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Prevalence of Iron Intake and Dietary Practices among Adolescent girls- A School based Study in Kozhikode District of Kerala

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Abstract

Adolescents should be considered as the treasure of a nation. For a developing country like India, it is important to provide ample opportunities for their better health and development. One of the important problems faced by these girls is anemia due to iron deficiency and the root cause is lack of balanced diet. This study is in a connotation to assess the prevalence of iron supplementation and the dietary pattern. . Body Mass Index is also calculated. This is a school based cross sectional study conducted among 139 higher secondary level adolescent girls from Kozhikode district of Kerala using a pre structured questionnaire during February 2016. The study results protrudes that haemoglobin level was tested only by a minority and iron supplementation was also not sufficient. Skipping of breakfast and use of junk food items were prevalent. Drinking water consumption was not at satisfactory level. Dietary intake of the girls are not sufficient enough to meet the required daily need of nutrients. Awareness programs and health camps along with effective and periodic evaluation from school and home can tackle the problem to some extent.

Key words- *Adolescents, Haemoglobin, breakfast, iron, Body Mass Index*

Introduction

Adolescence, the period of growth spurt need adequate nutrition for growth and sexual maturation. Women's reproductive health is largely influenced by the state of their health during infancy, childhood and adolescence. In order to improve the chances of child survival and safe motherhood, balanced diet is a must.

Iron is necessary for many functions in the body including formation of haemoglobin, brain development and function, regulation of body temperature, muscle activity and catecholamine metabolism. Lack of iron directly affects the immune system. A haemoglobin level 10-11g/dl has been defined as early anaemia; a level below 10gm/dl is marked as anaemia .Prevalence of anaemia is high in India. Iron deficiency can arise either due to inadequate intake or poor bio-availability of dietary iron or due to excessive losses of iron from the body (menstruation, hookworm /malaria infestation among adolescent girls)

The Ministry of Health and Family Welfare has launched the Weekly Iron and Folic Acid Supplementation (WIFS) Programme to meet the challenge

of high prevalence and incidence of anaemia amongst adolescent girls and boys. Administration of supervised Weekly Iron-folic Acid Supplements of 100mg elemental iron and 500ug Folic acid using a fixed day approach

Obesity may be defined as an abnormal growth of the adipose tissue due to enlargement of fat cell size. It is the most prevalent form of mal nutrition and one of the significant contributors to ill health. Body mass index is the simple index of weight –for height commonly used to classify underweight, overweight and obesity.

Summary of RDA (Recommended Dietary Intake index-2010) for Indians, shows girls 16-18 years (52.1kg) need 2440Kcal/daily from balanced diet. Which contains 55.5g/d protein, 35g/d visible fat, 800 mg/d calcium, 26mg/d Iron, 12mg/d zinc, 235mg/d magnesium etc along with vitamins. The main source of energy in diet is carbohydrates derived largely from cereals (80% of diet and 50-80% energy intake) .Healthy eating habits leads to physical, mental and social growth in this transitional period. But their choice of food related to peer pressure and advertisements is not related to nutrition .Healthy eating habits are followed only by a few. Excess energy intake from junk food and minimal physical activity can lead to problems with overweight and obesity.

Our teens are always behind 'tasty' food without thinking about their health .They like junk food and sometimes skip breakfast for acquiring a slim body. This may lead to so many problems like underweight, anaemia, obesity, eating disorders, reproductive health problems, Low Birth Weight babies etc. As future mothers, health of adolescent girl is very important. In this situation this study is an attempt to analyse the prevalence of iron intake, BMI and dietary practices of adolescent schoolgirls.

Objectives

1. To study the prevalence of iron intake and dietary practices among adolescent girls.
2. To assess Body Mass Index of the study population

Review of literature

Anthropometric measures of obesity in childhood such as BMI have previously been shown to be associated with measures of obesity in adult hood, for all studies and across all ages, the risk of adult obesity was at least twice as high for obese children compared to non-obese children (Serdula MK et al ,1993)

The nutritional status of an individual is often the result of many interrelated factors. It is influenced by the adequacy of food intake both in terms of quantity and quality and also by the physical health of the individual (WHO, 1978) .The extent of undernutrition was high among adolescents and was higher among boys than girls. Adolescent girls in the rural areas could be at greater risk of nutritional stress because of early marriage and early conception before completion of their physical growth (K Venkaiah, K Damayanti, M U Nayak and K Vijayaraghavan,2002).

