ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

NUTRITIONAL STATUS AND DIETARY PATTERN OF ADOLESCENT GIRLS OF KOTTAYAM TALUK

***Ramya.R[1] and Anooja Thomas[2]**

1. PhD scholar, Dept. of Home science , St.Teresa's College, Ernakulam

2. Associate professor, Dept. of Home Science, CMS College, Kottayam

Manuscript Info

Manuscript History:

Received: 12 February 2015
Final Accepted: 26 March 2015
Published Online: April 2015

Key words:

Nutritional status, Adolescent girls, Dietary pattern, Nutrients.

Corresponding Author

Ramya.R

Abstract

Good nutrition and dietary behaviour are important during adolescence to achieve full growth potential and appropriate body composition, to promote health and well being, and to reduce the risk of chronic diseases in adulthood. The physical, developmental and social changes that occur during adolescence can markedly affect eating behaviours and nutritional health. The period of adolescence for a girl is a period of physical and psychological preparation for safe motherhood. As the direct reproducers of future generations the health of adolescent girls influences not only their own growth, but also the health of future population. Thus a study was conducted on 500 adolescent girls (12-19 yrs) of kottayam Taluk of Kottayam District in Kerala to assess the nutritional status and dietary pattern. Anthropometric assessment revealed that the mean height and mean weight of adolescent girls were not reached NCHS standards whereas they met ICMR standards. Majority were having normal body mass index**.** The frequency of intake of leafy vegetables and fruits was very less. Meal-skipping was observed among 40.8% of the respondents and mostly (62.2%) skipped breakfast. Intake of protein, fat and calcium were at par with Recommended Dietary Allowance whereas consumption of energy, iron, vitamin C and folic acid was significantly lower than the RDA.

INTRODUCTION

Adolescence aged between 10-19 years account for more than one-fifth of the world's population (Krishna, 2004). Adolescents constitute about 22.8 per cent of the population in India (Dasgupta et al., 2010). Nutrition is usually taken as a significant indicator of the health and overall status of adolescence. Adequate nourishment is especially critical for adolescence as it is an essential determinant of the spurt of development that describes puberty (Spear, 2002). Poor nutrition is often cited as the major reason for the delay in the onset of puberty in Indian adolescents. Also gender discrimination in India is mentioned as one of the main causes of female under-nutrition (UNFPA, 2000). Socioeconomic status, heredity, food habits and environment also affect their nutritional status to a great extent.

During adolescence, young people are assuming responsibilities for their won eating habits, health attitudes and behaviours (Fleming-Moran & Thiagarajah, 2005). In fact attitudes play an important role in the adoption and maintenance of a variety of health and nutritional habits. Although adolescent's growing independence is often associated with unconventional eating patterns (Veugelers, 2005).

Disordered eating behaviours, such as unhealthy weight control practices and binge eating are of concern for adolescent health given their high prevalence and harmful consequences. Studies have found that these behaviours are prevalent among youth, particularly among adolescent girls. Disordered eating behaviours are

associated with a number of harmful behavioural, physical, and psychological consequences, including poorer dietary quality (Crawley and Shergill-Bonner,1995) weight gain and obesity onset, depressive symptoms and the onset of eating disorders (Neumark-Sztainer,2006).

Adolescence is a crucial life period in a women's life where socio-cultural factors not only influences her health but also determines the health of the future generations. The nutritional status of adolescent girls ie the future mothers, contributes significantly to the nutritional status of the community. Relatively little is known about the nutritional status of this population. Unfortunately precise estimation of nutritional status of adolescent girls residing in Kottayam district has been the least explored research area. So the present study is a small attempt to understand the nutritional status and dietary pattern of adolescent girls of Kottayam Taluk of Kottatayam district with the hope that the findings would help to start health programmes to prevent nutritional problems among adolescence, the vulnerable population.

