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Prevalence of Iron Deficiency Anemia among Government School Adolescent Girls in Virudhunagar Town-A Cross Sectional Study

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Abstract

Health status in India can be understood with its historical perspective, health concerns and health infrastructure in pre- independence and post- independence phases and the analysis of effectiveness of health care systems for the different expected beneficiaries of the society. This chapter has been organized keeping these aspects in view. Adolescent is one of the most challenging periods in human development. The relatively uniform growth of childhood is suddenly altered by a rapid increase in the growth rate. The sudden changes create nutritional needs. Adolescent is considered as nutritionally vulnerable period for several reasons. The present study has been undertaken as a study of "Prevalence of Iron Deficiency Anemia among adolescent girls in Virudhunagar town government school girls"

Keywords: Adolescent, Iron Deficiency, Anemia, Government Schools

Introduction

In early 1950s the government of India adopted some of the recommendations of the Bhore Committee which were in the form of setting up of Primary Health Centers (PHCs), for providing integrated health services as a part of Community Development Programme. During the first Five Year Plan, family planning Programme was introduced by the Government. The main objective of this plan was to improve the quality of health through a variety of training programmers. At the end of this plan, there were 12,600 hospitals and dispensaries throughout the country. But these facilities were not satisfactory. So the Government setup Mudaliar Committee to review the

infrastructure and functioning of the medical institutions. This committee emphasized the consolidation and integration of health infrastructure.

Health Systems: Historical Perspective

The historical perspective of public health in India can be studied with the help of the following different phases: India has one of the most ancient civilizations in recorded history which existed thousands of years before the Christian era, known as the Indus valley civilization. Excavations in the Indus valley (e.g. Mohenjo-Daro and Harappa civilization) showed relics of planned cities with drainage, house and public baths built of bricks suggesting the practices of environmental sanitation, by the ancient people as far back as 3000 BC.

India was invaded by the Aryans around 1400 BC. It was probably Introduction during this period, the Ayurveda and Siddha systems of medicine came into existence. Ayurveda as a science of life developed a comprehensive concept of health. The Manu Samhita prescribed rules and regulations for personal health, dietetics and hygienic rituals at the time of birth and death, and also emphasized the unity of the physical, mental and spiritual aspects of life. Sarva Jana Sukhina Bhavantu (may all men be free from disease and may all be healthy) was an ancient saying of the Indian ages. This concept of happiness has its roots in the ancient Indian philosophy of life, which conceived the oneness and unity of all people, wherever they lived.

The post Vedic period (600 BC-600 AD) was dominated by the religious teaching of Buddhism and Jainism. Medical education was introduced in the ancient universities of Takshila and Nalanda, leading to the title of Pranacharya. Hospital system and its infrastructure were developed during the period of Rahula (Son of Buddha) for men, women, animals and this system was continued and expanded by King Ashoka. The next phase in Indian history (650 AD-1850 AD) witnessed the rise and fall of the Mughal empire. The Muslim rulers intruded into India around 1000 AD. The Arabic system of medicine, popularly known as the Unani system, the origin of which can be traced to Greek medicine became a part of Indian medicine with changes in the political scenario in India. The torch which was lighted thousands of years ago by the ancient sages grew dim, medical education and medical services become static and the ancient universities and hospitals disappeared.

Health Status: Pre-Independence

The period of British rule have evidences about causes of deaths which has been inferred from small surveys or from special enumerations during epidemics, of plague or cholera. To estimate

population as well as mortality and fertility levels prior to 1871, sketchy information are available which may be interpreted in different ways. Das Gupta and his colleagues (1972) argued that the growth in population was largely during the relatively stable years of Mughal power between 1600 AD and 1675 AD, with little growth from 1675 AD to 1800 AD when Mughal regime declined under the internal strains and external pressures. However, estimates of mortality and fertility between 1800 and 1870 have to be based on data derived from the Censuses after 1871 and more substantial materials from 1851. The life expectancy figures are heavily Introduction dependent on demographic models which may be unrealistic as ages were wrongly recorded or people in some age groups were under recorded. As Alice Clark (1985) has demonstrated, newer techniques less vulnerable to these problems would produce much lower estimates of life expectancy at birth, especially for females, and correspondingly higher death rates.

