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Nutritional status of high school and intermediate school children

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Abstract

Obesity is a pre-disposing factor for many diseases. Studies have reported significantly higher among secondary school children. High School and Intermediate School (10+2) education are considered most important stage of learning in India as the choices for future education and livelihood are based on the achievements obtained at the level. Health with respect to nutritional status is fundamental and important to enable children to concentrate on their studies, therefore, a study was undertaken with the objective to study the nutritional status of high school and intermediate school students in the district Bahraich district of Uttar Pradesh. A total of 100 students were selected (50 children each from high and Intermediate school) from IRP colony. Anthropometric measurements BMI of the students was taken for nutritional assessment. The study found that mean BMI high school was 20.5 while BMI of intermediate school children was 21, thus on an average both high school children and Intermediate children had normal nutritional status in terms of BMI.

Keywords: BMI, high school, senior secondary/ intermediate school, obesity, adolescents

Introduction

Student's health is prime for their learning activities especially during their critical years of education – high school and senior secondary. A healthy body has healthy mind that promotes both physical and cognitive activities. According to Ashok *et al.* (2020) ^[1] one fifth of the population comprises of children aged 5-14 years covering primary and secondary education. Without ensuring optimal child growth and development, efforts of over economic development shall be unsuccessful. Majority of children in the study were underweight (24.5%), overweight (8.4%) and obese (4.1%). In a study conducted in India a total of 1728 children in the age group of 3-21 years were studied. The BMI grades were computed as per WHO standards and found that the children between 15-21 years were relatively healthy than 3-8 years group. Age and gender was significantly related with BMI. Average BMI of the sample was at par with WHO standards (Mahalakshmi and Abirami, 2019) ^[2].

In a study reported by Pavithran and Bant (2018) ^[11] it was found that 14.9% rural adolescent girls were under-weight for their age. Based on BMI, 25.2% of girls were under-nourished and 3.7% were over nourished. Significant relation with age, type of diet and age of menarche was found at $p < 0.05$. There is high prevalence of under nutrition among adolescent girls and is under nutrition is associated with micronutrient deficiencies like anemia. There was need to create awareness to improve the nutritional needs of adolescent girls in rural areas. Sharma *et al.* (2017) ^[6] reported the findings of cross-sectional study of 220 rural and urban adolescents students of Bikaner, Rajasthan, India as mean age of the students was 17.6 years and the mean weight was 52.3 kgs. A significant high prevalence of overweight was found among the adolescents with high calorie foods, physical inactivity and television or computer viewing for more than 3 hours a day. Firdos *et al.* (2018) ^[10] revealed that significantly ($p < 0.05$) lower heights of both male and female children of low SES. Kumar and Faisal (2015) ^[9] reported a cross-sectional study with a sample size of 1721 students aged 12-15 years from seven affluent private schools of Vijaywada and BMI revealed the prevalence of overweight and obesity to be 26.9% and 8.7% respectively.

Methods and materials

The *Ex-post Facto* study conducted in IRP colony of Bahraich district of Eastern Uttar Pradesh. A sample of 100 students were selected for study through snowball sampling. Students from high school (50 in number) and 50 Intermediate (10+2) school children were

examined for their nutritional status through anthropometric measurements and Body Mass Index (BMI) using measuring tape and weighing machine. A questionnaire was also developed to elicit information on the family profile of the children. The data was consolidated tabulated and analyzed.

Results and Discussion

The finding of the study was as follows:

Family Profile of the respondents

With respect to profile of the family, Table 1 presents the type of family children belonged to. It was found that the majority of student’s belonged to nuclear family in high school (72%) and joint family (28%). Similar results were revealed among Intermediate students with 62 percent from nuclear family and joint family (33%).

Table 1: Type of family to which high school and Intermediate students belonged to

Family Type	High School		Intermediate		Total	
	N	%	N	%	N	%
Nuclear	36	72.0	31	62.0	67	67.0
Joint	14	28.0	19	38.0	33	33.0
Total	50	100.0	50	100.0	100	100.0
χ^2	1.131				$p>0.05$	

Irrespective of the education group, 67% students belonged to nuclear family as against joint family system (33.0%). It was interesting to note that although about two third of the families were nuclear families, one third of them were joint families, which is a healthy sign and reflects Indian believe and trust in joint families. Studies conducted in Adhura, Bihar and Milkipur Ayodhya found that majority of families were nuclear families (Maurya, 2018; Maurya and Yadav, 2019) [3, 4].

Family size of the children

Table 2. revealed that among high school (64%) had family size of three to four members, 24 percent had 5 to 8 members and 9 to 12 members (12%) in their families. Amongst the intermediate group, 54 percent were with three to four members, 28% and 9-12 members (18%).