MATERIALS AND METHOD

The study was conducted in Kottayam Taluk of Kottayam district in Kerala with a total sample size of 500 adolescent girls in the age group of 12-19 years. Multistage random sampling was the technique adopted for sample selection. Five hundred adolescent girls were selected randomly by lottery method, from the two schools and two colleges of Kottayam Taluk. Data from adolescent girls were collected through a semi-structured interview schedule which included socio economic background, anthropometrical details, details regarding menstruation, general health details, intake of nutritional supplements, dietary pattern and intrinsic and extrinsic factors influencing nutrient intake. Anthropometric survey was conducted among 500 adolescent girls between 12 -19 years of age. In order to assess the nutritional status of subjects their (a) height, (b) weight (c) BMI and (d) waist-to-hip ratio were measured and recorded. And these data were compared with NCHS standards, NHANES I (NIN, 2005) and ICMR standards (1989).

Dietary pattern was studied among the 500 adolescent girls, which included meal pattern, dieting and meal skipping practices, individual and environmental factors influencing diet pattern and snacking pattern. Further 150 adolescent girls belong to late adolescent age group (≥16 years) were selected for detailed dietary assessment, based on their willingness to participate in 24-hour recall and to respond to food frequency questionnaire. Late-adolescence, being close to the reproductive phase of a woman's life, is very significant. Nutritional status during late adolescence thus requires immediate attention and appropriate interventions. The actual food and nutrient intake of the subjects were compared with ICMR (2004) RDA which was prevailing during the study period.

RESULTS AND DISCUSSION

The demographic status of the respondents show that majority (78.4%) of the respondents were from nuclear family and only 19.6% belonged to the economically weaker section having less than Rs.3,300 as their average monthly income (HUDCO, 2007). All the respondents' mothers were educated and about half (51.8%) belonged to Hindu religion. More respondents (34.6%) were of Christian origin than from Muslim religion (13.6%).

A large number (236, 47.2%) of the respondents were found to have a history of worm infection. Other ailments reported were acidity and peptic ulcer (5.8%), allergic to certain eatables (1.4%), asthma (5.2%), migraine and sinusitis (3.8%) and Tonsillitis. Other problems reported were polycystic ovarian disease (0.4%), urinary calculi (0.2%), skin diseases (0.2%) and muscle pain (0.2%).

The respondent adolescent girls were of the habit of taking dietary supplements and medicines such as health drinks, vitamin tablets etc. Consumption of iron tablets and multivitamin tablets was very common among the study respondents compared to other supplements.

Majority (59.3%) of the adolescent girls attained menarche after 12 years of age. The mean age of menarche of this study group was 12.5 years. An absolute majority (93%) of the respondent girls were in postmenarcheal stage.

As seen in following figure, the mean weight of adolescent girls ranged from 35.6 kg to 53.5 Kg. The range of mean height of the adolescent girls started from 145.7 cm to 157.8 cm. Similarly BMI also ranged from16.8 to 21.3 Kg/m^2. Except the other age groups, age 16 showed high values in height, weight and BMI.