Generally it is considered that from 1800 to 1921 India had high birth rates (fluctuating to a small extent, but over 40 per 1,000 populations in most years). The peaks in mortality are particularly associated with droughts and famines; in 'normal years, mortality was affected more by endemic diseases and poor living standards. Famines were often followed by epidemics whose effects were magnified by malnutrition in the vulnerable groups during the preceding years has listed incidences of droughts and famines reported between 1729 and 1973. They rarely affected the entire country. From the 1830s onwards, when reporting improved, a famine, scarcity, or draught was reported from somewhere in the country every three years or so argued that there was a much higher frequency of famines in the nineteenth century than in the preceding period, especially in Bengal, with the worst occurring during the fifty years after 1860. Widespread and severe famines and droughts occurred in 1877 and 1878 as well as in 1891 and 1898 (accompanied by an epidemic of plague); and in 1919 and 1920 (preceded by the influenza epidemic).

Before independence, the situation was very critical, the death rate was very high (29.2 per 1000 of population in 1931). About 5.75 per cent of deaths out of total deaths in 1940s were due to cholera, small pox and plague. The life expectancy for male (32.09 years) as well as for female (31.37 years) was very low in 1941.All this happened due to lack of basic and preventive medical facilities. So in order to improve the health status of people, the Indian government adopted modern system of medicine after independence. The government appointed a committee under the chairmanship of Sir Joseph Bhore, which is known as Bhore Committee this committee was appointed by the government of India to review the existing health situation from time to time and to recommend measures for further actions. Brief review of the recommendation of the committee,

which is an important landmark in the history of public health, is given below:

- Integration of preventive and curative services at all administrative levels.
- The committee visualized the development of primary health centers.
- Major changes in medical education which includes 3 months' training in preventive and social medicine to prepare 'social physicians'

Health Status: Post Independence

Several committees were set up by Indian Government Post independence to take care of the needs for further development and expansion of health services in the country.

Committees set up by Indian Government are as follows:

1. Mudaliar Committee was appointed in by the Government of India 1962 which was known as "Health Survey and Planning Committee to make recommendations for further development and expansion of health services. The Committee found that quality of services provided by the primary health centers is inadequate and advised strengthening of the sub-divisional and district hospitals so that they may effectively function as referral centers.

2. After that Chadha Committee was appointed by the Government of India (1963) under the chairmanship of Dr. M.S. Chadha to study necessary arrangements for the maintenance phase of the National Malaria Eradication programme. The Committee recommended that vigilance through medical institutions must be developed to the fullest extent. All medical institutions, Government or Non-Government private medical practitioners, irrespective of the system of medicine they practice, and all professional and other workers should be harnessed. The members of panchayats, block development committee, Mahila mandals, youth clubs, other voluntary agencies, teachers, etc. should participate and efforts should be so made that every village, hamlet or locally has one "voluntary collaborator." All efforts should be made to establish primary health centers provided for in the current plan period particularly for in the areas entering the maintenance phase. The States that have a plan programme for establishing a-certain number of midwifery or maternity and child health centers every year should give priority to introduction their establishment in the areas deficient in adequate medical coverage. In urban areas, institutional case detection should be the mainstay. The major medical institutions with heavy out-patient attendance should have a person specially detailed to take clinical samples including blood smears. These institutions should have a separate clinical side-room.

3. Jungawalla Committee on Integration (1967) looked into various problems related to

integration of health services, abortion of private practice by doctors in government services, and the service conditions of doctors. This Committee recommended integration of all levels of health organizations in the country.

4. Multiple activities of the mass programmers like family planning, smallpox, leprosy, trachoma, etc. were making it difficult for the states to undertake them effectively because of paucity of funds. This matter came for discussion at a meeting of the Central Council of Health held in Bangalore in 1966. The Council recommended that those related questions may be examined by a Committee of health secretaries under the Chairmanship of the Union Health Secretary, Shri B. Mukerji (1968). The Committee worked out details of the basic health services which should be provided at the block level.

