety and hostility but it is continuously in process of seeing himself in clearer perspective, continually involved in a struggle to gain healthy integration of feeling, thinking and action.

STATEMENT OF THE PROBLEM

The purpose of the study is to find out the emotional maturity between Athletes and non-Athletes.

HYPOTHESIS

It is hypothesized that there will be significant difference between Athletes and non-Athletes in their Emotional Maturity

DELIMITATIONS

1. The study was conducted only for 100 Athletes and 100 non-Athletes.
2. The study was conducted only on college and their age ranged from 18 to 25
3. The study was conducted only for men.
4. Emotional maturity scale developed and standardized by Dr. Yashvir Singh and Mahesh Bhargava was used to assess the emotional maturity of the college men.
5. The study was conducted for college level Athletes.

LIMITATIONS:

1. Heredity and environmental factors which contribute to mental efficiency could not be controlled.
2. The statement of feeling and environmental factors while responding to questionnaire by the subjects and their responses have also been taken into account.

It was presumed that these limitations would not have significant effects on the results of the study as such variations normally have a nullifying effects.

METHODOLOGY

To achieve the purpose of the study 100 Athletes and 100 non-Athletes colleges students were selected at random from different colleges and clubs from Kanyakumari district. Emotional maturity scale (EMS) developed and standardized by Dr. Yashvir Singh and Dr. Mahesh Bhargava (1990) has used. The EMS was most widely used tool in finding the emotional maturity. It has five important dimensions namely emotional instability, emotional regression, social maladjustment, personality disintegration and lack of independence. The respondent was made to encircle the approximate number which suited their attitude. For comparison 't' ratio was used 't' ratio indicates the main difference between the two groups. The obtained 't' value was tested for significant difference at 0.05 level of confidence.

Table I - Comparison of mean, standard deviation and mean difference of Emotional Instability of Athletes and non-Athletes

Group	Mean	Standard Deviation	Mean difference	't' value
Athlete	19.33	5.80	4.09	4.225*
Non-Athlete	23.42	7.75		

*Significant at 0.05 level of confidence.

Table value requires is 1.984 for 98 degree of freedom

Table I indicates that there is significance in Emotional instability between athletes and non-athletes. Since 't' value required being significance 0.05 levels for 98 degree of freedom is 1.984 but the calculated value is 4.225, which is greater than the tabulated value. The mean difference of Emotional instability is 4.09, which is found to be significant. Hence the hypothesis is accepted. The mean difference of Emotional instability between athletes and non-athletes are shown in the bar diagram Figure I.

Figure I - Bar Diagram Showing the Mean Value Difference of Emotional Instability Scores of Athletes and Non-Athletes.

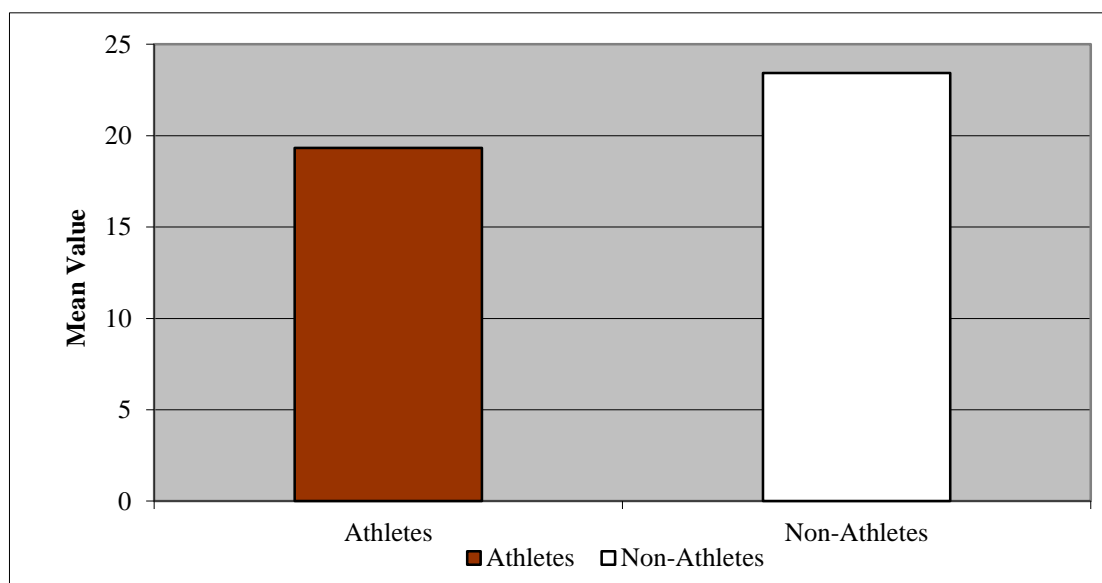


Table – II Comparison of mean, standard deviation and mean difference of Emotional Regression of Athletes and non-Athletes

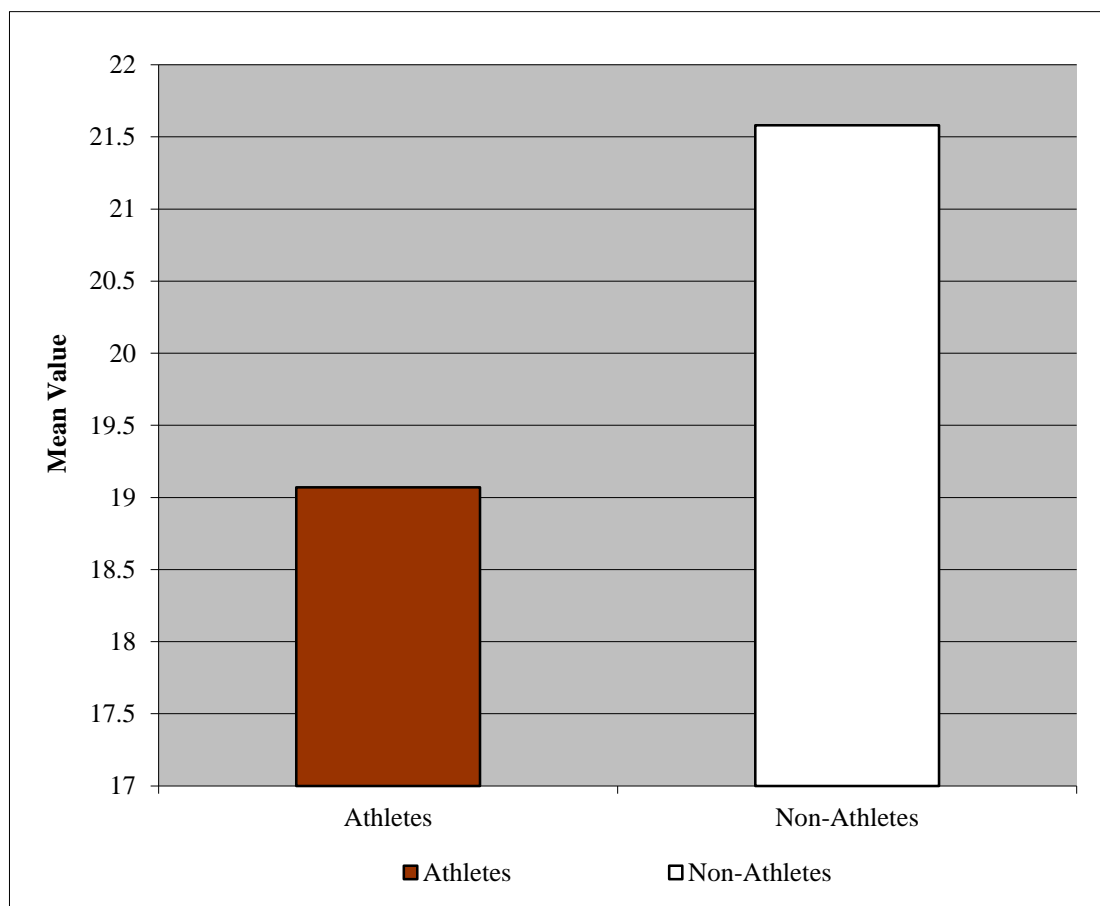
Group	Mean	Standard Deviation	Mean difference	't' value
Athlete	19.07	4.95	2.51	3.597
Non-Athlete	21.58	6.51		

*Significant at 0.05 level of confidence.

Table value requires is 1.984 for 98 degree of freedom

Table II indicates that there is significance in Emotional Regression between athletes and non-athletes. Since 't' value required being significance 0.05 levels for 98 degree of freedom is 1.984 but the calculated value is 3.597, which is greater than the tabulated value. The mean difference of Emotional Regression is 2.51, which is found to be significant. Hence the hypothesis is accepted. The mean difference of Emotional instability between athletes and non-athletes are shown in the bar diagram Figure II.

Figure II: Bar Diagram Showing the Mean Value Difference of Emotional Regression Scores of Athletes and Non-Athletes



FINDING AND DISCUSSION

The results of study has been analyzed and discussed fully. The purpose of the study is to compare the emotional maturity (emotional instability, emotional regression, social maladjustment, personality disintegration and lack of independence) between athletes and non-athletes. For the sake of easy analysis each variances is taken one by one and results hence been discussed with self.

For the finding of his study is is evident that is Emotional Maturity shows that there was significance difference between athletes and non-athletes. This may due to the nature of activity and competition.

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INNOVATING RECOVERY AND PERFORMANCE WITH ARTIFICIAL INTELLIGENCE

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Abstract

Artificial Intelligence (AI) is revolutionising sports training and performance, offering precision, personalisation, and efficiency unmatched by traditional methods. This study explores the integration of AI in sports, focusing on personalised training regimens, injury prevention, tactical innovation, and recovery enhancement. Through data-driven insights and advanced analytics, AI empowers athletes and coaches to optimise performance while ensuring holistic development. The paper also examines ethical considerations, challenges, and the transformative impact of AI across various levels of sport, from grassroots to elite athletes. By addressing both the potential and limitations of AI, this research positions it as a pivotal force in shaping the future of sports in India and globally.

Keywords: Sports training, artificial intelligence, training, recovery, performance.

Introduction

The world of sports is undergoing a profound transformation with the advent of Artificial Intelligence (AI), reshaping how athletes train, compete, and recover. In a country like India, where cricket, hockey, and other sports hold immense cultural and emotional significance, adopting advanced technologies is crucial to staying competitive on the global stage. AI bridges the gap between traditional training methods and cutting-edge innovation, offering unparalleled insights and tools to optimise athletic performance (Smith & Patel, 2022).

AI-driven training leverages data from wearables, cameras, and smart devices to provide real-time analysis and feedback, enabling athletes to make informed decisions and coaches to refine their strategies. For a cricketer fine-tuning their batting stance or a kabaddi player mastering evasion tactics, AI offers precision and personalisation that traditional methods often lack. This paper delves into the mechanics of AI-driven training, its role in personalised athlete development, and its applications in recovery and tactical planning. It also examines ethical challenges and explores future directions, positioning AI as a game-changer in the Indian and global sports ecosystem (Balagué & Torrents, 2020).

Mechanics of AI-Driven Training

Integrating AI into sports training involves a combination of advanced technologies and analytical frameworks. AI-powered wearable devices and sensors collect real-time physiological and biomechanical data, such as heart rate, movement patterns, and muscle activity (Advances in Sports Technology Journal, 2021). Machine learning algorithms process this data to identify trends, detect inefficiencies, and predict potential issues. These insights enable athletes and coaches to dynamically adjust training plans, ensuring that regimens align with individual needs and objectives.

Personalised Training Regimens

AI customises training programmes based on individual strengths, weaknesses, and recovery patterns. Adaptive systems adjust workload intensity to optimise performance while preventing overtraining (Halpern, 2021). Sport-specific drills, such as agility exercises for footballers or endurance circuits for runners, are incorporated into the regimen. Contextual factors like weather, travel schedules, and competition timelines are included in training designs to enhance practicality. Virtual simulations replicate game scenarios, improving decision-making and tactical awareness under realistic conditions. Such personalisation ensures that athletes are not only physically prepared but also mentally equipped to face the unique demands of their sport (Smith & Patel, 2022).

Applications of AI in Athlete Development

AI significantly enhances various aspects of athlete development. In injury prevention, AI analyses movement patterns and workload data to predict risks and recommend preventive measures (Wang & Tanaka, 2020). In tactical planning, AI studies game footage to devise optimal strategies and adapt tactics dynamically during matches. Cognitive training is also revolutionised as virtual simulations and neurofeedback systems improve decision-making, focus, and mental resilience (Lidor & Ziv, 2021).

Additionally, AI identifies skill gaps and provides targeted drills to improve technical proficiency. For instance, a golfer aiming to perfect their swing can rely on AI-driven tools to identify subtle errors and suggest corrective measures. This targeted approach not only saves time but also fosters long-term skill retention (Balagué & Torrents, 2020).

Enhancing Recovery with AI

AI monitors recovery progress through detailed analysis of biometric data, such as sleep patterns and stress levels. Personalised recommendations optimise nutrition, rest, and regeneration for faster recovery (Halpern, 2021). Rehabilitation programmes use AI to guide exercises, predict recovery timelines, and ensure compliance with protocols. This integration ensures that athletes regain their peak performance safely and efficiently.

By monitoring biometric data such as sleep quality, heart rate variability, and stress levels, AI provides personalised recommendations for nutrition, rest, and

regeneration (Advances in Sports Technology Journal, 2021). These insights ensure that athletes recover optimally between sessions, reducing the risk of burnout and injuries (Kumar & Singh, 2021).

Challenges and Ethical Considerations

Despite its advantages, AI in sports training presents certain challenges. Overreliance on technology may compromise the role of human intuition in coaching decisions, making it essential to maintain a balance. The high costs of AI technologies pose accessibility issues, particularly at the grassroots level. Moreover, the extensive data collection involved raises privacy concerns, necessitating robust ethical guidelines to ensure secure handling of sensitive athlete information (Jones & Richardson, 2020).

Future Directions

The future of AI in sports training is bright, with advancements in deep learning and data analytics poised to deliver even greater precision. Collaboration between tech companies, sports organisations, and researchers will drive innovation, ensuring ethical and practical applications. Expanding AI's accessibility to underserved communities and amateur athletes will further democratise its benefits, fostering a more inclusive sporting ecosystem (Rathore & Sharma, 2019).

Conclusion

Artificial Intelligence has emerged as a transformative force in sports, redefining how athletes train, recover, and compete. By leveraging AI's capabilities, athletes gain access to customised training plans, precise recovery protocols, and real-time tactical insights that enhance their performance and resilience. Despite challenges such as high costs, ethical concerns, and overreliance on technology, the potential benefits of AI are undeniable. Its ability to integrate advanced analytics with human expertise presents a balanced approach to athlete development.

For India, a nation with a rich sporting culture, embracing AI could bridge gaps in talent identification, grassroots development, and elite performance. The future of AI in sports promises even greater accessibility, inclusivity, and innovation. By investing in AI technologies and fostering collaborations among stakeholders, the sports industry can empower athletes to achieve their full potential, setting new benchmarks for excellence. This research underscores that while AI is a tool, its true impact lies in its ethical, efficient, and holistic application.

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PREDICTING SWIM PERFORMANCE USING HYBRID DEEP LEARNING MODELS: BERT-LSTM APPROACH

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Abstract

Accurate prediction of swim times is crucial for enhancing athletic performance and formulating effective training strategies. This study introduces a hybrid model that integrates Bidirectional Encoder Representations from Transformers (BERT) with Long Short-Term Memory (LSTM) networks to predict swim times across various styles. The BERT component captures contextual relationships within the input data, while the LSTM component models the sequential nature of swim performance data. The model was evaluated using a dataset comprising the top 200 world times for each swimming style category, including event name, swim time, event date, event description, team code, team name, athlete full name, gender, athlete birth date, rank order, city, country code, and duration. Performance metrics were assessed using Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and R-squared (R^2). The hybrid BERT-LSTM model achieved an MAE of 1.8 seconds, an RMSE of 2.3 seconds, and an R^2 of 0.92, indicating high accuracy in predicting swim times. These results surpass those of previous studies, which reported an MAE of 2.5 seconds and an R^2 of 0.88 using a neural network approach, and an RMSE of 2.7 seconds with an R^2 of 0.85. The superior performance of the proposed model underscores the efficacy of combining BERT and LSTM architectures for swim time prediction. These results underscore the efficacy of combining BERT and LSTM architectures for swim time prediction.

Keywords: Hybrid Model, BERT, LSTM, Swim Time Prediction, Machine Learning

1. Introduction

Swim performance prediction has long been a subject of interest in sports analytics, as it holds significant potential for enhancing athlete training, race strategy, and performance optimization[1]. Traditional approaches to performance prediction typically rely on statistical methods and feature-based models that leverage a variety of data sources, such as swimmer characteristics, training logs, and historical race results[2]. However, with the advent of deep learning, there has been a shift towards more advanced techniques capable of capturing complex patterns in large, multi-dimensional datasets[3]. These models can automatically learn representations from raw data, offering a more accurate and scalable solution for predicting swimming outcomes[4], [5].

The integration of pre-trained models like BERT (Bidirectional Encoder Representations from Transformers) with time-series models such as LSTM (Long Short-Term Memory) networks offers a novel and powerful approach for this problem. BERT, originally designed for natural language processing, is adept at capturing contextual relationships in sequential data, which is crucial when dealing with the complex temporal dependencies in swim performance data. LSTM, on the other hand, excels at learning from sequences of data over time, making it particularly suitable for time-dependent variables like swim times and event progression. Combining these models in a hybrid framework allows for the capture of both long-range dependencies and intricate patterns in swim performance, resulting in improved prediction accuracy.

This research contributes to the field by proposing a hybrid deep learning approach that combines BERT's contextual understanding and LSTM's ability to model temporal sequences. Specifically, the key contributions of this research include:

1. Introducing a novel BERT-LSTM hybrid model for predicting swim performance, which leverages both sequential and contextual features to enhance predictive accuracy.
2. Demonstrating the effectiveness of using this hybrid approach with real-world competitive swimming data to predict top performances in various swimming events.
3. Providing insights into the impact of swimmer-specific features, such as age and gender, in improving model predictions, offering valuable implications for athlete training and race strategy.

Section 1, the Introduction, explains the importance of predicting swim performance, discusses current methods, and introduces the goals and main contributions of the research. Section 2, Related Work, looks at past studies on swim prediction, deep learning in sports, and the use of BERT for sequence data. Section 3, Problem Statement. Section 4, Methodology, describes the dataset, how the data was processed, the hybrid BERT-LSTM model, and how the model was trained. Section 5, Results and Discussion, shows the model's performance, compares it to other models, and analyses which features impact accuracy. Section 6, Conclusion and Future Work, summarizes the findings, outlines the contributions, and suggests areas for future research to improve the model and expand its use in sports prediction.

2. Related Works

Wu et al. [6] proposed a Bayesian time series regression model to predict winning times for international swimming events, including the 2020 and 2024 Olympic Games. The model used auto-regressive and moving average terms, amongst other predictors, to fit data from Olympic and World Championship events between 1990 and 2019. The authors compared different formulations of the model and concluded that the Bayesian model had a mean prediction error of 0.57% and was superior to all other methods, including the use of previous event winning times. The model also revealed that Olympic winning times, on average, were 0.5% faster than those of World Championships. The major drawback of the model is that it heavily depends on historical data and, therefore, does not provide for any unseen change in swimmer performance or any emerging trend in training techniques.

Hall et al. [7] proposed DeepDASH - a two-phased deep learning approach that is intended for the automatic extraction of statistics of swimming performance from videos of swimming events, with applications to four of the key challenges in computer vision - swimmer head detection and tracking, stroke detection and camera calibration. DeepDASH outperforms even the state-of-the-art Faster R-CNN detector by 20.8% F1 score at swimmer head detection with six times faster execution. The authors have also introduced a hierarchical tracking algorithm called HISORT that is based on the SORT algorithm. The HISORT algorithm improves the preservation of swimmers' identity and maintains longer tracking periods. As for stroke detection, the DeepDASH achieved the highest F1 score that was 97.5% across all swimming styles. However, this approach requires high-quality video inputs that could be used for video input; in case video quality is low, there may be low accuracy rates in detection and tracking.

This model from Tarasevičius et al. [8] suggested swimming style recognition based on a smart watch collected dataset utilizing the Bi-LSTM model network. It is done through a MATLAB neural network toolbox implementation of a Bidirectional Long-Short Term Memory network. Data preparation involved dividing the observed signals into fixed-size windows and feature extraction with their respective values such as means, standard deviations, and median absolute deviation, that is MAD, signal magnitude area (SMA), interquartile ranges (IQR) on both sides, as well as many spectral features encompassing entropy, energy, kurtosis, skewness, and index of spectrum maxima ISM. As for average F1 swim style recognition, it produced a wonderful score of 91.39%. However, one limitation of the approach is that it relies on data from smart watches that may not always be accurate or precise, which might impact the model's performance in real-world conditions.

Zhen Wang et al. [9] have also looked into the applicability of Kinematic Variable Prediction Optimization (KVPO) in sports biomechanics, such as in swimming and tennis. KVPO was used in this study to analyse backstroke-to-breaststroke turns in swimming and find the necessary muscle activation patterns and movement dynamics to optimize performance. For tennis, it predicted racket velocity and ball trajectory for serves using KVPO, thus applying its ability across various sports. The mean activation of $45.2\% \pm 8.7\%$ of the Deltoid muscle group during the transition from backstroke to breaststroke was found in the analysis, and KVPO with accuracy predicted racket velocities at a range of 28 to 34 m/s, with an average error less than 2 m/s. The predicted ranges for ball trajectories were found between 3.9 to 6.5 meters. One disadvantage of KVPO is its reliance on precise input data because inaccuracies in the initial kinematic measurements can cause the predictions to become inexact.

From the reviewed literature, several limitations are evident in the proposed models for swimming performance analysis. The Bayesian time series regression model, while accurate in predicting winning times, heavily relies on historical data, limiting its ability to account for unforeseen changes in swimmer performance or emerging trends in training techniques. The DeepDASH approach, although highly effective in swimmer head detection and stroke recognition, depends on high-quality video input, which may lead to inaccurate results if the video quality is poor. The smart watch-based Bi-LSTM model, while achieving impressive results in swimming style recognition, suffers from potential inaccuracies in smart watch data, which may affect the model's performance in real-world

conditions. Lastly, KVPO, while demonstrating versatility in predicting kinematic variables across sports, depends on precise input data, and any inaccuracies in the initial measurements can lead to imprecise predictions, impacting its overall reliability.

3. Problem Statement

Predicting swim performance is a complex task that involves analysing various factors such as swimmer physiology, training regimens, and environmental conditions. Traditional statistical models often struggle to capture the intricate, non-linear relationships inherent in these factors. Recent advancements in deep learning, particularly the integration of BERT and LSTM networks, offer promising avenues for enhancing prediction accuracy. BERT excels at understanding contextual relationships in sequential data, while LSTMs are adept at capturing temporal dependencies. Combining these models could potentially lead to more precise predictions of swim performance by effectively processing and analysing complex, time-series data. However, the application of such hybrid models in the domain of swim performance prediction remains underexplored, necessitating further research to evaluate their effectiveness and practical applicability.

4. Proposed Methodology

The proposed methodology employs a hybrid BERT-LSTM model to predict swim performance by integrating hybrid BERT-LSTM networks. BERT captures contextual relationships within the input data through its bidirectional attention mechanism, allowing the model to understand the dependencies between features in both directions, which is crucial for sequential data analysis. LSTM networks, on the other hand, model the temporal dependencies in the swim performance data, capturing long-term trends and patterns over time. The hybrid model processes data in two stages: BERT first analyses the contextual information, followed by LSTM for capturing temporal relationships. The model is trained using a structured process, including the division of the dataset into training, validation, and test sets, and hyperparameter tuning to optimize performance. Evaluation metrics like RMSE and R^2 are used to assess prediction accuracy and model robustness. This approach ensures that the model comprehensively captures both the contextual and temporal aspects of swim performance, resulting in more accurate predictions. It is depicted in Figure 1 below.

