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Study of overweight and obesity and associated factors among school children, Paschim Medinipur, West Bengal

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Abstract
Background: Obesity is bad for your health and well-being. Obesity's negative health effects and rising prevalence are being recognized as a serious public health issue. School children frequently consume junk food, which is a significant risk factor for obesity.
Aims and objectives: The purpose of this study was to determine the relationship between various risk factors and the prevalence of overweight and obesity among school children.
Material and Method: 149 school children participated in the cross-sectional study. A thorough history was recorded. According to WHO guidelines, anthropometric measurements like weight, height, BMI, waist-to-height ratio, and waist-to-height ratio were taken
Result & Conclusion: The study revealed a high prevalence of obesity and overweight (30.2%) Non-vegetarian diet was significantly linked to obesity (p0.05).It is necessary to emphasize the significance of healthy lifestyle choices and eating habits. Throughout the study, we educated school children about healthy living.

Keywords: Obesity, school children, BMI, Fat, Diet

Introduction

Obesity is a medical condition in which excessive body fat builds up to the point where it may be harmful to one's health. In low- and middle-income nations, particularly in urban areas, obesity and overweight are currently dramatically on the rise. Obesity has multiple and intricate causes. Obesity is caused by a long-term positive energy balance, or the interaction of energy intake and energy expenditure, within the context of environmental, social, and genetic factors [1].

Diet, genetic predisposition, physical activity, physiological factors, and behavioral factors are all thought to play a role in obesity [2]. The prevalence of obesity is rising in developing nations. Worldwide, 13% of adults over 18 were obese in 2014 [3] .Overweight and obesity are linked to a variety of diseases, including diabetes mellitus, myocardial infarction, stroke, hypertension, and some cancers. Obesity and overweight are the fifth most common causes of death worldwide.

Overweight or obese adults cause at least 2-8 million deaths annually. Overweight and obesity are also responsible for 44% of the burden of diabetes, 23% of the burden of ischemic disease, and between 7% and 41% of certain cancer burdens [4]. A number of factors, including diet, genetic predisposition, physical activity, physiological, and behavioral factors, are thought to contribute to obesity [5]. The high prevalence of this condition and the severe health consequences it causes make obesity prevention a major public health priority. In many nations, studies on medical students and health care workers suggested that obesity is a problem for these populations [6-10].

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Aims & objective

This study determine the prevalence of obesity and overweight among school children, Paschim Medinipur, West Bengal, We investigated the relationships between obesity and associated risk factors.

Material and Method

This cross-sectional study was conducted on school children, Paschim Medinipur district, West Bengal. The study included 149 students in total. A written consent for participation in the study was obtained, along with a brief explanation of obesity and overweight, as well as their implications. The students' name, age, sex, blood type, type of diet (Veg/NonVeg), sleep duration, and exercise frequency were all taken into account. A point by point clinical history was taken. Standardized methods were utilized to measure the following anthropometric parameters [11]:

The height was marked on the wall in cm with an accuracy of 0.5 cm and the weight was taken using a scale weighing machine (accurate up to 0.5 kg).The waist-to-hip ratio of male students was significantly higher than that of female students (p0.05).

By asking them to stand barefoot with their backs to the wall and a scale straight on their heads, their height (in cm) was measured to within 0.1 cm. A point was set apart by the pencil on the wall.

At the end of expiration, the waist circumference (cm) was measured with an accuracy of up to 0.1 cm using non-stretchable measuring tape located halfway between the lower rib margin and the iliac crest.

Accuracy up to 0.1 cm allowed for the measurement of hip circumference (cm) as the maximum circumference over the buttocks.

Following parameters were calculated

BMI in kg: The formula weight (kg)/height (meters) 2 was used to calculate the Body Mass Index (BMI). The WHO BMI classification was used, which states that an overweight person has a BMI greater than or equal to 25.

And obesity is a waist-to-hip ratio (WHR) of 30.12 or higher: For males, central/abdominal obesity was defined as a WHR of 0.90 and for females, 0.85.13

Waist-height ratio (WHtR) more than 0.5 will be considered as abnormal [14].

Statistical analysis was done after collection of the data and it was analyzed and interpreted. Percentages and Chi square test were applied to it.

