ORIGINAL ARTICLE

Nutritional Status of Adolescent Girls in Rural Area of Kolar District -A Cross-Sectional Study

H.R. Shivaramakrishna[1*], A.V. Deepa[2] and M. Sarithareddy[3]

[1]*Department of Community Medicine, MIMS, Karnataka, India,* [2]*Department of Community Nursing, KIMS, Bangalore, India and* [3]*Medical officer, Ronnur Primary Health Center, Kolar, Karnataka, India*

Abstract: *Objective:* To assess the nutritional status of adolescent girls in selected villages of the Kolar district. *Methods:* A community-based cross-sectional study was carried out over a period of two months. 230 adolescent girls of age 10–19 years were selected randomly. Data was collected by interviewing the adolescent girls using predesigned and pre tested Proforma. Various statistical applications like percentiles, mean, standard deviation and proportions were used for analysis of the data. *Results:* The prevalence of wasting and stunting was 54.79% and 32.17% respectively as per water lows classification and the trend of wasting and stunting declines with the age. The prevalence of thinness was found to be 73.5% as *per* Indian standards. Prevalence of Anemia was 34.8% percent and it was more among menstruating girls than compared to non-menstruating girls. Anemia prevalence was less among adolescent girls using footwear during defecation than girls not using foot wear. *Conclusion:* It is concluded that there is a high prevalence of under nutrition among adolescent girls in the rural area of the selected villages. Health education and nutrition interventions are needed on priority basis.
Key words: Nutritional status, Adolescent girls, rural area

Introduction

Adolescence, a period of transition between childhood and adulthood, occupies a crucial position in the life of human beings. This period is characterized by an exceptionally rapid rate of growth. The peak rates of growth are exceeded only during the fetal life and early infancy [1]. Adolescents are the best human resources. But for many years, their health has been neglected because they were considered to be less vulnerable to disease than the young children or the very old. Their health attracted global attention in the last decade only [2]. Unfortunately assessment of nutritional status of adolescent girls has been the latest explored area of research particularly in rural India. The findings of studies on school children can not be extrapolated to adolescent girls, as their school enrollment as well as sustenance are less than that of boys. It is likely that girls not attending schools belonged to disadvantaged section of society and contribute significantly in domestic and peridomestic activities, there by jeopardizing their health [3]. With this back ground this community-based study was undertaken to assess the nutritional status of adolescent rural girls of Kolar district.

Objectives of the Study: To assess the nutritional status of adolescent girls (10 to 19 years) in a rural area of Kolar District.

Material and Methods

Source of Data: Following steps were involved in the selection of study subjects; a) one Taluk i.e. Kolar was selected from 5 Taluks of Kolar district by simple random sampling b) Villages of Kolar Taluk were stratified into 3 strata according to distance (i.e. <7Km, 7-14Km and >14Km) from Taluk headquarter c) From each stratum one village was selected by simple random sampling d) In the selected villages, total enumeration of adolescent girls was done. This served as the sampling frame. There were 1642 adolescent girls in the 3 selected villages of Kolar Taluk. From the literature [4] it was found that the prevalence of malnutrition in rural adolescent girls ranged from 50-72% and thus taking middle course a prevalence rate of 60% was assumed with 95% confidence interval and allowable error of 10%, a sample size of 229 was arrived and it was rounded off to 230.

Sampling Procedure: All the Adolescent girls in the selected 3 villages of Kolar taluk were arranged in alphabetic order and were numbered by using Village panchayat register. The required numbers of Adolescent girls were selected using 4 digit random number table.

Study Period: This was a cross-sectional study conducted during a period of Two months from January 1st 2009 to February 28th 2009.

Methods of Collection of Data: The selected Adolescent girls were interviewed, examined and investigated as per Pre-designed and pre-tested proforma. Parent's interview was taken whenever necessary. Anthropometric measurements were recorded using standardized methodology as recommended by World Health Organization (WHO). Standard operational definitions were used. Body mass index (BMI) was calculated from these parameters. Waterlows classification was used to classify wasting and stunting. Hemoglobin estimation was done by Cyanmethemoglobin method.

Data Analysis: Percentiles, Mean, Standard deviation and Proportions were used for analysis of the data.

Results

Age in Years	Total Number of girls	**Normal** girls	Mild wasting	Moderate Wasting	Severe Wasting
10	6	2(33.33%)	2(33.33%)	1(16.67%)	1(16.67%)
11	22	7(31.81%)	7(31.81%)	5(22.73%)	3(13.64%)
12	40	16(40.00%)	13(32.50%)	7(17.50%)	4(10.00%)
13	37	15(40.54%)	12(32.43%)	8(21.62%)	2(5.41%)
14	36	15(41.66%)	13(36.11%)	5(13.89%)	3(8.34%)
15	34	18(52.94%)	10(29.41%)	4(11.77%)	2(5.89%)
16	22	11(50.00%)	5(22.73%)	4(15.38%)	2(7.70%)
17	16	8(50.00%)	4(25.00%)	3(18.75%)	1(6.25%
18	7	4(57.14%)	2(28.58%)	1(14.28%)	0
19	10	8(80.00%	2(20.00%)	0	0
Total	230	104 (45.21%)	70 (30.43%)	38 (16.52%)	18 (7.82%)

Table-1: Nutritional Status of Adolescent girls (Wasting) as Per Age

Chi-square=8.469, DF=7, P=0.293 (All types of Wasting grouped together and analyzed with age)

Nutritional status of adolescent girls is shown in the Table 1 shows that 45.21% of girls were normal as per the weight for age, 55.79% were malnourished and out of these 30.43% were in mild degree of wasting, 16.52% were in moderate degree wasting and 7.82% were in severe degree of wasting. The prevalence of wasting decreases with the age but this was not significant. The prevalence of wasting was peak in 10 to 14yrs girls.