The high prevalence of dieting behaviours suggests that urban adolescents should be reached with appropriate interventions. Safe dieting strategies should be an integral part of any nutrition education and weight loss

intervention (Calderon LL, Yu CK, Jambazian , 2004).

A significant association of anaemia was found with socio-economic status and literacy status of parents (Sanjeev M Chaudhary and Vasant R Dhage , 2008)

The treatment of overweight and obesity in children and adolescents requires a multidisciplinary, multi-phase approach, which includes dietary management, physical activity enhancement, and restriction of sedentary behaviour, pharmacotherapy and bariatric surgery (Manu Raj and R Krishna Kumar ,2010)

Adolescents are not the sole decision-makers. Parents, particularly mothers, often make decisions on their behalf, and they need to be sensitized about diet and nutritional needs in adolescence and adverse effects of undernutrition of adolescents to change their mind set (Nurul Alam, Swapan Kumar Roy, Tahmeed Ahmed and A.M .Shamsir Ahmed ,2010)

Materials and methods

In this Observational-Descriptive- Cross sectional study among 139 adolescent girls from REC Government vocational Senior Secondary School, Kozhikode district, Kerala during February-2016, a Pre designed, Pre tested questionnaire including personal details, socio economic background, height and weight measurement, dietary practices etc. were used.

Data obtained by convenient sampling method were collated and analysed statistically by using mean, standard deviation, frequencies, range and percentile.

2 to 20 years: Girls Body mass index-for-age percentiles chart by CDC used to calculate BMI level. BMI (Quetelet's index) calculated by using the formula

$$= \frac{\text{weight (kg)}}{\text{Height}^2 \text{ (m)}}$$

Results and discussions

All the parents of the study population are literate and among them 82% have studied up to higher secondary level. Most of them are engaged in unskilled to skilled work. Among mothers, 85% are not working. Monthly income level show that 60% of the families in the study population fall in the category of 20 thousands/month and the rest in the group ranging from 20 to 40 thousands. Religious status shows 64% Hindus, 31% Muslims and only 1% Christian. Majority of these adolescent girls have siblings (98%). Mean age of the study population is 16.03.

Table -1-Usage and source of iron tablets among the study population

Intake of iron tablets	Frequency	Percent
Regularly	17	12.2
Occasionally	58	41.7
Not using	64	46.0
Source of iron tablets		
School	38	27.3
Health centre	17	12.2
Medical shop	20	14.4
Not using	64	46.0
Total	139	100

Iron is of great importance in human nutrition and its deficiency cause anaemia. 15% of the students reported that they have symptoms of anaemia like fatigue and paleness, 35% have no such symptoms, but half of the respondents couldn't identify the symptoms clearly.

Even though it is important to test haemoglobin level only 13.9% tested their haemoglobin level and the remaining (86.1%) have not tested their Hb level. Among the tested cases 52.5% reported that their Hb level was <10 gm% and 47.48% have an Hb level of 12gm% and above.

India probably has the highest prevalence of nutritional anaemia in women and children. The most frequent cause of anaemia is iron deficiency .Iron supplementation is important for adolescent health. In the present study only 12.2% taking iron supplementation regularly, 41.7% occasionally and 46% are not taking iron supplementation. Among the 54% users, only 27% are comfortable to collect from the school, 12.2% depending on health centres and the remaining 14.4% buying from medical stores.

Mean age at menarche in the Study population is 13.14 years with SD of 0.878. The minimum age at menarche is 11 and the maximum is 16years. Among the girls 58.5% attained menarche within 13 years. Considering menstrual cycle 67 % have normal cycles while 33% have irregular periods.

Table-2-Body Mass Index of the study population

BMI		
N	Valid	139
Percentiles	1	14.52
	5	14.75
	10	15.31
	20	16.23
	30	16.88
	40	17.11
	50	17.52
	60	18.07
	70	19.22
	80	20.54
	85	20.93
	90	21.82
	95	23.12
	100	25.96