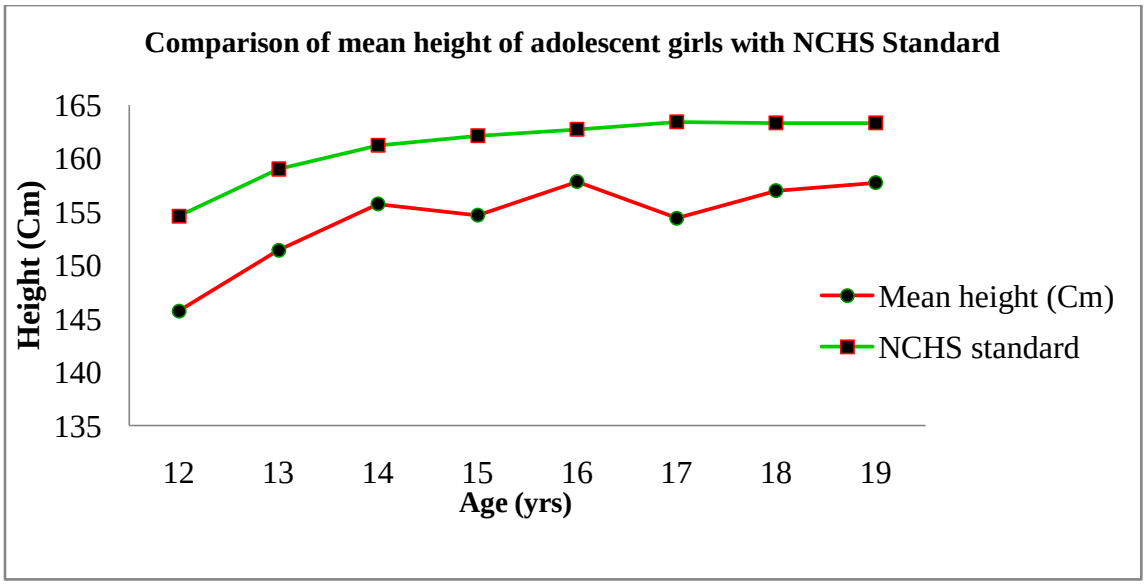

Fig 1- Comparison of mean height of adolescent girls with NCHS Standard

Comparison of mean height of adolescent girls with NCHS standard revealed that there is a gradual increase in height up to the age of 12-14 years from 145.7 cm to 155.7 cm. Subjects falling in the age group of 15-17 years showed an irregular pattern in their mean heights. There after by the age of 17 upwards there was a steady or gradual increase in height was observed i.e. from 156.9cm to 157.7cm. The adolescent girls of all age group did not achieve the mean height of NCHS standards with a *p*-values <0.01 and <0.05 for age 16.

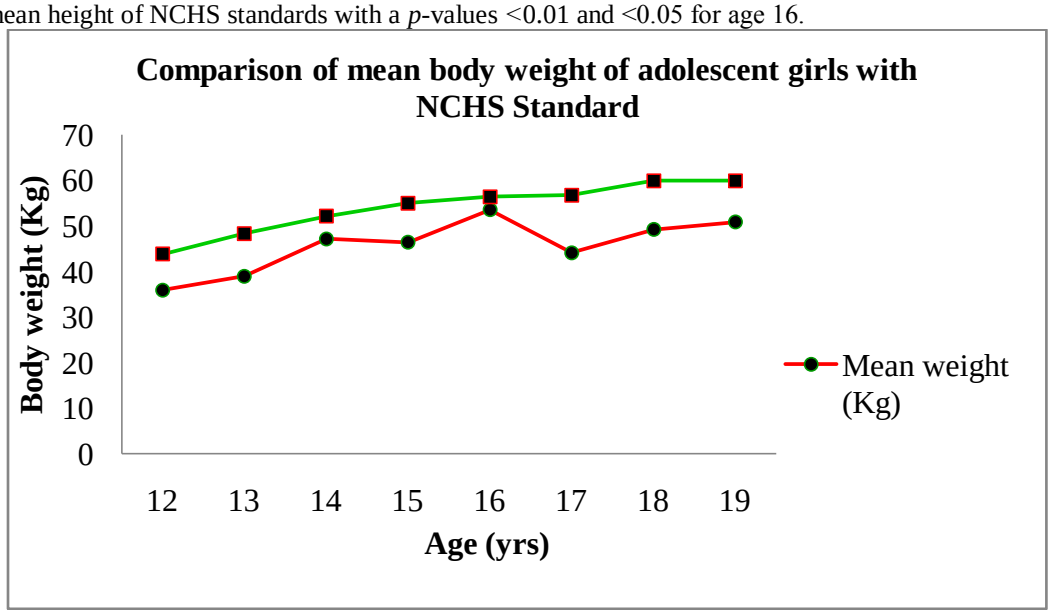

Fig 2- Comparison of mean body weight of adolescent girls with NCHS Standard

The comparison between mean weight of adolescent girls and the NCHS standards revealed that there is a gradual or steady increase in body weight up to the age of 12-14 years from 35.87 kg to 47.10 kg. Subjects under the age group of 15-17 years showed an irregular pattern in their mean weights. Thereafter by the age of 17 onwards, a steady or gradual increase in weight was observed, i.e. from 44.062 kg to 50.8438 kg. The mean weight of adolescent girls of all age group under study except 16 years were not achieved NCHS standards with a *p*-value <0.01.

