Original Research

Assessment of nutritional status of adolescent girls residing in rural area of Belagavi

Sulakshana S Baliga, Vijaya A Naik, Mallapur M D

Department of Community Medicine, Jawaharlal Nehru Medical College, Belagavi, Karnataka, India.
Correspondence to: Sulakshana S Baliga, E-mail: baliga1983@rediffmail.com

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Abstract

Background: Adolescence is a period of transition between childhood and adulthood. Health and nutrition of the girls will affect the health and survival of future generation. However, there is very little information about the nutritional status of adolescents, particularly from rural areas in India. In view of the above facts, an attempt was made to assess the nutritional status of rural adolescent girls.

Objective: To assess the nutritional status of adolescent girls.

Materials and Methods: This one-year community-based, cross-sectional study was undertaken at a village of district Belgaum, Karnataka among 400 adolescent girls of 10–19 years. Information on socio-demographic variables was collected by an interview using pre-designed and pre-tested questionnaire and anthropometric measurements were recorded for assessing the nutritional status.

Result: The mean weight of adolescent girls in all age groups was better than Indian Council of Medical Research (ICMR) standards except in the ages 10, 12, and 13 years. The mean height of adolescent girls in all age groups was better than ICMR standards except in the ages 11, 12, 13, and 18 years. The prevalence of thinness in adolescent girls was 62% and prevalence of overweight was 2%.

Conclusion: Majority of adolescent girls had mean height and mean weight in all age groups better than ICMR standards. More than half of adolescent girls were thin. None of the girls aged 15–19 years were obese.

KEY WORDS: Anthropometry, Adolescent Girls, Nutritional Status, Body Mass Index, ICMR

Introduction

Adolescence is a transitional period between childhood and adulthood.[1] India's population has 21% of adolescents.[2] World Health Organization suggest that in South East Asian region, a large number of adolescents, suffer from malnutrition, which adversely affects their health and development.[3] So growth monitoring by anthropometric measurements during adolescence is not only important health indicator but also a predictor of various morbidity in the community.[4] However, there is very little information about the nutritional status of adolescents, particularly from rural areas in India. In view of the above facts, an attempt was made to assess the nutritional status of rural adolescent girls.

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Materials and Methods

This one-year community-based cross-sectional study was undertaken at village Peeranwadi of Primary Health Centre Kinaye, under the field practice area of KLE University's Department of Community Medicine, J.N. Medical College, Belagavi.

Four hundred (400) adolescent girls of 10–19 years were selected for the study, by systematic random sampling method. After obtaining a written informed consent, the

interview was conducted at the residence of the girls using pre-designed and pre-tested questionnaire. It included the information on socio-demographic variables. For the comparison, Indian Council of Medical Research (ICMR) reference value for height and weight were used. Body Mass Index (BMI) was computed using the standard equation: BMI(kg/m^2) = Weight (kg/height^2 (m^2)).[5] For the comparison of anthropometric data, National Centre for Health Statistics and National Health and Nutrition Examination Survey standards were used. The cut-off value for thinness was the <5th percentile of NCHS-CDC standards and for overweight, it was > 85th of NCHS-CDC standards.[4] The statistical analysis was done using SPSS statistical software applying chi-square test.

Ethical Considerations

The study was approved by the institutional ethics committee.

Result

The mean age of the study population was 12.9 ± 2.06 years (Table 1). A majority (73.5%) of them were Hindus and 394 (98.5%) were literate (Table 1). In the present study, 360 (90%) were currently studying, 11 (2.8%) were housewives, and 29 (7.2%) were doing domestic work. Six (6%) were illiterate and 34 (8.5%) were school drop outs.

Among 400 girls, 385 (96.25%) were unmarried and 15 (3.75%) were married. With regard to socioeconomic status, 8 (2%) belonged to class II, 50 (12.5%) belonged to class III, 92 (23%) belonged to class IV and 250 (62.5%) belonged to class V (Table 1). 51% had attained menarche and 51% of them attained menarche by age of 11 years. The mean age of menarche was 13.00 ± 2.15 years. Of the 15 (3.75%) married girls, nine (60%) were pregnant and all nine pregnant women were registered for antenatal care (ANC), either in government or private hospital. In the present study, out of 300 adolescent girls with anaemia, 85 (21.25%) adolescent girls were taking vegetarian diet and 315 (78.75%) had mixed diet.