5. Kartar Singh Committee (1973) was constituted to form a framework for integration of health and medical services at peripheral and supervisory levels. It recommended that various categories of peripheral workers should be amalgamated into a single cadre of multipurpose workers (male female). The works of 3-4 male female multipurpose workers was to be supervised by one health supervisor. One primary health centre should cover a population of 50,000. It should be divided into 16-sub-centre (one for 3000-3500 population) each to be staffed by a male and a female health worker (Jungawalla Committee on Integration (1967) looked into various problems related to integration of health services, abortion of private practice by doctors in government services, and the service conditions of doctors. This Committee recommended integration of all level of health organizations in the country.

6. Srivastava Committee was set up in 1974 as “Group on Medical Education and Supports Manpower” to determine the steps needed as well as to identify the priorities, and develope a curriculum for health assistants, who were to function as a link between medical officers and multipurpose health workers and who were supposed to provide health care, family welfare and nutritional services. It recommended that a cadre of semi-professionals at village level health workers should be developed within the community. Steps should be taken to develop a referral system from Primary Health Centers (PHCs) to hospitals at tehsil, district and regional levels and the medical colleges. A medical and health education commission on the lines of University Grant Commission should be established. Acceptance of the recommendations of Srivastava Committee in 1977 led to the launching of the Rural Health Scheme.

Adolescence is a critical stage in the life cycle, when the health of females is affected due to growth spurt, beginning of menstruation, poor intake of iron due to poor dietary habits and gender bias. Iron deficiency anemia affects over 60% of the adolescent girls in India. Anemia in adolescent girls has far-reaching implications. The anemic adolescent girls grow into adult women with compromised growth, both physical and mental. These women have low pre-pregnancy weight, and are more likely to die during childbirth and deliver low birth weight babies.

Table 1: Periods of development in adolescence

Early adolescence	(10 -13 years)
Middle adolescence	(14 – 16 years)
Late adolescence	(17 -20 years)

Iron is one of the micronutrient. It is used for formation of hemoglobin, oxygen transportation, brain development, regulation of body temperature and muscle activity. When the iron is decreased in human body, it is called as iron deficiency. Iron deficiency is the most common etiological factor in anemia. The decreased hemoglobin level is called as iron deficiency anemia. Anemia is a serious public health problem, which affects the mental and physical development, as well as health maintenance and work performance. Iron deficiency is by far the most common cause of anemia worldwide. About 2 billion people suffer from varying degrees of anemia in developing countries. Iron deficiency occurs when insufficient iron is absorbed to meet the body's needs. This may be due to inadequate iron intake, poor iron absorption, increased iron need or chronic blood loss. Prolonged iron deficiency leads to iron deficiency anaemia.

Table 2: Cut–off points for the diagnosis of anemia

Age Group	Hemoglobin level
Children 6 month-6 years	11
Children 6-14 years	12
Adult male	13
Adult female (Non pregnant)	12
Pregnant woman	11

Source: K. Park, (2000). Text book of Preventive and social medicine, 16th edition

Statement of the Problem

Adolescent is one of the most challenging periods in human development. The relatively

uniform growth of childhood is suddenly altered by a raped increase in the growth rate. The sudden changes create nutritional needs. Adolescent is considered as especially nutritionally vulnerable period for several reasons. First they have an increased demand for nutrients because of the dramatic increase in physical growth and development. Second the change in the life style and food habits of adolescent effect nutrients intake and needs. Third adolescence nutrient needs are affected by participation in sports, pregnancy, and development of an eating disorder, excess diet, use of alcohol and drugs or some other situations. In world health report of World Health Organization (WHO) states that the world wide mortality rate of iron deficiency anemia is 60,404,000 in 2005. High prevalence of iron deficiency anemia reflects their poor status of nutrition because of their rapid growth combined with poor eating habits and menstruation.

Estimates suggest that over one third of the world's population suffers from anemia, mostly iron deficiency anemia. India continues to be one of the countries with very high prevalence. National Family Health Survey (NFHS) reveals the prevalence of anemia to be 70-80% in children, 70% in pregnant women and 24% in adult men. Prevalence of anemia in India is high because of low dietary intake, poor availability of iron and chronic blood loss due to hook worm infestation and malaria. Anemia has also well-known adverse effects on physical and cognitive performance of individuals, the true toll of iron deficiency anemia lies in the ill-effects on maternal and fetal health. Poor nutritional status and anemia in pregnancy have consequences that extend over generations. Against this backdrop the present study has been undertaken as a study of "Prevalence of Iron Deficiency Anemia among adolescent Girls in Virudhunagar town government school girls"

Hypothesis of the Study

There is no significant difference in the importance rating given by the respondents regarding the problem faced by sleeping pattern, menarche history.