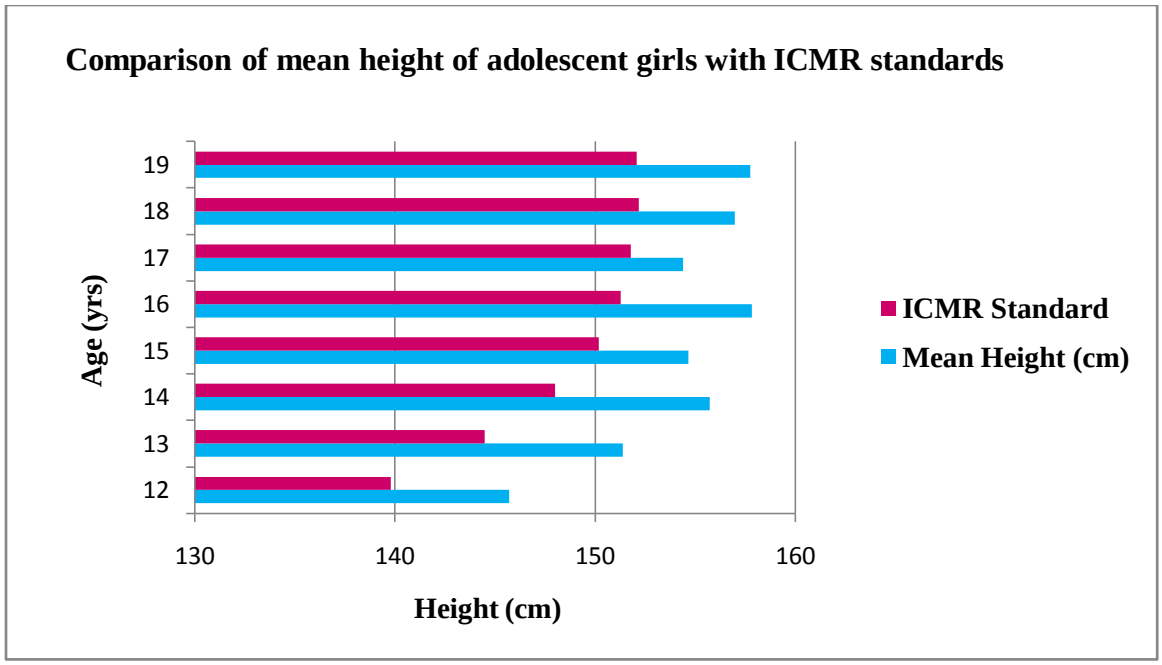

Fig 3- Comparison of mean height of adolescent girls with ICMR standards

The mean heights of adolescent girls in all age groups were much better than ICMR standards. There was an increase in the height up to the age of 12-14 years (145.7 cm to 155.7 cm.) There after by the age of 17 upwards, there was a steady or gradual increase in height i.e. from 156.9 cm to 157.7cm.The mean height of adolescent girls of all age group under study were significantly higher than ICMR standards with a p value <0.01 and p value <0.05 for age 17.