Table 2: Family size of the respondents

Family Size	High School		Intermediate		Total	
	N	%	N	%	N	%
3 to 4 members	32	64.0	27	54.0	59	59.0
5 to 8 members	12	24.0	14	28.0	26	26.0
9 to 12 members	6	12.0	9	18.0	15	15.0
Total	50	100.0	50	100.0	100	100.0
χ^2	1.178				$p>0.05$	

Overall 59.0 percent students were from families having three to four members followed by 26.0 percent families who had 5 to 8 members and 15.0 percent respondent’s families were found having 9 to 12 members in their families. It was hypothesized that there is no association between the family size and the class of the students. The calculated value of χ^2 (1.178) was less than the table value at 5% L.S. Therefore, the hypothesis was accepted. Thus, no significant association was found between the family size and the class of the students which indicates that educational level and family size are not significantly associated.

Anthropometric measurements of the High school and Intermediate students

Nutritional anthropometric measurement has been defined as measurement of variations of physical dimensions and gross composition of the human body at different age levels and degrees of nutrition (Silakshmi, 2012) [8].

Table 3: Height of the High school and Intermediate Students - gender wise

Gender	Height			
	High School		Intermediate	
	N	Mean ± SD	N	Mean ± SD
Male	32	160.0±1.3	26	169.8±2.4
Female	18	154.4±1.0	24	159.1±2.7
Total	50	158.0±3.0	50	164.7±5.9
Z value	6.650*		$p<0.05$	

Table 3 shows that in high school the mean height of 32 male students was 160 cm, while the mean height of 18 female students was 154.4 cm. Hence, mean of height of total high school students with was 158 cm. With respect to intermediate, the mean height of 26 male students was 169.8 cm, while the mean height of 24 female students was 159.1 cm. The mean of height of total intermediate students was 164.7 cm.

Weight of High school and Intermediate School children

Table 4 shows that with respect to high school students, the mean weight of 32 male students was 53.1 kg, while the mean weight of 18 female students was 48 kg. The mean of weight of total high school students was 51.3 kg. In intermediate the mean weight of 26 male students was 61.6 kg, while the mean weight of 24 female students is 52.1 kg. Hence mean of weight of total intermediate students was 57 kg.

Table 4: Weight of the High school and Intermediate student - gender wise

Gender	Weight (Kg)			
	High School		Intermediate	
	N	Mean ± SD	N	Mean ± SD
Male	32	53.1±1.8	26	61.6±1.7
Female	18	48.0±1.6	24	52.1±1.6
Total	50	51.3±3.0	50	57.0±5.1
Z value	5.968*		$p<0.05$	

Comparing the weight of high school students to Intermediate students, the z value was calculated (5.968) was found to be significant at 5% level of significance, which implies that standard deviation is more than mean.

Raikar *et al.* (2019) [7] also found a trend of changing anthropometric measurement as evident in their study of 995 students aged 5-16 years that indicated the school children were growing taller and heavier.

Table 5: Body Mass Index (BMI) of high school and Intermediate Students - gender wise

Gender	BMI			
	High School		Intermediate	
	N	Mean ± SD	N	Mean ± SD
Male	32	20.7±0.8	26	21.4±0.8
Female	18	20.1±0.8	24	20.6±1.1
Total	50	20.5±0.8	50	21.0±1.0
(B) Z value	6.626*		$p<0.05$	

Table 5 revealed that with respect to high school students, the mean BMI of 32 male students was 20.7, while the mean BMI of 18 female students was 20.1. The mean of BMI of total high school students was 20.5. While among intermediate students, the mean BMI of 26 male students was 21.4, while the mean BMI of 24 female students was 20.6. Thus, the mean of BMI of total intermediate students was 21. Thus, it was heartening to find that the nutritional status of children was normal as in both the groups the mean BMI of the children was between the standards of WHO i.e. 18.5 to 24.9. While study at Buraydah Saudi Arab found a relatively high prevalence of overweight

Summary and Conclusion

Adolescent stage is important milestone and foundation of adulthood and its responsibilities. Nutritional status of these children indicate the future of any country. Although there has been incidences of under-nourishment among school going and adolescent, there are cases of obesity and obese among adolescents, especially in the affluent groups. From the results of the study, it is concluded that mean height and weight of female students was lower than that of male students of both high school and Intermediate school children. Average BMI of the adolescents of high and intermediate school was 20 which according to WHO standard is within normal range. Thus, it is good indicator that the children are being provided health diet and may also be living and healthy lifestyle leading India towards healthy India.

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