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Original Article

Prevalence of overweight, obesity and its associated risk factors among school children aged 6- 16 years of Biratnagar

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Abstract

Background

The World Health Organization (WHO) defines obesity as a 'global epidemic. Overweight and obese children are at higher risk for developing long-term chronic diseases like hypertension. With globalization bringing more lifestyle modifications, adolescents are exposed to multiple risk factors including obesity, diet, academic stress, lack of physical work apart from hereditary risk factors. Early diagnosis of obesity and hypertension is an important strategy in its control, effective treatment and prevention of complications. The aim of the study is to assess the prevalence of and the factors associated with childhood overweight/obesity among school children

Material and Methods

It is a school based cross sectional study done in schools of Biratnagar. School going children aged 6 to 16 years from 10 different schools of Biratnagar were taken as study population. Five were private schools and five were government schools. All the school going children aged 6 to 16 years were included in the study. Children with any chronic illness were excluded from the study.

Results

A total of 1900 students were included between age group of 6 to 16 years. The prevalence of overweight, obesity and hypertension were 2.9%, 1.8% and 6.1%.

Conclusion

Overweight, obesity was significantly associated with hypertension. Students studying in private schools and family income > Rs.10,000 were strongly associated with overweight, obesity and hypertension. Family history of hypertension was also associated with overweight/obesity.

Keywords: *overweight, obesity, co-morbidity, hypertension.*

Introduction

According to World Health organization, obesity is defined as being at or above the 95th percentile of body mass index for age and sex and Overweight as being between the 85th and 95th percentiles of body mass index for age and sex.

WHO defines Body mass index(BMI) as being weight in kilogram per height in

square metres recommended for use in children and adolescent [1]. The WHO has categorized obesity as a 'Global Epidemic'. Traditionally, overweight/obesity used to be considered a problem in developed countries, however this problem is being on rise in developing countries, particularly in urban areas due to change in sedentary lifestyles and food habits [2-3]. Reviewing

the data, Childhood obesity has increased from 4% to 6% from 1990 to 2010, and is expected more to increase to 9% or approximately 60 million by 2020[4].

At present, precise data on prevalence of childhood obesity, overweight, hypertension in school children in Nepal is lacking although there is data available regarding prevalence of overweight, obesity HTN in adults.

So, this study aims to find out prevalence as well as factors associated with overweight, obesity and hypertension to prevent for the future risk for development of the cardiovascular disease. This study would generate some evidence based recommendation for the preventive of non-communicable diseases like hypertension, overweight and obesity in the future.

Material and Methods:

This study was a school based cross sectional study among school going children aged 6-16yrs from 10 different school of Biratnagar, 5 were private and rest 5 were public school. All children aged 6-16yrs studying in grade 1-10 were enrolled into the study. Population proportionate simple random sampling technique used based on their roll numbers of the class so that each student has the chance of being included in the study. Age was verified from school records and rounded off to completed years. Height and weight of each child were recorded. Height was measured by using stadiometer with child standing upright barefoot on ground with heels, buttocks touching wall and head in the Frankfurt plane. A calibrated and standardized electronic weighing scale were used to measure weight. BMI was calculated using the formula $BMI = \text{weight in kg} / (\text{height in metre})^2$. A child was classified according to NCHS guidelines as overweight with BMI for age between 85th and 95th percentiles and as obese with BMI for age at or above the 95th percentile. For information to be

taken from the parents of the school children, a small questionnaire was handed over to the children, which was subsequently given to their respective parents.

Results:

This study enrolled total of 1900 participants. The mean age in the study was seen to be 11.78 years with standard deviation of 2.89. This study included minimum age of 6 years with maximum age of 16 years. Majorities (66.8%) of the participants were greater than 10 years of age. Of these 1900 participants 51.1% were male followed by 48.9% females. The participants representing private school was slightly high (55.3%) compared to the government school of 44.7%.