Objectives of the Study

The following are the specific objectives of the present study are:

1. To study the socio-economic conditions of the school going adolescent girls in government school.
2. To access the health conditions of the school going adolescent girls in government school.
3. To examine the menarche history of the sample respondents.
4. To providing various suggestions for reducing iron deficiency anemia in the study area.

Methodology of the Study

Any research study requires a well-planned and systematic methodology. A clear understanding of the methodological process provides essential training and equips researchers to conduct their work in a more structured and scientific manner. This section explains the methodology adopted for the analysis of data, covering the nature of the study, the database used, sampling procedures, and methods of data analysis, the period of the study, limitations, and the overall chapter scheme.

Nature of the Study

The study is based on cross sectional data collected through the survey method with the help of pre-Interview schedule specially designed for collecting comprehensive information. It describes the iron deficiency of anemia among the government school girls in Virudhunagar town.

Sampling Technique

There is only one government girl's school in the study area. In that school those who are in the age group of above 13 were consider as a adolescent girls. There are 950 adolescent girls were studying in that school. Out of 950 adolescent girls 10% were selected for the study purpose with the help of simple random sampling method. The equal weight age has given at the time of selecting a sample. At the end 95 adolescent girls were selected for the study purpose.

Data Base

Relevant and required data pertaining to the present study had been collected form primary sources. For collection of information from the households a pre-tested and structured interview schedule has been used. Information collected through direct field enquiries from the respondents. The completed schedules were checked and the omissions were rectified on the spot. The secondary sources of information have been collected from published sources like books, journals, periodical, etc.

Method of Data Collection

The method of data collection is direct personal interview with the sample respondents with pre tested interview schedule while collecting primary data. Primary data collected from the school going adolescent girls in government school.

Data Analysis: The collected data have been analyzed and interpreted using statistical tools. After the data collection the master table has been prepared. The simple systematic tables have been

formulated and also used chi-square test and percentage analysis.

Study Period: The present study covers a period of three months i.e., from November 2014 – January 2015. The field study survey was conducted during this period for data collection.

Review of Literature

Hall G.S. (1844-1924) was first psychologist who systematically conducted research on adolescents in the beginning of the present century and collected enormous data on adolescents. According to his study, adolescent in terms of psychological changes occurring in adolescents. He begins this period from 10-13 years of age and ends when full adult status is attained by 22-25 years of age. It is found that adolescence is a period of storm and stress.

Erikson (1964) a famous psychoanalyst, who developed very comprehensive theory of human development, stated that adolescence as a period of rapid changes physical, physiological, psychological and social.

According to Adams (1973) "Adolescence can be defined as a holding period in which education maturating and waiting are the major tasks to be faced." For this reason it seems scarcely profitable to define adolescence as being tied with age. It is the time when child begins to feel a lesser need for the security of familial supervision and protection at the time when physiological and hormonal development begins to approximate adult maturity and lastly when psychological maturing moves in the child in the direction of becoming responsible in society adolescence has begun.

Pastides (1981) initiated a study in order to estimate and compare the occurrence of nutritional anemia in three groups of adolescents and young adults. The first group comprised 159 individuals aged 14-21 years, who had been previously screened for thalassemia in three cities of England. The second group was comprised of 163 Derby High School students, aged 14-18 years, who had also been previously screened for thalassemia. The third group consisted of 118 Yale undergraduate students, aged 16-21 years, who were monitored for nutritional anemia while undergoing routine physical examinations at the Yale University Health Service. The prevalence of nutritional anemia varied from 0.0% to 5.5% among the three female groups, and from 4.4% to 17.9% among the three male groups. Only the Yale undergraduate male group was found to be anemic and the Yale undergraduate females were discovered to have the highest prevalence.

Chauhan (1983) stated that the adolescence is the most important period in human development about which poets, writers and historians have made occasional references and have

held esteem the sacrifices made by the adolescences. It is the transaction period and turning point in the life of the individual.

