Prevalence of thinness among the adolescent girls (age group 13yrs-18yrs) of Garhkhal village of Himachal Pradesh, India.

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Abstract

Malnutrition has now been redefined in terms of "under nutrition" and conceptualized in terms of thinness which is an important problem among children and adolescents in rural areas of developing countries like India. Therefore, present study was carried out to assess the prevalence of thinness among the adolescent girls (age group 13yrs-18yrs) of Garhkhal Village of Himachal Pradesh, India. The study design was cross-sectional. Height and weight were measured and Body Mass Index (BMI) was carried out. Identification of thinness was done according to the new International BMI-based classification cut offs as given by Cole et al., 2007. In general the mean BMI increased with increasing age. Overall age-combined prevalence was 79.5%. Present study indicated the poor health status of the adolescent girls of the selected area which indicates the high nutritional stress among them as evident from the thinness prevalent among them.

Keywords: nutrition; adolescent girls; basal metabolic index; health

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Introduction

Obesity and malnutrition are the opposite extremes on the scale of adiposity. Malnutrition has now been redefined in terms of "under nutrition" and conceptualized in terms of thinness. Prevalence of thinness among children and adolescents is emerging as a major concern in rural areas of India [1, 2]. The available data from developing countries like India reports 15-20% obesity in urban areas among school children [3-6] and about 5% in rural areas [7]. Thus, obesity is a concern in urban areas; but children in the rural areas still suffer from under nutrition. Adolescents have the lowest mortality among the different age groups and have, therefore, received low priority. However, recent studies have shown that the prevalence of malnutrition is high in these age groups [8-10]. The poor nutritional status of adolescents, especially girls, can lead to adverse reproductive outcomes. Body Mass Index (BMI) is used to define thinness in children and adolescents. Based on International Survey of Six large nationally representative cross-sectional studies on growth, Cole et al., [11] determined BMI cut offs to define thinness in children & adolescents, based on BMI at age of 18yrs. Underweight has different meaning from overweight in adults and children. In adults, underweight or thinness represents the low BMI among them; whereas in children and adolescents it indicates low weight for age. In the present study an attempt is made to assess the prevalence of thinness among adolescent girls age 13-18yrs of Garhkhal village of Himachal Pradesh, India.

Methods

A cross-sectional study recruiting 100 adolescent (age: 13-18yrs) girls was carried out in Garhkhal Village of Himachal Pradesh. Local secondary schools were approached for permission of data collection. Information on age was confirmed from the students and was reconfirmed from school data.

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Anthropometric assessment

Height and weight were measured using standard anthropometer and weight scale, respectively, following the standard techniques. BMI was computed using the following standard equation: BMI= Weight (kg)/height (m2). Thinness was evaluated according to the international BMI cut offs given by Cole at al [9]. Cut offs for the age range studied is presented in table 1.

Table 1: BMI for age cut offs for the adolescents as given by Cole et al., 2007.

Age (year)	Grade III	Grade II	Grade I
13	14.2	15.14	16.57
14	14.75	15.72	17.18
15	15.25	16.22	17.69
16	15.63	16.62	18.09
17	15.9	16.89	18.38
18	16	17	18.5

According to these cut offs, children with low BMI for age were assigned particular grade of thinness. Those falling above grade I thinness were considered normal.

Results

The mean BMI and SD of the subjects are presented in table 2. In general the mean BMI increased with increasing age. Mean BMI for age did not fall into normal category for any age group. The overall mean (age-combined) BMI was 16.41 kg/m2. Table 3 and Figures 2 & 3 presents the percentage prevalence of thinness by age among the subjects; 26.24% of the total girls fell under grade III, 21.2% fell under grade II and 32.1% fell under grade I. Age-wise prevalence of thinness was 85.7%, 73.3%, 71.4%, 100%, 80% & 66.6% among 13yrs, 14yrs, 15yrs, 16yrs, 17yrs & 18 yrs age groups respectively. Overall age-combined prevalence was 79.5%.

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**Table 2: Mean BMI ± SD of the subjects**

Age(years)	N	Mean BMI (kg/m2)± SD	Grade
13	21	15.57±3.14	I
14	30	16.48±3.11	I
15	27	16.5±2.40	I
16	11	15.25±2.11	III
17	25	16.62±2.06	II
18	6	17.935±2.05	I

Table 3: Prevalence of thinness by age among the subjects

| Age(years)	Grade III	Grade II	Grade I	Total Thinness	Normal
13	4 (19.04)	7 (33.3)	7 (33.3)	18 (85.7)	3 (14.2)
14	9 (30)	6 (20)	7 (23.3)	22 (73.3)	6 (20)
15	0	2 (28.5)	3 (42.8)	5 (71.4)	2 (28.6)
16	7 (63.6)	1 (9)	3 (27.2)	11 (100)	0
17	7 (28)	9 (36)	4 (16)	20 (80)	5 (20)
18	1 (16.6)	0	3 (50)	4 (66.6)	2 (33.3)

Values without parenthesis are frequencies and within parenthesis are percentages.

Figure1: Prevalence of thinness in each age group according to grades
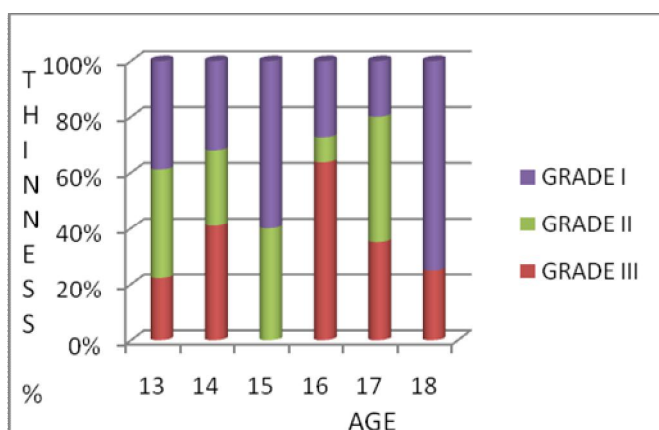
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Figure 2: Percentage of thin and normal girls in each group.
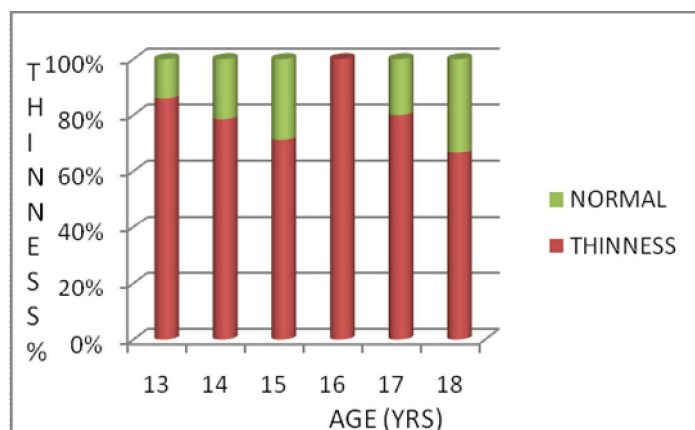
Conclusion

In the present study , mean BMI for age fell into Grade I for the age group 13-15 yrs & in Grade III for the 16 yrs and in Grade II for group 17-18yrs. This indicates the high prevalence of thinness among adolescent girls of Garhkhal village of Himachal Pradesh. High prevalence of thinness indicated the prevalence of nutritional stress among the children especially girls. The limitation of the present study is small sample size. This study adds to the current knowledge of thinness/underweight prevalent among the rural areas of India, basically among the adolescent girls of Himachal Pradesh. However, larger sample size is needed for better replication of the study.

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