The overall mean weight of the study population was 29.5±8.08 kg with the range being 15–55 kg. The mean weight of adolescent girls in all age groups was better than ICMR standards except in the ages 10, 12, and 13 years. However, this difference in mean weight was statistically significant in ages 12, 14, and 17 years (Table 2).

The mean height was 138.60±29.54 cm with range minimum being 102.50 cm to maximum 165 cm. The mean height of adolescent girls in all age groups was better than ICMR standards except in the ages 11, 12, 13, and 18 years. However, this difference in mean height was statistically significant in ages 10 and 17 years (Table 3).

The prevalence of thinness in adolescent girls was 62 % and prevalence of overweight was 2%. The highest prevalence of thinness, i.e. 75% was in 12 years aged girls and the highest prevalence of obesity, i.e. 6.52% was in 11 years, aged girls. None of the girls aged 15–19 years were obese (Table 4).

Table 1: Demographic characteristics (n=400)

Demographic characteristics		Study Participants	
		No	%
Age	10 to 14	329	82.25%
	15 to 19	71	17.75%
Education	Illiterate	6	1.50%
	Primary School	278	69.50%
	High School	105	26.25%
	Collegiate education	11	2.75%
Socio-economic status (Modified B. G. Prasad's Classification)	I	0	0
	II	8	2
	III	50	12.5
	IV	92	23
	V	250	62.5

Table 2: Distribution of mean weight (kgs) of adolescent girls by age

Age (years)	Study weight ± S.D	ICMR weight ± S.D	*p*-value
10	21.42 ± 3.56	22.5 ± 4.28	0.095
11	24.78 ± 6.49	24.5 ± 4.62	0.379
12	25.42 ± 5.75	27.3 ± 5.70	0.001
13	30.16 ± 5.24	30.6 ± 6.58	0.569
14	34.33 ± 6.82	33.5 ± 5.69	0.001
15	36.91 ± 4.91	35.4 ± 6.78	0.145
16	38.78 ± 3.97	37.9 ± 5.81	0.301
17	41.00 ± 5.75	39.3 ± 5.65	0.046
18	40.40 ± 7.30	39.6 ± 7.57	0.818
19	43.27 ± 6.85	39.9 ± 6.38	0.110
Total	29.54 ± 8.08		

Table 3: Distribution of mean height (cms) of adolescent girls by age

Age (years)	Study height ± S.D	ICMR weight ± S.D	*p*-value
10	129.28 ± 11.66	126.7 ± 7.01	0.015
11	129.30 ± 9.04	131.2 ± 7.25	0.075
12	135.39 ± 9.29	136.7 ± 8.16	0.091
13	140.79 ± 8.71	141.5 ± 7.26	0.406
14	146.11 ± 7.98	145.3 ± 7.22	0.413
15	148.22 ± 7.38	147.7 ± 6.87	0.711
16	150.76 ± 4.67	149.6 ± 5.99	0.246
17	155.62 ± 4.77	150.61 ± 5.96	0.013
18	149.00 ± 8.58	150.00 ± 5.92	0.725
19	153.40 ± 4.90	150.5 ± 5.97	0.078
Total	138.63 ± 12.02		

Table 4: Distribution of adolescent girls by age and body mass index

Age (years)	No	BMI ± S.D	<5[th] percentile		>85[th] percentile	
			No	%	No	%
10	44	13.00 ± 2.49	24	54.54	2	4.54
11	46	14.76 ± 3.07	27	58.69	3	6.52
12	112	13.82 ± 2.37	84	75	2	1.78
13	73	15.23 ± 2.40	49	67.12	0	0
14	54	16.02 ± 2.65	32	59.25	1	1.85
15	24	16.86 ± 2.42	11	45.83	0	0
16	23	17.05 ± 1.49	10	43.47	0	0
17	8	16.93 ± 2.37	4	50	0	0
18	5	18.07 ± 1.66	2	40	0	0
19	11	18.50 ± 3.58	5	45.45	0	0
Total	400	15.18 ± 2.79	248	62	8	2

Discussion

Nearly one-fourth of India's population comprises of adolescents representing a vibrant human resource. Nutritional status during adolescence is an important determinant of health outcomes. Hence, it is of utmost importance to strengthen efforts and formulate innovative strategies to channelize adolescents' energies in a constructive direction.