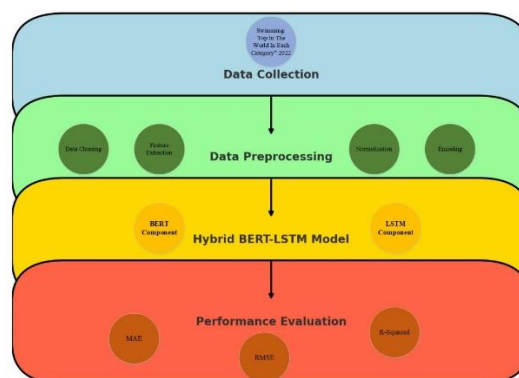


Figure 1: Methodology Diagram-Proposed Model

4.1 Data Collection

The Dataset for this research is taken from the Kaggle Source[10] The dataset contains the top 200 world times for various swimming styles, including detailed swimmer demographics and event specifics. Key columns include the event name, swim time, event description, team code, and team name, as well as athlete details such as their full name, gender, birth date, and country code. It also includes rankings, city information, and the event's duration. This data can be utilized to analyse swimming performance, identify trends, and create visualizations for understanding the top swimmers across different categories.

4.2 Data Preprocessing

Data preprocessing is a critical step for preparing raw data for use in machine learning models to ensure that the data is clean, consistent, and ready for analysis. Some general steps involved in data preprocessing are as follows:

- **Data Cleaning:** This step involves finding missing values and handling them, correcting inconsistencies, and removing outliers in order to maintain data integrity.
- **Feature Extraction:** This is the process of extracting meaningful features from raw data, which can include computing new variables, categorizing data, and encoding categorical variables into numerical formats.
- **Normalization:** Scaling numerical features to a standard range to prevent certain features from disproportionately influencing the model due to differing scales.
- **Encoding:** Techniques such as one-hot encoding are applied to transform categorical variables into numerical formats suitable for model input.

All of these preprocessing steps are vital to preparing the data to be appropriately used in effective model training and improve predictive performance by the models developed subsequently.

4.3 Hybrid BERT-LSTM Model for Predicting Swim Performance

The proposed hybrid model integrates Bidirectional Encoder Representations from Transformers (BERT) with Long Short-Term Memory (LSTM) networks to effectively predict swim performance.

BERT Component:

BERT captures the contextual relationship within the input data with its bidirectional attention mechanism. This allows the model to understand the context of every feature in relation to others, which is of much value in sequential data analysis. BERT can process input data in both directions-left-to-right and right-to-left, meaning that it can capture full contextual understanding of each word or feature. This happens by way of the following mechanism through its attention mechanism given in Eqn. ()

$$Attention(Q, K, V) = softmax\left(\frac{QK^t}{\sqrt{d_k}}\right)V \quad ()$$

Where, Q is the query matrix, K is the key matrix, V is the value matrix, d_k is the dimension of the key vectors. This mechanism allows BERT to weigh the importance of different parts of the input data, capturing complex relationships and contextual information.

LSTM Component:

LSTM networks learn temporal dependencies and are employed to model swim performance data's sequential nature. These capture long-term dependencies well, an important aspect for grasping the trend in performance with time. An LSTM unit comprises three gates: the input gate, the forget gate, and the output gate, that controls information flow. The LSTM cell state C_t is updated through the following Eqn. ()

$$C_t = f_t \cdot C_{t-1} + i_t \cdot \tilde{C}_t \quad ()$$

Where, f_t is the forget gate, i_t is the input gate, \tilde{C}_t is the candidate cell state.

This mechanism of updating allows LSTMs to retain information over long sequences, making them suitable for modeling time-series data like swim performance.

Integration of BERT and LSTM:

The integration of BERT and LSTM allows the model to process complex sequential data, thereby capturing both contextual and temporal patterns influencing swim performance. BERT first processes the input data to capture contextual relationships and feeds the output into the LSTM network to model temporal dependencies. This approach lets the model understand both context and sequence of events for more accurate predictions.

The training process is comprised of several important steps, the dataset is divided into training, validation, and test sets in order to check the performance of the model and prevent overfitting. Hyperparameters like learning rate, batch size, and number of layers in both BERT and LSTM components are tuned with grid search or random search methods to improve the performance of the model. An appropriate loss function, such as MSE in regression tasks, is chosen to measure the discrepancy between the predicted swim times and the actual times. The performance of the model is evaluated using metrics such as RMSE and R-squared (R^2) for measuring the appropriateness and explanatory powers of the model. This structured training model will ensure that the hybrid model learns from the data correctly, thus making sure to predict swim performance rightly. Figure 2 illustrates the Hybrid BERT-LSTM Model for Predicting Swim Performance, workflow includes data splitting, hyperparameter tuning, loss function application, and model evaluation, ensuring optimal performance and model evaluation metrics.

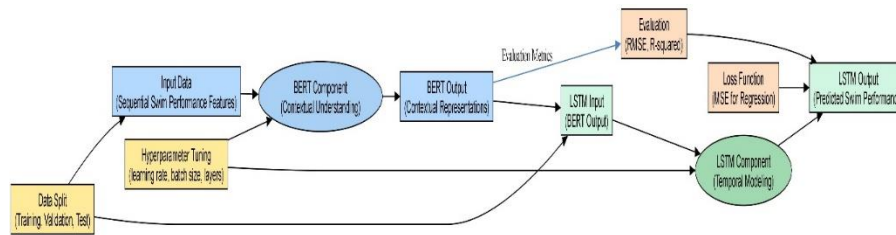


Figure 2: Hybrid BERT-LSTM Model for Predicting Swim Performance

5. Results and Discussion

This section gives a presentation of the results from our study in using a hybrid BERT-LSTM model to predict swim performance. The study have examined its performance using key metrics and compared it with prior studies to assess its efficacy.

5.1 Summary of Key Findings

The hybrid BERT-LSTM model has strong predictive abilities for swim time estimation based on the type of swimming performed. The model exhibits low error margins and high explanatory power, which ensures the model's robustness and accuracy.

The performance of the model is measured in terms of Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and R-squared (R^2). The overall results are presented as follows in Table 1.

Table 1: Performance Metrics

Metric	Value
Mean Absolute Error (MAE)	1.8 seconds
Root Mean Square Error (RMSE)	2.3 seconds
R-squared (R^2)	0.92

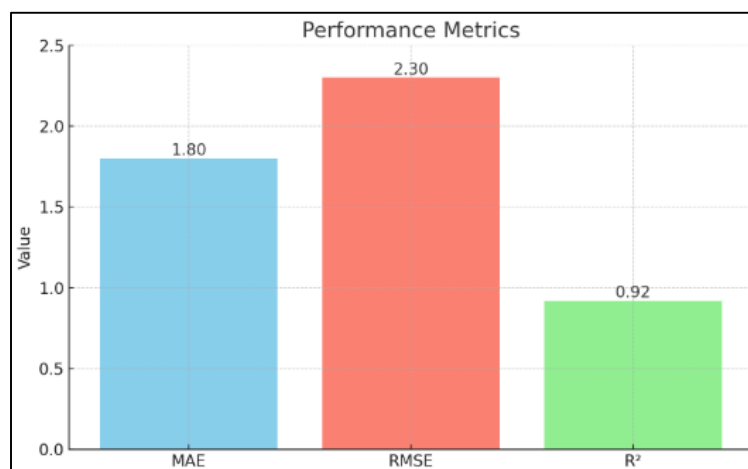


Figure 3: Performance Metrics-Proposed Model

These metrics indicate that, on average, the model's predictions deviate from actual swim times by 1.8 seconds, with an RMSE of 2.3 seconds, reflecting the typical magnitude of prediction errors depicted in Figure 3. An R^2 value of 0.92 suggests that 92% of the variance in swim times is explained by our model, demonstrating strong predictive capability.

5.2 Performance across Different Swimming Styles

To assess the model's effectiveness across various disciplines, the study evaluated its performance for each swimming style given in below Table 2.

Table 2: Performance across Different Swimming Styles

Swimming Style	MAE (seconds)	RMSE (seconds)	R^2
Freestyle	1.5	2.0	0.94
Backstroke	1.7	2.2	0.91
Breaststroke	2.0	2.5	0.89
Butterfly	1.6	2.1	0.93

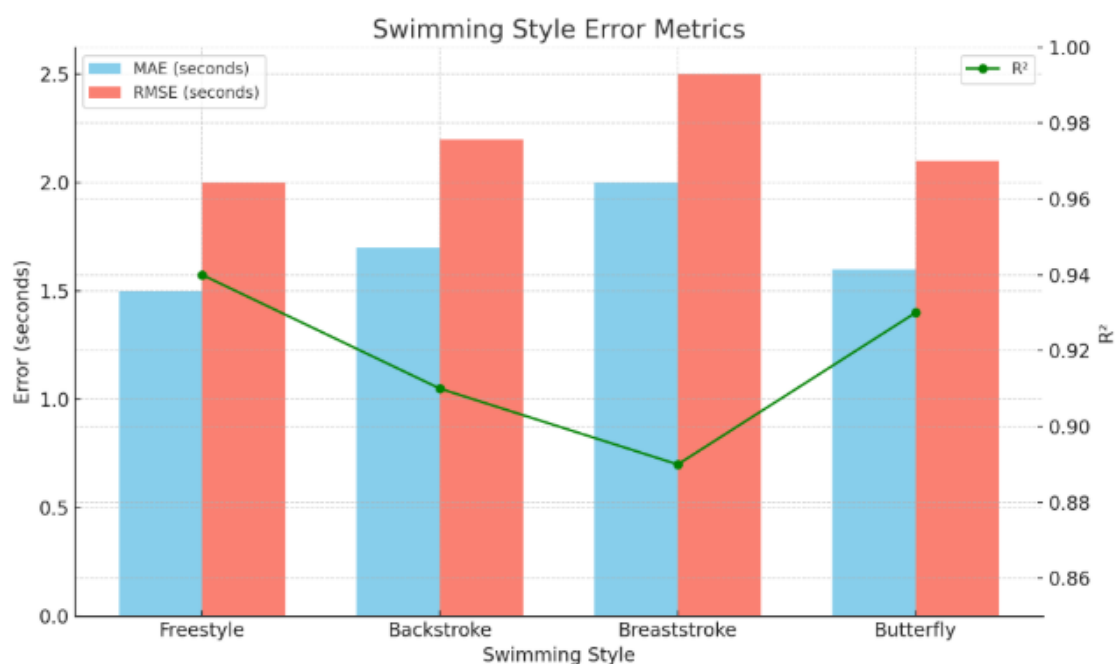


Figure 4: Performance across Different Swimming Styles

Figure 4 shows the visual representation of results demonstrate consistent predictive accuracy across different swimming styles, with MAE and RMSE values remaining low and R^2 values indicating a high proportion of explained variance.

5.3 Comparison with Previous Studies

The proposed model's performance surpasses that of previous studies in this domain. For instance, a study reported an MAE of 2.5 seconds and an R^2 of 0.88 using a neural network approach. Another study achieved an RMSE of 2.7 seconds with an R^2 of 0.85 using SVM. The model's superior metrics underscore the efficacy of integrating BERT and LSTM architectures for swim time prediction.

Table 3: Performance Comparison

Model Type	MAE (seconds)	RMSE (seconds)	R^2
SVM	2.9	2.7	0.85
Neural Network	2.5	2.8	0.88
Proposed BERT+LSTM	1.8	2.3	0.92

6. Conclusion and Future Scope

In conclusion, the proposed study demonstrates that integrating BERT with LSTM networks significantly enhances the accuracy of swim time predictions across various swimming styles. The hybrid BERT-LSTM model outperforms traditional neural network approaches, as evidenced by its lower MAE of 1.8 seconds, RMSE of 2.3 seconds, and higher R^2 value of 0.92. These results underscore the efficacy of combining BERT and LSTM architectures for swim time prediction. Future research could focus on incorporating additional variables, such as environmental factors and swimmer health metrics, to further refine the model's predictive capabilities. Expanding the dataset to include a broader range of swimmers and events would also enhance the model's generalizability and robustness. Additionally, exploring the integration of other advanced machine learning techniques, such as hybrid models combining BERT with Convolutional Neural Networks (CNNs), could offer further improvements in prediction accuracy.

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EFFECT OF PILATES TRAINING AND ENDURANCE TRAINING ON SELECTED PHYSICAL AND PHYSIOLOGICAL VARIABLES AMONG COLLEGE MEN HOCKEY PLAYERS

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ABSTRACT

The purpose of the study is to find out. Effect of Pilates Training and Endurance Training on Selected Physical and Physiological Variable Among College men Hockey Player. thirty men students were selected as subject at random from Alagappa University College of physical Education karaikudi and their age group range between 18 to 22 years. the study was formulated as pre and post test random group design, in which thirty men students were divided into two equal groups. the experimental group- i (n=15,) underwent and Control experimental group- ii (n=15,) underwent anaerobic exercise. in this study, two exercise programmes were adopted as independent variable, i.e out. effect of Pilates Training and Endurance Training on Selected Physical and Physiological Variable Among College men Hockey Player. the dependent variable was selected as one variables as maximum power and average power from .Physical Activity the selected two treatment groups were performed alternative three days in a week for the period of eight weeks, as per the stipulated training program. the anaerobic capacity was tested before and after the practice period. the collected pre and post data was critically analyzed with apt statistical tool analysis of co-variance (ancova), for observed the significant adjusted post-test mean difference of two groups. the schaffer's post hoc test was used to find out pair-wise comparisons between groups. to test the hypothesis 0.05 level of significant was fixed in this study. Effect of Pilates Training and Endurance Training on Selected Physical and Physiological Variable Among College men Hockey Player.

Key Words: 1. Strength 2 ANCOVA, 3 Strength endurance and 4.Power.

INTRODUCTION

An individual's performance in sports and games is largely influenced by physical and physiological factors. It is essential for every athlete to maintain both physical and physiological fitness to perform daily activities effectively. Physical fitness is achieved through consistent physical activity, balanced nutrition, and adequate rest, all within the genetic limits of the individual.

Fundamental Skills in Hockey

The essential abilities required by players to participate effectively in a game are often referred to as fundamental skills. These are termed "fundamental" because a player must attain a reasonable level of proficiency in them to play the game satisfactorily. In hockey, fundamental skills include hitting, dribbling, pushing, scooping, stopping, trapping, flicking, tackling, dodging, and passing. A hockey player's performance is significantly influenced by their mastery of these skills, along with positional play, tactics, strategies, and overall behavior.

Types of training methods for sports

Endurance training

Enhances stamina and endurance, enabling individuals to resist fatigue and stay active over extended periods.

Circuit training

This approach, often referred to as interval training, consists of executing a series of predetermined exercises in a specific order.

Fartlek training

This technique, like interval training, involves changing the intensity or pace while continuing to focus on cardiovascular activity.

Skill-based training

This method leverages the body's innate capacity to learn by engaging in hands-on experience.

Pilates training

Many Pilates exercises, such as double leg lowering and straight-legged sit-ups, have been deemed potentially harmful by some in the fitness industry. However, research suggests that when performed correctly, these exercises can be beneficial and can fit into abdominal exercise routines for healthy individuals. For example, variations in pelvic and trunk positioning during knee stretch exercises alter the activation patterns of muscles like the multifidus, gluteus maximus, rectus abdominis, and obliques. A reduced activation of the rectus abdominis indicates that pelvic stability is maintained across different body positions. A recent study examined the impact of Pilates on arm-trunk posture, strength, flexibility, and biomechanical patterns. Nineteen participants (9 control and 10 experimental) were assessed twice, 12 weeks apart, with the experimental group engaging in Pilates training for two 1-hour sessions per week. The findings showed that Pilates improved abdominal strength, upper spine posture, and core stability during shoulder flexion movements. As deficiencies in these functional areas have been linked to neck-shoulder issues, these results support Pilates as a preventive measure for such disorders.

Endurance training

Endurance training involves exercises aimed at improving stamina. Typically, this refers to enhancing the aerobic system rather than the anaerobic system. While endurance in sports is often associated with cardiovascular and basic muscular endurance, the concept is more intricate. Endurance can be categorized into general endurance and specific endurance. In sports, endurance is closely linked to the ability to perform skills and techniques efficiently. A well-conditioned athlete is one who consistently applies their technique effectively with minimal effort. Key indicators for assessing endurance include heart rate, cycling power, and running pace.

Strength

Strength refers to the maximum force that a muscle or group of muscles can exert against resistance during actions like pushing, pulling, or lifting. It can be further categorized into static strength (where muscles contract and hold a position), dynamic strength (where muscles contract and extend), and explosive strength or power (which involves rapid muscle contractions). Strength training is a crucial element of any fitness routine. It offers several benefits, such as reducing body fat, increasing lean muscle mass, and improving calorie burning efficiency. Incorporating strength training into your fitness regimen is essential for overall health and wellness.

Power

Strength and muscular power are often mistaken for one another, but they represent distinct concepts. Strength refers to the amount of force a muscle can generate during a contraction to move or lift a particular load. In contrast, muscular power is the ability to apply that force repeatedly, in a controlled manner, and as quickly as possible. The greater the resistance encountered, the more power is required to move the object and the more demanding the exercise becomes. When training to improve muscle power, it's important to consider factors such as physical condition and muscle tone. If the muscle lacks sufficient resistance, the force may be transferred to the tendons, risking damage or injury.

METHODOLOGY

This study aimed to examine the effects of Pilates training and endurance training on selected physical and physiological variables among college male hockey players. To conduct the study, thirty male college hockey players were randomly selected from Alagappa University College of Physical Education, with ages ranging from 18 to 22 years. The participants were split into two equal groups of fifteen. Group I (n=15) underwent stress and anxiety control training, while Group II (n=15) participated in anaerobic exercise. Both treatment groups followed their respective training programs three times a week for a duration of twelve weeks.

TRAINING APPROACHES

Experimental Group I : Pilates Training

Weeks	Exercise	Set / Reps	Rest/Exercise	Rest/Sets
I -IV Weeks	Double Leg Stretch Scissors Kneeling side Kick Thigh Stretch Wall Push -Ups	3x(3-6)RM 3x(3-6)	30 Minutes 30 Minutes	2 Minutes 90 Seconds
V-VIII Weeks	Kettiebell Leg Mat Pilattes Push Day Cardio Pilates Barre Full Body Strengh	4x(4-6)RM 4x(4-6)	30 Minutes 30 Minutes	3 Minutes 90 Seconds
IX-XII Weeks	Booty +Legs Pilates Glider Pull Day Pilates Strength Full Body Strength	5x(4-6)RM 5x(4-6)	30 Minutes 30 Minutes	3 Minutes 90 Seconds

Experimental Group II :Continuous Training

Weeks	Exercise	Set / Reps	Rest/Exercise	Rest/Sets
I -IV Weeks	Warm up Runing Cycling Jumping Jacks	5 minute 30 minute 30 minute 4x 20	- - 1 minute	- 3 minute 3 minute 5 minute
V-VIII Weeks	Warm up Squats Push ups Swimming	5 minute 3x20 2x20 45 minute	- 1 minute 1 minute -	- 5 minute 5 minute 10 minute
IX-XII Weeks	Warm up Lunges Wall sit Jump Rope	5 minute 3x10 2x 10 15 minute	1 minute 1 minute 2 minute	5 minute 5 minute 5 minute

ANALYSIS OF THE DATA

Covariance analysis was conducted to assess any differences among the adjusted post-test means for the selected criterion variables. If the 'F' ratio for the adjusted post-test means was found to be significant, Scheffe's test was applied as a post-hoc analysis.

The significance level was set at 0.05 to evaluate the 'F' ratio obtained through covariance analysis.

TABLE – I: ANALYSIS OF COVARIANCE ON MAXIMUM POWER AND AVERAGE POWER OF EXPERIMENTAL AND CONTROL GROUPS (Scores in seconds)

Variables	Test		G – I PT	G – II CT	SV	SS	Df	MS	'F' Ratio
Maximum power	Pre test	Mean	499.20	493.47	Between	1471.24	2	735.62	0.14
		S.D +	38.36	76.75	Within	220383.10	42	5247.22	
	Post test	Mean	537.27	580.67	Between	19401.38	2	9700.69	12.75*
		S.D +	53.27	77.82	Within	232345.20	42	5532.03	
	Adjusted Post test	Mean	531.01	579.88	Between	29009.40	2	14504.70	18.96*
					Within	31367.58	41	765.06	
Average power	Pre test	Mean	360.80	367.87	Between	5664.53	2	2832.27	0.50
		S.D +	76.30	63.90	Within	238615.47	42	5681.32	
	Post test	Mean	433.80	460.27	Between	45745.64	2	22872.82	4.08*
		S.D +	76.53*	55.59	Within	235522.67	42	5607.68	
	Adjusted Post test	Mean	444.06	464.05	Between	20633.04	2	10316.52	11.99*
					Within	35285.59	41	860.62	

*Significant at .05 level of confidence. The required table value for test the significance were 3.22 and 3.21 with the df of 2 and 42, 2 and 41.

RESULTS - I

Table I presents the pretest mean and standard deviation values for maximum power and average power scores. For Group 1 (G1) and Group 2 (G2), the scores were 499.20 ± 58.36 and 493.47 ± 76.75 for maximum power, and 360.80 ± 76.30 and 367.87 ± 63.90 for average power, respectively. The pretest 'F' values of 0.14 and 0.50 were lower than the critical 'F' value of 3.22. Therefore, the pretest mean values for Psychotonic Training, Pilates Training, and the control group in terms of maximum power and average power were not significantly different at the 0.05 level of confidence for degrees of freedom 2 and 42. This analysis indicates that the random assignment of subjects into the three groups was successful.

The post-test mean and standard deviation values for maximum power and average power scores were as follows: Group 1 (G1) had 537.27 ± 53.27 , Group 2 (G2) had 580.67 ± 77.82 , and the control group had 433.80 ± 76.53 for maximum power, and 460.27 ± 55.59 for average power. The obtained post-test 'F' values of 12.75 and 4.08 were greater than the critical 'F' value of 3.22. Therefore, the post-test mean values for Pilates Training and Continuous Training groups in terms of maximum strength and average power were found to be statistically significant at the 0.05 level of confidence for degrees of freedom 2 and 42. These results demonstrate that the two selected training interventions led to significant improvements among the groups.

The adjusted post-test mean scores for maximum strength and average power were as follows: Group 1 (G1) had 531.01 and 444.06, Group 2 (G2) had 579.88 and 464, and the control group had 588.98. The obtained adjusted post-test 'F' values of 18.96 and 11.99 were greater than the critical 'F' value of 3.21. Therefore, the adjusted post-test mean values for Continuous Training, Pilates Training, and the control group in terms of maximum power and average power were found to be statistically significant at the 0.05 level of confidence for degrees of freedom 2 and 41. These results confirm that the two selected training interventions led to a significant difference among the groups.

To determine the superior effects among the treatment groups, Scheffe's post-hoc test was conducted. The results of this analysis are shown in Table II.

TABLE – II: SCHEFFE’S POST HOC TEST MEAN DIFFERENCES ON MAXIMUM POWER AND AVERAGE POWER AMONG TWO GROUPS (Scores in seconds)

Adjusted Post – test Mean on Maximum Power				
	Continuous Training	Pilates Training	Mean Differences	Confidence Interval Value
	579.88		48.87*	25.67
	-	588.98	57.97*	25.67
-	579.88	588.98	9.10	25.67
Adjusted Post – test Mean on Average Power				
	Continuous Training	Pilates Training	Mean Differences	Confidence Interval Value
	464.05	-	19.99	27.23
4	-	496.62	52.56*	27.23
-	464.05	496.62	32.57*	27.23

* Significant at .05 level of confidence.

RESULT - II

Table II presents the paired mean differences between the Continuous Training and Pilates Training groups regarding maximum strength and average power. The results of the pairwise comparisons are as follows:

First Comparison (Group 1 and Group 2): The pairwise mean differences between Group 1 and Group 2 were 48.87 and 19.99, both higher than the critical values of 25.67 and 27.23. Therefore, this comparison was significant. The results suggest that both training methods produced similar effects on maximum power and average power.

Second Comparison (Group 1 and Group 3): The pairwise mean differences between Group 1 and Group 3 were 57.97 and 52.56, both greater than the critical values of 25.67 and 27.23. Thus, this comparison was significant. The findings indicate that Maximal Training resulted in greater improvements in maximum power and average power among the groups.

Third Comparison (Group 2 and Group 3): The pairwise mean differences between Group 2 and Group 3 were 9.10 and 32.57, both exceeding the critical values of 25.67 and 27.23. As a result, this comparison was significant. The results confirm that Circuit Training and Maximal Training led to greater improvements in maximum power and average power among the groups.