Percentile 1-100

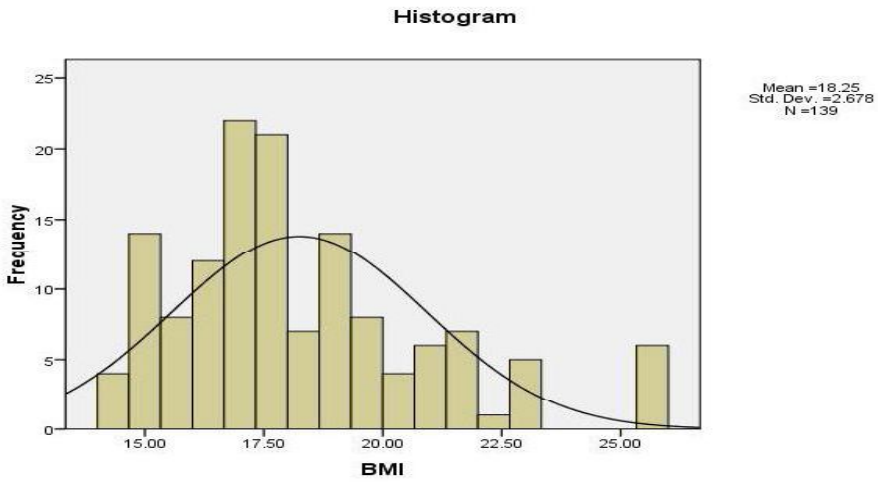

Fig-1- Body Mass Index of the study population

Anthropometric measurements of the girls show a minimum BMI of 14.44 and maximum of 25.96 within a range of 11.52 .According to the chart ,Body mass index-for-age percentiles-2-20year girls by CDC growth chart 5 (3.6%) coming under 5th percentile considered underweight .109 (78.41%) between 5th percentile to less than the 85th percentile considered normal healthy weight. 16(11.51%) coming under 85th to less than the 95th percentile considered Overweight. 9 (6.47) Equal to or greater than the 95th percentile is Obese. It is difficult to provide healthy weight ranges for children and teens because the interpretation of BMI depends on weight, height, age, and sex.

Table-3 Classification of respondents on daily intake of drinking water

Drinking water (glass)	Frequency	Percent
2	12	8.63
4	53	38.12
5	24	17.3
8	28	20.14
10	19	13.66
>10	3	2.15
Total	139	100.0

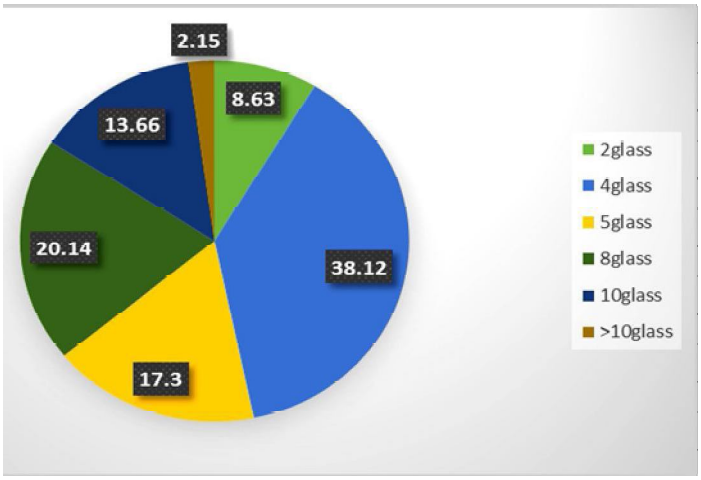

Fig-3- Respondents on daily intake of drinking water

A minimum of 8 glass drinking water is needed daily for the proper health and development of human beings.35.95% of the respondents have a daily intake of 8 glasses and above. 64.05% less than 8 glasses and among them 8.6% taking only 2glasses daily

Table-4- Intensity of Breakfast skipping among the study population

Intensity of Breakfast skipping	Frequency	Percent
Not skipping	78	56.1
Once in a week	33	23.7
Twice in a week	5	3.6
Thrice in a week	7	5.0
Occasionally	13	9.4
Always	3	2.1
Total	139	100

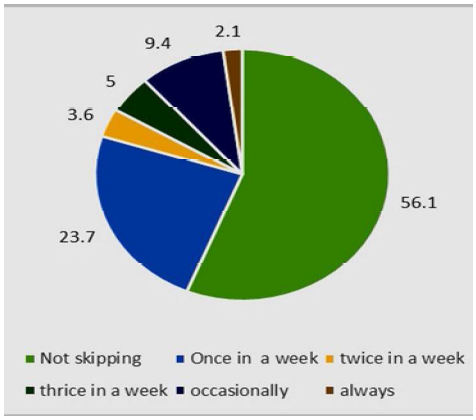

Fig-4- Intensity of Breakfast skipping among the study population

Breakfast is the food of brain. 44% girls in the study population skipping breakfast. While considering the intensity of skipping, 23.7% once in a week and 8.6% twice and thrice in a week and 9.4% occasionally skipping breakfast. But 2.1% always avoiding breakfast and is a serious problem.