The results of present study showed that majority (82.25%) were between 10 and 14 years and 17.75% between 15 and 19 years with mean age among study population 12.9 ± 2.06 years. A similar trend was also seen in a study conducted in Rajasthan.[6] Whereas study conducted in Ratnagiri reported 94.6% in the age group 15–19 years and 5.3% in 11–14 years.[7]

In our study 51% had attained menarche, the mean being 13.00 ± 2.15 years. Age of menarche has been similar in studies[7,8,9] conducted in other parts of India. There are many factors influencing age at menarche besides genetic makeup of an individual such as nutritional status, socio-economic status, and climate which determine the age at menarche.

Poor socio-economic status and associated malnutrition delay menarche. However, in the present study, 49% of adolescent girls had not attained menarche perhaps due to lower socio-economic and poor nutritional status. It may also be due to low iron stores throughout childhood contributing to delayed menarche.

The most common causes among the school dropouts in this study have been domestic work (38.23%), opposition from parents (41.17%), and marriage (8.82%). According to NFHS-2,[10] the most common causes for not attending school have been, education not considered necessary (13.17%), not interested in studies (15.8%), involvement in domestic work (24.5%), and could not afford fee (24.5%). UNICEF report 2011 has also shown that for girls, school attendance has dropped sharply from primary to secondary school that is 83–59%.[11] A recent UNICEF's State of the World's Children 2011 report says that malnourishment among India's adolescent population is found to be higher than even some of the least developed countries in Sub-Saharan Africa. The appalling nutritional figures for adolescents put India in the company of least developed nations such as Congo, Burkina Faso, and Guinea. India, in fact, beats even Sub-Saharan Africa with the highest underweight adolescent girl population of 47% in age group of 15–19 years.[11]

In the present study 15 (3.75%) were married. Among them 4 (1%) married before the age of 18 years and 11 (2.75%) married after 18 years of age. Among the married adolescents, more than half of them were pregnant. According to UNICEF report 2011, 43% of girls were married off before the age of 18 and more than half of them gave birth before they turned adults and 6000 adolescent mothers die every year.[11]

In the present study, the mean weight of adolescent girls in all age groups was better than ICMR standards except in the ages 10, 12, and 13 years. Similar differences in mean weight from ICMR standard for corresponding ages was found in studies[12,13]conducted in Lucknow. Whereas another study conducted in Lucknow showed significant difference in mean weight from ICMR standards for respective ages except in ages 18 and 19 years.[14]

In the present study, the mean height of adolescent girls in all age groups was better than ICMR standards except in the ages 11, 12, 13, and 18 years. Whereas various studies[12,13,14] have observed that mean height in all ages was better than ICMR standards except in the ages of 16, 17, 18, and 19 years.

In the present study, weight and height seem to be increasing over time and the adolescent girls exhibited better nutrition status which may be due to Mid-day Meal Programme and increasing literacy rate.

The prevalence of thinness in adolescent girls was 62%. The highest prevalence of thinness, i.e. 75% was in girls of age 12 years. High prevalence of thinness in the present study may be attributed to the poor socioeconomic status of adolescent girls. Similar prevalence of thinness was reported in a study conducted in the rural community of Bangladesh.[15] Whereas studies conducted in Lucknow have reported a lower prevalence of thinness.[14] The prevalence of overweight was 2% in the present study. The highest prevalence of obesity, i.e. 6.52% was in 11 years, aged girls. None of the girls aged 15–19 years were obese. Similar findings have been reported by a study conducted in Lucknow.[14]

Limitation

Since the study is cross-sectional, it cannot show cause and effect relationship between different factors with outcome variables.

Conclusion

In the present study, the mean weight of adolescent girls in all age groups was better than ICMR standards except in the ages 10, 12, and 13 years and mean height of all age groups was better than ICMR standards except in the ages 11, 12,

13, and 18 years. The prevalence of thinness in adolescent girls was 62% and prevalence of overweight was 2%.

The poor nutritional status of adolescent girls has important implications in terms of physical work capacity and adverse reproductive outcomes. There is a need for periodic weight assessment of adolescent girls and health education to promote healthy eating habits and regular physical exercise as a part of school health services. This is essential for early detection, planning, and implementation of programmes to reduce morbidity, mortality associated with under and over nutrition.

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