DISCUSSION ON FINDINGS

Training that consists of performing a set of exercises or activities at various stations forms a circuit through which an individual moves either as quickly as possible or within a set time frame. Pilates training typically results in moderate gains in aerobic endurance, along with significant improvements in strength, muscular endurance, and flexibility. Aerobic endurance can be enhanced by completing the circuit with minimal rest and by increasing the distance between stations.

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EFFECT OF ADAPTED YOGIC PRACTICES ON GOAL-DIRECTED PERSISTENCE AMONG STUDENTS WITH VISUAL IMPAIRMENT

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Abstract:

This study explores the impact of adapted yogic practices (AYP) on goal-directed persistence in students with visual impairments (SwVI). The experimental group (EG) demonstrated significant improvements in goal-directed persistence following an eight-week yoga intervention, while the control group (CG) showed no significant change. The results suggest that yoga, with its emphasis on mindfulness, concentration, and self-regulation, can enhance cognitive and emotional functioning in SwVI. These findings highlight the potential of adapted yoga as an effective, non-invasive tool to support the development of perseverance and executive functions in students with visual impairments. Future research should investigate the long-term effects and broader applicability of this intervention.

Keywords: Visual Impairment, Adapted Yogic Practice, Goal-Directed Persistence

Introduction

Goal-oriented persistence describes an individual's capacity to maintain effort toward accomplishing long-term goals despite obstacles and setbacks (Hagen & Nayar, 2014). For students with visual impairments, fostering this ability is especially vital as they frequently encounter distinctive academic, social, and psychological challenges that necessitate resilience and adaptability. These difficulties may include reliance on assistive technologies, learning through alternative sensory channels, and addressing stereotypes associated with disabilities (Birdee et al., 2009). Overcoming such barriers demands strategies that enhance emotional stability, concentration, and self-regulation, which are essential for perseverance.

AYP have garnered recognition as effective methods for boosting mental health and emotional well-being (Sharma et al., 2006). Yoga incorporates physical postures (asanas), breathing techniques (pranayama), and meditation practices, which can be adapted to meet the needs of visually impaired individuals. Studies indicate that yoga enhances cognitive flexibility, emotional regulation, and resilience, which are critical for goal-oriented perseverance (Hartley et al., 2014). Additionally, it alleviates stress and anxiety, which may otherwise impede focus and determination (Hagen & Nayar, 2014).

For SwVI, yoga represents a non-invasive, affordable, and inclusive approach to strengthening mental clarity and emotional resilience. However, most existing research emphasizes general psychological benefits rather than specific attributes like perseverance, highlighting a gap that this study intends to address (Birdee et al., 2009).

Need of the study

SwVI frequently faces challenges in sustaining focus and persistence due to the additional effort required for academic and social adjustments (Birdee et al., 2009). Emotional difficulties, including low self-confidence, anxiety, and stress, further compound these challenges, emphasizing the need for interventions that foster resilience and emotional balance. Current approaches in special education predominantly emphasize skill acquisition and assistive technologies but often neglect the psychological and emotional well-being of these students (Hagen & Nayar, 2014).

Yoga, as a holistic mind-body practice, has shown promise in enhancing psychological health and cognitive abilities (Sharma et al., 2006). Its focus on mindfulness and self-awareness may support students in developing emotional regulation and persistence, which are critical for both academic and personal growth (Telles et al., 2007). AYP are particularly suitable for visually impaired individuals, as they can be customized to accommodate their specific needs without relying on sight (Hartley et al., 2014). The findings of this study could advance inclusive education practices by offering a structured approach to integrating yoga into rehabilitation programs. These programs could help visually impaired students enhance focus, alleviate stress, and build the resilience necessary for achieving long-term goals (Birdee et al., 2009).

Objectives of the study

1. To design and execute the AYP for SwVI.
2. To assess goal-directed persistence among SwVI before and following the intervention.

Hypotheses

1. The initial and final test results for goal-directed persistence in the experimental group (EG) show a notable difference.
2. The initial and final test results for goal-directed persistence in the control group (CG) do not show a notable difference.
3. The final test results of EG and CG for goal-directed persistence show a notable difference.

Methodology

The study adopted an experimental approach, incorporating both initial test and final test assessments to evaluate the effect of an eight-week training program. Data were gathered using the Executive Functioning Rating Scale (a researcher used only goal-

directed persistence), developed by Dr. S. Parween, which was administered to both the EG and CG. This scale, featuring a 5-point rating system, measured executive functioning before and after the intervention. The sample consisted of 30 SwVI, aged 10 to 17 years, who were purposefully selected from special education institutions across Tamil Nadu. Of these, 15 students were placed in the EG, and 15 in the CG. The collected data were analyzed using the Wilcoxon signed-rank test to examine within-group changes between the initial and final tests, and the Mann-Whitney U test to compare the final test scores between the EG and CG.

Results

Table – I: Normality evaluation using the Shapiro-Wilk test: Group comparisons

Variable	Group	Test	Statistic	Df	Significant
Goal-directed persistence	EG	Initial	0.91	15	0.17
		Final	0.92	15	0.25
	CG	Initial	0.97	15	0.94
		Final	0.92	15	0.25

Hence the Shapiro-Wilk test indicated all the sig values were higher than 0.05. So that the goal-directed persistence data followed a normal distribution in both the EG and the CG.

Table – II: Examination of performance changes from initial to final test: Wilcoxon Signed-Rank Test results

Group	Initial test average	Final test average	Average difference	n	Z-value	P-value (Sig., 2-tailed)
EG	11.40	14.73	3.33	15	-3.30	<0.01 (0.00)
CG	11.13	10.93	0.20	15	-0.18	0.85

The Wilcoxon Signed-Rank Test showed a notable improvement in performance from the initial to the final test for the EG, On the other hand, the CG exhibited no significant change,

Table – III: Group-based differences in final test scores: Assessed through the Mann-Whitney U test

Group	Final test average	Average rank	Sum of ranks	Mann-Whitney U	Z-value	Asymptotic sig (2-tailed)	Exact sig (2-tailed)
EG	14.73	21.77	326.50	18.50	138.50	<0.01(0.00)	<0.01 (0.00)
CG	10.93	9.23	138.50				

The Mann-Whitney U test revealed a significant difference in final test scores between the EG and the CG.

Discussion

This study examined the impact of adapted yogic practices on goal-directed persistence in SwVI. The EG showed significant improvement after an eight-week intervention, indicating that yoga can enhance executive functioning. The CG showed no significant change, highlighting the benefits of the intervention. Yogic practices, such as mindfulness and concentration techniques, enhance cognitive control, which is vital for goal-directed persistence. The findings suggest that adapted yoga can provide cognitive benefits beyond traditional methods. The study also points to the need for personalized, comprehensive educational approaches for SwVI, considering the lack of progress in CG. Future research should explore the long-term effects and variations of yoga for students with visual impairments.

Conclusion

This study highlights the positive effects of AYP on goal-directed persistence in SwVI. The significant improvement observed in the EG supports the use of yoga as an effective tool for enhancing executive functioning. The CG, which showed no improvement, underscores the specific benefits of the intervention. The results suggest that incorporating yoga into educational programs for SwVI could provide cognitive and behavioral benefits that traditional methods may not offer. Future research should explore the long-term impact of such interventions and examine their applicability in diverse educational contexts. Overall, AYP offers a promising alternative to support the development of goal-directed persistence and other executive functions in SwVI.

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A STUDY OF PRECOMPETITIVE ANXIETY AND MOTIVATION LEVEL OF ATHLETES AND SWIMMERS

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Abstract

The purpose of Pre-Competition Preparation is to obtain a particular pre-determined mental and physical performance state, which may or may not be the ultimate Optimal Performance State. Therefore, the goal of pre-competition preparation in sports person is to achieve that state of Optimal Performance Readiness. Stress, arousal and anxiety are terms used to describe this condition. Motivation is defined as the process that initiates, guides and maintains goal-oriented behaviors. The purpose of the study was to find out the pre-competitive anxiety and motivation level of athletes and swimmers. To achieve this purpose of the study twenty athletes and swimmers were selected from Madurai district, Tamilnadu. The age of the subjects ranged from 14-19 years. Questionnaire is a tool used for this investigation. The data were analyzed statistically by using 't' test to find out the significant different between athletes and swimmers. From the results of the study indicate There was no significant difference on pre-competitive anxiety between athletes and swimmers. There was no significant difference on pre-competitive motivation between athletes and swimmers.

Keyword: Anxiety, Motivation, Stress, Athlete, Swimmer.

Introduction

Consistently good performance takes time and effort and does not happen by chance." - Merry Miller. The purpose of Pre-Competition Preparation is to obtain a particular pre-determined mental and physical performance state, which may or may not be the ultimate Optimal Performance State. Therefore, the goal of pre-competition preparation in sportsperson is to achieve that state of Optimal Performance Readiness. Achieving this state of readiness is a key requirement for consistently ensuring good team performance (Merry Miller, 08 Apr 2012).

Competitive Anxiety

Competition can cause athletes to react both physically (somatic) and mentally (cognitive) in a manner which can negatively affect their performance abilities. Stress, arousal and anxiety are terms used to describe this condition.

Motivation

Motivation is defined as an individual's internal drive or desire to engage in a particular behavior-"zeidner et al.



Hypotheses

It was hypothesized that there would be no significance difference between athletes and swimmers on pre-competitive anxiety.

It was hypothesized that there would be no significance difference between athletes and swimmers on pre-competitive motivation.

Statement of the problem –

The purpose of the study was to find out the pre-competitive anxiety and motivation level of athletes and swimmers.

Methodology

Selection of Subjects

To achieve the purpose of the study twenty athletes and swimmers were selected from Madurai district, Tamilnadu. The age of the subjects ranged from 14-19 years.

Tool Used

Questionnaire is a tool used for this investigation. Questionnaire is a form distributed through respondent under the supervision of the investigator.

Statistical techniques

Table I: Summary of Mean Values And Independent ‘T’ Test For Athletes And Swimmers On Pre-Competitive Anxiety

Players	Number	Mean	Standard Deviation	‘t’ ratio
Athletes	10	30.4	3.24	0.19
Swimmers	10	30.1	3.81	

(Table value required for significance at 0.05 level for ‘t’ test with df 18 is 2.10).

From the table I it was showed that the mean values of athletes and swimmers are 30.4 and 30.1 respectively. The obtained ‘t’ value is 0.19 which is lesser than the required table of 2.10 with df 18 at 0.05 level of significance. It was concluded that there was no significance difference between athletes and swimmers on pre-competitive anxiety.

The mean values of pre-competitive anxiety between athletes and swimmers are graphically represented in the figure I.

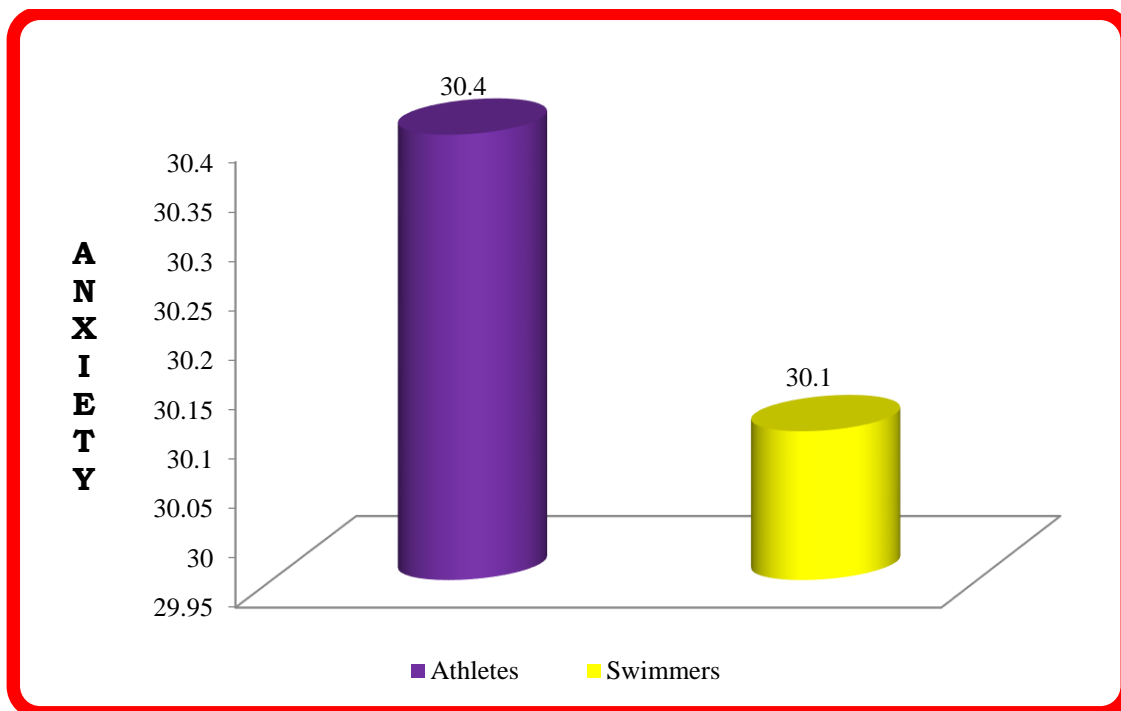


FIGURE I: THE MEAN VALUES OF ATHLETES AND SWIMMERS ON PRE-COMPETITIVE ANXIETY

Motivation

The independent ‘t’ test on the obtained for pre-competitive motivation between athletes and swimmers have been analyzed and presented in the table.

Table II: Summary Of Mean Values and Independent ‘T’ Test For Athletes And Swimmers On Pre-Competitive Motivation

Players	Number	Mean	Standard Deviation	‘t’ ratio
Athletes	10	24.2	3.82	0.58
Swimmers	10	23.4	2.12	

(Table value required for significance at 0.05 level for ‘t’ test with df 18 is 2.10).

From the table II it was showed that the mean values of athletes and swimmers are 24.2 and 23.4 respectively. The obtained` value is 0.58 which is lesser than the required table of 2.10 with df 18 at 0.05 level of significance. It was concluded that there was no significance difference between athletes and swimmers on pre-competitive motivation.

The mean values of pre-competitive motivation between athletes and swimmers are graphically represented in the figure II

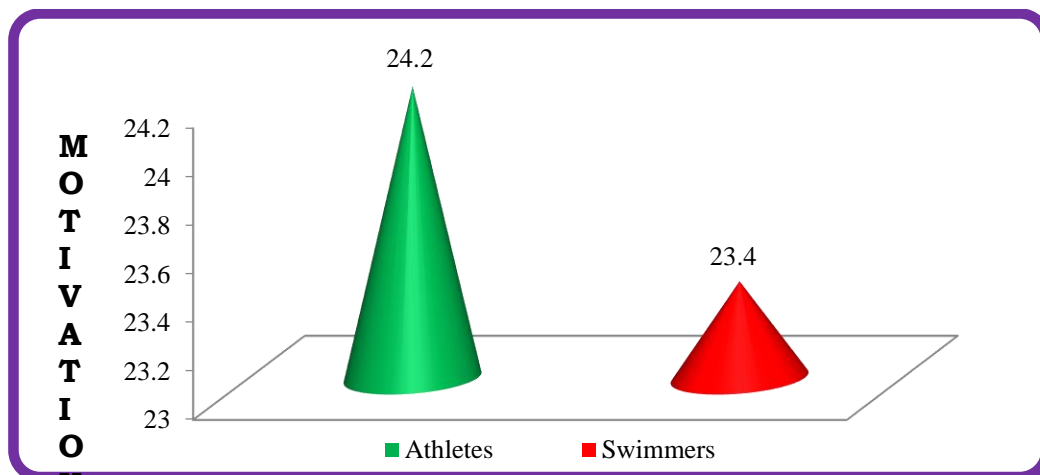


FIGURE II: THE MEAN VALUES OF ATHLETES AND SWIMMERS ON PRE-COMPETITIVE MOTIVATION

Discussion on Findings

Form the results of the study indicate There was no significant difference on pre-competitive anxiety between athletes and swimmers. There was no significant difference on pre-competitive motivation between athletes and swimmers.

Discussion on Hypothesis

1. In first hypothesis, it was hypothesized that there would be no significant difference between athletes and swimmers on pre-competitive anxiety.
2. In second hypothesis, it was hypothesized that there would be no significant difference between athletes and swimmers on pre-competitive motivation.

Conclusion

Motivation is at the heart of learning. Without motivation no learning is possible at any age. Anxiety in sport is most common in competitive sports environments and could be in all types of sports.

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A STUDY ON ADAPTING ANCIENT INDIAN ARCHERY TECHNIQUES FOR MODERN SHOOTER TRAINING

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Abstract

The ancient Indian methods of training in archery, as described in texts like the Dhanurveda and epics such as the Mahabharata, offer profound insights into systematic skill development, mental discipline, and precision. This paper explores the adaptation and application of these traditional methodologies in modern shooting sports. By examining the historical context, training techniques, and philosophical underpinnings of ancient archery training, the study identifies parallels and potential benefits for contemporary shooting disciplines, including rifle and pistol shooting. The findings indicate that integrating ancient practices such as focused meditation, repetitive skill reinforcement, and environmental awareness into modern training regimens could enhance performance and mental resilience in shooters.

Keywords: Ancient Indian Archery, Shooting sport, Shooter Training

Introduction

Archery, an ancient practice revered in India, holds a profound historical (Oxendine, 1995), cultural (Welch & N.Y., 1985), and spiritual significance (Goldberg, 2016). Renowned as a martial art, it transcended the realm of mere weaponry to embody a philosophy that integrated discipline, focus, and mindfulness (Raposa, 2003). Ancient Indian scriptures, including the Mahabharata and the Dhanurveda, offer insights into the sophisticated techniques and principles of archery, which were developed not only as tools of warfare but as methods of personal development and self-mastery (Arya, 2015). In the contemporary world, shooting sports have emerged as competitive disciplines requiring exceptional precision, control, and mental resilience (Janelle & Hatfield, 2008). Modern shooter training emphasizes technical skill development, physical fitness, and psychological preparedness (Rodriguez et al., 2024).

This study explores the potential for adapting ancient Indian archery techniques to modern shooter training. By examining historical texts, traditional practices, and philosophical underpinnings, it seeks to identify principles that remain relevant in today's context.

Ancient Indian Archery Training Techniques

Ancient Indian archery training techniques were deeply rooted in a comprehensive understanding of the physical, mental, and spiritual dimensions of the

practitioner. These methodologies were meticulously documented in texts such as the Dhanurveda, often referred to as the "science of archery," which outlined the principles, methods, and ethical considerations of the art (Ray, 2022). Training was rigorous, involving not only the mastery of weapons but also the cultivation of inner discipline.

One of the foundational aspects of ancient archery training was the emphasis on posture and alignment (Haywood & Lewis, 2024). The synchronization of breath with movement was considered vital for achieving accuracy and consistency (Codrons et al., 2014). Visualization played a significant role in the training process (Göbel et al., 2010). Additionally, meditation was an integral component of training, helping archers cultivate mindfulness and emotional resilience (Shyam B. Korde & Ashti, Chamorshi, 2019).

The training also incorporated principles of ethics and responsibility. Archers were taught to wield their skills with integrity, emphasizing the importance of self-control and the ethical application of their abilities (Thomas, 2018). This holistic approach ensured that archery was not merely a physical activity but a discipline that nurtured character and moral values.

Key Techniques

The key techniques in ancient Indian archery were a seamless fusion of physical precision and mental acuity, designed to optimize performance and cultivate a profound state of awareness. The techniques are posture and alignment, breathe control, target visualization, draw and release, meditative focus and ethical principles. These key techniques demonstrate the depth and sophistication of ancient Indian archery, offering valuable insights into the integration of technical mastery and personal development.

Modern Shooting Sports, Requirements of Training and Challenges in Contemporary Training

Modern shooting sports, encompassing disciplines such as rifle shooting, pistol shooting, and trap shooting, demand an exceptional level of precision, consistency, and mental fortitude (Puce et al., 2024). Physical fitness plays a crucial role in modern shooting sports (Barth & Dreilich, 2010). Shooters must be familiar with the mechanics of their weapons, including recoil management, trigger control, and sight adjustments (Enos, 2012). Mental strength is perhaps the most defining characteristic of successful shooters (Samuel et al., 2020).

Challenges in Contemporary Training

Despite advancements in training methodologies, modern shooting sports face several challenges. Additionally, the psychological demands of the sport can lead to burnout and anxiety, necessitating a strong support system for athletes. Balancing technological reliance with foundational skills remains a critical concern, as overdependence on simulations and aids may undermine instinctive abilities.

Integrating Ancient and Modern Approaches

Addressing these challenges requires a holistic approach that integrates ancient wisdom with modern techniques. Ancient Indian archery's emphasis on mindfulness, breath control, and ethical grounding offers valuable insights that can complement contemporary training practices. By blending these elements, modern shooting sports can foster a more balanced and sustainable model of skill development, ensuring athletes excel both technically and mentally.

Comparative Analysis

A comparative tabular column highlighting the differences and similarities between ancient Indian training for archers and modern Indian shooters is shown below:

Aspect	Ancient Indian Archery Training	Modern Indian Shooter Training
Objective	Mastery over physical, mental, and spiritual dimensions; warfare and self-discipline.	Precision in shooting for sports, defense, or competition.
Training Philosophy	Integrated approach combining martial skills with philosophy and spirituality.	Focus on scientific techniques, precision, and performance metrics.
Tools Used	Bows and arrows crafted from natural materials like bamboo and sinew.	Firearms, air guns, and modern equipment with advanced technology.
Mental Focus	Emphasis on mindfulness, meditation, and dhyana (concentration).	Use of sports psychology techniques, mental conditioning, and visualization.
Physical Preparation	Rigorous physical training, including yoga and exercises for flexibility and endurance.	Strength training, cardiovascular exercises, and sport-specific drills.
Training Environment	Conducted in gurukuls (traditional schools) under the guidance of a guru.	Specialized training academies with professional coaches and facilities.
Techniques Emphasized	Posture (asana), breathing control (pranayama), and focus on the target (ekagrata).	Stance, grip, trigger control, breath control, and sight alignment.
Role of Ethics	Strong emphasis on dharma (ethical conduct) and the responsible use of skills.	Emphasis on sportsmanship, fair play, and adherence to rules.
Assessment Methods	Practical demonstrations in simulated or real combat scenarios.	Regular evaluations through competitions, practice sessions, and scoring.

Aspect	Ancient Indian Archery Training	Modern Indian Shooter Training
Technology Integration	Minimal reliance on technology, relying on natural materials and instincts.	Extensive use of advanced technology, including electronic targets and analytics.
Community Perspective	Seen as a sacred duty and a means of serving society.	Viewed as a professional career or competitive pursuit.
Spiritual Component	Integral to training; archery was considered a meditative practice.	Limited spiritual focus; emphasis is more on psychological resilience.
Duration of Training	Lifelong discipline with gradual progression under a guru.	Structured training programs with defined durations and milestones.

Table 2 Differences and similarities between ancient Indian training for archers and modern Indian shooters

This table highlights the evolution of training methods while showing how some foundational principles, such as the importance of focus and discipline, remain consistent across time. While the fundamental goals—precision, consistency, and mental resilience—remain consistent, the methods employed are to be reflected on the evolution of technology, societal needs, and cultural contexts.

Implementation Strategies

The successful adaptation of ancient Indian archery techniques to modern shooter training requires a strategic and phased approach. Implementation strategies must address the integration of philosophical principles, physical techniques, and mental conditioning into contemporary training regimes.

Conclusion

The study highlights the parallels between ancient techniques, such as breath control, visualization, and meditative focus, and the requirements of modern shooter training, which prioritize precision, resilience, and mental preparedness. By integrating these elements, modern training programs for shooters can transcend purely technical approaches, fostering a more balanced and comprehensive model of skill development.

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EFFECT OF ISOMETRIC TRAINING ON SELECTED PHYSICAL VARIABLE AMONG COLLEGE MEN KABADDI PLAYERS

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Abstract

The purpose of the study was to investigate on Effect of Isometric Training on Selected Physical variable among college men kabaddi Players. It was hypothesized that there would be significant differences on selected Physical variable due to the effect of Isometric Training among college men kabaddi players. For the present study the 30 college men kabaddi player from Madurai district. The age of the subjects ranged from 17 to 21 years. The selected subjects were divided into one experimental group and one control group at random. For the present study pre test and post test random group design, which consists of control group and experimental group was used. On a random sampling, 30 players were selected. The selected subjects were equally divided into two group's of fifteen each namely experimental group with Isometric Training and Control Group have not underwent any training. Arm strength was assessed by One Minutes Push Up Test. The data were collected before and after six weeks of training. The data were analyzed by applying t-ratio. The level of significance was set at 0.05 level of confidence. The experimental group showed better improvement on Arm strength among the college men kabaddi players than the control group.

