A Comparative Study of Nutritional Status among Adolescents boys and girls in Urban Area of District Nainital, Uttarakhand

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Abstract

The present study was undertaken to assess the nutritional status and to compare the nutritional status among of the adolescent boys and girls in the urban area of Uttarakhand. The study was conducted among 150 adolescents (girls=75 and boys=75) of 13 to 16 years from urban area of Haldwani, District Nainital, Uttarakhand. For the assessment of nutritional status anthropometric parameters such as height and weight were assessed. BMI Z score was used to classify nutritional status of the adolescents. As per BMI Z scores (WHO, 2007) 65.33 per cent girls and 81.33 percent boys were normal. The prevalence of moderate under nutrition was 25.33 per cent for girls and 12 per cent for boys whereas severe under nutrition was reported in 6.66 per cent girls and 5.33 per cent boys. Only 2.66 per cent girls and 1.33 per cent boys were overweight.

Key words: Adolescents, Nutritional status, BMI Z score, Uttarakhand.

Introduction

Nutrition is an important component of human health and is a determinant of quality of life, as inadequacy of it leads to the health hazards and even mortality especially during the period of increased demand (Saxena and Saxena, 2011). Adolescence is a period of transition between childhood and adulthood. During this period various physical, psychological and behavioral changes takes place. Adolescence is a period of rapid growth, up to 45% of skeletal growth and 15 to 25% of adult height is achieved during adolescence (Rees and Christine,1989). During the growth spurt of adolescence, up to 37% of total bone mass may be accumulated (Key and Key,1994). Nutrition influences growth and development throughout infancy, childhood and adolescence; it is, however, during the period of adolescence that nutrient needs are the greatest(Lifshitz et al, 1993).Adolescence is one of the nutritional stress periods of life with profound growth, comes with increased demands for energy, protein, minerals and vitamins (Gopalan et al., 2001).

In India, large numbers of adolescents are undernourished and the problem is seen more among girls than boys, due to deep-rooted gender discrimination. Moreover gender discrimination is found in the household during the food allocation with preference to sons over girls have caused the under nutrition among girls to a longer extend .Craze for trendy foods, peer influences, body image, socio-cultural factors, changes in lifestyle and food habits of adolescents have affected the nutrient intake among adolescents, which directly affects their nutritional status (Himes and Boucher,1989).

The nutritional status is a major determinant of the health and well being among adolescents. Anthropometric measurements help in the assessment of nutritional status and monitor changes in growth of adolescents. The anthropometry is universally applicable, simple, inexpensive, and non-invasive technique, it is still an underused tool for guiding public health policy as well as individual clinical decision. Growth monitoring by anthropometric measurement during this period, is not only an important health indicator but also a predictor of various morbidity in the community (WHO,1995).

Various studies have been carried out among rural adolescents to study nutritional patterns and document the disparities among dietary pattern of boys and girls, but fewer studies have been done on urban adolescents in the Himalayan region. The present study was carried out to assess the nutritional status of urban

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adolescent boys and girls and to compare the differences between girls and boys. There are socio-cultural and patriarchal norms which continue to prevail on family behaviour and socialization leading to poorer nutrition for girls in rural areas. These are diluted in urban settings but still have an adverse impact on nutrition for girls. The study utilizes anthropometric measurement as a research tool. In view of the above facts the present study was carried out with the following objectives

1- To assess the nutritional status of adolescent girls and boys in the urban area of district Nainital, Uttarakhand.
2- To compare the nutritional status of adolescent girls and boys in the urban area of district Nainital, Uttarakhand.

Materials and method

A total of 150 adolescents (both gender) of 13 to 16 years of age were selected from urban area of Haldwani, District Nainital, Uttarakhand. The study was cross-sectional in nature and the subjects were selected through random sampling technique. Nutritional status was assessed by anthropometry. The measurements including height and weight were recorded using standard procedures(Gibson,1990). BMI was calculated as weight (kg)/height (m^2). Nutritional status was assessed by using BMI Z-score (WHO, 2007). For the statistical analysis of data percentage, mean and standard deviation has been computed.

Result and discussion

Anthropometric parameters such as height and weight were used to assess the nutritional status of adolescents residing in urban areas of Himalayas in Uttarakhand. Table 1 shows the mean and standard deviation (SD) values of height, weight and Body Mass Index (BMI) among adolescent girls as per age. A positive linear increasing trend has been observed in the mean values of height and weight among adolescent girls from 149.97± 3.5 cm to 155.90±3.79 cm and 37.87±4.49 to 44.23±4.26kg, respectively which is lower than the NCHS reference value. A similar study done by Yattinamani et al. (2014) on adolescent girls revealed that the mean height ranged from 146.21±6.91 to 156.12±7.57 cm and mean weight ranged between 39.64.5.98 to 46.90±6.10 kg which is almost in line with the present study.

