Effect of An AI – Supported IKS Yoga Training Programme on Selected Physical and Psychological Variables among College Students

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Abstract

The integration of traditional Indian Knowledge Systems (IKS) with emerging Artificial Intelligence (AI) technologies provides new possibilities for strengthening physical education and yoga practice. The present study examined the effect of an AI-supported IKS Yoga training programme on selected physical and psychological variables among college students. Thirty men college students participated in the study. The participants underwent a six-week yoga training programme based on selected traditional yogic practices, supported by AI-based instructional and monitoring techniques. Flexibility, balance and concentration were selected as the dependent variables. Pre-test and post-test measurements were obtained before and after the training programme. The significance of the difference between the pre-test and post-test means was examined using the paired t-ratio. The illustrative results showed significant improvement in flexibility, balance and concentration following the intervention. The findings indicate that the integration of traditional yogic knowledge with appropriate AI-supported learning can provide an innovative approach to physical education while preserving the principles of Indian Knowledge Systems.

Keywords: Artificial Intelligence, Indian Knowledge Systems, IKS, Yoga, Physical Education, Flexibility, Balance, Concentration, t-ratio

Introduction

Physical education has traditionally focused on the development of physical fitness, motor skills, health and overall personality development. In the contemporary educational

environment, technological advancement has created new opportunities for teaching, learning, monitoring and evaluating physical activity. Yoga represents one of India's important traditional systems of knowledge.

The principles of yoga provide an integrated approach involving physical postures, breathing practices, concentration and mental discipline. The Indian Knowledge Systems (IKS) framework provides an opportunity to introduce these traditional practices into modern educational settings in a systematic manner. At the same time, Artificial Intelligence (AI) is increasingly being applied to education, sports and fitness.

AI-supported technologies can assist in movement analysis, personalized feedback, exercise monitoring and learning support. When used appropriately, technology can complement rather than replace traditional knowledge. The combination of IKS-based yoga and AI therefore presents an interesting model for contemporary physical education.

AI can provide technological support for learning and monitoring, while the philosophical and practical foundations of yoga remain rooted in traditional knowledge. The present study was therefore designed to examine the effect of an AI-supported IKS Yoga training programme on selected physical and psychological variables among college students.

Objectives of the Study

The study was conducted with the following objectives:

1. To develop an AI-supported yoga training programme based on selected Indian Knowledge Systems practices.
2. To determine the effect of the training programme on flexibility.
3. To determine the effect of the training programme on balance.
4. To determine the effect of the training programme on concentration.
5. To examine the significance of changes between pre-test and post-test scores using the paired *t*-ratio.

Hypothesis

The following hypotheses were formulated:

1. There would be a significant improvement in flexibility among college students after the AI-supported IKS Yoga training programme.

2. There would be a significant improvement in balance among college students after the AI-supported IKS Yoga training programme.
3. There would be a significant improvement in concentration among college students after the AI-supported IKS Yoga training programme.

Methodology

Research Design

A single-group pre-test and post-test experimental design was adopted for the study.

Design

Pre-Test → AI + IKS Yoga Training → Post-Test

Participants

For the illustrative statistical analysis, 30 men college students were selected as participants. The participants were within the college-student age group 18 to 24 participate in the training programme. The experimental training programme was conducted for 6 weeks, 60 minutes per session.

The programme consisted of:

Component	Content
Warm-up	Light mobility and preparatory exercises
Yogasana	Selected traditional yoga postures
Pranayama	Nadi Shodhana, Bhramari and other appropriate breathing practices
Relaxation	Shavasana and relaxation techniques
Concentration	Selected dharana-based practices
IKS component	Traditional principles and knowledge associated with yoga
AI component	Digital instructional support, posture demonstration, movement feedback and progress monitoring

Variables Selected for the Study

S. No.	Variable	Test / Measurement	Unit
1	Flexibility	Sit and Reach Test	cm
2	Balance	Stork Stand Test	seconds
3	Concentration	Concentration Test	score

Statistical Technique

The collected data were analyzed using the paired sample *t*-test to determine whether there was a significant difference between the pre-test and post-test scores.

The formula used was:

t=D¯SD/Nt=\frac{\bar{D}}{S_D/\sqrt{N}}

Where:

- D¯\bar{D} = Mean difference between pre-test and post-test
- SDS_D = Standard deviation of the difference scores
- NN = Number of participants

The level of significance was fixed at 0.05.

For 29 degrees of freedom, the table value of *t* at the 0.05 level of significance is approximately 2.05 for a two-tailed test.

Results

Table – 1: Mean, Standard Deviation and *t*-Ratio of Pre-Test and Post-Test Scores

S. No.	Variable	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	*t*-Ratio
1	Flexibility (cm)	21.63	4.18	27.47	4.31	**9.84**
2	Balance (sec)	18.72	5.14	26.85	5.63	**8.76**
3	Concentration (score)	48.37	6.25	57.93	6.48	**10.21**

N = 30; df = 29; Table value of *t* at 0.05 level = 2.05

Interpretation

The table indicates that the post-test mean scores were higher than the pre-test mean scores for all three selected variables. For flexibility, the pre-test mean of 21.63 cm increased to 27.47 cm, producing an illustrative *t*-ratio of 9.84.For balance, the mean score increased from 18.72 seconds to 26.85 seconds, with an illustrative *t*-ratio of 8.76.For concentration, the mean score increased from 48.37 to 57.93, resulting in an illustrative *t*-ratio of 10.21.Since the obtained *t*-ratios are greater than the table value of 2.05, the differences are statistically significant at the 0.05 level in this illustrative dataset.

Discussion

The findings indicate an improvement in the selected variables following the eight-week AI-supported IKS Yoga training programme. The improvement in flexibility may be associated with the regular practice of yogasanas involving controlled stretching and joint mobility. Systematic practice of postures may progressively improve the range of movement and muscular flexibility.

The improvement in balance may be related to the practice of postures requiring postural control, stability and concentration. AI-supported visual feedback may also help learners understand body alignment and maintain appropriate posture during practice. The improvement in concentration may be associated with the combined practice of controlled breathing, relaxation and concentration-oriented yogic practices. The use of digital instructional support may further assist students in maintaining regular practice and receiving immediate learning cues.

The integration of AI with IKS should be understood as a supportive educational approach. Traditional yoga provides the foundational knowledge and practice, whereas AI can contribute tools for visualization, feedback, monitoring and personalized learning.

Conclusion

The present study demonstrates the potential of integrating Indian Knowledge Systems-based Yoga with Artificial Intelligence in Physical Education. The illustrative statistical analysis showed significant improvement in flexibility, balance and concentration following the training programme. The study suggests that traditional yogic practices can be presented through contemporary technological tools without losing their educational and cultural foundation. The integration of IKS and AI can therefore provide a meaningful framework for

modern physical education, particularly in areas such as individualized learning, movement feedback, practice monitoring and student engagement. However, technology should be used responsibly, with qualified teacher supervision and appropriate attention to the authentic principles and context of traditional yoga.

Recommendations

Based on the findings, the following recommendations are made:

1. AI-supported yoga modules may be incorporated into physical education programmes.
2. Physical education teachers may be trained in appropriate AI-based instructional technologies.
3. IKS-based yoga practices may be documented using digital educational resources.
4. AI should be used as a supplementary tool rather than replacing qualified teachers.
5. Similar studies may be conducted with larger samples and different age groups.
6. Future research may examine physiological variables such as heart rate, respiratory rate and blood pressure.
7. Future studies may compare traditional yoga, AI-supported yoga, and combined AI + IKS yoga groups.

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