Switoniak *et al.* (1992) in their study found the prevalence of iron deficiency anemia in 224 women aged 31-47 years, working in textile industry. Anemia was found in 11.2% participating women, evident iron deficiency was found in 13.4% of population.

Results and Discussion

Table 3: Age Wise Distribution of the Sample Respondents

Age (in years)	Anemic (<10.0 g %)		Normal (≥ 10.0 g %)		Total	Percentage of anemic	p-value
	Count	% age	Count	% age			
13	11	11.6	6	6.3	17	65	0.58
14	16	16.8	19	20.0	35	46	
15	6	6.3	5	5.3	11	55	
16	15	15.8	17	17.9	32	47	
Total	48		47		95		

*Source: primary data - *P < 0.05 show the significant results, χ2 = 1.93*

Table 4: Family Structure of the Sample Respondents

Type of Family	Anemia (<10.0 g %)		Normal (≥ 10.0 g %)		Total	Percentage of Anemic	p-value
	Count	% age	Count	% age			
Joint	12	12.6	8	8.4	20	60 %	0.34
Nuclear	36	37.9	39	41.1	75	48 %	

*Source: primary data - *P < 0.05 show the significant results, χ2 = 0.91*

Table 5: Family Structure of the Sample Respondents

Type of Family	Anemia (<10.0 g %)		Normal (≥ 10.0 g %)		Total	Percentage of Anemic	p-value
	Count	% age	Count	% age			
Joint	12	12.6	8	8.4	20	60 %	0.34
Nuclear	36	37.9	39	41.1	75	48 %	

*Source: primary data - *P < 0.05 show the significant results, χ2 = 0.91*

Table 6: Respondent's Standard of Enrollment in School

Enrollment in school	Anemic (<10.0 g %)		Normal (≥ 10.0 g %)		Total	Percentage of anemic	p-value
	Count	% age	Count	% age			
7-8	6	6.3	5	5.3	11	54.5	
9-10	34	35.8	29	30.5	63	53.9	
11-12	8	8.4	13	13.7	21	38.0	
Total	48		47		95		0.43

*Source: primary data - *P < 0.05 show the significant results, χ2 = 1.67*

Table 7: Literacy Status of the Sample Respondents Mother

Literacy Status of Mother	Anemic (≥ 10.0 g%)		Normal (≥ 10.0 g%)		Total	percentage of anemic	p-value
	Count	% age	Count	% age			
Illiterate	35	36.8	14	14.7	49	71.4	
Up to higher secondary	9	9.5	23	24.2	32	28.1	0.01
Graduate	4	4.2	10	10.5	14	28.5	
Total	48		47		95		

*Source: primary data - *P < 0.05 show the significant results, χ2 = 8.95*

Table 8: Body Mass Index of the Sample Respondents

Body Mass Index	Anemic (<10.0 g%)		Normal (≥ 10.0 g%)		Total	Percentage of anemic	p-value
	Count	% age	Count	% age			
Under	18	18.9	16	16.8	34	52.9	
weight							
(below 18.5							
kg)							
Normal	29	30.5	27	28.4	56	51.7	
weight							
(18.5-24.9)							0.37
Over weight	1	1.1	4	4.2	5	20	
(25-29.9)							
Total	48		47		95		

*Source: primary data - *P < 0.05 show the significant results, χ2 = 1.98*

Table 9: Clinical Signs and Symptoms of the Sample Respondents

Clinical Signs		Anemic (<10.0 g %)		Normal (≥ 10.0 g%)		Total	Percentage of anemic	p-value
		Count	% age	Count	% age			
Eye	Normal	42	44.2	35	36.8	77	54.5	0.10
	Watery	3	3.2	8	8.4	11	27.2	
	Dry	3	3.2	4	4.2	7	42.8	
Tongue	Normal	41	43.2	34	35.8	75	54.6	0.12
	Pale	3	3.2	5	5.3	8	37.5	
	Red	4	4.2	8	8.4	12	33.3	
Skin	Normal	30	31.6	22	23.2	52	57.6	0.12
	Pale	5	5.3	15	15.8	20	25	
	Dry & Rough	13	13.7	10	10.5	23	56.5	
Teeth & Gum	Normal	23	24.2	25	26.3	48	47.9	0.61
	Discolored	10	10.5	12	12.6	22	45.4	
	Bleeding	15	15.8	10	10.5	25	60	