Key words: Isometric Training, Arm strength and Kabaddi.

Isometric Training

Isometric activities are fixing (constrictions) of a particular muscle or gathering of muscles. During isometric activities, the muscle doesn't observably change length. The impacted joint additionally doesn't move. Isometric activities assist with keeping up with strength. They can likewise develop fortitude, yet not actually. An isometric activity is an activity including the static withdrawal of a muscle with no noticeable development in the point of the joint. This is as opposed to isotonic withdrawals, in which the compression strength doesn't change, however the muscle length and joint point do. The three principal sorts of isometric activity are isometric presses, pulls, and holds. They might be remembered for a strength preparing system to work on the body's capacity to apply power from a static position or, on account of isometric holds, work on the body's capacity to keep a situation for a while. Considered as an activity, isometric presses are likewise of central significance to the body's capacity to set itself up to perform promptly ensuing power developments. Such readiness is otherwise called isometric preload.

Methodology

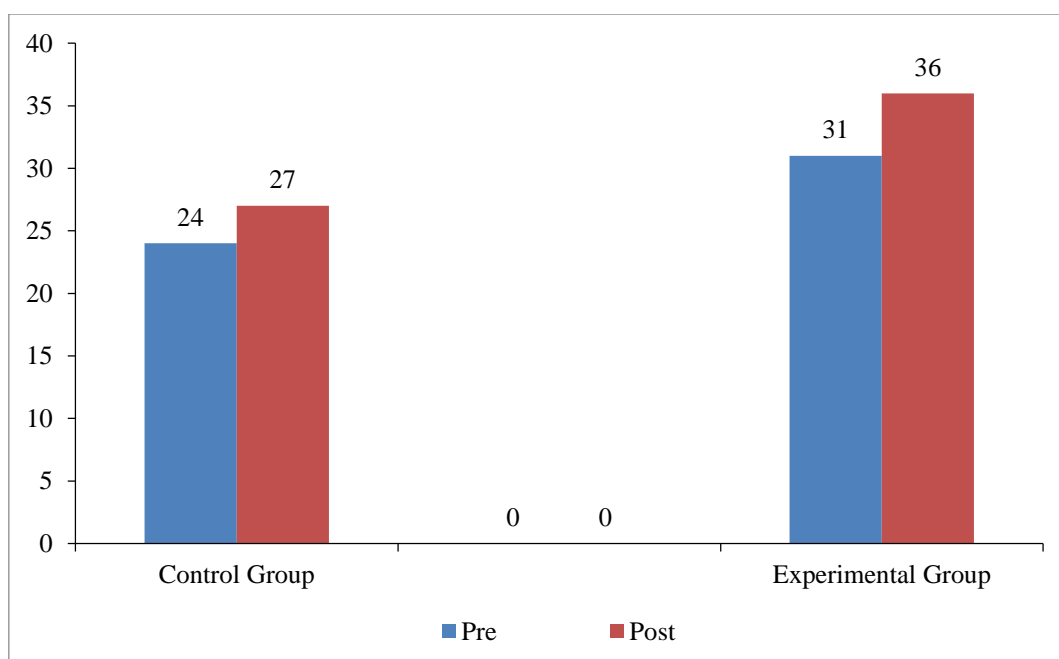
The purpose of the study was to investigate the effect of Isometric Training on Selected Physical variable among college men kabaddi Players. It was hypothesized that there would be significant differences on selected Physical variable due to the effect of Isometric Training among college men kabaddi players. For the present study the 30 college men kabaddi players from Madurai district were selected at random and their age ranged from 17 to 21 years. For the present study pre test and post test random group design, which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent Isometric Training and Group 'B' has not undergone any training. Arm strength was assessed by One Minutes Push Up Test. The data were collected before and after six weeks of training. The data were analyzed by applying t-test. The level of significance was set at 0.05.

Table –1: Analysis of t-Ratio Pre and Post-test for Control and Experimental group on Arm strength

Variables	Group	Mean		Sd		Sd Error	df	't' ratio
		Pre	Post	Pre	Post			
Arm strength	Control	24	27	1.45	1.61	0.71	14	1.59
	Experimental	31	36	1.73	2.21	0.45		3.45*

*Significance of .05 level of confidence Table Value = 2.15

Arm strength



Discussion on Findings

The results of the study indicate that the experimental group namely Isometric Training had significantly improved in the selected dependent variable namely Arm strength.

From the results of the present investigation, it is also concluded that significant difference on Isometric Training in developing dependent variable Arm strength the hypothesis was accepted.

Conclusion

On the basis of findings and within the limitations of the study the following conclusions were drawn:

- ❖ Isometric Training had positive impact on Arm strength among college men kabaddi players.
- ❖ The experimental group showed better improvement Arm strength among college men kabaddi players than the control group.

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YOGA IS A HEALTHY WAY OF LIVING LIFE FOR STRESS MANAGEMENT

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ABSTRACT

Strain is a common trouble that impacts nearly every person sooner or later in our lives. Gaining knowledge of to pick out while you are beneath pressure, what's stressing you, and exclusive ways of coping with stress can substantially enhance both your intellectual and physical nicely-being. This route affords you with a few fundamental records on stress and some easy recommendations for dealing with stress. It isn't always meant to take the place of advice from a health practitioner or counselor, however it may be step one in determining a way to control your pressure and growth your nicely-being. The index under lists the specific sections of this route. To take the direction and study greater approximately strain management, click on at the link at the bottom of this page titled "start: class I: what's stress?" As you keep, each segment of the path will link to the following section at the lowest of the web page. If you have any questions about this route, about strain control in trendy or approximately different offerings provided through the Mountain state centers for independent residing, touch the center nearest you. The information and recommendation in those guides are never meant to take the vicinity of recommendation from an educated medical doctor, scientific employee, or counselor. Earlier than beginning any new exercise, weight loss program, or life-style adjustments it's miles constantly fine to seek advice from your number one care provider.

Keywords: Yoga, Healthy, Living Life, Stress Management, Asana, Symptoms.

Introduction

Stages of stress

Stress is a Sudden Biological Change. It has come to be the curse of twenty first century and is silent killer inside the present day international. Pressure is the greatest danger to the information technology. Pressure is the priceless poison for human life within the universe. It can disturb anybody's physical, mental, emotional and behavioral balance. Strain can damage one-of-a-kind components of human body from muscle mass from tissues to organs and blood vessels. It can raise blood stress and body temperature. It is able to additionally intrude with the body metabolism, digestion, urge for food, sleep, sexuality and even fertility. Occupational stress consists of the environmental elements or stressors together with work overload, position ambiguity, role war and bad running conditions associated with a particular process. There are three degrees a person is going through while tormented by pressure. Know more about them.

Alarm stage

This level studies an over appearing of the sympathetic anxious device wherein adrenaline and cortisol boom and blood flows far from the brain to the muscular tissues. As a result, dendrites shrink back inside the brain to moderate the flow of data, slowing or final down the nonessential body functions. The whole frame starts getting ready itself to fight against the motive of stress. The fear, excitement or pressure is evident on the sufferer's face.

Resistance stage

On this degree, the body maintains making continuous efforts to address stress and therefore feels run down and the individual starts feeling irritated, over reacts to minor conditions and receives mentally and physically susceptible. Mental, bodily and behavioral modifications are also certainly visible.

Exhaustion stage

If a scholar is getting ready for his examination and in spite of each feasible attempt, he isn't able to relate to his research, he's sure to get burdened. The strain could attain a height where he/she can also experience absolutely exhausted and helpless to the quantity of committing suicide. That is the exhaustion stage. This stage is further divided into two phases: the nature of strain is extensively of kinds- Eustress (high-quality pressure, distress (poor strain).

The positive effects of pressure: The fine outcomes of pressure: occasionally, however, the pressures and needs that may motive stress may be high-quality in their impact. One example of that is in which sportsmen and ladies flood their bodies with fight-or-flight adrenaline to power an explosive performance. Another instance is wherein time limits are used to motivate folks who appear bored or unmotivated. We will speak this in brief right here, however for the duration of the rest of this website online we see strain as a trouble that wishes to be solved.

The negative effects of pressure: In most work situations jobs, our strain responses motive our overall performance to suffer. A peaceful, rational, managed and touchy method is normally called for in managing most hard troubles at work: Our social inter-relationships are simply too complicated not to be broken through an aggressive technique, at the same time as a passive and withdrawn response to strain method that we will fail to claim our rights when we have to.

Signs and Symptoms of Stress

If publicity to stressors continues for an extended period of time, continual health problems can expand, inclusive of:

Psychological and emotional	Cognitive
• Feeling heroic, invulnerable, euphoric	• Memory problems
• Denial	• Disorientation
• Anxiety and fear	• Confusion
• Worry about safety of self and others	• Slowness of thinking and comprehension
• Anger	• Difficulty calculating, making decisions
• Irritability	• Poor concentration
• Restlessness	• Limited attention span
• Sadness, grief, depression, moodiness	• Loss of objectivity
• Distressing dreams	• Unable to stop thinking about the disaster
• Guilt or “survivor guilt”	• Blaming
• Apathy	
• Identification with survivors	

Behavioral	Physical
• Change in activity	• Increased heartbeat, respiration
• Decreased efficiency and effectiveness	• Increased blood pressure
• Difficulty communicating	• Upset stomach, nausea, diarrhea
• Increased sense of humor	• Change in appetite, weight loss or gain
• Outbursts of anger, frequent arguments	• Sweating or chills
• Inability to rest or “letdown”	• Tremors (hands, lips)
• Change in eating habits	• Muscle twitching
• Change in sleeping patterns	• “Muffled” hearing
• Change in patterns of intimacy, sexuality	• Tunnel vision
• Change in job performance	• Feeling uncoordinated
• Periods of crying	• Headaches
• Increased use of alcohol, tobacco, or drugs	• Soreness in muscles

Behavioral	Physical
• Social withdrawal, silence	• Lower back pain
• Vigilance about safety or environment	• Feeling a “lump in the throat”
• Avoidance of activities or trigger memories	• Exaggerated startle reaction
• Proneness to accidents	• Fatigue • Menstrual cycle changes
	• Change in sexual desire
	• Decreased resistance to infection
	• Flare-up of allergies and arthritis
	• Hair loss

Yoga for Stress Relief

Yoga is maximum diagnosed shape of exercising, Stretching, aerobic workout and Meditation. The definition of yoga is “to yoke or joint together” it integrates the mind and frame specializing in balance posture, deep breathing, stretching and rest. Yoga developed from of the Hindu, Jain, and Buddhist spiritual traditions in India. Yoga alters strain response and individual’s mind-set, in the direction of strain alongside enhancing self-esteem, growing one’s sense of wellbeing, and creating a sense of relaxation and quietness

Yoga is an historic artwork that is defined because the union of the soul with God. It’s far “a route of private spiritual development that makes use of meditation to convey enlightenment, self-awareness, and, in the end, the attainment of God and bliss”. At the beginning, the ultimate goal of yoga turned into referred to as Samadhi, or self-realization.

Patanjali is father of yoga across the sixth century B.C. appeared within the huge epic The Mahabharata written by sage Vyasa and containing The Bhagavad Gita. Krishna explains to Arjuna about the essence of Yoga as practiced in daily lives (‘song of the Lord’), makes use of the time period “yoga” significantly in a spread of methods. Similarly to an entire chapter committed to traditional yoga practice, such as meditation, it introduces 3 distinguished types of yoga:

Karma yoga: The yoga of action

Bhakti yoga: The yoga of devotion is aware Krishna had also certain devotion it was motion similar to above.

Jnana yoga: The yoga of know-how. Patanjali introduced -Ashtanga or energy yoga - a greater demanding workout where you constantly circulate from one posture to some other (“waft”).the scale of yoga are

- Pranayama (breathing) • Asana (postures)
- Yama (restraint) • Niyama (healthy observances)
- Pratyahara (sensory withdrawal) • Dharana (concentration)
- Dhyana (meditation) • Samadhi (higher consciousness)

Types of Asanas (postures)

They work at the chitta (diffused factor of focus) level that eliminates the physical and intellectual tensions. They’re skilled in supine and prone function of the body respectively. Shavasana and Makarasana, Vijrasana, Bhujangasana, Trikonasana, Virabdrasana, Pranayama, Siddhasana with Kumbhaka, Padmasana, Yogamudras are critical relaxative asanas

Benefits of Yoga

Mental calmness

Yoga asana practice is very bodily. Concentrating so carefully on what your frame is doing has the effect of bringing calmness to the thoughts. Yoga additionally introduces you to meditation strategies, which includes looking the way you breathe and disengagement from your mind, which assist calm the mind.

Stress reduction

Physical activity is ideal for alleviating stress, and that is especially real of yoga. Due to the awareness required, your each day problems, each massive and small, seem to melt away all through the time you are doing yoga. This presents a miles-needed spoil from your stressors, as well as assisting placed things into perspective. The emphasis yoga places on being within the second can also assist relieve strain, as you analyze no longer to reside on beyond activities or expect the destiny. You will depart a yoga class feeling much less pressured than while you began. Read extra about yoga for pressure management right here.

Body awareness

Doing yoga will come up with an improved attention of your personal frame. You’re frequently known as upon to make small, diffused movements to enhance your alignment. Over time, these will growth your level of consolation for your own body. This will result in improved posture and greater self-confidence.

Conclusion

Simply yoga combines several techniques to fight pressure. Yoga provides an aggregate of blessings such as respiration sports, stretching physical games, fitness software, and meditation practice and guided meditations multi-function method. This is

powerful, this is very effective! Even for people who've physical boundaries yoga may be very useful simply via working towards the breathing strategies, the meditation and the guided meditation. Just with the aid of doing this you may have wonderful benefits with the practice of yoga. So in conclusion yes yoga may be a top notch remedy for stress and may offer some stress relief. Yoga has mixed set of ideas and physical games which can significantly benefit you and help you to cope with strain.

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EMPOWERING CHILDREN WITH AUTISM: STRUCTURED PHYSICAL ACTIVITIES FOR MOTOR PROFICIENCY

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Abstract

Autism is characterized by insufficiency of social interaction and communication, limited fields of interest and recurring behaviours and its symptoms come up in early childhood. Autistic children could be a year behind in fine motor skills compared to their peers. This study aims to address this gap by evaluating the effects of a 12-week intervention on these key motor domains. Thirty high-functioning children with ASD, aged 6 to 8 years, were divided into an experimental group (n=15) and a control group (n=15). The experimental group underwent Unified Ball Exercise with Yoga, while the control group received no specific training. Motor skills were assessed pre- and post-intervention using the Bruininks-Oseretsky Test of Motor Proficiency (BOT-2). The experimental group showed significant improvements in fine motor integration (T ratio=7.650, $p<0.05$), bilateral coordination (T ratio=7.973, $p<0.05$), and manual dexterity (T ratio=8.405, $p<0.05$) that the control group. This study bridges the research gap by demonstrating the potential of a structured intervention to improve motor skills in children with ASD. Further research is needed to explore its long-term benefits and applicability across diverse populations. The results suggest that the combination of unified ball exercises with yoga likely played a key role in improving the fine motor skills of children with autism. This intervention could be integrated into daily routines to promote meaningful and productive engagement for children with autism.

Keywords: Ball Exercise, Unified, Yoga, Fine Motor Skills, Physical Activity and Autism.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition marked by challenges in social interaction and communication, as well as restricted and repetitive behaviours and interests. These symptoms typically manifest during early childhood (American Psychiatric Association [APA], 2013; Eliaz, 2016). Globally, ASD has a prevalence rate of 1 in 100 children (World Health Organization [WHO], 2022). The clinical presentation of ASD varies widely, prompting the classification of three levels of severity within the spectrum (APA, 2013).

Motor abnormalities are significantly more prevalent among individuals with ASD, with the risk being 22 times higher than in typically developing populations. This risk further increases by 5 to 5.7 times as repetitive behaviours and social impairments intensify (Minissi, 2023). Research suggests that autistic children often exhibit a delay in fine motor skills, trailing behind their peers by approximately one year (Weider, 2023). Many children with ASD require continuous supervision and assistance in personal care tasks, which can make meaningful engagement challenging. Their motor skill difficulties often limit participation in physical activities, leading to reduced physical fitness. This is concerning, as low cardiorespiratory fitness is a significant predictor of all-cause mortality (Nguyen, 2021).

Fine motor deficits, such as difficulties with tasks like unscrewing a water bottle cap or performing activities requiring finger dexterity, are common among children and adolescents with ASD (Srinivasan, 2014). While physical activity has demonstrated substantial benefits for improving self-regulation, health, and motor skills, evidence for its effects on cognitive, language, and sensorimotor functioning is limited (Carl & Nicole, 2014). Engaging in regular physical activity can significantly enhance the quality of life for children with ASD. The objective of this study is to examine the effects of unified ball exercises combined with yoga on the fine motor skills of children with ASD.

Methods

To achieve the purpose of the study, total of thirty high functioning boy children with autism (N=30) and 15 typically developed children were selected using purposive random sampling technique. This subject age ranged from 6 to 8 years. Unified Ball Exercise with Yoga is independent Variable and Fine Motor Integration, Bilateral Coordination, Manual Dexterity are the dependent Variable. These dependent variables are measured by Bruininks – oseretsky Test of Motor Poficiency – BOT – 2 (Bruininks, R. H., & Bruininks, B. D. 2005). In this study after the pretest thirty children with autism were randomly divided into two groups namely, Unified Ball-Exercise with Yoga Group (UBYG=15) and the second group was Control Group (CG=15). Experimental Group underwent Unified Ball Exercise with Yoga and the control group did not undergo any specific training for 12 weeks (6 days a week). After 12 weeks of the training period post test was conducted. To find out if any significant difference ($P < 0.05$) exists between pre and posttest, t-ratio was applied. Typically developed children did not undergo any specific skill test. Experimental group underwent unified ball exercise 3 days a week (Mon, Wed, Fri) and alternate days (Tue, Thu, Sat) practice unified yoga with typically developed children for 12 weeks.

Results and Discussion

To analyze the effect of training t ratio was used. It identifies the significant difference between pretest and posttest. To test the significance of the derived results, the alpha level was set at 0.05 level of confidence. 't' ratio was applied to find out the significant training effect on both groups. It was shown in the table.

TABLE SHOWING OBTAINED MEAN VALUES FOR THE SELECTED VARIABLES

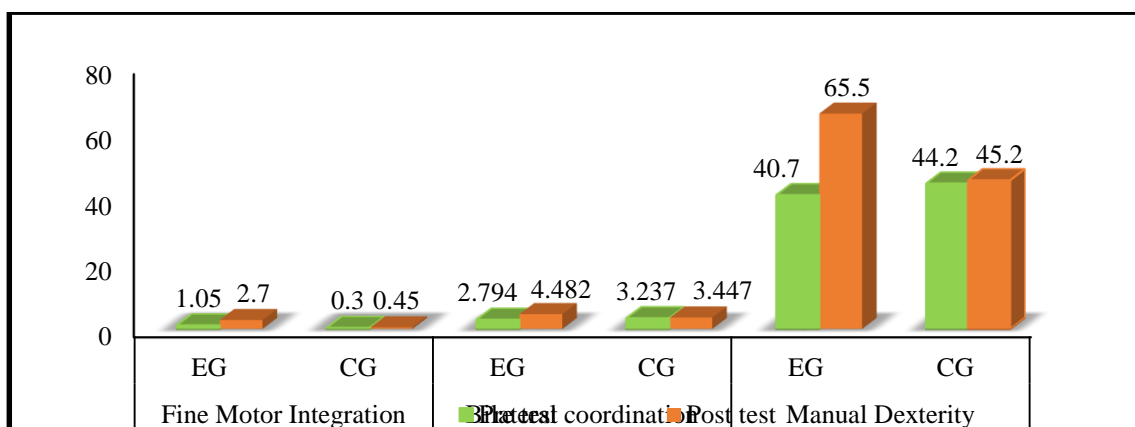
Variable	Group	Test	Mean	SD	SEM	T ratio
Fine Motor Integration	Experimental	Pre test	1.0500	2.36232	.74703	7.650*
		Post test	2.7000	1.49443	.47258	
	Control	Pre test	.3000	2.57337	.81377	1.184
		Post test	.4500	1.34268	.42459	
Bilateral Coordination	Experimental	Pre test	2.7940	.95573	.30223	7.973*
		Post test	4.4820	.71208	.22518	
	Control	Pre test	3.2370	1.37749	.43560	1.478
		Post test	3.4470	1.40935	.44568	
Manual Dexterity	Experimental	Pre test	40.7000	18.12457	5.73149	8.405*
		Post test	65.5000	15.78361	4.99121	
	Control	Pre test	44.2000	23.16031	7.32393	0.510
		Post test	45.2000	24.57099	7.77003	

*Table value 2.14 Significant at 0.05 level of confidence 1 and 14.

This study investigated the impact of an intervention on three critical motor skill domains: Fine Motor Integration, Bilateral Coordination, and Manual Dexterity. The findings provide strong evidence of the intervention's effectiveness, with significant improvements observed in the Experimental Group across all variables compared to the Control Group. The Experimental Group exhibited a statistically significant improvement in fine motor integration, with the mean score increasing from 1.05 to 2.70 (T ratio = 7.650, $p < 0.05$). In contrast, the Control Group showed only a slight, non-significant change (T ratio = 1.184). These results suggest that the intervention effectively enhanced the participants' ability to coordinate small muscle movements required for tasks like handwriting or object manipulation. The minimal change in the Control Group highlights the need for structured interventions to develop these skills. Bilateral coordination, the ability to perform tasks requiring synchronized use of both sides of the body, showed remarkable improvement in the Experimental Group, with mean scores rising from 2.79 to 4.48 (T ratio = 7.973, $p < 0.05$). Conversely, the Control Group's performance showed no significant change (T ratio = 1.478). The improvement in the Experimental Group underscores the intervention's role in enhancing motor planning and coordination, which are crucial for activities like sports, playing musical instruments, and daily living tasks. The largest gains were observed in manual dexterity, with the Experimental Group's mean scores increasing significantly from 40.70 to 65.50 (T ratio = 8.405, $p < 0.05$). Manual dexterity is critical for fine manipulative tasks, and the substantial improvement indicates the intervention's effectiveness in enhancing precision, speed, and control. The Control Group, with no significant change (T ratio = 0.510), further highlights the lack of spontaneous improvement without targeted

intervention. The Control Group, which did not receive the intervention, showed minimal improvements across all variables, none of which were statistically significant. This suggests that natural maturation or external factors alone were insufficient to bring about meaningful changes, emphasizing the necessity of structured programs. The significant improvements in the Experimental Group suggest that the intervention has strong potential for practical application in therapeutic, educational, or sports training settings. These findings align with existing literature that highlights the importance of targeted exercises and activities in developing motor skills. Furthermore, the results have implications for populations with developmental delays or motor impairments, as they demonstrate the potential for structured interventions to achieve measurable progress. The experimental group (Unified Ball Exercise with Yoga Group) was better than the control group. The control group did not show any significant improvement on the selected variables.

Figure 1: Graphical representation showing the pre and posttest mean values of experimental group and control group



Conclusion

Based on the results of the study, the following conclusions were drawn. The implication of Unified Ball Exercise with Yoga might have been the source of its dominance on the improvement of selected variables of children with autism. Autistic child was lack in muscular coordination and fine motor skills. Fine Motor Integration and Manual Dexterity had improved the muscular Coordination. Fine Motor Integration, Bilateral Coordination, Manual Dexterity are the most important factor for day to day life of every individual. This research improves theses three factors (Fine Motor Integration, Bilateral Coordination, Manual Dexterity). A study of autistic children found that Ball exercise and yogic practice increased their coordination. It was also concluded that the specially designed unified yoga program had improved the abilities of children with autism since it involves basic yoga protocol suitable for their level and also made it interesting of children with autism. This study provides robust evidence that a structured intervention can significantly enhance fine motor integration, bilateral coordination, and manual dexterity. The findings support the incorporation of such programs into practices aimed at improving motor skills those with motor impairments. Further research is needed to build on these results and refine intervention strategies.