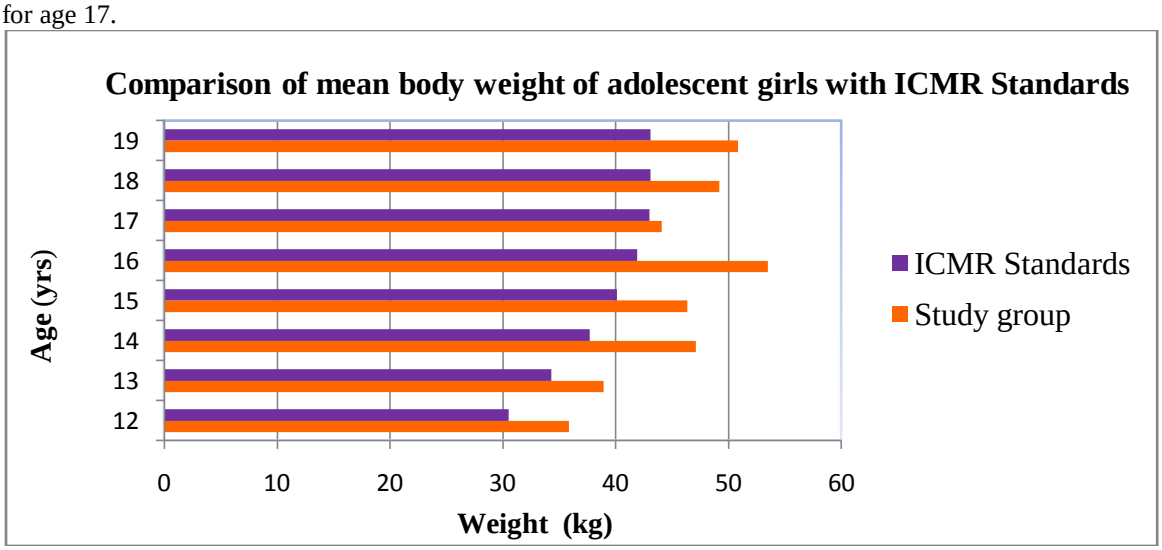

Fig 4- Comparison of mean body weight of adolescent girls with ICMR Standards

There was a gradual or steady increase in body weight up to the age of 12-14 years from 35.875 kg to 47.102 kg. Subjects falling in the age group of 15-17years showed an irregular pattern in their mean weights. There after by the age of 17 onwards there was a steady or gradual increase in weight was observed i.e. from 44.062 kg to 50.8438 kg. The mean weight of adolescent girls of all age group under study except 17 yrs achieved ICMR standards with a p value <0.01.

Waist-to-hip ratio of the adolescent girls under the study ranged from 0.73 to 0.75.Subjects, 19 years of age possessed lowest waist-to-hip ratio of 0.73, which indicated that any of the girls under study were not having any risk of abdominal obesity with waist to hip ratio less than 0.80.

Table 1
Dietary Pattern of Adolescent Girls

Subjects	Type of meal			Number of meals per day				
	Non-vegetarian (%)	Vegetarian (%)	Non-vegetarian often takes vegetarian foods (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)
Adolescent Girls (N=500)	64.2	4.8	31	2.4	6.4	87	4	0.2

Majority of the adolescent girls were non vegetarians (64.2%) and had almost 3-4 meals per day .The four meals pattern found by the 24-hour recall and it was composed of four main meals (breakfast, Lunch, a light evening meal and dinner) and a healthy mid-time snacks were missing in majority of the respondents' diet pattern.

Dieting was followed by 10% of the subjects under the study. For dieting adolescent girls reduced the amount of food or skipped their meals without considering that they are normal in weight. Body image dissatisfaction and a desire to be thinner was the motivating factor behind the majority of adolescent girls who followed dieting. It is observed that 40.8% adolescent girls skipped at least one meal of a day. Majority i.e. 62.2% skipped their breakfast which is the most important meal of the day.

Only 5% adolescent girls were of the habit of skipping lunch. The practice of bringing and eating rice-based packed lunches was common among adolescent girls under study because lunch was considered as a main meal that contributed to a whole day's food intake. The diet pattern was influenced by predominantly (90%) by family followed by friends (89%), media and adds (87%) and psychological status (55%).

Table 2
Nutrient Consumption of Adolescent Girls

(N=150)

Age	Nutrients	Actual Intake	RDA	% of RDA met	% of surplus or deficit	t value	P value
17-18 yrs (N=116)	Energy (Kcal)	1567.10 (±257.07)	2060	76.07	-23.92	20.65	0.000**
	Protein (gm)	64.57 (±12.24)	63	102.49	+2.49	1.38	0.844^{NS}
	Fat (gm)	50.08 (±11.33)	22	227.63	+127.63	26.69	0.000**
	Calcium (mg)	607.29 (±308.41)	500	121.45	+21.45	3.75	0.0001**
	Iron (mg)	19.01 (±5.83)	30	63.36	-36.64	20.30	0.0001**
	Vitamin C (mg)	22.24 (±9.65)	40	55.6	-44.4	19.80	0.0001**
	Folic acid (µg)	73.22 (± 9.50)	100	73.22	-26.78	30.37	0.0001**
Age 19 yrs	Energy (Kcal)	1566.25 (±251.40)	1875	83.54	-16.46	7.16	0.0001**
	Protein (gm)	67.00 (±11.46)	50	134	+34	8.65	0.0001**
	Fat (gm)	49.25 (± 10.85)	20	246.25	+146.25	15.72	0.0001**
	Calcium(mg)	677.57	400	169.39	+69.39	5.64	0.0001**

