Original Article

NUTRITIONAL STATUS OF THE GOVERNMENT SCHOOL CHILDREN OF ADOLESCENT AGE GROUP IN URBAN AREAS OF DISTRICT GAUTAMBUDH-NAGAR, UTTAR PRADESH

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ABSTRACT

Introduction: Adolescents are overlooked in most health programs as they are basically considered healthy population but the scenario varies. The present study was done with the objective of assessing the nutritional status of adolescent children attending a school in urban resettlement colony.

Methodology: A cross-sectional study was done covering 392 children between 10-19 years of age from two government schools and interviewed and anthropometric measurements taken.

Results: The overall prevalence of thinness was found to be 23.2% and severe thinness was found to be 7.4%.The prevalence of thinness and severe thinness in boys was 24.1% and 8.6% respectively whereas in girls it was comparatively low thinness 20.6 and 3.9%. Overall 12.5% children were found to be suffering from stunting and 1.5% from severe stunting. Moderate stunting was found in 13.7% and 12% girls whereas severe stunting was found in 0.7% boys and 3.9% girls.

Conclusion: Adolescents have the lowest mortality among the different age groups and have therefore received low priority in national health programs but considering the high prevalence of malnutrition in this important transitional phase of human life, the adolescent nutrition should be given prior importance in nutritional programs.

Keywords: Adolescence, thinness, stunting

INTRODUCTION

Adolescence is defined as a period of life ranging from 10 to 19 years of age[1]. Adolescents aged between 10-19 years account for more than one-fifth of the world's population. In India, this age group forms 21.4 percent of the total population[2] .Malnutrition denotes impairment of health arising either from deficiency or excess or imbalance of nutrients in the body[3]. Inadequate nutrition in adolescence can put them at high risk of chronic diseases particularly if combined with other adverse lifestyle behaviours[4]. In India, large numbers of adolescents are undernourished and the problem is more among girls (45%) than boys (20%), primarily due to deep-rooted gender discrimination[2]. World

Health Organization (WHO, 1995) has recommended various indices based on anthropometry to evaluate the nutritional status of the school aged children[5]. It has now been established that the Body Mass Index (BMI) is the most appropriate variable for nutritonal status among adolescents[5,6]. There is paucity of anthropometry based information on nutritional status of govt school children in Uttar Pradesh. Moreover, to date there are few studies which have dealt with sex differences in the level of malnutrition among govt school children in Uttar Pradesh. The objective of the present study was to study the nutritional status of the government school students of 10-19 years age group in District Gautambudh-nagar, Uttar Pradesh.

MATERIALS AND METHODS

The study was cross-sectional (Observational) in nature. The study was carried out in the Government schools in Bhangel , the urban field practice area of Department of Community Medicine. The study was carried out between July to September 2012.

Sample Size: By taking the prevalence of malnutrition ranging from 6-50% in school going adolescent children in various studies and taking prevalence (p) of malnutrition as 50% and relative precision of 10% (d) at 95% confidence interval , optimal sample size comes out to be 400. (sample size[7]= **$4pq/d^2 = 400$)**

Since there are two government schools in Bhangel , the study sample was selected from both the schools. A total of 1200 students from both the schools were enrolled as primary unit and every third student was selected as study unit by systematic random sampling. After taking prior permission from the principals of schools, dates of visits to the schools were fixed. A semi structured, pre-tested questionnaire was administered to each of the 392 students (290 boys and 102 girls) of 11-18 years age group studying in VIth-XIIth standard, eight students did not give consent to fill questionnaire so excluded from the study. The questionnaire included socio-demographic data (Age, Sex, father's and mother education, occupation and family income). All the students were subjected to measurement of height and weight and BMI was calculated.

Height: Height in centimetres was marked on a wall with the help of a measuring tape. All students were made to stand against the wall without foot wear and with heels together and their heads positioned so that the line of vision was perpendicular to the body. A glass scale was brought down to the topmost point on the head and the height was recorded.

Weight: A bathroom scale was used for recording weight. The zero error was checked for and removed if present. The clothes of the students were not removed as adequate privacy was not available.

Body mass index(BMI) of all the students was calculated by using the formula:

$BMI = Wt\ (in\ kg) / (Ht\ in\ mtrs)^2$

The height, weight and BMI of the students was then compared with the WHO standards[8].

Statistical Analysis: The data thus collected was entered on Excel master chart and then statistically analysed. WHO growth reference 2007, for adolescent and older children was used as reference cut offs for BMI and stunting. Weight for age has been found to be unreliable and therefore has not been included in this analysis.[8]

Table 1: Distribution of Adolescent Children according to Age and Sex

Age (in yrs)	Boys (%)	Girls (%)	Total (%)
11	10 (2.6)	5 (1.3)	15 (3.82)
12	22 (5.6)	18 (4.6)	40 (10.2)
13	32 (8.2)	15 (3.8)	47 (11.9)
14	63 (16.1)	19 (4.8)	82 (20.9)
15	53 (13.5)	13 (3.3)	66 (16.8)
16	64 (16.3)	13 (3.3)	77 (19.6)
17	22 (5.6)	12 (3.1)	34 (8.7)
18	24 (6.1)	07 (1.8)	31 (7.9)
Total	290 (73.9)	102 (26.0)	392 (100)

Of the total children studied (73.9%) were boys and (26.0%) girls. According to WHO cut -off values of BMI in adolescents , overall 23.2% of the children were found to be having thinness and 7.4% having severe thinness . The thinness was more in boys (24.1%) compared to girls (20.6%) . Similarly, severe thinness was also more in boys (8.6%) compared to girls (3.9%). A total of 2% adolescents were found to be over-weight , with 3.9 % over-weight adolescent girls compared to only 1.4% over-weight boys.(Table2). However the difference in prevalence of thinness among the boys and girls was not found to be statistically significant.