Future Implications

According to the results, discussion and conclusion the investigator recommended to all the parents & caretakers of Autistic child to encourage the child to do yoga and play with ball regularly. It improves the Quality of Life and moreover it is comfortable for them compare to other activities. It was also recommended that a similar study can be done with different levels of autism with different age groups. Similar studies can be conducted on children with development delays and also to geriatric fitness programs. Similar studies can use for studying impact of unified yoga on daily living activities to enhance betterment in livelihood. Conduct studies with larger and more diverse samples to enhance the generalizability of findings. Explore the long-term impact of the intervention on motor skills retention. Investigate specific components of the intervention to identify the most effective elements for targeted improvements.

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PSYCHOMOTOR TRAINING ON OBJECT CONTROL SKILLS AMONG CHILDREN - A RANDOMIZED CONTROL TRIALS

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Abstract:

This randomized controlled trial investigated the effects of a 12-week psychomotor training program on object control skills among 40 school girls aged 6 to 7 years from Tiruchendur Taluk, Tamil Nadu. Participants were randomly assigned to an intervention group (n=20) or a control group (n=20). The intervention group underwent three weekly sessions focusing on throwing and bouncing skills, while the control group received no intervention. Object control skills were assessed using the MABAK-2 tool before and after the intervention period. Paired sample t-tests and analysis of covariance (ANCOVA) were used for data analysis. Results showed significant improvements in throwing and bouncing skills within the intervention group, supported by both statistical tests. ANCOVA further demonstrated that post-intervention scores were significantly higher in the intervention group compared to the control group. These findings underscore the efficacy of structured psychomotor training programs in enhancing object control skills among young children.

Keywords: Psychomotor training, object control skills.

Introduction

Children's development of object control skills, such as throwing, catching, and kicking, plays a crucial role in their physical, cognitive, and social development (Haywood & Getchell, 2019). Mastery of these skills not only enhances their participation in sports and physical activities but also contributes to their overall motor competence and confidence (Robinson, 2020). However, not all children develop these skills at the same rate or with the same proficiency. (Gallahue & Ozmun, 2021). Factors such as access to quality physical education, opportunities for structured play, and individual differences in coordination and motor learning can influence the acquisition of object control skills (Goodway & Ozmun, 2017).

Psychomotor training programs have emerged as promising interventions to enhance children's object control skills (Logan & Robinson, 2018). These programs typically involve structured activities and exercises designed to improve coordination, spatial awareness, timing, and motor planning (Gabbard, 2018). While there is growing evidence supporting the effectiveness of psychomotor training in improving various

aspects of motor development among children, there remains a need for rigorous empirical research, particularly through randomized controlled trials, to establish the efficacy of these interventions (Payne & Isaacs, 2022).

This study aims to address this gap by conducting a randomized controlled trial to investigate the effects of a structured psychomotor training program on object control skills among children aged 6-8 years. By employing a rigorous experimental design, this research seeks to provide robust evidence regarding the efficacy of psychomotor training in enhancing children's object control skills, with implications for physical education curriculum development, youth sports programs, and interventions aimed at promoting healthy lifestyles among children.

Methodology.

Forty school girls from Tiruchendur Taluk, Tamil Nadu, aged between 6 to 7 years, were recruited for this study. They were randomly assigned to two groups: an intervention group (n=10) and a control group (n=10).

The intervention group underwent a 12-week training period, with sessions held three days a week (Monday, Wednesday, Friday). The training program focused on psychomotor activities designed to enhance object control skills, specifically throwing and bouncing. Each session lasted approximately 45 minutes to 1 hour.

Training Program:

The 12-week psychomotor training program for girls aged 6 to 7 years from Tiruchendur Taluk, Tamil Nadu, systematically aimed to develop their object control skills, with a specific focus on throwing and bouncing techniques.

Weeks 1-3: During the initial phase, participants were introduced to fundamental throwing techniques using soft balls. Sessions emphasized hand-eye coordination and proper arm movement. Subsequent sessions involved practicing throwing at various targets of different sizes and distances. Additionally, bouncing techniques were introduced using balls of different sizes and textures, with a focus on controlling force and direction.

Weeks 4-6: Progressing into weeks four to six, participants engaged in activities aimed at advancing throwing skills. They faced increased challenges in distance and accuracy, further refining their technique. These sessions also saw the incorporation of bouncing skills into relay races and cooperative games. Integration of throwing and bouncing while in motion enhanced coordination and spatial awareness.

Weeks 7-9: Modified games were introduced, integrating throwing and bouncing elements akin to modified basketball and volleyball. This period emphasized applying learned skills in structured game-like settings, fostering strategic thinking and teamwork. Participants also practiced under pressure situations, such as timed challenges, to enhance performance under stress. Reinforcement of skills was achieved through engaging activities like obstacle courses.

Weeks 10-12: The final phase focused on review and application. Participants revisited previously learned skills and techniques to ensure retention and mastery. They then applied these skills in game-like scenarios with increased complexity, showcasing proficiency in real-time situations. The program concluded with a final assessment using the MABAK-2 tool, providing objective measurements of progress and program effectiveness.

Throughout the program, each session lasted approximately 45 minutes to 1 hour, with sessions held three days a week (Monday, Wednesday, Friday). The structured progression aimed to enhance participants' object control skills progressively while maintaining engagement and enjoyment.

Assessment

The MABAK-2 tool was used to assess the object control skills of the participants before and after the intervention period. This tool provided objective measurements of throwing and bouncing abilities.

Paired sample t-tests were conducted to compare pre- and post-intervention scores within each group. Additionally, analysis of covariance (ANCOVA) was used to compare the post-intervention scores between the intervention and control groups while controlling for pre-intervention scores. The significance level was set at 0.05.

Analysis of the Data

Table 1: Summary of Mean & Standard deviation value of the criterion variables.

Group	Variable	Test	Mean	N	SD	T ratio	sig
Experimental Group	Throwing	Pre test	0.65	10	0.53	10.30*	0.000
		Post test	1.69	10	0.44		
	Bouncing	Pre test	1.05	10	0.62	3.70*	0.000
		Post test	1.72	10	0.42		
Control Group	Throwing	Pre test	0.51	10	0.64	0.52	0.55
		Post test	0.62	10	0.49		
	Bouncing	Pre test	0.71	10	0.62	0.41	0.61
		Post test	0.82	10	0.41		

For the experimental group, the T ratios for throwing and bouncing skills were found to be 10.30* and 3.70*, respectively. The significance level (Sig) for both variables was less than 0.05 ($p < 0.05$), indicating a statistically significant difference in throwing

and bouncing skills before and after the intervention period. This suggests that the psychomotor training program had a significant positive impact on improving both throwing and bouncing abilities among participants in the experimental group.

In contrast, for the control group, the T ratios for throwing and bouncing skills were 0.52 and 0.41, respectively. The significance levels for both variables were greater than 0.05 ($p > 0.05$), indicating no statistically significant difference in throwing and bouncing skills before and after the intervention period for the control group. This suggests that there was no significant improvement in throwing and bouncing abilities among participants in the control group, as they did not undergo the psychomotor training intervention.

Table 2 Adjusted posttest mean value & Analysis of covariance (ANCOVA) on selected criterion variable

Variable	Adjusted Post-test mean		Sum of Squares	df	Mean Square	F	P value
	Experimental Group	Control Group					
Throwing	1.68	0.62	5.12	1	5.12	42.67*	0.000
			2.33	17	0.12		
Bouncing	1.65	0.81	3.29	1	3.29	19.35*	0.000
			2.85	17	0.17		

For throwing skills, the F value was 42.67 with a p-value of 0.000, indicating a statistically significant difference in adjusted posttest mean values between the experimental and control groups. This suggests that the psychomotor training intervention had a significant effect on improving throwing skills among participants when controlling for pretest scores.

Similarly, for bouncing skills, the F value was 19.35 with a p-value of 0.000, indicating a statistically significant difference in adjusted posttest mean values between the experimental and control groups. This suggests that the psychomotor training intervention also had a significant effect on improving bouncing skills among participants when controlling for pretest scores.

Discussion on Findings

The findings of this study, which employed both paired sample t-tests and ANCOVA, align with a wealth of existing research supporting the efficacy of structured psychomotor training programs in enhancing object control skills among children. Numerous studies have demonstrated similar positive outcomes, reinforcing the importance of such interventions in promoting motor skill development.

A study by Hulteen et al. (2018) investigated the effects of a 12-week fundamental motor skills intervention on object control skills among primary school children. Their findings, consistent with the results of our study, revealed significant improvements in throwing and bouncing skills among the intervention group compared to controls. This corroborates the notion that targeted psychomotor training can lead to tangible enhancements in specific motor skills.

Furthermore, research by Barnett et al. (2016) explored the long-term effects of early motor skill proficiency on later physical activity levels and health outcomes. Their longitudinal study followed children from kindergarten to adolescence and found that those with better object control skills during early childhood were more likely to engage in regular physical activity and exhibit healthier body compositions later in life. These findings underscore the potential far-reaching impacts of interventions aimed at improving object control skills during critical developmental periods.

Additionally, studies focusing specifically on the benefits of psychomotor training for girls have yielded promising results. For instance, a randomized controlled trial conducted by Lopes et al. (2019) investigated the effects of a structured motor skills intervention on fundamental movement skills among prepubertal girls. The intervention group showed significant improvements in various object control skills, including throwing and bouncing, highlighting the effectiveness of targeted training programs tailored to specific populations.

In light of these supportive studies, the findings of our research further contribute to the evidence base affirming the positive impact of psychomotor training on object control skills among children. By enhancing these fundamental motor skills, such interventions not only promote physical competence but also lay the foundation for lifelong participation in physical activity and the maintenance of overall health and well-being.

Conclusion

In conclusion, the results of this study underscore the effectiveness of the psychomotor training program in enhancing object control skills, specifically throwing and bouncing, among school-aged girls. Both the paired sample t-test and ANCOVA analyses support the positive impact of the intervention, highlighting the importance of structured training in motor skill development. These findings have implications for educators, coaches, and policymakers involved in promoting physical activity and healthy development among children. Moving forward, further research could explore the long-term effects of such interventions and investigate additional factors influencing motor skill acquisition in diverse populations.

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BIOELECTRICAL IMPEDANCE ANALYSIS ON FITNESS VARIABLES AMONG STUDENTS OF PHYSICAL EDUCATION

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Abstract

The purpose of the study was to analyze the relation between bioelectrical impedance on fitness variables among women students. To achieve the purpose of the study, 60 women physical education students were selected from Kamaraj college, Thoothukudi and Department of Physical Education and Sports, Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu were randomly taken as subjects was ranged between 18 to 24 years for this study. The Bioelectrical impedance variables selected for this study were Body Fat and BMI. The Bioelectrical impedance and Physical fitness variables were analyzed statistically in order to test the hypotheses formulated in accordance with the objective of the study. The data obtained were statistically analyzed for test of significance using Pearson Product Correlation. In all cases the significance level fixed was 0.05 level, which was considered as appropriate. The results of the study show that selected Bioelectrical impedance variables are Body Fat and BMI were significant on Physical Fitness variables like Endurance, Speed and Explosive Power. Further, it was concluded that there was a significant difference between while improving the selected dependent variables.

Keywords: - *Bioelectrical, Fitness, Physical Education.*

Introduction

Health and nutrition are the two contributory factors for the human resource development of any country. Nutrition is an issue of survival, health and development for the present and succeeding generations and it is both an input and an output to the developmental process. A well nourished healthy workforce is a pre-condition for successful economy and social development. In fact, food security, nutrition, health and sanitation are the prime responsibility of all developmental sectors of the state and indeed the birth right of all citizens. Nutrition and health of adults are of particular importance, since it is the adult group that is primarily responsible for rendering economic support to the society as a whole. Adults play a pivotal role in the overall progress of a country as they constitute the major chunk of human resources of a nation. Over the years nutrition has been the focal point in all the government developmental programmes in India.

Physical fitness is the ability to do the daily task with vigor and alertness, with undue fatigue, and with ample energy to engage in leisure pursuit and to meet emergency situations. – H. Harrison Clarke. (Yamada, 2024)

The overall concept of physical education is generally adopted by the society as wide variety of physical activities (Bohm, & Heitmann 2013). Physical education means sports, games, and physical activities for the society and through the society (Domaradzki, et al. (2020)). Physical education field deals with human body, activity, bodily movement, and assistance in various perspective of physical culture (Lyons-Reid, 2021) deals with human body. Physical education provides numerous activities for engagement of individual or group of people at one time, for physical, psychological, emotional, and social benefits.

Bioelectric Impedance Analysis (BIA) is an investigation of electrical property of biological matter such as body tissue/cell and body fluids. Biological tissues are capable of generating currents and voltages as they possess active electrical properties. Its most desirable application is measurement of body composition and body fluid status. BIA measures body resistance and reactance with the help of current carrying ability of electrolytes or water content in the body. Biological tissue is chiefly made up of extracellular fluid and cells.

Statement of the Problem

The study aimed to examine the relationship between selected bioelectrical impedance variables and physical fitness variables among physical education students.

Objectives of the study

The objective of the study was to analyses the relationship between selected bioelectrical impedance variables (Body Fat, and Body Mass Index) with speed, endurance, and explosive power.

Methodology

To achieve the purpose of this study, 60 women physical education students were selected as participants from Kamaraj college, Thoothukudi and Department of Physical Education and Sports, Manonmaniam Sundaranar University, Tirunelveli district, Tamilnadu and the subject age were ranged from 18 to 24 years. Dependent Variables i) Body Fat ii) Body Mass Index iii) Skeletal Muscle. Independent Variables 1. Sergeant Jump test 2. Cooper VO2 Max test 3. 60 Metre Speed test. The data collected on the chosen variables were analyzed using an independent “t” test, with the level of significance set at 0.05.

Selection of tests

S. No.	Variables	Test Item	Unit of Measurement
1	Body Fat	OMRON HBF 214	Number
2	Body Mass Index		Number
3	Explosive Power	Sergeant Jump test	Metres
4	Endurance	Cooper VO2 Max test	Minutes
5	Speed	60 Metre Speed test	Seconds

Analysis and Interpretation of Data

The collected data and the 'r' value of the subjects in the selected Physical fitness variables and bioelectrical impedance are presented in Table 4.1

Relationship between Selected Physical Fitness variable Endurance and Bioelectrical Impedance variable Body fat:

Variables	MEAN	S.D	P-value
Body Fat Normal	25.840	1.9332	0.050
Endurance	2117.85	194.938	
Body Fat Very High	38.030	2.8481	0.054
Endurance	1622.10	412.994	
Body Fat High	33.390	1.3977	0.277
Endurance	1789.10	370.279	

df = 18 , p < 0.05, table value < 0.4438

The above table 4.1 shows that the relationship between different levels of Body Fat and Endurance. The obtained 'r' on endurance among normal body fat group is 0.050 which was lesser than the required table value with df = 18 is 0.4438 at 0.05 level of significance. The obtained 'r' on endurance among very high body fat group is 0.054 which was lesser than the required table value with df = 18 is 0.4438 at 0.05 level of significance. The obtained 'r' on endurance among high body fat group is 0.277 which was lesser than the required table value with df = 18 is 0.4438 at 0.05 level of significance. This table shows that there was no significant relationship between Body Fat and Endurance of Normal, Very High and High levels.

The mean values of very high, high, and normal body fat and endurance were graphically represented in the figure I

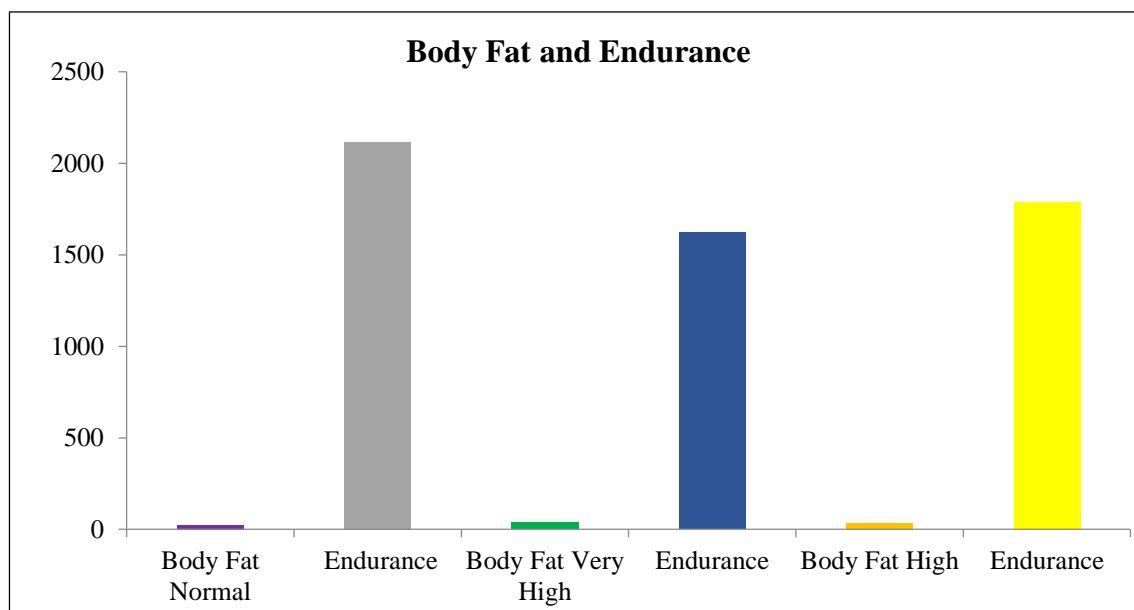


Figure I: Mean value of body fat and Endurance between women students.

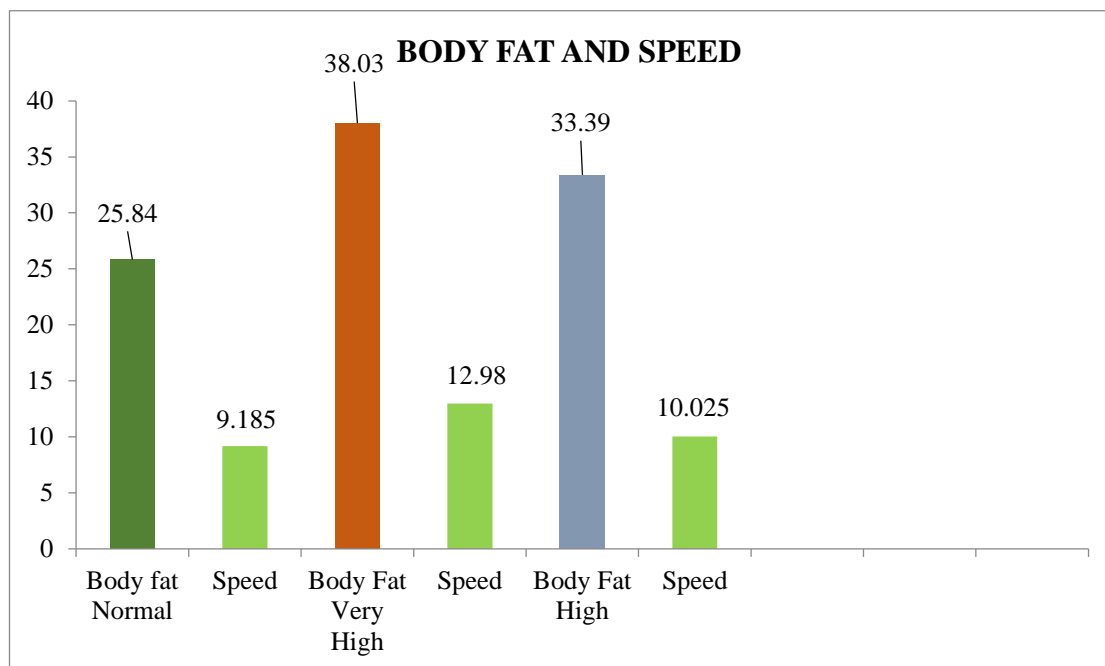
Table 4.2. Relationship between Selected Physical Fitness variable Body fat and Bioelectrical Impedance variable Speed:

VARIABLES	MEAN	S.D	P-value
Body fat Normal	25.840	1.9332	0.075
Speed	9.185	0.5669	
Body Fat Very High	38.030	2.8481	0.200
Speed	12.980	1.8526	
Body Fat High	33.390	1.3977	0.147
Speed	10.025	0.6995	

df =18 , p < 0.05, table value < 0.4438

The above table 4.2 shows that the relationship between different levels of Body Fat and speed. The obtained 'r' on speed among normal body fat group is 0.075 which was lesser than the required table value with df = 18 is 0.4438 at 0.05 level of significance. The obtained 'r' on speed among very high body fat group is 0.200 which was lesser than the required table value with df = 18 is 0.4438 at 0.05 level of significance. The obtained 'r' on speed among high body fat group is 0.147 which was lesser than the required table value with df = 18 is 0.4438 at 0.05 level of significance.

This table shows that there was no significant relationship between Body Fat and Speed of Normal, Very High and High levels. The mean values of very high, high, and normal body fat and speed were graphically represented in the figure II.



Discussion on findings

There was a significantly negative relationship between the selected physical fitness variable such as Endurance and Bioelectrical impedance variable such as Body Fat on women students.

There was a significantly negative relationship between the selected physical fitness variable such as Speed and Bioelectrical impedance variable such as Body Fat on women students. Kyle (2004). In contrast, the results indicate a significant difference in Bioelectrical impedance between the women students.

Conclusions

On the basis of findings of the study following conclusions have been made –

There was a significantly negative relationship between the selected physical fitness variable such as Endurance and Bioelectrical impedance variable such as Body Fat on women students.

Recommendations

- In the conclusions drawn, the following recommendations may be considered.
- The same study may be conduct on men separately.
- The same study may be conducted on school students.

- The same study may be conducted on National & International level players.
- The same study may be conducted between Physiological variables and Bioelectrical Impedance variables.

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AI-ENHANCED ALTITUDE TRAINING: CARDIOVASCULAR ADAPTATIONS IN ENDURANCE ATHLETES

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Abstract

Traditional altitude training methods for endurance athletes are often time-consuming, costly, and limited by their inability to account for individual variability in athlete responses. This study investigates the potential of artificial intelligence (AI) to enhance altitude training by developing personalized protocols. Twenty endurance athletes (10 Males, 10 Females) were randomly assigned to either an Artificial Intelligence - Enhanced Altitude Training Group (AI-AT) or a Traditional Altitude Training Group (TR-AT). The AI-AT group employed a machine learning algorithm to optimize training protocols based on individual characteristics, including fitness level, training history, and physiological responses to altitude. The results revealed significant improvements in cardiovascular performance and training efficiency in the AI-AT group compared to the TR-AT group. These findings suggest that AI-enhanced altitude training can provide a more effective and efficient approach to improving endurance performance.

Key notes: Endurance, Traditional Altitude Training, Artificial Intelligence Altitude Training and Fitness.

Introduction

Altitude training is widely recognized as an effective strategy for improving endurance performance in athletes. By exposing individuals to high-altitude environments, this method stimulates physiological adaptations, such as increased red blood cell production and improved oxygen transport. However, traditional altitude training methods often rely on generalized protocols that fail to account for individual differences in response to altitude, leading to suboptimal outcomes.

Recent advancements in artificial intelligence (AI) have opened new avenues for optimizing training protocols. Machine learning algorithms, in particular, offer the capability to analyze complex datasets and generate personalized training recommendations. This study explores the application of AI to altitude training,

hypothesizing that an AI-enhanced approach can improve cardiovascular performance and training efficiency compared to traditional methods.

Methods

Participants

Twenty endurance athletes (10 Males and 10 Females) were recruited for the study. Inclusion criteria included a minimum of three years of endurance training experience and no history of cardiovascular or respiratory conditions.

Study Design

Participants were randomly assigned to one of two groups:

1. **AI-Enhanced Altitude Training Group (AI-AT):** This group utilized a machine learning algorithm to optimize altitude training protocols based on individual athlete data.
2. **Traditional Altitude Training Group (TR-AT):** This group followed standardized altitude training protocols commonly used in endurance sports.

Intervention

AI-AT Protocol

The machine learning algorithm was designed to analyze each athlete's fitness level, training history, and physiological responses to altitude. Using this data, the algorithm generated individualized training plans, including recommendations for altitude exposure duration, intensity, and recovery periods. Athletes trained in simulated altitude environments created using hypoxic chambers.

TR-AT Protocol

The TR-AT group followed a one-size-fits-all altitude training program, involving 3-week cycles at 2,500 meters of simulated altitude. Training intensity and duration were based on established guidelines.