(N=34)		(±287.08)					
	Iron (mg)	15.13 (±2.30)	30	50.43	-49.57	37.73	0.0001**
	Vitamin C (mg)	16.51 (±7.12)	40	41.2	-58.8	19.22	0.0001**
	Folic acid (µg)	63.91 (±10.59)	100	63.91	-36.09	19.87	0.0001**

**Significant at one percent level ($p < 0.01$)

The intake of all the nutrients except protein, fat and calcium was significantly lower ($p < 0.01$) than RDA among the adolescent girls. It was found that the consumption of energy, iron, vitamin C and folic acid did not meet the Recommended Dietary Allowance (RDA).However protein, fat and calcium intakes exceeded the RDA levels. The intake of protein and calcium were at par with RDA and that of fat was significantly higher ($p < 0.01$) than RDA for the ages 17,18 and 19, that may be because of the frequent intake of fried foods and excessive use of coconut. Iron intake of adolescent girls between the age group of 17 to 19 was remarkably low with percentage around 55. This may be related to the intake of particular food groups as green leafy vegetable intake was very poor. Vitamin C intake reported the least percentages i.e. 55.6% for age 17 and 18 and 41.2% for age 19. This can be a result of low intake of fruits and vegetables consumption reflected in food frequency questionnaire.

CONCLUSION

From the present study it can be concluded that the nutritional status of adolescent girls of Kottayam Taluk was not reached international standards (NCHS) but just achieved ICMR standards. Many issues were found in dietary habit of the subjects like inadequate dietary intake, dieting, meal skipping, unnecessary influence of intrinsic and extrinsic factors etc. So the findings of the present study emphasise the need of early intervention among the adolescent girls, the future mothers of next generation.

REFERENCES

1. Crawley,H and Shergill-Bonner,R.(1995):The nutrient and food intakes of 16-17 year old female dieters in the UK. Journal of Human Nutrition and Dietetics, Vol. 8(1), pp. 25–34.
2. Dasgupta, A., Butt, A., Saha, T.K., Basu, G., Chattopadhyay, A and Mukherjee, A. (2010): Assessment of malnutrition among adolescents: can BMI be replaced by MUAC. Indian Journal of Medicine, 2010, Vol.35 (2), pp.276-279.
3. Fleming-Moran,M., Thiagarajah,K.,(2005): Behavioral interventions and the role of television in the growing epidemic of adolescent obesity-data from the 2001 Youth Risk Behavioral Survey. Methods Inf Med.Vol. 44, pp.303-309.
4. HUDCO (Housing and Urban Development Corporation Ltd).(2007) :Board meeting ,vide item no.4, held on 4 July 2007.
5. ICMR (Indian Council of Medical Research). (2004): Recommended dietary allowance for Indians – Nutritive value of Indian foods. Hyderabad: National Institute of Nutrition, ICMR, p.98.
6. ICMR (Indian Council of Medical Research). (1989): Growth and physical development of Indian infants and children. Technical Rep. Series No.18, Indian Council of Medical Research.
7. Krishna,V.V .(2004):School Psychology, Discovery Publishing House, New Delhi,P-34.
8. Neumark-Sztainer, D.,S. J. Paxton, P. J. Hannan, J. Haines, and M. Story.(2006).Does Body Satisfaction Matter? Five-year Longitudinal Associations between Body Satisfaction and Health Behaviors in Adolescent Females and Males. Journal of Adolescent Health, Vol. 39(2) pp. 244–251.
9. NIN (National Institute of Nutrition).(2005): NCHS Standards,NHANES-1,Resource material, Epidemiological tools in assessment of nutritional status ,pp.11-17.
10. Spear B. (2002): Adolescent growth and development. In: Rickert VI (ED). Adolescent nutrition assessment and management. New York : Chapman & Hall:1-24
11. UNFPA (United Nations Population Fund). (2000): Adolescents in India – A profile. UNFPA, p.9.
12. Veugelers, P.J, Fitzgerald, A.L and Johnston, E.(2005):Dietary intake and risk factors for poor diet quality among children in Nova Scotia. Canadian Journal of Public Health, Vol. 96, pp.212– 216 .