Analysing the reason of skipping breakfast, 34.65% opined that they had no time for breakfast and 9.35% for slim body image. Usage of junk food items are common among children and adolescents.15% of the girls are regular users. 58% occasionally and 27% minimum once in a week using junk food. Nobody show habit of eating disorders like anorexia, bulimia or binge eating.

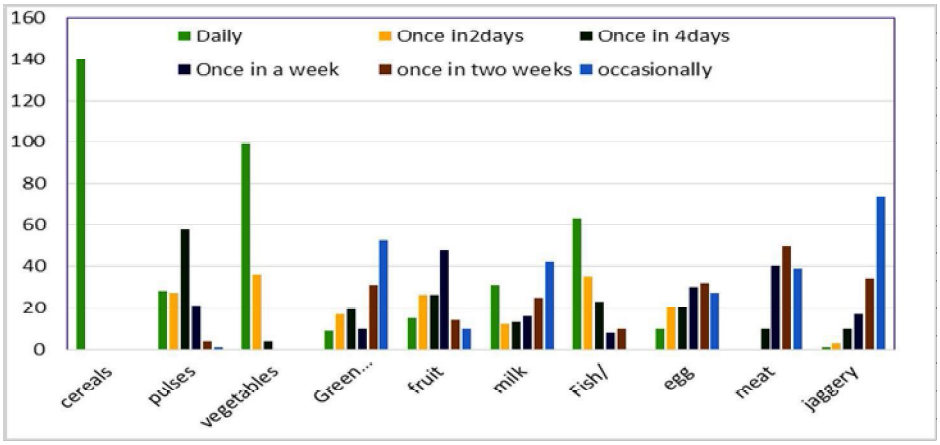

Fig-1 Study population on Practice of food type

Rice is the staple food item in Kerala, cent percent are daily using cereals. Only 20% of the study population have daily intake of pulses.19.42 % using once in 2 days, 57% using once in 4-7 days and 1% are occasional users.

50gms each of vegetables and G L V are required daily for adolescent girls for a balanced diet, but only 3/4th of the population are using vegetables daily, 1/4th once in 2-4 days. In the case of GLV only 6.5%are daily users, 21% once in 2-4 days and 12.23% using once in a week. More than half of the population use GLV once in 2 weeks or occasionally.

Daily milk users are only 20.3%, 18% using once in 2-4 days and 11.51% once in a week and more respondents (48.19%) using once in 2 weeks or occasionally, but majority using tea/ coffee daily .In the case of fruit intake only 11% are daily users.37.4% using once in 2-4 days and 34.53% once in a week. 17.26% are occasional users.

Daily intake of fish along with meals is by 45.32%. 41.71%using once in 2-3days, weekly users are 5.7% and 7.19% using once in 2 weeks. Egg is also used daily by 7.19%, 28.76% using egg within 2-4 days. Weekly users are 21.58% and

42.4% are using within 2 weeks or occasionally.

Meat is used once in 4 days by 7.1% of the girls, 9.7% use weekly , 24.46% once in 1or 2 weeks and 53.23% are occasional users. All are mixed diet users and non-vegetarian food availability and usage is comparatively more in Kozhikode district.

Conclusion and recommendations

Even though iron supplementation programs implemented for adolescents; regular usage is very less and only a minority tested haemoglobin level in the blood. They are not giving much importance to iron supplementation and haemoglobin estimation due to less awareness about the consequences. Breakfast skipping and usage of junk food items are followed by many. Drinking water consumption is also not sufficient. Problem of obesity and overweight is not problematic in the study population, but their food pattern is not enough to meet the recommended daily requirement of nutrients for the maintenance of their health and development. Deficiency of nutrients lead to irregular periods also .So it is important to make them aware about the consequences of under nutrition and maintain their health through behavioral changes and thus could improve their potential.

Based on the findings, we put forward the following recommendations

1. Health camps should be conducted for periodic evaluation of hemoglobin level and for the prescription of sufficient quantity iron supplement
2. Make strict instructions from school to take breakfast before coming to school
3. Arrange dieticians to give awareness about the required quantity of nutrients and its resources from locally available, affordable food items to adolescents and their mothers.
4. Facilities for drinking water and sanitary latrines at school
5. Include 1hr/week in curricula for the periodic evaluation of adolescent health.

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