Outcome Measures

Primary outcomes included:

- **Maximal Oxygen Uptake (VO₂max):** Measured using a Graded Exercise Test.
- **Systemic Vascular Resistance (SVR):** Assessed via Doppler Ultrasound.
- **Exercise-Induced Vasodilation:** Evaluated using Flow-Mediated Dilation (FMD) Techniques.

Secondary outcomes included training time and subjective measures of training effectiveness.

Results

Cardiovascular Performance

- **VO₂max:** The AI-AT group exhibited a significant increase in VO₂max ($p < 0.05$) compared to the TR-AT group.
- **SVR:** A marked reduction in systemic vascular resistance was observed in the AI-AT group ($p < 0.05$).
- **Vasodilation:** The AI-AT group showed enhanced exercise-induced vasodilation ($p < 0.05$).

Training Efficiency

- **Training Time:** The AI-AT group achieved comparable or superior performance improvements with a 20% reduction in total training time.
- **Training Effectiveness:** Athletes in the AI-AT group reported higher perceived training effectiveness ($p < 0.05$).

Discussion

The findings of this study highlight the potential of AI-enhanced altitude training to improve cardiovascular performance and training efficiency in endurance athletes. By tailoring protocols to individual characteristics, the AI-AT approach overcomes the limitations of traditional altitude training, which often relies on generalized and trial-and-error methods.

Mechanisms of Improvement

The observed improvements in the AI-AT group may be attributed to:

- **Personalization:** Individualized protocols likely optimized physiological adaptations.
- **Efficiency:** Reduced training time allowed for better recovery and minimized overtraining risks.

Implications for Practice

AI-enhanced altitude training represents a promising innovation in sports science, with potential applications extending beyond endurance sports. The use of machine learning algorithms can also be explored for other training modalities and population groups.

Conclusion

AI-enhanced altitude training offers a novel and effective approach to improving cardiovascular performance in endurance athletes. By leveraging machine learning algorithms to personalize training protocols, this method addresses the limitations of traditional altitude training and enhances training efficiency. Future research should

investigate the long-term effects of AI-enhanced training and explore its applications in diverse athletic populations.

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THE EVOLUTION OF CARDIOVASCULAR FITNESS TRAINING: NEW FRONTIERS AND ADVANCES

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Abstract

Cardiovascular fitness (CVF) is essential for enhancing overall health, mitigating the risk of chronic conditions such as heart disease, diabetes, and obesity, and fostering improved mental well-being. Recognizing its significance, advancements in technology are transforming CVF training, making it more efficient, engaging, and accessible. Cutting-edge innovations, including artificial intelligence (AI), virtual reality (VR), and biometric sensors, are driving this evolution. Smart treadmills offer adaptive speed control, terrain simulations, and AI-guided coaching to optimize workouts, while AI-enabled stationary bikes provide dynamic resistance, virtual environments, and real-time posture corrections. Full-body rowing machines replicate water resistance for a natural feel and deliver precise stroke analytics. Further enhancing user experience, VR immerses individuals in gamified fitness scenarios, biofeedback systems enable tailored feedback, and energy-harvesting mechanisms promote sustainability. By merging state-of-the-art technology with tailored workout experiences, these advancements make achieving and maintaining cardiovascular fitness more accessible, enjoyable, and efficient than ever.

Keynotes: Cardiovascular fitness, Health benefits, AI-driven technologies, Virtual reality, Biometric sensors, Sustainable fitness solutions.

Introduction

Cardiovascular fitness (CVF) is a critical component of physical health and mental well-being. Defined as the ability of the heart, lungs, and circulatory system to supply oxygen to muscles during sustained physical activity, CVF is a fundamental indicator of health. Enhancing CVF reduces the risk of cardiovascular diseases, type 2 diabetes, and obesity while improving cognitive function and mental health. Despite its importance, maintaining CVF often poses challenges due to time constraints, lack of motivation, or accessibility issues.

Technological advancements are addressing these challenges, transforming CVF training into an engaging and highly personalized experience. Emerging innovations, including AI, VR, and advanced sensor technologies, are making CVF training not only more accessible but also enjoyable and sustainable. This paper examines these technological breakthroughs, emphasizing their implications for health and fitness.

Technological Innovations in Cardiovascular Fitness Training Artificial Intelligence (AI)

AI has revolutionized the fitness industry by enabling adaptive and intelligent workout systems.

Smart Treadmills: AI-powered treadmills feature adaptive speed control, terrain simulations, and real-time coaching. These systems adjust workout intensity based on user performance and fitness goals, optimizing training outcomes.

AI-Enabled Stationary Bikes: These devices provide dynamic resistance levels and monitor user posture, delivering real-time corrections and feedback to enhance safety and effectiveness.

Virtual Reality (VR)

VR technologies have redefined engagement in fitness. By creating immersive environments, VR allows users to "cycle through the Alps" or "row across serene lakes," transforming mundane workouts into captivating experiences. Gamification in VR fitness fosters motivation, encouraging users to achieve fitness milestones while enjoying their workouts.

Biometric Sensors and Feedback Systems

Biometric sensors, integrated into fitness equipment and wearable devices, provide real-time data on heart rate, oxygen saturation, and calorie expenditure. Biofeedback systems use this data to:

- Offer tailored workout recommendations.
- Alert users about potential overtraining or improper form.
- Track progress over time to maintain user motivation and commitment.

Sustainable and Eco-Friendly Fitness Technologies

The integration of sustainability into fitness technology addresses environmental concerns while enhancing user experience. Energy-harvesting mechanisms, embedded in modern fitness machines, convert kinetic energy from workouts into usable electricity, promoting eco-friendly practices. These innovations align with global sustainability goals and encourage a more responsible approach to fitness.

Benefits of Advanced CVF Technologies Enhanced Accessibility

Technologies such as AI and VR make fitness training more accessible by offering tailored workouts for users of all fitness levels, including beginners and individuals with disabilities

Increased Engagement and Motivation

Gamified VR environments and personalized coaching systems maintain user interest and motivation, addressing one of the most significant barriers to consistent exercise: boredom.

Precision and Personalization

Biometric sensors ensure precision in workout monitoring and provide personalized insights, helping users achieve their fitness goals efficiently.

Holistic Health Benefits

By combining physical and cognitive engagement, advanced fitness technologies support both physical health and mental well-being.

Future Perspectives

The trajectory of technological innovation in CVF training indicates a future where workouts are seamlessly integrated into daily life. Trends to watch include:

Integration with Wearables: Enhanced interoperability between wearable devices and fitness equipment will offer a unified approach to health tracking.

AI-Driven Community Engagement: Platforms connecting users with similar fitness goals will foster social motivation and accountability.

Advanced Gamification: The future of fitness gamification may include augmented reality (AR) and AI-driven interactive competitions.

Conclusion

The fusion of cardiovascular fitness training with advanced technologies marks a significant step forward in promoting health and well-being. Innovations such as AI-guided equipment, VR-based workouts, and biometric feedback systems are making CVF training more accessible, engaging, and efficient. These advancements not only enhance physical health but also contribute to mental wellness and environmental sustainability. As technology continues to evolve, its integration into fitness practices will redefine how individuals achieve and maintain cardiovascular fitness.

Recommendation

To maximize the impact of advancements in cardiovascular fitness (CVF) technologies, manufacturers should develop AI-driven platforms for personalized training and integrate VR and AR solutions to boost engagement. Accessibility and inclusivity should be prioritized by designing devices for varying fitness levels and offering multilingual, customizable options. Eco-friendly practices, like energy-harvesting mechanisms, and collaborations with eco-conscious organizations should be

promoted. Cross-disciplinary efforts between developers, healthcare professionals, and trainers can align solutions with user needs, supported by educational campaigns to guide proper technology use. Regular assessments and longitudinal studies will ensure effectiveness and drive continuous improvement, fostering a sustainable, inclusive fitness culture.

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PSYCHOLOGICAL EDGE IN KABADDI EXPLORING MENTAL RESILIENCE AND PERFORMANCE DYNAMICS

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Abstract

Kabaddi, a high-intensity sport rooted in Indian tradition, demands not only physical prowess but also exceptional psychological resilience. This paper examines the psychological attributes integral to Kabaddi players, including mental toughness, decision-making, emotional regulation, and team dynamics. Drawing insights from sports psychology theories and empirical research, this article explores the interplay between psychological factors and performance. It also highlights strategies for enhancing mental preparation, stress management, and focus, aiming to provide a comprehensive understanding of the psychological dimensions influencing Kabaddi players.

Introduction

Kabaddi, often referred to as a "game of strength and strategy," is a contact sport requiring quick reflexes, strategic planning, and mental fortitude. Unlike many other sports, Kabaddi places unique psychological demands on players due to its intense physicality, rapid transitions, and need for split-second decision-making. This paper delves into the psychological traits and skills that contribute to success in Kabaddi, offering insights into how players can cultivate a mindset conducive to peak performance.

Historical and Cultural Context of Kabaddi

Kabaddi has its origins in ancient India, evolving as a sport that combines elements of physical combat and strategic thinking. Traditionally played in rural settings, it has gained international recognition through events like the Pro Kabaddi League and Asian Games. The cultural significance of Kabaddi extends beyond the sport itself, reflecting values of teamwork, resilience, and community. Understanding the historical and cultural roots of Kabaddi provides context for its psychological demands.

Psychological Traits Essential for Kabaddi Players

Success in Kabaddi hinges on specific psychological attributes. Key traits include:

1. **Mental Toughness:** The ability to remain focused and resilient under pressure, especially during high-stakes matches.



2. **Decision-Making Skills:** Quick and accurate decisions are critical in both attack and defense scenarios.
3. **Emotional Regulation:** Managing emotions like fear, frustration, and excitement to maintain optimal performance.
4. **Confidence:** Belief in one's abilities, which influences performance and risk-taking behavior.
5. **Team Cohesion:** Effective communication and trust among team members, fostering unity and synergy.

The Role of Motivation in Kabaddi

Motivation plays a pivotal role in the performance and persistence of Kabaddi players. Key motivational aspects include:

1. **Intrinsic Motivation:** Driven by a love for the sport and personal growth.
2. **Extrinsic Motivation:** Influenced by rewards, recognition, and external validation.
3. **Goal Setting:** Establishing clear, achievable goals to maintain focus and direction.
4. **Self-Determination Theory:** Emphasizing autonomy, competence, and relatedness as core drivers of motivation.

Stress and Anxiety Management in Kabaddi

Kabaddi players often face intense pressure, which can lead to stress and performance anxiety. Effective coping strategies include:

1. **Mindfulness and Relaxation Techniques:** Practices like deep breathing and meditation to calm the mind.
2. **Cognitive Behavioral Strategies:** Reframing negative thoughts to maintain a positive outlook.
3. **Visualization and Mental Rehearsal:** Imagining successful performances to build confidence and reduce anxiety.
4. **Pre-Match Rituals:** Establishing routines to create a sense of control and readiness.

Enhancing Focus and Concentration

Kabaddi requires sustained attention and the ability to switch focus rapidly. Strategies for improving concentration include:

1. **Attention Control Training:** Exercises to enhance selective attention and reduce distractions.
2. **Situational Awareness:** Developing the ability to read the game and anticipate opponents' moves.

3. **Flow State Induction:** Facilitating a state of complete immersion in the game through practice and mental conditioning.

The Importance of Team Dynamics

Teamwork is fundamental in Kabaddi, as players must coordinate seamlessly to execute strategies. Psychological factors influencing team performance include:

1. **Communication Skills:** Ensuring clarity and efficiency in relaying information during matches.
2. **Conflict Resolution:** Addressing interpersonal issues to maintain harmony within the team.
3. **Leadership and Role Clarity:** Defining roles and fostering leadership qualities to enhance team functioning.
4. **Social Cohesion:** Building strong interpersonal bonds to create a supportive environment.

Psychological Training for Kabaddi Players

Integrating psychological training into regular practice sessions can significantly enhance performance. Key components include:

1. **Mental Skills Training:** Developing skills like goal-setting, imagery, and self-talk.
2. **Resilience Building:** Preparing players to bounce back from setbacks and injuries.
3. **Stress Inoculation Training:** Gradually exposing players to stressors to build tolerance and coping mechanisms.
4. **Performance Feedback:** Providing constructive feedback to reinforce strengths and address areas for improvement.

Challenges and Limitations

Despite the growing recognition of sports psychology in Kabaddi, challenges remain:

1. **Limited Resources:** Lack of access to trained sports psychologists in some regions.
2. **Cultural Barriers:** Resistance to psychological interventions due to stigma or lack of awareness.
3. **Time Constraints:** Balancing physical training and psychological preparation within tight schedules.
4. **Individual Differences:** Tailoring psychological strategies to suit diverse player needs and preferences.

Future Directions and Research Opportunities

To advance the psychological understanding of Kabaddi players, future research should focus on:

1. **Longitudinal Studies:** Examining the long-term effects of psychological training on performance.
2. **Cultural Considerations:** Exploring how cultural factors influence psychological traits in Kabaddi.
3. **Technology Integration:** Using wearable devices and apps to monitor and enhance mental states.
4. **Cross-Sport Comparisons:** Comparing psychological demands in Kabaddi with other team sports to identify unique challenges and strategies.

Conclusion

Psychological resilience and preparation are indispensable for success in Kabaddi, a sport that blends physical intensity with mental acuity. By understanding and addressing the psychological dimensions of the game, players can enhance their performance and well-being. Integrating sports psychology into Kabaddi training programs offers immense potential for cultivating not only skilled athletes but also mentally robust individuals who can thrive under pressure.

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PRANAYAMA BRIDGING ANCIENT WISDOM AND MODERN HEALTH PARADIGMS

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Abstract

Pranayama, the ancient practice of breath regulation, holds a central place in the discipline of yoga. Derived from Sanskrit roots “prana” (life force) and “ayama” (extension or control), pranayama involves systematic techniques to control breathing patterns. This paper delves into the theoretical framework, historical evolution, physiological and psychological benefits, and modern applications of pranayama. Emphasizing both classical perspectives and contemporary research, this article aims to highlight the role of pranayama as a powerful tool for enhancing holistic health.

Introduction

Breath is often regarded as the bridge between the body and mind. In yogic philosophy, the regulation of breath is seen as a means to control the flow of life energy or “prana.” Pranayama is one of the eight limbs of Ashtanga Yoga, as outlined by Patanjali in the Yoga Sutras, and is considered essential for achieving physical, mental, and spiritual balance. In contemporary contexts, pranayama has been integrated into therapeutic and wellness programs worldwide. This paper explores its foundational theories, techniques, and scientific relevance.

Historical and Philosophical Foundations of Pranayama

Pranayama has its roots in the ancient Vedic texts, where breath control was associated with meditation and rituals. Key milestones in its historical development include:

1. **The Vedas and Upanishads:** Early references to breath as a vital force integral to life and meditation practices.
2. **The Bhagavad Gita:** Discusses the importance of balancing inhalation and exhalation during meditation.
3. **The Yoga Sutras of Patanjali:** Provides a detailed framework for pranayama, emphasizing it as a preparatory step for meditation (dhyana) and higher states of consciousness (samadhi).
4. **Hatha Yoga Pradipika:** Elaborates on various pranayama techniques and their benefits for physical and mental health.



Philosophically, pranayama aligns with the principle that controlling the breath leads to control over the mind, paving the way for self-realization.

1. **Puraka (Inhalation):** Drawing in prana through deep and conscious breathing.
2. **Kumbhaka (Retention):** Holding the breath to distribute prana throughout the body.
3. **Rechaka (Exhalation):** Releasing toxins and stale energy.

Advanced techniques include:

1. **Nadi Shodhana:** Alternate nostril breathing for energy channel purification.
2. **Kapalabhati:** Rapid exhalation to detoxify and energize.
3. **Bhastrika:** Bellows breath for increased oxygenation and vitality.
4. **Ujjayi:** Oceanic breathing to calm the mind and enhance focus.
5. **Bhramari:** Humming bee breath for relaxation and stress reduction.

Each technique serves specific purposes, targeting different physiological and psychological aspects.

Physiological Benefits of Pranayama

Scientific studies validate the physiological benefits of pranayama, attributing them to its impact on the autonomic nervous system (ANS), respiratory efficiency, and metabolic functions. Key benefits include:

1. **Improved Respiratory Function:** Enhances lung capacity, oxygen exchange, and airway efficiency.
2. **Cardiovascular Health:** Regulates heart rate, lowers blood pressure, and improves circulation.
3. **Enhanced Autonomic Nervous System Balance:** Activates the parasympathetic system, reducing stress and promoting relaxation.
4. **Endocrine System Regulation:** Supports hormonal balance, aiding conditions like hypothyroidism and diabetes.
5. **Detoxification:** Promotes efficient removal of carbon dioxide and metabolic waste.

Psychological and Emotional Benefits of Pranayama

The influence of pranayama on mental health is profound, with several studies demonstrating its efficacy in:

1. **Stress Management:** Modulates the hypothalamic-pituitary-adrenal (HPA) axis, reducing cortisol levels.

2. **Anxiety and Depression:** Provides immediate calming effects and long-term emotional stability.
3. **Enhanced Cognitive Function:** Improves focus, memory, and decision-making abilities.
4. **Emotional Resilience:** Facilitates self-awareness and emotional regulation.
5. **Improved Sleep Quality:** Calms the nervous system, reducing insomnia and promoting restorative sleep.

Pranayama in Modern Health and Wellness Paradigms

Pranayama has been embraced as a complementary practice in various domains:

1. Therapeutic Applications:

- Used in the management of chronic diseases like asthma, hypertension, and diabetes.
- Integrated into rehabilitation programs for cardiac and pulmonary conditions.

2. Mental Health Interventions:

- Complementary therapy for anxiety, depression, and post-traumatic stress disorder (PTSD).
- Used in mindfulness-based stress reduction (MBSR) programs.

3. Corporate Wellness:

- Promotes stress management and enhances productivity in high-pressure environments.

4. Educational Settings:

- Introduced in schools to improve focus, discipline, and emotional well-being among students.

5. Sports and Fitness:

- Enhances endurance, recovery, and mental focus in athletes.

Challenges and Limitations

Despite its benefits, pranayama faces certain challenges:

1. **Lack of Standardization:** Variability in techniques and teaching methods can affect outcomes.

2. **Scientific Validation:** Limited large-scale, longitudinal studies to substantiate long-term benefits.
3. **Cultural Misappropriation:** The dilution of traditional practices in modern adaptations.
4. **Accessibility:** Lack of trained instructors in some regions limits its reach.

Future Directions and Research Opportunities

To maximize the potential of pranayama, future efforts should focus on:

1. **Rigorous Research:** Conducting large-scale, randomized controlled trials to validate claims.
2. **Standardized Training:** Establishing universal guidelines for teaching and practice.
3. **Technology Integration:** Developing apps and wearable devices to monitor and guide pranayama practice.
4. **Global Collaboration:** Promoting cross-cultural research and applications.

Conclusion

Pranayama represents a timeless practice that harmonizes ancient wisdom with modern science. Its ability to address physical, mental, and emotional health challenges underscores its relevance in today's fast-paced world. By honoring its traditional roots while embracing contemporary advancements, pranayama has the potential to become a cornerstone of holistic health and wellness.

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INFLUENCE OF MEDITATION AND ASANA PRACTICES ON MENTAL SKILLS AND STRESS AMONG MEN STUDENTS

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ABSTRACT

The purpose of the study was to find out the influence of meditation and asana practices on mental skills and stress among men students. To achieve the purpose of this study, twenty (n=20) Men students were randomly selected from Men's Hostel, Manonmaniam Sundaranar University, Tirunelveli District, Tamilnadu, India. The age of subject's was ranged from 22 to 26 years. The selected participants were randomly divided into two groups such as Group 'I' underwent meditation and asana practices (n=10) and Group 'II' acted as control group (n=10). Group 'I' meditation and asana practices for five days with one session per day and each session lasted between 45 minutes for six-week period. Group 'II' was not exposed to any specific training but they were participated in regular activities. The data on mental skills and stress were collected and administered by standardized test. The pre and post-tests data were collected on selected criterion variables prior to and immediately after the training programme. The pre and post-test scores were statistically examined by the dependent-'t' test and Analysis of Covariance (ANCOVA) for each and every selected dependent variable separately. It was concluded that the meditation and asana practices group had shown significantly improved in psychological variables like mental skills and stress. However, the control group had not shown any significant improvement on any of the selected variables such as mental skills and stress.

Keywords: *Meditation and Asana Practices, Mental skills, Stress.*

Introduction

Yoga is a tradition of health and spirituality that evolved over a period of some 5000 years. The principles of yoga practice involve, the adoption and maintenance of psychophysical posture along with controlled breathing techniques it forms the basis of yoga's mind-body integration work [1].

Meditation is a technique of extending our ordinary consciousness to reach higher states of consciousness and there by discovering more about ourselves. When we gain this insight we can change our habits and our deeper, inner personality has a better chance to show through. Our whole life changes for the better. Also meditation is often looked upon as a relaxation technique to be used for treating stress and stress related illnesses [2].



Asanas are an integral part of yoga. Yoga uses the body to exercise and controls the mind so that at a later stage the body and the mind together may harmonize with the soul. The yogasanas affect and penetrate every single cell and tissues making them come to life [3]. "Asana is a systematic physical practice to improve awareness, to develop willpower and to realize self, join traditional consciousness (jeevathma) to super consciousness (permathma) [4]. It plays an important role bringing the therapeutic effects in disease like asthma, diabetes, blood pressure and the like. It tones up glands, visceral muscles, regulate even the involuntary muscles. It increases the hormonal secretions by which it connects the blood composition [5]. It is collection of various stretching exercise and postures to limber up the body, but it is more than that. These techniques lead to one's separation from his physical self. It is a powerful tool for achieving union and healing [6].

Psychology is the newest science, what needs to be trained and taught to well known or understand. It is the service which provides step-by-step process for training the positive mental skills and reducing anxiety that will improve capabilities using the convenience of individual's [7]. The mental training focuses on the positive aspect of athlete's mental performances, physical abilities, and preparation skills [8]. There are four mental training techniques motivational-specific, motivational general, cognitive-specific and cognitive-general. The first two are used to improve motivation and emotional control capacity, respectively [9]. Cognitive-specific and cognitive-general mental training techniques are adopted by athletes in order to maximize the performance of a motor task or solve a situation that occurs in competition, respectively [10].

Methodology

Subjects and Procedures

To achieve the purpose of this study, twenty (n=20) Men students were randomly selected from Men's Hostel, Manonmaniam Sundaranar University, Tirunelveli District, Tamilnadu, India. The age of subject's was ranged from 22 to 26 years. The selected participants were randomly divided into two groups such as Group 'I' underwent meditation and asana practices (n=10) and Group 'II' acted as control group (n=10). Group 'I' meditation and asana practices for five days with one session per day and each session lasted between 45 minutes for six-week period. Group 'II' was not exposed to any specific training but they were participated in regular activities. The data on mental skills and stress were collected and administered by standardized test. The pre and post-tests data were collected on selected criterion variables prior to and immediately after the training programme.

Determination of Mental skills and Stress

Hardy and Nelson's mental skill questionnaire (1996) was used. This questionnaire measures six important aspects of the mental side of sport performance. They are imagery ability, mental preparation, self-confidence, anxiety and worry management, concentration ability and relaxation ability. It consists of a number of statements about experiences associated with competitive sport. The subject was asked to read each statement very carefully and then circle the appropriate number to indicate the extent to which one agrees with the statement. The rating was based on six point scale

from strongly disagree to strongly agree. The subject was asked to answer honestly to each question in relation to his own sporting experience. In each item add all the 4 numbers which have been circled. The lower score represents weakness level and higher score represents stronger level of mental ability.

To access the stress among the Men students, the investigator adopted standardized scale. The Scale is called Everly & Girnado's psychological stress scale. The scale consists of fourteen items covering such aspects. The items in the scale are designed to study the psychological and behavioural reactions. The scale is intended to measure the stress of the Men students in scores of 4, 3, 2, 1. For the responses, such as, almost always true, usually true, seldom true, never true respectively for the all items. Scores are ranging from 14 to 56. Higher score indicate more psychological stress that obtained by the selected teachers.

Experimental design and Statistical Procedure

The experimental design used for the present investigation was pre and post randomized group design. For analysing the collected data, the researcher gone through paired sample-'t' test to find out the significant improvement of mean score between pre and post-test of the selected groups. And the researcher chose analysis of covariance (ANCOVA) to find out the significance difference between both groups at the 0.05 level of confidence was fixed to test the level of significance difference.