Result

The present study was conducted on 149 students, out of them 74 (49.67%) were males and 75 (50.33%) were females. Out of total students, 92 (61.75%) were normal weight, 49 (32.89%) were overweight and 8 (5.36%) were obese according to BMI. Nobody was underweight in our study group. (Table I). 97 (65.11%) students had normal waist-hip ratio and 52 (34.89%) were obese. Waist-hip ratio was significantly higher in male students than the female students (p0.05) (table II). We also observed that 62 (41.61%) students were vegetarian and rests 87 (58.39%) were non-vegetarian. Prevalence of obesity was significantly higher in non-vegetarian than vegetarian students (p<0.05).

14.09%) students were exercising regularly while 85.91% were not exercising at all (table IV). 40.94% students had family history of overweight/obesity while 59.06% had family history of diabetes mellitus.

Table I: Distribution of subjects according to BMI

Sex	Normal	Overweight	Obese	Total
Male	44	28	2	74 (49.67%)
Female	48	21	6	75 (50.33%)
Total	92 (61.75%)	49 (32.89%)	8 (5.36%)	149 (100%)

Table II: Distribution of subjects according to waist/hip ratio and waist/height ratio

Sex	Waist/hip ratio		Waist/height ratio	
	Normal	Obese	Normal	Obese
Male	41	33	43	31
Female	56	19	46	29
Total	97 (65.11%)	52 (34.89%)	89 (59.74%)	60 (40.26%)

Table III: Distribution of subjects according to food habits & exercise

BMI	Veg/nonveg		Junk food		Frequency of exercise	
	Veg	Non veg	Eater	Non Eater	Regular exercise	Occasional/no exercise
Normal	39	53	29	63	41	51
Overweight	21	28	18	31	17	32
Obese	2	6	1	7	3	5
Total	62 (41.61%)	87 (58.39%)	48 (32.21%)	101 (67.79)	61(40.94)	88 (59.06)

Table IV: Distribution of subjects according to family history (obesity & Diabetes mellitus)

BMI	FH/obesity		FH/Diabetes Mellitus	
	Yes	No	Yes	No
Normal	13	79	39	53
Overweight	5	44	18	31
Obese	3	5	4	4
Total	21 (14.09%)	128 (85.91%)	61(40.94%)	88 (59.06%)

Discussion

The WHO says that in a population study, the most useful indicator of obesity is the body mass index. In our study, 32.89% and 5.36%) of students had BMIs greater than or equal to 30 Kg/m2. Similar to Jayaraj et al.'s study, these findings were found in a medical school in south India, where 31.3 percent of students had a BMI greater than 25 kg/m2 and 6.3% had a BMI greater than 30 kg/m2 [15]. Additionally, they discovered 4% of students to be underweight (BMI 18.5%).

No student in our study was underweight. A similar study in Delhi found a prevalence of 11.7% overweight and 2% obesity among school children [17]. WHR has been found to be a more effective predictor of obesity [18]. If obesity is redefined using WHR instead of BMI, the proportion of people categorized as at risk of heart attack worldwide increases threefold [19]. In our study, central obesity was significantly higher in male students than in females. Similar findings were found in a study that was conducted in Lahore [20]. In addition, the waist-to-height ratio is a more accurate indicator of obesity than BMI [21]. Male and female students' waist-to-height ratios did not differ significantly in our study. Additionally, we discovered a significant link between obesity and eating a non-vegetarian diet. Despite the fact that non vegetarians were more likely to be obese, Tiwari R et al. found no significant correlation between obesity and a vegetarian or non-vegetarian diet [16]. While other studies indicated that obese students consumed more calories from butter and zinger burgers, our study found no significant link

between obesity and junk food. We also did not find any significant relationship between obesity and family history. This may be because changes in the genetic makeup of the population occur too slowly to be responsible for obesity. The lack of information on portion size and food's caloric density limited this study. However, additional studies may demonstrate a positive link between obesity and family history [15, 16].

Conclusion

This study found that school children in West Bengal are very likely to be overweight and obese, which is in line with previous research from other states in India and other countries. In our investigation, no student was underweight. School children are known to engage in very little physical activity. Their physical activity declines dramatically. Students don't have time to take care of themselves. Several serious diseases could emerge as a result.

Conflict of interest: The authors declared no conflict of interest

Contribution

AM and DP designated and implemented the study. AM collected data. AM & DP analyzed the data. AM and DP drafted the manuscript. Finally, all authors have checked and approved it.

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