It was seen that mean height in this study was 141 cm (SD= 15.87) and mean weight was 35.99 kg (SD= 12.14). BMI was then calculated and classified as per the WHO guidelines. It was seen that 19.9% of the respondents were underweight. 75.3% of the respondents had normal BMI. Overweight and obese represented 2.9% and 1.8% respectively.

It was seen in the study that overweight and obesity was found to be only 2.9% and 1.8% respectively. Although it was in small number this was found to be statistically significantly associated with hypertension ($p=0.001$)

The study also tried to compare the risk factor for overweight/obesity among the 1900 participants. It was seen that age was not significantly associated with overweight or obesity ($p=0.363$). Similarly, sex was also not found to be significantly associated with hypertension (0.915). Both males and females represented almost equal proportion in the overweight/obese category. However, participants who were from the private school were found to be more overweight / obese compared to their government school counterparts.

Table 1: Socio-demographic characteristics of the participants (n= 1900)

Background characteristics	Category	Number	Percentage
Age	10	631	33.2
	> 10	1269	66.8
Mean age(yrs)± SD	11.78± 2.89		
Gender	Male	971	51.1
	Female	929	48.9
School type	Government	849	44.7
	Private	1051	55.3
Family Income	10000	939	49.4
	< 10000	961	50.6

Figure 1: BMI of the Respondents (n= 1900)

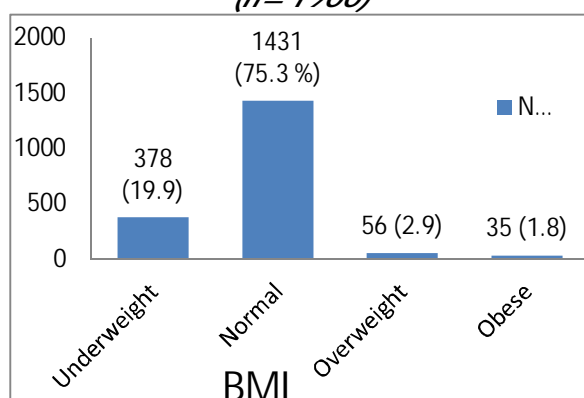


Table 2: BMI classification of the Respondents (n= 1900)

BMI category	Category	Number	Percentage
BMI category	Underweight	378	19.9
	Normal	1431	75.3
BMI category	Overweight	56	2.9
	Obese	35	1.8

Table 3 : Association of BMI with hypertension (n= 1900)

Risk factors	Category	Hypertension		p-value
		Normal	Hypertension	
BMI	Underweight	363 (96)	15 (4)	0.001
	Normal	1353 (94.5)	78 (5.5)	
	Overweight	43 (76.8)	10 (28.6)	
	Obesity	25 (71.4)	10 (28.6)	

Discussion

This study was done to find out the prevalence of overweight, obesity and hypertension and its associated risk factors. This study was a cross sectional descriptive study, done in school children of Biratnagar. In this study prevalence of obesity was 1.8%. Similar study done in kaski district of Nepal, found the prevalence of obesity was 2.3% [5]. This result was comparable to our study. In this study prevalence of overweight was 2.9%. In our study, students studying in private school were found to have high prevalence of overweight/obesity/hypertension than those population studying in government school. In this study, students with family income of Rs> 10,000 have higher prevalence of overweight/obesity/hypertension than those having family income of Rs< 10,000. In this study, family history of hypertension was associated with overweight and obesity. So far there are no published data on pediatric overweight, obesity and hypertension and its associated risk factors in Eastern region of Nepal. So, this study gives information about above co morbidity. Further there is a need of further studies to find out the overall prevalence of overweight, obesity and hypertension in pediatric population in this country.

CONCLUSION

Although overweight/obesity was found to be of lower prevalence in our study yet there was strong association with hypertension, so timely identification or control of overweight/obesity is required for prevention of development of other cardiovascular comorbidities.

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