Source: primary data

**P < 0.05 show the significant results, χ2 = (eye 2.62, tongue 2.44, skin2.36,teeth&gum 0.26)*

Table 10: Health Status of the Sample Respondents

Health status	Anemic (<10.0 g %)		Normal (≥ 10.0 g %)		Total	Percentage of anemic	p-value
	Count	% age	Count	% age			
Breathlessness	1	1.1	2	2.1	3	33.3	0.635
Weakness	10	10.5	5	5.3	15	66.6	
Tiredness	2	2.1	1	1.1	3	66.6	
Irritability	2	2.1	2	2.1	4	50	
None	33	34.7	37	38.9	70	47.1	

*Source: primary data - *P < 0.05 show the significant results, χ2 = 2.52*

Table 11: Absent in School due to Sickness by the Sample Respondents

Absent in school due to sickness	Anemic (<10.0 g %)		Normal (≥ 10.0 g %)		Total	Percentage of anemic	p-value
	Count	% age	Count	% age			
Never	23	24.2	17	17.9	40	57.5	0.001
Sometimes	19	20.0	20	21.1	39	48.7	
Often	6	6.3	10	10.5	16	37.5	

*Source: primary data - *P < 0.05 show the significant results, χ2=17.364*

1. Among the sample respondents, the highest proportion (65%) of anemic cases was observed in the 13-year age group.
2. A maximum of 60% of anemic respondents belonged to nuclear family structures.
3. Overall, the prevalence of anemia among girls was lower (45.8%) in families with only 1–3 members.
4. A majority of anemic girls (54.5%) were studying in the 7th–8th standard.

5. The highest proportion of anemic respondents (71.4%) had mothers who were illiterate. This finding statistically supports the notion that a mother's educational status may influence the anemia status of her child.
6. The highest proportion of anemic respondents (65.4%) had fathers who were illiterate. This finding raises the question of whether the educational status of the father significantly influences the anemia status of the respondents, warranting statistical verification.
7. A considerable proportion of the respondents (30.5%) fell within the normal category.
8. More than half of the anemic respondents (52.5%) exhibited an average body appearance.
9. The highest proportion of anemic respondents (63.1%) presented with dry eyes.
10. More than half of the anemic respondents (54.6%) exhibited a normal tongue on examination.
11. A majority of anemic respondents (57.6%) had normal skin findings.
12. Nearly half of the anemic respondents (47.9%) had normal dentition.
13. The largest proportion of anemic respondents (66.6%) reported symptoms of weakness and tiredness.
14. Majority of anemia i.e 60.5 percent of the sample respondents are those who do not have the habit of skipping food.
15. The highest percentage groups i.e 61.0 percent of the sample respondents are those who eat more than really need
16. Between the two groups i.e 54.0 percent are those who do not take junk food.
17. The highest percentage between the two groups i.e 75.4 percent are those who tried dieting always.
18. The highest percentage between the two groups i.e 57.5 percent are those who never absent in school due to sickness.
19. Between the two groups i.e 54.8% are those who always believe balanced diet
20. The highest percentage between the two groups i.e 60 percent are those who never believe slim concept
21. Between the two groups i.e 64 percent are those who never have the habit of eat food watching TV.
22. The highest percentage between the two groups i.e 62.5 percent are those who take boiled water often only.
23. The highest percentage between the two groups i.e 52.7 percent are those who always had packed school lunch.
24. The highest percentage between the two groups i.e 70 percent of the respondents consumed

green vegetables always.

