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Research Article

A study to determine the nutritional status of high school children in rural field practice area of medical college

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ABSTRACT

Background: Overweight and underweight are major health problems among high school children worldwide. The present study was undertaken to determine the prevalence of overweight and underweight in Nagavalli Government High School children and to assess the various determinants associated with the two nutritional statuses.
Methods: Cross-sectional study was carried out in government high school in Nagavalli by using preformed questionnaire. Totally 100 high school children from 8th, 9th and 10th standard were included in the study. Anthropometric measurements such as height, weight, body mass index, waist and hip ratio were assessed.
Results: Majority of students was underweight. Only few students were overweight, and no cases of obesity were found, but some were found to have central obesity. The overweight students were mainly boys and the underweight were mainly girls. Nutritional values of the majority of students were poor due to unhealthy food lifestyles, lack of exercise, outdoor activities, imbalanced diet and inadequate food intake.
Conclusions: 40% of female students were underweight as compared to 36% of male students who were underweight. Only 3% of girls were overweight compared to 4% boys who were overweight. In the present study, majority of high school students in 8th, 9th, and 10th standards were underweight, and the prevalence of overweight and obesity were less.

Keywords: Overweight, Underweight, Adolescence, Rural

INTRODUCTION

Over the past few years in India, childhood overweight and obesity is increasingly being observed with the changing lifestyle of families with inadequate exercises and unhealthy food lifestyles.[1] Obesity can be seen as the first wave of a defined cluster of non-communicable diseases called "New World Syndrome" creating an enormous socio-economic and public health burden in poorer countries and World Health Organization has described obesity as one of today's most neglected public health problems.[1] Physical inactivity and poor food habits has not only a prime role in its development, but also in the development of chronic diseases such as heart disease, diabetes, hypertension, cancers and osteoporosis in later life.[2] However in the rural India underweight and malnutrition still persists as a major health concern rather than overweight and obesity. Due to inadequate amount of food, improper balanced diet, lack of human resources, financial constraints, gender inequality and physical labor many adolescent age group are vulnerable to underweight.[3] Health concerns such as anemia, especially the female students, protein energy malnutrition, infections, delayed growth and development are some of the major health concerns that may accompany along that.[4]

METHODS

A cross-sectional study was carried out in Nagavalli Government High Schools (8-10th standards) with a

Table 1: BMI.

BMI	No	Percentage
<18.5	76	76
18.5-24.9	17	17
25-29.9	7	7
>30	0	0

BMI: Body mass index

Table 2: Waist hip ratio.

Waist hip ratio	Percentage
0.6-0.7	2
0.7-0.8	5
0.8-0.9	82
>0.9	11

sample size of 100. Required number of students from each class was selected using systematic random sampling. A pre-designed and pre-tested questionnaire was used to interview the study participants to elicit the information based on questions concerning eating habits such as regular intake of fruits, vegetables, junk foods, milk, outdoor/indoor sports, fathers and mother's education and occupation, regularly eating from restaurants. Anthropometric parameters such as height, weight, hip and waist measurements were also taken into consideration. School authorities consent was obtained after the objectives and goals for the studies were explained. The measurement of height (to the nearest 0.5 cm), body weight (to the nearest 0.1 kg), waist and hip circumferences of each student was recorded by following the standard techniques and body mass index were calculated. The international cut-off points for the body mass index were used, body mass index (BMI) for age >85th and <95th percentile were classified as

Table 3: Factors for assessing nutritional status.

Variable	Total number	Overweight	Underweight	*p* value
Overall	100	7	76	
Age				0.44
12-14	48	3	44	
15-16	52	4	32	
Gender				0.62
Male	50	4	36	
Female	50	3	40	
Television viewing				0.17
<60 min	53	2	42	
>60 min	47	5	34	
Activities				
Swimming				057
Yes	39	3	41	
No	61	4	35	
Dancing				0.17
Yes	32	2	42	
No	68	5	34	
Dietary habits				0.25
Only vegetarian	37	2	39	
Only non-vegetarian	0			
Both	63	5	37	
Eating habits				0.28
Milk				
Regular	73	5	38	
Occasionally	20	2	38	
		7	76	
Fruits and vegetables	100% regular			0.35
Junk food				
Regular	8	3	20	
Occasionally	72	4	56	
Eating in restaurants				
Occasionally	99	7	76	
Soft drinks				
Occasionally	100	7	76	
Fried foods				
Occasionally	100	7	76	

overweight and others who had BMI for age >95th percentile were classified as obese. Institutional ethical clearance was taken.