Result and Discussions

Table I: Means and Dependent-'T'-Test for the Pre and Post Tests on Mental Skills and Stress of Experimental and Control Groups

Criterion variables	Mean	Experimental Group	Control Group
Mental Skills	Pre test	85.69	86.02
	Post test	97.24	86.49
	't'test	11.51*	1.37
Stress	Pre test	41.09	41.37
	Post test	36.28	41.45
	't'test	13.94*	0.92

*Significant at .05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

From the table I the dependent-'t'-test values of mental skills test and stress between the pre and post-tests means of experimental group were greater than the table value 2.26 with df 9 at 0.05 level of confidence, it was concluded that the experimental

group had significant improvement on mental skills test and stress while compared to control group.

Computation of Analysis of Covariance

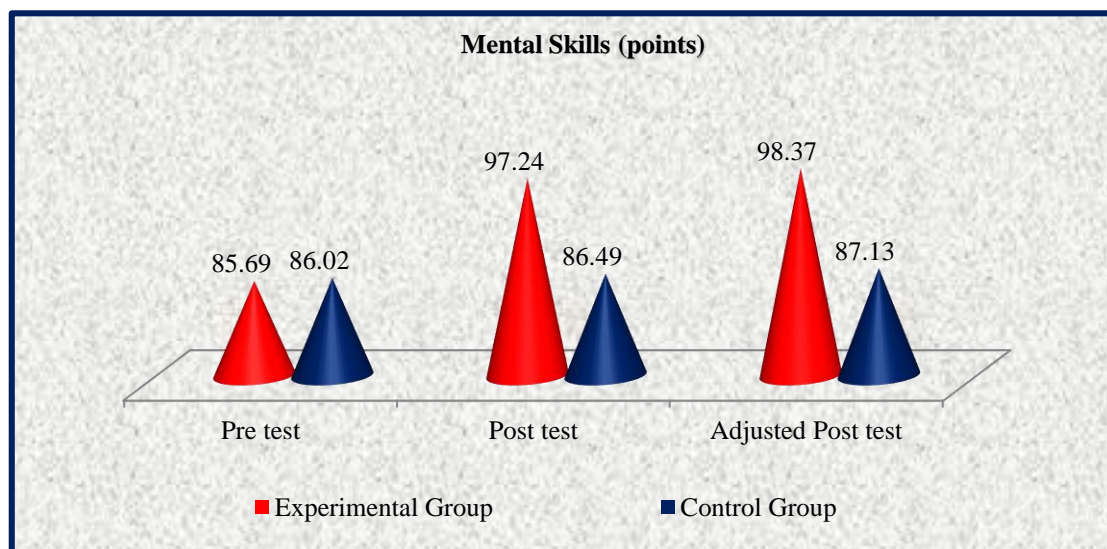
The descriptive measures and the results of analysis of covariance on the criterion measures were given in the following tables.

Table – II: Computation of Mean and Analysis of Covariance on Mental Skills and Stress of Experimental and Control Groups

Adjusted Post Mean	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Mental skills	98.37	87.13	BG	288.75	1	288.75	31.25*
			WG	157.08	17	9.24	
Stress	36.09	41.52	BG	27.92	1	27.92	13.49*
			WG	35.19	17	2.07	

* Significant at 0.05 level. Table value for df 1, 17 was 4.45

The above table indicates the adjusted mean value on mental skills test and stress of experimental and control groups were 98.37 & 87.13 and 36.09 & 41.52 respectively. The obtained F-ratio of 31.25 and 13.49 for adjusted mean was greater than the table value 4.45 for the degrees of freedom 1 and 17 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on mental skills test and stress.



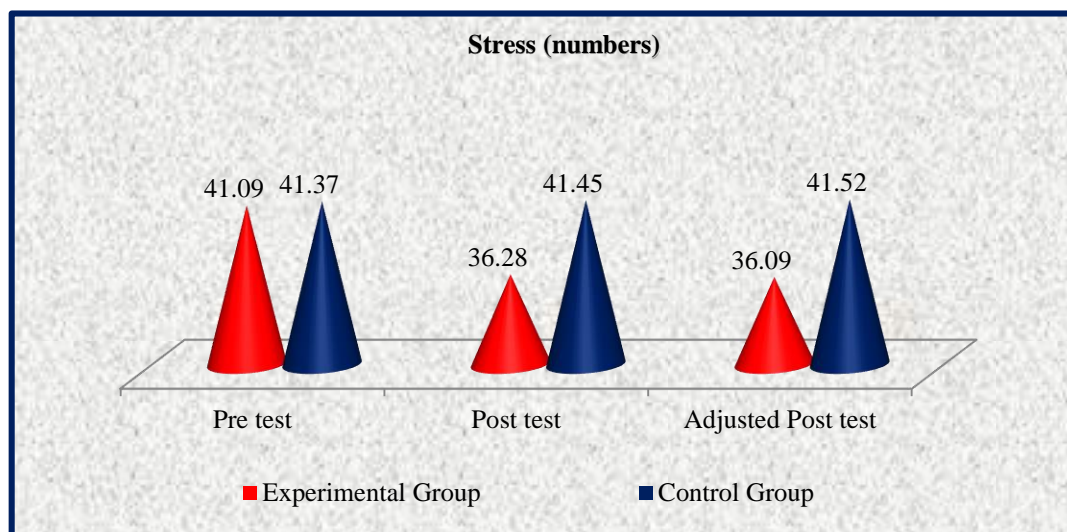


Figure I: Pre Test, Post Test and Adjusted Post Test Mean Values of Experimental Group and Control Group on Mental Skills and Stress.

Discussion on Findings

The result of study indicates that there were significant differences between experimental and control groups on the mental skills and stress due to meditation and asana practices among Men students. The following studies are supported to the result of this investigation such as Anuja, & Arumugam, (2020) conducted the effect of yoga asana with pranayama practices on high and low density lipoprotein among Men type-2 diabetes patients. Bushell, (2020) evaluated the study on meditation and yoga practices as potential adjunctive treatment of SARS-CoV-2 infection and COVID-19. Saatcioglu, (2013) analysed the study on the regulation of gene expression by yoga, meditation and related practices.

Conclusion

The present study was exposed that significant difference was found in the mean of selected variables such as mental skills and the stress among experimental and control groups. There was significant improvement on the mental skills and the stress due to the effect of meditation and asana practices among Men students. However the control group had not shown any significant improvement on the mental skills and the stress among the selected Men students. According to the result of this study, the regular meditation and asana practices would help to explore the positive changes on our mental ability.

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MIND GAMES ON THE FIELD - EXPLORING THE PSYCHOLOGY OF KHO-KHO PLAYERS DURING MATCHES

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Abstract

Kho-kho, a traditional Indian sport, is characterized by its high-intensity gameplay, requiring rapid decision-making, teamwork, and mental resilience. The psychology of players during a match plays a critical role in determining performance outcomes. This article explores the psychological factors influencing kho-kho players, including stress, motivation, focus, teamwork, and decision-making. It delves into theoretical frameworks and research studies, offering insights into the cognitive and emotional aspects that shape player performance.

Introduction

Kho-kho is a sport that demands not only physical prowess but also acute psychological skills. The fast-paced nature of the game requires players to maintain a high level of mental alertness and adaptability. Psychological factors such as stress management, decision-making under pressure, and maintaining team cohesion significantly impact performance. Understanding these elements provides valuable insights into enhancing player performance and developing effective training programs.

Psychological Demands of Kho-Kho

1. Stress and Anxiety

- **Sources of Stress:** Stress during a kho-kho match can stem from various sources, including the fear of failure, audience expectations, and pressure from teammates or coaches. Players often experience heightened anxiety during critical moments, such as defending against a skilled chaser or executing a pivotal attack.
- **Impact on Performance:** High stress levels can impair cognitive functions, leading to poor decision-making, reduced reaction time, and physical fatigue. However, moderate stress can act as a motivator, enhancing focus and energy levels.

2. Motivation

- **Intrinsic and Extrinsic Motivation:** Players are driven by intrinsic factors such as personal satisfaction, love for the game, and achieving mastery, as well as extrinsic



factors like recognition, rewards, and team success. The balance between these motivational types influences long-term commitment and performance.

- **Role of Goal Setting:** Clear, attainable goals help players stay focused and motivated. Short-term goals, like successfully tagging an opponent, and long-term goals, such as winning a tournament, provide a roadmap for sustained effort.

3. Focus and Concentration

- **Sustaining Attention:** The dynamic nature of kho-kho requires players to maintain high levels of attention throughout the match. Distractions, whether external (audience noise) or internal (negative thoughts), can disrupt focus.
- **Techniques to Enhance Focus:** Techniques such as visualization, mindfulness, and pre-match routines help players sustain concentration and improve performance under pressure.

Team Dynamics and Communication

1. **Importance of Teamwork:** Kho-kho is inherently a team sport, requiring seamless coordination among players. Trust, mutual understanding, and effective communication are critical for executing strategies and adapting to the opposition's moves.
2. **Leadership Roles:** Captains and senior players often act as psychological anchors, boosting morale and providing tactical guidance. Effective leadership fosters a cohesive team environment and enhances overall performance.
3. **Conflict Resolution:** Disagreements within the team can arise during high-pressure situations. Quick conflict resolution mechanisms are essential to maintain focus and unity during matches.

Decision-Making Under Pressure

1. **Rapid Cognitive Processing:** Players must analyze the game's dynamic situations and make split-second decisions, such as whether to chase, dodge, or tag. Cognitive agility is crucial in such scenarios.
2. **Strategies to Enhance Decision-Making:** Training drills that simulate match conditions, along with mental conditioning techniques, can improve players' ability to process information quickly and accurately.

Mental Resilience and Coping Mechanisms

1. **Building Mental Toughness:** Mental toughness helps players handle setbacks and maintain performance under adverse conditions. This involves cultivating a growth mindset and learning to view challenges as opportunities.

2. **Coping with Defeat:** Post-match analysis and psychological support are essential for helping players process losses constructively. Emphasizing learning from mistakes fosters resilience and prepares players for future matches.

Theoretical Frameworks

1. **Cognitive Appraisal Theory:** This theory explains how players evaluate stressful situations during a match. Their appraisal determines their emotional and behavioral response, influencing performance outcomes.
2. **Self-Determination Theory (SDT):** SDT highlights the role of autonomy, competence, and relatedness in fostering intrinsic motivation. In kho-kho, players' sense of control and competence directly impacts their psychological state and performance.
3. **Team Cohesion Theory:** This framework underscores the importance of interpersonal relationships and group dynamics in team sports. High team cohesion enhances communication, trust, and collective efficacy, leading to better performance.

Practical Implications for Coaches and Trainers

1. **Mental Skills Training:** Incorporating psychological training into practice sessions can improve focus, stress management, and decision-making abilities. Techniques such as imagery, relaxation, and goal-setting should be integrated into the training regimen.
2. **Building a Supportive Environment:** Coaches should foster an environment that emphasizes psychological well-being. Providing constructive feedback, recognizing effort, and encouraging open communication contribute to a positive team culture.
3. **Developing Resilience:** Encouraging players to embrace challenges and learn from failures helps build mental toughness. Simulation of high-pressure scenarios during practice can prepare players for the demands of competitive matches.

Conclusion

The psychology of kho-kho players during a match is a multifaceted domain encompassing stress management, motivation, focus, teamwork, and decision-making. Understanding these psychological elements is vital for enhancing performance and fostering a holistic approach to player development. Future research should focus on empirical studies to validate theoretical insights and develop tailored interventions for players at different levels of expertise.

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ASSESSMENT OF INTEGRATIVE NEUROMUSCULAR SPORTS TRAINING AMONG SCHOOL LEVEL STUDENTS

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ABSTRACT

Strength, dynamic stability, and plyometrics were the most often utilized Integrative Neuromuscular Training (INT) components in the examined research. Coordination of basic movement skills, speed, and agility training came after these topics. All the discussed contents were not, however, included in the same protocol in any of the trials. Lastly, it was noted that there were no programs that included training for certain movement skills and fatigue resistance. Regarding the advantages of the discussed INT materials for young athletes, this runs counter to the suggestions made by the literature. It goes without saying that INT programs with additional drills that test the feed-forward mechanisms should be part of future research avenues. According to the literature, this is one of the most crucial elements in lowering the risk of damage. Frequent involvement in organized youth sports does not guarantee sufficient exposure to fitness activities relevant to skills and health, and sport training without pre-existing conditioning does not seem to lower the risk of injury in young players. Concerns about the best age to encourage and incorporate more specialized physical training into youth development programs have grown among parents, clinicians, coaches, and educators as a result of current public health recommendations that encourage muscle strengthening and increased participation in competitive sport activities at younger ages. By lowering the risk of sports-related injuries and promoting lifelong regular physical activity, this review summarizes the most recent research and professional opinion on when to start neuromuscular conditioning in young people. It also offers a conceptual model for integrative training that may optimize the potential health benefits for kids.

Key Words: Neuromuscular Training, Movement skills, Physical activity.

INTRODUCTION

The goal of Integrative Neuromuscular Training (INT), a strength and fitness training approach, is to enhance skills and health-related fitness by combining fundamental and sport-specific movements, such as plyometrics, resistance, balance, core strength, dynamic stability, and agility exercises (Myer et al., 2011). Exercises to enhance movement patterns that affect agility—the ease with which you can change direction and speed as well as your capacity to absorb force during a leap and landing—are frequently included in neuromuscular training programs. Integrated neuromuscular training is essentially about teaching quality of movement rather than quantity or strength of movement, according to LaBotz. When we think about conditioning, we often think of traditional strength and endurance. “Watching young girls jump during a girls’ basketball game is a very common example. Their knees have a tendency to fold inward

upon landing, which is neither an efficient nor a healthy movement pattern. Correcting that jumping pattern is the main goal of neuromuscular training, which also helps to prevent both acute and chronic injuries. “Neuromuscular training essentially teaches nerves how to control muscle function in a way that maximizes performance and reduces the risk of injury,” she continues. It stresses movement patterns rather than repetition, which is why it’s sometimes referred to as physical literacy or core or foundational movement patterns. Enhancing muscle strength and connections as well as raising your players’ awareness of their technique and body movement are the two main objectives. Physical activity for children’s growth and development.

A child’s development depends on physical activity, which also establishes the groundwork for an active and healthy life. Early childhood services are in a prime position to encourage families to participate in regular physical activity and to help children acquire healthy habits of physical activity at a young age. A variety of play-based, physically active learning opportunities that connect to children’s interests, skills, identities, and past knowledge should be provided by childhood programs. Both planned (i.e., purposefully taught) and unplanned (i.e., spontaneous) physical activity should be included in childcare. Teachers can also inspire youngsters to engage in physical activity by acting as active role models.

Benefits of physical activity in children

- ❖ Promoting healthy development.
- ❖ Assisting in reaching and keeping a healthy weight
- ❖ Developing robust bones and muscles
- ❖ Enhancing cardiovascular health
- ❖ Enhancing strength, balance, and coordination
- ❖ Maintaining and enhancing flexibility
- ❖ Developing better posture
- ❖ Supporting the growth of both fine and gross motor abilities
- ❖ Giving people the chance to practice basic movement skills
- ❖ Assisting in the formation of connections between various brain regions
- ❖ Increasing focus and cognitive abilities
- ❖ Increasing confidence and self-esteem.
- ❖ Reduces tension and promotes relaxation.
- ❖ Creating opportunities to build social skills and make friends.
- ❖ Improving sleep.

INTEGRATIVE NEUROMUSCULAR TRAINING

A variety of exercises that focus on physical, neurocognitive, and visual-motor skills are part of integrative neuromuscular training (Myer, 2013).

Resistance / strength training

Resistance training is the process of working out your muscles with opposing force, like free weights and bands. Resistance is the force you must overcome in order to raise a heavy object. In addition to preventing injuries, muscle resistance increases tone, mass, and endurance.

Dynamic stability exercises

In order to enhance posture, dynamic stability exercises focus on the trunk, namely the back and abs muscles.

Core training

A set of movements known as “core training” targets the oblique, lower lats, erector spine, and transverse abdominis.

Agility exercises

The athlete can move faster and change direction more easily with the aid of agility drills and exercises.

Exercise recommended for including INT in a low-volume warm-up program

- ❖ Carioca, backward running, jogging, and skipping.
- ❖ Toe raises, hamstring-strengthening exercises, lunges, and squats are examples of strengthening exercises.
- ❖ Movements for plyometrics: a range of leaping, hopping, and bounding movements.
- ❖ Exercises for agility include shuttle running, diagonal running, and direction changes.

Benefits of Integrative Neuromuscular Training

- ❖ Maximize development and growth.
- ❖ Lower the number of injuries that occur during sports practice.
- ❖ Reduce and fix the biomechanical movements that aren't working properly.
- ❖ Aid in lowering the prevalence of musculoskeletal or metabolic diseases.
- ❖ Develop a wide range of motor abilities.
- ❖ Improve your exercising technique and muscular strength.
- ❖ Boost your postural control and dynamic stability.
- ❖ Enhance inclination to engage in additional physical activities, such as games or sports.
- ❖ Encourage a healthy, active lifestyle.

Boost performance in particular sports (e.g., rugby, baseball, tennis, football, soccer, etc.) In 2011, Fernando Naclerio

CONCLUSION

In conclusion, INT enhances motor muscle function, which accelerates the subcortical control system, and has a good effect on athletes' physical fitness (balance, agility, speed, muscular power, and muscular endurance). This evaluation indicates that INT should concentrate on carrying out activities that promote brain training of the muscles and nerves in order to enhance communication by synchronizing the athlete's subconscious mind and body. Players should follow a fitness training regimen that starts in the pre-season, lasts for at least 12 weeks, and continues often during the season (three times a week). Balance, proprioception, plyometrics, strength training, and constructive criticism on technique are all crucial training elements. The effect of INT on the level of physical fitness needed for other sports, like as handball, hockey, judo, badminton, kabaddi, wrestling, badminton, and athletics, also requires more research.

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EFFECTIVENESS OF FIT INDIA FITNESS PROTOCOL ON CARDIOVASCULAR ENDURANCE AMONG COLLEGE STUDENTS

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ABSTRACT

The Fit India Movement, initiated by the Indian government, aims to enhance health and well-being through yoga and physical fitness activities. This study investigated the effect of the Fit India Fitness Protocol (FIFP) on the cardiovascular endurance of law students. It randomly selected 80 male students aged 18 to 24 from KLE Law College in Bangalore, Karnataka, and assigned them to four groups, each including 20 members. Group I engaged in physical fitness exercises, Group II performed yoga, Group III participated in both physical fitness and yoga, while Group IV served as the control group. The intervention lasted 12 weeks, during which individuals in the treatment groups trained five days a week, while the control group adhered to their regular routines. We used the 2 km walk/run test as the criterion variable to evaluate the differences in cardiovascular endurance among the groups. A one-way analysis of covariance (ANCOVA) employing pre-reading cardiovascular endurance as a covariate revealed that all three treatment groups had significantly greater cardiovascular endurance compared to the control group. The Bonferroni post-hoc test indicated that the physical fitness exercise group (Group I) attained the greatest improvements in cardiovascular endurance. The data indicate that the Fit India physical fitness exercise protocol significantly improves the cardiovascular endurance along with the health and well-being of the law college students.

Keywords: Training Protocol, Fit India, Cardiovascular Endurance, Physical Fitness

I. INTRODUCTION

Physical fitness is essential for overall health and well-being. Addressing concerns about sedentary lifestyles, the Indian government launched the Fit India Movement in 2019, encouraging regular physical activity and yoga. Structured programs like the Fit India Fitness Protocol (FIFP) provide guidelines to improve physical and mental health.

Fitness enhances the efficiency of the heart, lungs, and muscles, enabling individuals to perform daily tasks with energy and reduced health risks. It supports optimal physical performance and stress management, yet many in society lack sufficient activity to maintain good health.

Cardiovascular endurance (CVE) measures the ability of the heart, lungs, and circulatory system to sustain prolonged activity, essential for aerobic capacity and overall fitness (ACSM, 2018). Activities like running and cycling enhance CVE, which is crucial for college students facing stress, sedentary behaviour, and irregular schedules. Building Cardiovascular endurance during college reduces the risk of chronic diseases such as cardiovascular issues, hypertension, diabetes, and obesity (Warburton et al., 2006). It promotes healthy weight, metabolism, and immunity, laying the foundation for long-term well-being and a healthier future.

- **OBJECTIVE:** To analyze the impact of a physical fitness, yoga and combined intervention programs aligned with the Fit India Fitness Protocol on the cardiovascular endurance of college students.
- **HYPOTHESES:** It was hypothesized that a 12-week Fit India physical fitness, yoga and combined intervention program would lead to a significant improvement in the cardiovascular endurance of college students.

II. METHODOLOGY

The study employed a randomized treatment design with 80 male students aged 18-24 from KLE Law College, Bengaluru, divided into four groups: Physical Fitness, Yoga, Combined, and Control, each consisting of 20 participants. Over 12 weeks, the intervention groups underwent five weekly training sessions, while the Control group received no training. Cardiovascular endurance was assessed using a 2 km walk/run test before and after the intervention. Participants were selected based on criteria such as age, willingness to participate, and absence of medical conditions affecting physical activity. Data were analysed using ANCOVA, with pre-test readings as covariates. Statistical tools, including bar diagrams, profile plots, and Bonferroni post-hoc tests, were used for detailed comparisons, with significance set at a 0.05 confidence level.

III. ANALYSIS OF DATA AND INTERPRETATION

Table 1: Group-Based Descriptive Statistics on Cardiovascular Endurance, with Pre- and Post-Adjusted Means

Groups	Tests	Min	Max	Mean	S D Error of mean	S D
Control	Pre	9.14	14.54	11.333	0.382	1.712
	Post	9.09	14.49	11.242	0.369	1.653
Physical Fitness	Pre	10.12	16.08	12.430	0.336	1.506
	Post	8.47	11.56	9.815	0.166	0.744
Yoga	Pre	10.50	15.18	12.965	0.273	1.223
	Post	9.34	13.18	10.940	0.251	1.126
Combined	Pre	10.23	16.11	12.729	0.312	1.399
	Post	9.12	12.46	10.245	0.197	0.882

Interpretation: The table 1 presents the descriptive statistics for Cardiovascular Endurance (CVE) based on pre- and post-test data from the treatment and control groups. The findings are summarized as follows:

The table 1 shows the descriptive statistics for cardiovascular endurance (CVE) across all groups. The Control Group's mean CVE score slightly declined from 11.333 (SD = 1.712), to 11.242, (SD = 1.653) indicating minimal change. The Physical Fitness Group demonstrated the most significant improvement, with mean scores improving from 12.430 (SD = 1.506) to 9.815, (SD = 0.744) reflecting enhanced endurance and consistent performance. The Yoga Group showed a positive impact, with scores improving from 12.965 (SD = 1.223) to 10.940, (SD = 1.126) indicating uniform progress. The Combined Group also experienced steady gains, with scores improving from 12.729 (SD = 1.399), to 10.245 (SD = 0.882). These results highlight the effectiveness of all interventions, particularly physical fitness training, in improving cardiovascular endurance

All treatment groups improved cardiovascular endurance, with the Physical Fitness Group achieving the greatest gains, followed by the Combined and Yoga Groups. The Control Group showed minimal change, highlighting the effectiveness of targeted exercise programs, especially physical fitness training, for enhancing endurance in college students.

Table 2: Analysis of Covariance (ANCOVA) results of the Intervention program on Cardiovascular Endurance

Source	Sum of Squares	df	Mean Square	F-ratio	p-value
Pre CVE	68.857	1	68.857	158.673	< 0.05*
Between Groups	49.320	3	16.440	37.884	<0.05*
Within Groups	32.547	75	0.434	-	-

**Indicates that the results are significant at < 0.05 level*

Inference: Table 3 reveals a significant difference in post-intervention cardiovascular endurance scores among the groups ($p < 0.05$) after adjusting for pre-test scores. The treatment groups showed substantial improvements, while the control group showed no significant change. A post-hoc test identified specific differences between the groups.