25. The highest percentage between the two groups i.e 61.9 percent of the respondents consumed fruits always.
26. The highest percentage between the two groups i.e 64 percent of the respondents consumed milk always.
27. The highest percentage between the two groups i.e 60 percent are those who sometimes spend leisure time in outdoor games.
28. The highest percentage between the two groups i.e 58.8 percent are those who never give a important in exergues regularly.
29. The highest percentage between the two groups i.e 65 percent are those who never watching TV, and 60% are often browsing computer, and 55.5% are always simply sitting.
30. The highest percentage between the two groups i.e 54.2 percent are those who always believe Physical inactivates got negative effect on their health.
31. The highest percentage between the two groups i.e 60.8 percent are those who never spend leisure time in extracurricular activities.
32. The highest percentage between the two groups i.e 62.9 percent are those who never interested to maintain body built appropriates.
33. The highest percentage between the two groups i.e 64.1 percent are those who never take part in physical activities.
34. The highest percentage between the two groups i.e 80 percent are those who always feel difficulty in falling sleep, and 53.3 percent are sleep 4-6 hours every night in sometimes, and 61.5 percent are always have the habit of sleeping in late night.
35. The highest percentage between the two groups i.e 57.1 percent are those who never feel adequate sleep give positive effect in their health, and 72.2 percent are never feel sleep in class room.
36. Majority i.e 30.5 percent of the sample respondents are those who said the year to attempt first menarche.
37. Majority i.e 20.0 percent of the sample respondents are those who have the menopausal syndrome in vomiting.
38. Majority of anemic i.e 52.1 percent of the sample respondents had monthly cycle duration more than 28 days.
39. The highest percentage of anemic i.e 53.7 percent had regular cycle.
40. Majority of respondents did not have complaint of any type of past illness.

41. Majority i.e 17.9 percent of the sample respondents are those who take special care is maintain hygiene & used clean cloth.
42. Majority i.e 41.1 percent of the sample respondents go to school during menstruation period.
43. Highest percentage i.e42.1 percent takes medicine during menstruation.

Suggestion

Measures which can be implemented for adolescent girls in order to improve their nutritional status (especially iron level) are:

Inclusion of iron rich foods and regularity of meals need to be established among the adolescent girls. Foods like green leafy vegetables, meat, chicken, pulses and egg to be consumed in abundance so as to improve the nutritional stores of the body. Moreover vitamin C rich fruits should be consumed to enhance iron absorption. Fortification of widely consumed foods with iron/float regular deforming of adolescents. The strategy for Nutrition intervention in adolescence suggests components of promotion, prevention and treatment. Thus, promoting adequate nutrition with adolescents means enhancing control of adolescents over their food and food resources and improving their access to appropriate nutrition services in addition to strengthening food related skills and encouraging healthy eating and lifestyle. Prevention focuses on specific condition like malnutrition and specific micronutrient deficiencies. Treatment includes health care services to deal with nutritional aspects diseases in adolescents in an appropriate manner.

Conclusion

From the present study it was revealed that anemia is a major health problem among adolescents especially girls. Because of lack of proper information regarding dietary habits adolescents have a habit of skipping their meals because they are more conscious about their body structure. Anemia could be also the result of heavy periods and reduced iron intake, thus govt. should promote awareness programs in schools which will lead to healthy eating patterns and selection of appropriate foods. They should also be given education about enhancing factor intake of vitamin C which helps in the absorption of iron. From the study it was concluded that overall nutritional status of adolescent girls was not up to the mark. Clinical examination showed that girls had signs of various deficiencies. BMI of adolescent girls was less than the standard. The intake of all the nutrients was found less than recommended dietary allowances.

References

Adams, J.F. (1973). Understanding Adolescents Current Developments in Adolescent Psychology. 2nd edition, Stanley O. and Kochman.

Agarwal, D., & Agarwal, D.K (2002). Nutritional anaemia and its control, Indian Journal of Pediatrics, 69 (7), 607-616.

Abdelrahim, I.I., Mahgoub, H.M., Mohamed, A.A., Ali, N.J., Elbashir, M.I & Adam,I (2009). Anaemia, Folate, Zinc and Copper Deficiencies among Adolescent Schoolgirls in Eastern Sudan. Biological trace element research, 132 (1-3), 60-66.

Adamson (1996). A longitudinal study of change in food habits between adolescents 11-12 years and adult hood. Oxford Journal of Public Health pp 32-33

Agarwal, K.N., Gomber, S., Bisht, H & Som, M. (2010). Anaemia prophylaxis in adolescent School girls by weekly or daily iron-folate supplementation. Indian Pediatrics, (40) 296-301

Agarwal., Madhu. (2010). A Study on impact of iron folic acid along with vitamin C on the hemoglobin status of adolescent girls in an ICDS block, Lucknow. NIPCCD Regional Centre, 77 DCWC Research Bulletin, XV (2).