RESULTS

A total of 100 students from 8th to 10th standard participated in the study. The age ranged from 12 to 16. Out of the 100 students, 50 were male, and 50 were female. About 76% of students are of BMI <18.5, 17% between 18.5 and 24.9, 7% between 25 and 29.9 and none had a BMI over 30; thus leading to the conclusion that majority of the students were underweight (Figure 1). Only few students were overweight, and no cases of obesity were found, but some were found to have central obesity. The overweight students were mainly boys and the underweight students were mainly girls. Nutritional value of the majority of students was poor due to consumption of junk foods, lack of exercise, outdoor activities, inadequate intake of food and imbalanced diet (Tables 1-4).

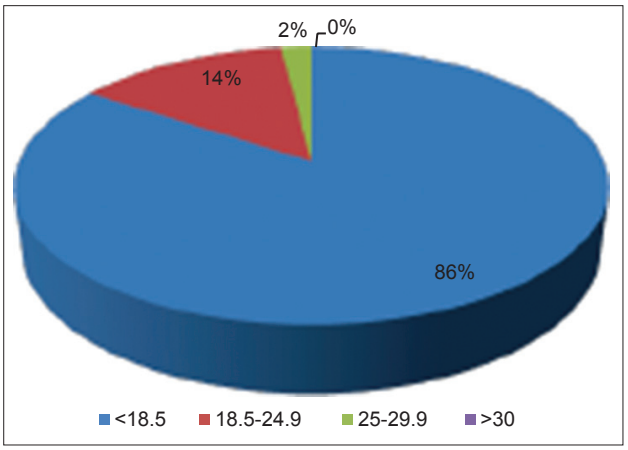

Figure 1: Body mass index.

Table 4: Educational status of parents.

Distribution of educational status of mother	
Above high school	55
Under high school	40
Illiterate	5
Distribution of educational status of father	
Above high school	63
Under high school	36
Illiterate	1

DISCUSSION

Globally, an estimated 10% of school-aged children, between 5 and 17 year of age are overweight or obese.[1] According to a recent data, the prevalence among adolescent children (14-17 year) was 29% in private schools and 11.3% in government funded schools in 2006-2007.[5] In this present study, only 7% of the overall study was overweight and none were obese. In Deshmukh et al reported prevalence of overweight/obesity to be 2.2% of rural area of Wardha District. In a study conducted of a sample size of 3886, 16.6% were underweight with a BMI <15, and 2.44% were severely underweight with a BMI <13 (Table 5).[3]

The results of this study that focused on the nutritional status of children in high school expose the fact that the percentage of underweight still precedes that of overweight in rural regions of India. Furthermore, the study also shows that underweight was more prevalence in girls than boys, while overweight was more prevalent in girls. Educating the students about daily caloric intake as well balanced diet should be implemented. Formal education also should be conducted to the students by the school especially to girls because majority of underweight is among them. Mid-day meal program should be effectively practiced with proper food supplementation to prevent malnutrition. Physical education classes should be actively participated by the students. Parent teacher association conferences should be held regarding health education of the students. Through these various processes, preventive efforts can be used for the better health of the future generation.

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Ethical approval: The study was approved by the Institutional Ethics Committee

Table 5: Childhood obesity in India.

Author (year)	Age group (year)	N	Location in India	Prevalence (%)
Gupta et al. (1990)[6]	5-15	3861	Uttar Pradesh (North)	Obesity, 7.6
Kapil et al. (2002)[7]	10-16	870	Delhi (North)	Obesity, 7.4, boys, 8, girls, 6
Mohan et al. (2004)[8]	11-17	3326	Punjab (North)	Rural, overweight, 4.7
Ramachandran et al. (2002)[9]	13-18	4700	Chennai (South)	Overweight, boys, 17.8, girls, 15.8
Rao et al. (2006)[10]	9-16	2223	Pune (West)	Overweight, boys, 27.5, girls, 20.9
Sharma et al. (2007)[11]	4-17	4000	Delhi (North)	Overweight, 22

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