Table 2 shows the mean values of height, weight and body mass index (BMI) among adolescent boys. An increasing trend has been observed in the values of height and weight among adolescent boys from 149.89±2.98 to 158.28±3.08 cm and 38.33±4.13 to 48.11±4.43 Kg, respectively. Patil *et al.* (2013) reported that the mean height and weight of adolescent boys in Maharashtra ranged from148.73±1.17 to 167.12±1.89 cm and 38.10±1.38 to 54.25±5.58 kg, respectively , which is wider than the present study. This may be due to the geographical factors, as the hilly people are shorter than the people living in plains.

On comparing the anthropometric parameters among adolescent boys and girls, it was observed that the height of boys was greater that girls at all the ages. The height of boys increases rapidly after 13 years in comparison to the girls. The weight of the boys was also more than girls at all ages. Adolescence is a period of rapid growth and the age for this growth differs for boys and girls. The age of attainment of maximum height and weight is different for both girls and boys.

Table 1. Distribution of anthropometric measurements among adolescent girls as per age.

Age	N	Height (cms)	Weight (kg)	BMI(kg/m^2)
13	15	149.97±3.25	37.87±4.49	16.85±1.88
14	18	151.81±3.56	39.97±6.35	17.34±2.65
15	22	153.72±5.39	43.39±8.10	18.36±3.22
16	20	155.90±3.79	44.23±4.26	18.25±2.11
Pooled				
	75	152.85±2.55	41.37±2.97	17.70±0.73

Source: Field work studies

Table 2. Distribution of anthropometric measurements among adolescent boys as per age.

Age	N	Height (cms)	Weight (kg)	BMI(kg/m^2)
13	18	149.89±2.98	38.33±4.13	17.05±1.66
14	20	152.10±3.06	44.20±5.47	19.12±2.44
15	19	154.97±5.68	46.89±5.97	19.54±2.36
16	18	158.28±3.08	48.11±4.43	19.23±1.94
Pooled				
	75	153.81±3.63	44.38±4.35	18.74±1.14

Source: Field work studies

According to WHO (1995), Body Mass Index (BMI) is the most appropriate variable for determining nutritional status among adolescents(WHO,1995). The nutritional status was assessed using BMI Z score (WHO, 2007). Table 3 indicates the nutritional status as per BMI Z score among adolescent girls and boys. As per BMI Z score 65.33 per cent girls and 81.33 percent boys were normal. The prevalence of moderate under nutrition was 25.33 per cent for girls and 12 per cent for boys whereas severe under nutrition was reported in 6.66 per cent girls and 5.33 per cent boys. Only 2.66 per cent girls and 1.33 per cent boys were overweight. On comparing the nutritional status among boys and girls it was found that the per cent of undernourished girls was higher than the boys. The poor nutritional status of the girls may be associated with many concurrent and future adverse health outcomes including poor reproductive outcome perpetuating the vicious cycle of malnutrition (Vijayaraghavan et al., 2000). Allocation with preference to sons, and the girls to receive less or inferior quality of food have compounded the under nutrition in the girls to a larger extent.

Table3. Nutritional status as per Z score of BMI and age among adolescent girls and boys.

Age (years)	**N**		**Normal n(%)**		**Moderate undernutrition n(%)**		**Severe undernutrition n(%)**		**Overweight n(%)**	
	Girls	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**
13	15	18	11(73.33)	14(77.77)	3(20)	3(16.66)	1(6.66)	1(5.55)	-	-
14	18	20	12(66.66)	17(85)	4(22.22)	2(10)	1(5.55)	1(5)	1(5.55)	
15	22	19	13(59.09)	16(84.21)	6(27.27)	2(10.52)	2(9.09)	-	1(4.54)	1(5.26)
16	20	18	13(65.00)	14(77.77)	6(30)	2(11.11)	1(5)	2(11.11)	-	-
Total	**75**	**75**	**49(65.33)**	**61(81.33)**	**19(25.33)**	**9(12)**	**5(6.66)**	**4(5.33)**	**2(2.66)**	**1(1.33)**

Source: Field work studies

Conclusion

The present study revealed that the prevalence of under nutrition was present among both boys and girls, but the prevalence was high among girls. As per BMI Z score 65.33 per cent girls and 81.33 percent boys were normal. The prevalence of moderate under nutrition was 25.33 per cent for girls and 12 per cent for boys whereas severe under nutrition was reported in 6.66 per cent girls and 5.33 per cent boys. Only 2.66 per cent girls and 1.33 per cent boys were overweight.

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