Table 2: Distribution of Adolescent Children according to Sex and BMI

BMI	Boys (%)	Girls (%)	Total (%)
Normal	191 (65.9)	73 (71.6)	264 (67.3)
Thinness (<-2SD and ≥ -3SD)	70 (24.1)	21 (20.6)	91 (23.2)
Severe Thinness (<-3SD)	25 (8.6)	4 (3.9)	29 (7.4)
Overweight (>+1SD)	4 (1.4)	4 (3.9)	8 (2.0)
Total	290 (100)	102 (100)	392(100)

Table 3: Distribution of Adolescent Children according to Sex and Height

Height for Age	Boys (%)	Girls (%)	Total (%)
Normal	253 (87.2)	84 (82.4)	337 (85.9)
Moderate Stunting (<-2SD and ≥-3SD)	35 (12.0)	14 (13.7)	49 (12.5)
Severe Stunting (<-3SD)	2.0 (0.7)	4 (3.9)	6 (1.5)
Total	290 (100)	102(100)	392 (100)

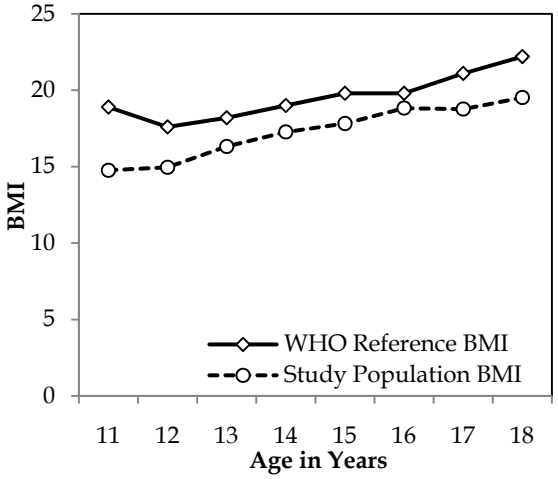

Fig.1: Comparison of Study Population Adolescent Girls BMI with WHO Reference BMI (Z-Score)

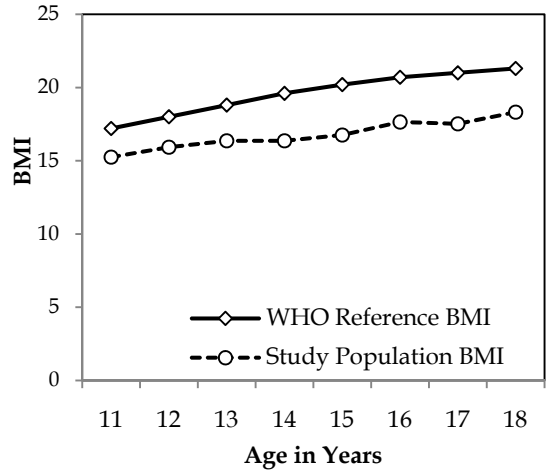

Fig 2: Comparison of Study Population Adolescent Boys BMI with WHO Reference BMI (Z-Score)

Considering the WHO cut-offs for stunting , Stunting was found in 12.5% adolescents, and was more in adolescent girls (13.7%) compared to boys (12.0%) .Severe stunting was found in 3.9% adolescent girls compared to only 0.7% boys.

As in Fig.1 &2 , the BMI in all the age groups in adolescent boys & girls was found to be less compared to WHO reference cut-offs and the difference was found to be statistically significant on applying Z test (p value < .01 in all the age groups) .

DISCUSSION

In a recent period anthropometric measurements have become a popular measure for the assessment of nutritional status among children and adolescents. It is well established that among other anthropometric measures body mass index (BMI) is not only the single most appropriate, cost effective and non-invasive tool for the assessment of the nutritional status of adolescents and adults (WHO 1995) [5]but it is also the best indicator of thinness during adolescence . The study thinness is of particular interest because it is associated with poor school achievement and work productivity. Thinness is defined as Body Mass Index (BMI) less than Z score < -2 SD of the(WHO growth reference for adolescents 2007) [8]. BMI (weight/height^2) for age was recommended as the best indicator for use in adolescence

In the present study the prevalence of thinness among the adolescent age group was found to be 30.6% overall with prevalence of 24.1% thinness and 8.6% severe thinness among boys and 20.6% thinness and 3.9% severe thinness among girls ,

this is comparatively less as compared to the study findings of Anand etal[9]. in which prevalence was found to be 30.1% in girls and 43.8% in boys and study by Malhotra and Passi[10] which also reported the prevalence of thinness among adolescent girls as 30.6% however this is comparatively more when compared with a study conducted by Kapil et al[11] which found the prevalence of Under nutrition ranging from 6.6% to 22.5% in urban set-up. Regarding prevalence of Over-weight only 2% were found to be over-weight which is comparatively much less as compared to findings of other studies as Kapil et. al. The difference may be because the present study was done in resettlement colony whereas previous studies have been carried out in affluent schools. However the difference in the prevalence of thinness in boys (24.1%) and girls (20.6%) and severe thinness (8.6%) in boys and (3.9%) in girls was not found to be statistically significant.

The prevalence of stunting was found to be 12% in boys and 13.3% in girls whereas severe stunting was 0.7% in boys and 3.9% in girls this is also comparatively less as compared to the study findings of Anand et.al[9] which found the prevalence to be 37.2% in boys and 19.9% in girls.

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