Table-2: Nutritional Status of Adolescent girls (Stunting) as Per Age					
Age in Years	Total Number of girls	Norma girls	Mild wasting	Moderate Wasting	Severe Wasting
10	6	3(50.00%)	3(50.00%)	0	0
11	22	11(50.00%)	8(36.36%)	2(9.09%)	1(4.55%)
12	40	22(55.00%)	14(35.00%)	3(7.5%)	1(2.50%)
13	37	22(59.46%)	11(29.73%)	3(8.11%)	1(2.70%)
14	36	23(63.89%)	10(27.78%)	2(5.56%)	1(2.78%)
15	34	27(79.41%)	5(14.71%)	2(5.86%)	0
16	22	18(81.82%)	3(11.54%)	1(3.85%)	0
17	16	14(87.50%)	2(12.50%)	0	0
18	7	6(85.71%)	1(14.29%)	0	0
19	10	10(100.00%)	0	0	0
Total	230	156(67.83%)	57(24.64%)	13(5.8%)	4(1.7%)
Chi-square=20.823, DF=7, P=0.004(All types of Wasting grouped together and analyzed with age)					

Table 2 shows that 24.64% girls were in mild degree of stunting, 5.8% were in moderate degree stunting and 1.7% in severe degree stunting. The 10-14years old girls were again the most affected. The prevalence of stunting decreases with the age and this was significant (p=0.004).

Table-3: Distribution of Girls According to the Various Grades of Undernutrition Based on BMI		
BMI	category	Number of girls
<16.0	Grade 3 thinness	51(22.2%)
16.0 -16.99	Grade 2 thinness	65(28.3%)
17.0 -18.49	Grade 1 thinness	53(23.0%)
18.50 -24.99	Normal	61(26.5%)
25.0 -29.99	Overweight	0
>30.0	Obese	0
Total		230(100%)

Table 3 shows that 73.3% girls were under-nourished (BMI≤ 18.5). The prevalence of chronic energy deficiency based on BMI (grade I, II and III) were 23.0%, 28.3%, and 22.2 % respectively. Out of the total 230 girls, none of the girls was found to be overweight or obese.

Average hemoglobin of adolescent girls was 12.14+_1.11g/dl.The prevalence of anemia among adolescent girls was 34.8% (Hb<12gm %). As per WHO guidelines 3.84% adolescent girls had marked anemia i.e. Hb <10gm/dl.Average Hemoglobin of non-menstruating girls (11.80+_1.1gm/dl) was significantly (p<0.001) more than that of menstruating girls (12.35+_1.2gm/dl).

Mean Hb of adolescent girls using footwear during defecation (12.30+_1.1gm %) was significantly (p<0.001) higher than the subjects without footwear (11.8+_1.3gm %). The prevalence of anemia in this group (28%) was significantly less (p<0.001) than that in subjects (44%) not using foot wear.

Discussion

The prevalence of wasting in the present study was 54.79% which was similar to the J.Semwal study [5] conducted in rural areas of Dehradan district and Seema et al [3] in Varanasi. The prevalence of stunting in the present study was 32.17% which also similar to the Haboubi et al study [5], Seema et al study [3] and M.Kalhan et al study [1]. The Prevalence of wasting and stunting was more among 10 to 14yrs girls which was similar to Varanasi and Haboubi et al study. The prevalence of thinness in the present study is 73.5% which was also similar to the M.Kalhan study. Anemia was detected in 34.8% of adolescent girls in the present study, which was higher than the Varanasi study, Gangadharan et al study [6], K.Anand et al [7] (Delhi) study. Anemia in the present study was more among menstruating girls than non-menstruating girls, but it was opposite in the Varanasi study (2003).

Conclusion

The poor nutritional status of adolescents, especially girls, has important implications in terms of physical work capacity and adverse reproductive outcomes [8]. The median age at marriage in the study area is around 18 years. Thus, the window period for intervention is quite short. School based mid day meal programme and iron supplementation should receive priority in rural areas. A beginning has been made by inclusion of adolescent girls as beneficiaries of iron tablets (once a week) under the Integrated Child Development Services (ICDS) scheme. Also in 1995, the Government of India launched the National Programme of Nutritional Support to Primary Education (NSPE). Though the primary objective of this programme is to improve school attendance, it is likely to have a major impact on nutritional status of school children. However, much more needs to be done to address the issue of adolescent mal-nutrition at the national level.

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*All correspondences to: Dr. Shivaramakrishna H.R, Assistant Professor, Department of Community Medicine, MIMS, Mandya,, Karnataka, India. Email: srkholur1979@gmail.com