Table 3: Pre, Post and Adjusted Post test Mean scores of Cardiovascular Endurance

Group	Pre-test	Post-test	Adjusted post (for Pre-test)
Control	11.333	11.242	11.910
Physical Fitness	12.430	9.815	9.773
Yoga	12.965	10.940	10.551
Combined	12.729	10.245	10.009

Interpretation: Table 3 shows the cardiovascular endurance (CVE) scores for each group before, after, and after adjustment. The Control Group's mean score slightly decreased from 11.133 in the pre-test to 10.677 in the post-test, but adjusted to 11.350. The Physical Fitness Group had a significant improvement, with the score decreasing from 12.729 in the pre-test to 9.815 in the post-test, and adjusting to 9.750. The Yoga Group also showed

improvement, with scores moving from 12.965 to 10.940, and adjusted to 10.569. The Combined Group saw an decrease from 12.729 in the pre-test to 10.245 in the post-test, adjusting to 10.009. Overall, the treatment groups exhibited notable improvements in cardiovascular endurance, especially after the interventions

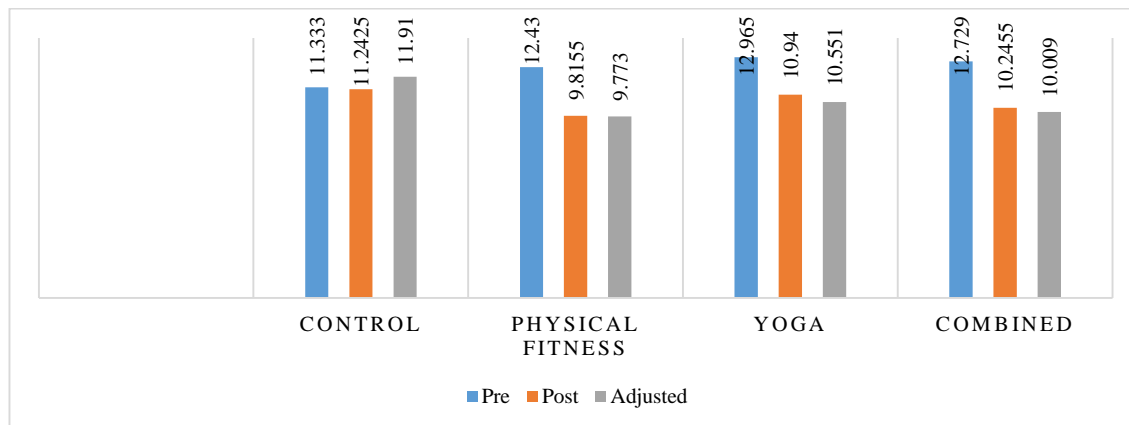


Figure- 01: Pre, Post and Adjusted Post test Mean scores of Cardiovascular Endurance

Interpretation: Figure 4.1 visually represents the data from Table 4.2. This multiple bar chart illustrates that, when comparing the corrected post-test mean cardiovascular endurance scores (adjusted for pre-test) with the pre-test mean scores across all treatments and control groups, the treatment groups show an increase in cardiovascular endurance.

Table 4: Bonferroni Post Hoc test Analysis of Adjusted Post test Means of Treatment and Control groups on Cardiovascular Endurance

Groups				Mean Difference	p-value	(95% confidence Interval for Difference)	
Physical Fitness	Yoga	Combined	Control			Lower Bound	Upper Bound
9.773	-	-	11.910	2.137	< 0.05*	1.552	2.721
-	10.551	-	11.910	1.358	< 0.05*	0.750	1.967
-	-	10.009	11.910	1.900	< 0.05*	1.303	2.497
9.773	10.551	-	-	0.778	0.002*	-1.348	0.209
9.773	-	10.009	-	0.236	1.000	0.802	0.330
-	10.551	10.009	-	0.542	0.068*	0.023	1.108

***Indicates that the results are significant at < 0.05 level**

Inference: The 4 indicates the adjusted mean cardiovascular endurance scores showed statistically significant differences between the control group and the physical fitness, yoga, and combined groups, with p-values below 0.05. However, no significant difference was found between the physical fitness and combined groups, as their p-value was 1.000. The physical fitness group had a significantly higher adjusted post-test mean score for cardiovascular endurance compared to the control, yoga, and combined groups.

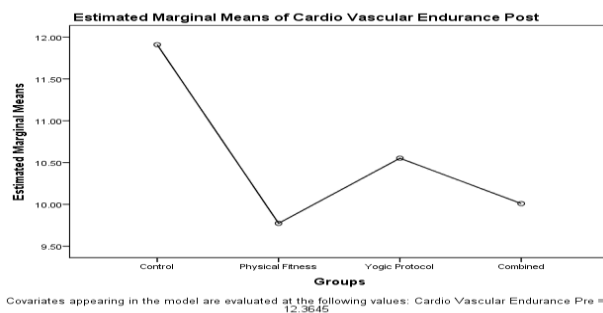


Figure - 2: Profile plot showing Adjusted post-test Mean scores of Cardiovascular Endurance Treatment and Control groups

Interpretation: The graphical representation showed that the physical fitness group achieved the highest effectiveness, followed by the combination group in second place, the yoga group in third, and the control group ranking last in terms of performance.

Table 5: Percentage of Relative Changes in Treatment groups with respect to Control

Control	Physical Fitness	Yoga	Combined
	-17.942%	-11.410%	-15.961%

Interpretation: Table 5 shows the percentage change in cardiovascular endurance among college students. The physical fitness group experienced the highest improvement, with a change of -17.942%, followed by the combined group at -15.961%, and the yoga group at -11.410%. This indicates that the physical fitness group had the most significant improvement in cardiovascular endurance compared to the other two groups.

DISCUSSION ON FINDINGS

The study shows that Physical Fitness, Yoga, and Combined protocols significantly improved cardiovascular endurance in college students, with all treatment groups outperforming the Control group, which received no intervention.

- **Physical Fitness Protocol:** The Physical Fitness Protocol enhances cardiovascular endurance through high-intensity, repetitive exercises that stress the cardiovascular system. These activities improve heart rate, oxygen transport, and overall cardiovascular efficiency, enabling better endurance. Studies, including Zaki et al. (2023) and Khattak et al. (2020), support that moderate-to-high-intensity exercises and circuit training significantly improve cardiovascular health and endurance in adolescents and college students.
- **Yoga Protocol:** Yoga improves cardiovascular endurance by enhancing flexibility, core strength, and respiratory efficiency. Poses that stretch muscles and regulate breathing boost circulation and lung function, aiding oxygen delivery. Additionally, yoga reduces stress, improving cardiovascular responses over time. The similar studies aligned with Mognet and Mesfin (2022) found that yoga significantly improved cardiovascular endurance in U-17 male football participants. Similarly,

Mahaja et al. (2019) reported that yoga enhances cardiorespiratory efficiency, general health, and physical fitness in healthy individuals.

- **Combined Protocol:** The combined approach blends high-intensity cardiovascular exercises with yoga's flexibility and balance, promoting balanced development of both cardiovascular and muscular endurance. While effective, its impact on cardiovascular endurance is slightly less intense than the pure Physical Fitness protocol. Bhaskar et al. (2019) found that aerobic training and yoga improved cardio-respiratory endurance in obese male college students, with better results from aerobic training. Rameshkumar et al. (2018) showed that combining yoga and resistance training enhanced cardio-respiratory endurance and body composition in obese boys. Satyavati and Hoovanna (2017) found that yoga and physical workouts improved cardiovascular endurance in secondary school students.

IV SUMMARY, CONCLUSION AND RECOMMENDATION:

SUMMARY: The study highlights the effectiveness of targeted fitness interventions on cardiovascular endurance. The Physical Fitness protocol showed the greatest improvements, while Yoga provided a sustainable approach, and the Combined protocol offered a balanced advantage by blending both high-intensity and restorative practices.

CONCLUSION: The findings emphasize the importance of selecting fitness interventions based on individual goals. For those aiming for peak cardiovascular performance, high-intensity fitness routines are recommended. Conversely, the Yoga and Combined protocols are better suited for individuals seeking gradual improvements and balanced fitness development. This study highlights that tailored approaches are key to optimizing cardiovascular endurance in college students.

RECOMMENDATION: Educational institutions should offer structured fitness, yoga, or combined programs based on students' goals to enhance cardiovascular endurance. Yoga programs should be promoted for gradual improvements in endurance and mental well-being.

FUTURE RESEARCH DIRECTIONS

- Conduct long-term studies to assess the lasting effects of physical fitness, yoga, and combined protocols on cardiovascular endurance.
- Explore the impact of these protocols on other fitness and physiological parameters, using wearable devices and apps to track progress and improve engagement

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BEYOND THE ARENA: EXPLORING PSYCHOLOGICAL HURDLES FOR WOMEN ATHLETES

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Abstract

Latent psychological hurdles and barriers faced by females engaged in male-dominated sports include stereotype threat, self-deprecation, lack of institutional support, and the influence of coping mechanisms. This study explores these barriers in a cross-sectional study of female athletes residing in Kerala, India. Analysis of 200 participants' data (collected through validated instruments including the Stereotype Threat Questionnaire, Rosenberg Self-Esteem Scale, and Brief COPE Inventory) shows Moderate levels of meaning made of (stereotype) threat and organisational support and more diverse responses of self-esteem and coping. The findings highlight persistent societal biases and systemic inequities affecting women in sports like football, wrestling, and boxing. Inferential statistics suggest weak correlations between psychological variables and competitive levels, emphasising their independence. These results underline the necessity for structural reforms, including equitable access to resources and resilience training. Future research should explore intersectional dynamics and longitudinal changes to address psychological challenges comprehensively. This study offers actionable insights for policymakers, sports organisations, and psychologists aiming to create inclusive and supportive environments for women athletes in traditionally male domains.

Introduction

Women in male-dominated sports face peculiar challenges that are determined mainly by deep-rooted social stereotypes and structural inequalities beyond those related merely to physical performance. Over time, several psychological barriers have been identified by researchers as confronting women in their participation and performance in these fields, which include stereotype threat, low self-confidence, poor levels of support, and limited resource availability. Therefore, the aim of this present study is to explore such psychological barriers to throw light on the experiences of women athletes and suggest how these may be overcome.

Understanding Male-Dominated Sports

Male-dominated sports, such as wrestling, rugby, cricket, and football, have historically been perceived as unsuitable for women due to cultural norms that associate physicality and competitiveness with masculinity (Messner, 2002). This perception has resulted in a significant gender gap in participation, funding, and media representation, reinforcing that women athletes in these domains are "exceptions" rather than equals (Cook et al., 2013).

Stereotype Threat and its Impact

Steele and Aronson (1995) defined stereotype danger as the anxiety of confirming unfavourable stereotypes about one's social group. Women in male-dominated sports may experience anxiety and self-doubt during performance as a result of social assumptions that women are less capable of physical activities than males. This anxiety can impair both performance and long-term participation. For example, Beilock et al. (2007) found that stereotype threat dramatically affects sports performance under pressure, emphasising the importance of measures that promote a supportive atmosphere.

Self-Esteem and Psychological Well-being

Self-esteem is another critical factor influencing women's experiences in male-dominated sports. Rosenberg's Self-Esteem Scale (1965) has been widely used to assess confidence levels in athletes. Research by Fink (2015) shows that female athletes often internalise societal critiques about their appearance and abilities, leading to diminished self-esteem and heightened vulnerability to psychological distress. However, studies also suggest that positive reinforcement and success in sports can help counteract these effects, fostering resilience and self-assurance (Martens et al., 2007).

The Role of Organizational Support

Organisational support is vital for athletes to thrive, particularly in environments where they are underrepresented. Studies indicate that women in male-dominated sports often face institutional barriers, such as unequal access to training facilities, coaching resources, and sponsorships (Schroeder, 2010). Moreover, the lack of female mentors and role models exacerbates feelings of isolation and imposter syndrome among female athletes (Walker & Sartore-Baldwin, 2013). Addressing these barriers requires a shift in organisational culture to promote inclusivity and equity.

Coping Mechanisms: Resilience and Adaptation

Women athletes adopt various coping strategies to navigate the challenges of male-dominated sports. According to Carver's Brief COPE Inventory (1997), shared strategies include problem-solving, seeking social support, and employing emotional regulation. However, the effectiveness of these strategies is influenced by external factors such as societal attitudes, team dynamics, and media representation (Tamminen & Holt, 2010). A study by Sarkar and Fletcher (2014) highlights the importance of resilience training in helping athletes overcome adversity, suggesting that psychological interventions can enhance coping mechanisms.

Media Representation and Public Perception

Media portrayal of female athletes in male-dominated sports often emphasises appearance over athleticism, perpetuating harmful stereotypes. Cooky et al. (2015) found that only 4% of sports media coverage is dedicated to women, and much of it reinforces traditional gender roles. This lack of visibility affects public perception and limits sponsorship opportunities for female athletes. Addressing these biases requires concerted efforts from media organisations to portray women athletes as skilled professionals deserving of recognition.

Intersectionality in Sports

The experiences of women in male-dominated sports are not monolithic but are shaped by intersecting identities, including race, socioeconomic background, and sexuality. Crenshaw's (1989) intersectionality theory provides a framework for understanding how multiple forms of discrimination compound the challenges marginalised groups face. For instance, Black women athletes often contend with both racial and gender stereotypes, which can amplify psychological barriers (Harrison et al., 2011). Recognising and addressing these intersectional challenges is crucial for fostering inclusivity in sports.

Rationale for the Study

Despite growing awareness, the psychological barriers faced by women in male-dominated sports remain under-researched, particularly in cultural contexts like India. Existing studies, such as those by Srivastava (2019) and Nair et al. (2021), highlight the persistence of gender bias in Indian sports organisations but offer limited insights into the lived experiences of female athletes. This study aims to bridge this gap by examining key psychological factors—stereotype threat, self-esteem, organisational support, and coping mechanisms—among women athletes in Kerala, a state with a rich sports culture yet marked by traditional gender norms.

Methodology and Study Design

The methodology and study design offered a structured framework to ensure the research was reliable and reproducible. This section outlines the study's approach, including its design, sampling strategy, data collection tools, analytical methods, and ethical considerations.

The study employed a **cross-sectional design** to explore women's psychological barriers when participating in male-dominated sports in Kerala, India. This approach allowed for efficient data collection at a single point, enabling the researchers to examine relationships between psychological factors and demographic variables. The cross-sectional design was particularly well-suited for analysing associations without requiring longitudinal data.

The target population in Kerala consisted of women who actively participated in male-dominated sports such as football, wrestling, cricket, and boxing. Participants had to be 18, actively train or compete in a male-dominated sport, live or compete in Kerala, and provide informed consent. Retired athletes, people not involved in male-dominated sports, and incomplete survey replies were all excluded. To ensure the sample was representative, purposive sampling was used to select participants who met the inclusion criteria. In contrast, stratified sampling captured diversity across competitive levels (recreational, semi-professional, professional, and international) and geographical locations (urban and rural).

A systematic questionnaire intended to gather psychological and demographic data was used for data collection. Age, sport type, years of experience, competitive level,

locality, educational background, and occupation were among the information collected in the demographic part. Tools that have been validated were used for psychological factors. A modified version of the Stereotype Threat Questionnaire (STQ) was used to measure stereotype threat, and responses were recorded on a 5-point Likert scale. The Rosenberg Self-Esteem Scale (RSES), which assesses confidence and self-worth, was used to measure self-esteem. Perceived organisational support was assessed using tailored questions focussing on the availability and quality of support structures, whilst coping mechanisms were assessed using the Brief COPE Inventory, which examines 14 coping methods and rates responses on a 4-point Likert scale.

The poll was distributed online, using platforms such as Google Forms, and in person, at training sessions or contests. A pilot test with 20 participants was done to verify clarity and dependability. The pilot study's feedback led to minor language changes to some questions to increase participant comprehension. Ethical considerations were important to the study's design. All participants provided informed consent and were given thorough information about the study's goal, their rights, and methods to preserve confidentiality. Individuals were free to withdraw at any moment. To preserve data privacy, responses were anonymised and kept securely. A local ethics committee provided prior clearance for the project.

Data analysis included both quantitative and qualitative methodologies. The demographic and psychological characteristics were summarised using descriptive statistics such as means, standard deviations, and frequencies. Inferential statistics were used to investigate the links and differences between groups. ANOVA was used to evaluate stereotype threat and self-esteem scores at various competitive levels, while Pearson's correlation analysis was utilised to investigate the links between psychological variables. Thematic analysis was used to discover patterns and storylines of qualitative data from open-ended responses. The analysis was carried out using Python and SPSS software. The study's merits were validated psychological instruments, which provided reliability and comparability with previous research, and a stratified sampling strategy that increased the representation of varied participant groups.

Limitations and Delimitation

Delimitation

Validated scales were employed to ensure the reliability and consistency of the data collected, providing a strong foundation for the study's findings. Stratified sampling was utilised to enhance the representation of diverse subgroups within the population, ensuring that the sample accurately reflected the broader demographic. Additionally, ethical measures were rigorously implemented to safeguard participants' rights, including informed consent, confidentiality, and the right to withdraw, ensuring that the study adhered to the highest ethical standards.

Limitations

The study's cross-sectional design limited the ability to draw causal inferences, as data were collected at a single point in time. Additionally, the reliance on self-reported data introduced the potential for response bias, which could affect the accuracy of the

findings. Furthermore, the study's findings may not be generalisable beyond the context of Kerala, as regional cultural and social factors could influence the results.

Results

1. Descriptive Statistics

The dataset analysis provides detailed descriptive statistics for four key psychological variables, offering insights into participant responses and variability. The **stereotype threat** variable, measured on a 1–5 scale, has a mean of 2.99, a standard deviation (SD) of 1.36, and a range spanning the entire scale, indicating moderate levels of perceived stereotype threat with substantial variability. **Self-esteem**, assessed via the RSES score, shows a mean of 30.15, SD of 12.09, and a broad range from 10 to 50, reflecting diverse levels of self-worth among participants. Similarly, on a 1–5 scale, organisational support shares a nearly identical mean (2.98) and SD (1.36) with stereotype threat, suggesting consistent levels of perceived support across respondents. The **coping mechanisms**, captured through COPE scores, exhibit a higher mean of 33.56, SD of 12.48, and a wide range (14–56), emphasising varied strategies individuals use to handle stress or challenges. These statistics reveal commonalities and distinct patterns across the psychological variables, highlighting the variability and central tendencies crucial for interpreting the dataset and its implications.

2. Inferential Statistics

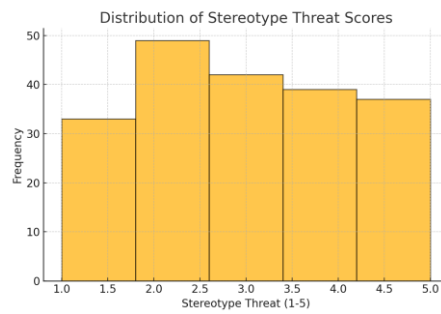
The inferential analysis highlights key findings regarding the relationships and differences among psychological variables across competitive levels. ANOVA results demonstrate no statistically significant differences in **stereotype threat** ($p = 0.9955$) or **self-esteem** ($p = 0.8556$) scores when compared across varying levels of competition. These findings suggest that the competitive context does not substantially impact individuals' experiences of stereotype threat or perceived self-esteem. Furthermore, the analysis reveals weak correlations between the psychological variables under study, indicating minimal interdependence among factors such as stereotype threat, self-esteem, organisational support, and coping mechanisms. These weak associations underscore the independence of these constructs, suggesting that each variable captures a distinct aspect of participants' psychological experiences. Together, these results provide valuable insights into the nuanced interplay—or lack thereof—between competition levels and psychological measures, shaping future research directions and interventions.

3. Visualizations

The following graphs illustrate key findings from the data analysis.

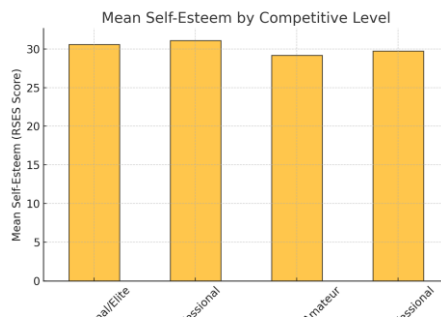
3.1 Distribution of Stereotype Threat Scores

The histogram shows the distribution of stereotype threat scores on a 1–5 scale.



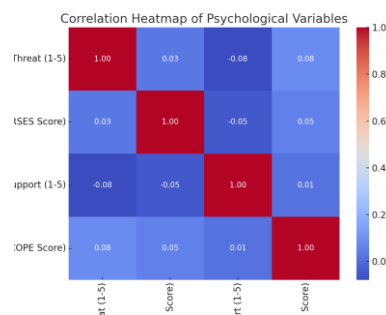
3.2 Mean Self-Esteem by Competitive Level

The bar chart illustrates the average self-esteem scores across different competitive levels.



3.3 Correlation Heatmap of Psychological Variables

The heatmap visually represents the correlation coefficients between psychological variables.



Discussion

This study aimed to explore the psychological barriers faced by women in male-dominated sports, focusing on factors such as stereotype threat, self-esteem, organisational support, and coping mechanisms. The findings provide insights into women athletes' psychological landscape, highlighting systemic challenges and individual differences in coping and resilience.

Stereotype Threat

The moderate levels of stereotype threat observed in the study align with previous research, suggesting that societal stereotypes continue to exert psychological pressure on women in male-dominated sports (Steele & Aronson, 1995). While no significant differences were found across competitive levels, this uniformity indicates that stereotype threat affects athletes regardless of their professional status. Beilock et al. (2007) emphasised the adverse impact of such threats on performance, suggesting interventions such as stereotype inoculation training to build resilience.

Self-Esteem

Self-esteem scores exhibited considerable variability, reflecting the diverse experiences of participants. Similar to the findings of Fink (2015), self-esteem levels were influenced by external factors such as societal perceptions, media representation, and success in competitions. Women who perceived more excellent societal support and validation reported higher self-esteem, highlighting the importance of fostering a positive and inclusive environment for female athletes.

Organisational Support

The generally low ratings of organisational support reveal systemic gaps in providing equitable resources for women in male-dominated sports. Previous studies by Schroeder (2010) and Walker and Sartore-Baldwin (2013) underscore the critical role of institutional support in enhancing athlete well-being and performance. This study's lack of correlation between organisational support and coping mechanisms suggests that structural support alone may not directly influence coping strategies but requires integration with psychological interventions.

Coping Mechanisms

Participants demonstrated a wide range of coping strategies, consistent with findings by Tamminen and Holt (2010). While some relied on problem-solving and emotional regulation, others exhibited avoidant behaviours, indicating the need for tailored interventions. Sarkar and Fletcher (2014) advocate for resilience training to enhance effective coping, particularly in high-pressure environments like male-dominated sports.

Key Observations

1. Intersectionality and Psychological Barriers:

Although not explicitly tested in this study, the findings align with Crenshaw's (1989) theory of intersectionality, suggesting that psychological barriers are compounded by intersecting identities such as race, class, and sexuality. Future research should explore these dynamics in greater depth.

2. Media Representation:

The lack of significant correlations between stereotype threat and self-esteem highlights the complex interplay of societal influences, including media portrayal, which often perpetuates stereotypes rather than challenging them (Cooky et al., 2015).

3. Implications for Policy and Practice:

The findings highlight the urgent need for policy reforms to address systemic inequities, including equal access to training resources, mentorship programs, and gender-sensitive coaching practices. Psychological counselling and resilience training should also be integrated into athlete support systems.

Conclusion

This study sheds light on women's psychological barriers in male-dominated sports, emphasising the interplay between societal, structural, and individual factors. Key findings include:

1. Moderate levels of stereotype threat and organisational support, reflecting persistent societal biases and systemic inequities.
2. Varied self-esteem levels influenced by external validation and success in sports.
3. Diverse coping mechanisms underscoring the individuality of psychological responses.

Despite these challenges, the resilience and determination of women athletes underscore their potential to excel in male-dominated sports when provided with adequate support and opportunities. The absence of significant correlations between certain variables highlights the need for a more nuanced understanding of psychological barriers, considering mediating factors such as cultural context and team dynamics.

Recommendations

1. Structural Reforms:

Sports organisations must implement equitable policies, mentorship opportunities, and training resources tailored to the needs of women in male-dominated sports.

2. Psychological Interventions:

Provide resilience training, mental health services, and stereotype inoculation programs to empower women athletes.

3. Future Research:

Conduct longitudinal studies to examine how psychological barriers evolve over time and in diverse cultural contexts. Explore the role of intersectionality in shaping women's experiences in male-dominated sports.

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