Agdeppa, I.A., Schultink, W., Sastroamidijojo, S., Gross, R., & Karyadi, D. (1997).Weekly micro-nutrient supplementation to build iron stores in Indonesian adolscents: American Journal of Clinical Nutrition, (66) 177-183.

Ahmed, F., Khan, M.R., Islam, M., Kabir, I & Fuchs, G.J. (2000). Anaemia and ironDeficiency among adolescent schoolgirls in peri-urban Bangladesh, European Journal Clinical Nutrition (54) 678-683.

Aikawa, R., Ngyen, K.,C. Sasaki, S & Binns, C.W. (2006). Risk factors for iron- deficienc anaemia among pregnant women living in rural Vietnam. Public Health Nutrition, 9(4), 443-448.

Akhter Shabnum , (2003). “A study of health and nutritional status of school going children in the age of (6-12 years) in the schools of Pattan block”. Unpublished M.Sc dissertation Institute of Home Science, University of Kashmir.

Akkamahadevi, K.H., Kasturiba, B. and Rao M.(1998). Prevalence of anaemia in urban and rural

adolescent girls. 31(4) Journal of Agriculture Sciences.

Akramipour, R., Rezaei, M., and Rahimi, Z. (2008). Prevalence of iron deficiency anaemia among adolescent school girls from Kermanshah, Western Iran. Hematology,13(6),352-5.

Al Mousa,M., Prakash,P., Jackson,R.T & Al (2003). A comparison of selected nutrient intakes in Anemic and non Anemic adolescent girls in Kuwait. Nutrition Research, (23),425–433.

.Alaofè, H., Zee, J., and Turgeon, O. Brien. H. (1996). Dietary iron and iron deficiency anaemia among adolescent girls from Benin: Rev Epidemiol Sante Publique. 55(3), 187-96

Al-Buhairan AM& Oluboyede OA.(2001). Determination of serum iron, total iron-bindingcapacity and serum ferritin in Saudi adults. Annals of Saudi medicine,

Al-Sayes, F., Gari , M., Qusti, S., Bagatian ,N & Abuzenadah, A. (2010). Prevalence of iron deficiency and iron deficiency anaemia among females at university stage. Journal of Medical Laboratory and Diagnosis, 2(1) pp. 5-11.

Al-Sharbatti,S.S., Al-Ward,N.J & Al-Timimi, D.J (2003). Anaemia among adolescents. Saudi Medical Journal (2),189-194

Amine E.K, .AL-Awadi FA (1996).utritional status survey of preschool children in Kuwait. East Mediterr Health 2 (3) :386-95

Anand, K., Kant,S., Kapoor,SK. (1999). Nutritional Status Of Adolscent School Children In Rural North India. From the Comprehensive Rural Health Services Project, Ballabgarh, All India Institute of Medical Sciences, New Delhi 110 029, India. (29)1203-1268.

Chauhan, S.S. (1983). Psychology of Adolescents. Allied Publishers Pvt. Ltd.

Creed–Kanashiro, H.M., Uribe, T.G, Bartolini, R.M, Fukumoto, M.N, Lopez,T.T,Zavaleta, N.M & Bentley, M.E. (2000). Improving Dietary Intake to Prevent Anaemia in Adolescent Girls through Community Kitchens in a Periurban Population of Lima, Peru,American Society for Nutritional Sciences J. Nutrition, 130: 459 S–461S.

Merkel, D., M., Huerta., I., Grotto., D., Blum., O., Tal., E., Rachmilewitz., E., Fibach, Y.,Epstein & O. Shpilberg (2005). Prevalence of iron deficiency and anaemia among strenuously trained adolescents. J. Adolescent Health, 37(3), 220- 3.

Deepa, K.S., Pushpabharati and Kasturiba, B.(2004). Seasonal variation in iron status of adolescent girls in Dharwad taluk. J. Human Ecology, 15 (3),175-178.

Devi, T.A. and Uma, K.R., (2005). Effect of supplementation of spirulina on Anemic adolescent girls. The Ind. J. Nutr and Dietetics, 42, 534-539.

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