Prevalence of overweight and obesity and lifestyle assessment among school–going children of Multan, Pakistan

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ABSTRACT

Objective: To evaluate the burden of obesity in school–going children.
Study Design: A descriptive cross sectional study.
Place and Duration: Six months from 1st November 2017 to 30th May 2018 at Department of Preventive Pediatrics, Children Hospital and Institute of Child Health Multan.
Methodology: Data was collected from different schools of Multan District**.** Children age 3 to 18 years were enrolled by simple random sampling method. Weight, height and body mass index measured by trained Nutritionist. Life style pattern, physical activity and dietary patterns were questioned from all students. Consent and questionnaires were filled by parents of students less than 5 years of age as the students are not mature enough to answer on their own. Students from 5-18 years answered their questionnaires by themselves.
Results: Total 1872 children were assessed and 10% children were overweight and 5% children were obese. The prevalence of obesity was more in children who were attending private school (57%) than public school (43%). Most of the children consume fast foods once/twice weekly (35.6%) which enhances overweight and obesity. The chi-square test revealed that family size, no, of siblings, mother's working status, skipping breakfast, fast food consumption, physical activity and sedentary lifestyle were significantly (P value < 0.05) linked with overweight and obesity.
Conclusion: Overweight and obesity among school going children of private and public schools in Multan was high and dietary behavior, physical activity and sedentary life style are major causes of higher burden of obesity among school going children.
Keywords: Children, Obesity, Life style, Overweight, Dietary habits, Physical activity

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INTRODUCTION

Obesity is a condition of abnormal or excess fat accumulation in adipose tissues. Obesity in childhood has become a serious threat for Public Health[1,2]. Childhood obesity is a contributing risk factor for serious diet related chronic diseases later in life, such as cardiovascular diseases, hypertension, stroke, Type II diabetes mellitus and certain forms of cancer[3]. Overweight and obesity is built up by bad dietary behaviors such as consumption of cold drinks and fast foods, skipping of meal, low intake of fruits and vegetables, eating away from home[4]. Lack of physical activity, sedentary lifestyle (poor sleeping habits, increase in screen time) and unhealthy eating patterns are behaviors that directly influence body weight in children[5].

In last two decades, number of overweight children and adolescents has doubled in developing and developed countries and the prevalence of overweight and obesity among school-going children is increasing day by day[6,7]. Childhood obesity and overweight is an emerging problem in Pakistan[8].The burden of childhood overweight and obesity is between 15-20% in Pakistan[9]. Now days in Pakistan the focus of health policy is on under nutrition but there are also evidences for nutrition transition in urban cities particularly in Multan which are contributing to over nutrition. In Multan there was no

information regarding burden and contributing factors of overweight and obesity among children going to school. The main focus of current study was to assess and evaluate the burden of obesity in school going children in Multan city. So that further studies and measures can be taken with the help of teachers and parents to promote healthier lifestyle in children from an early age and burden of overweight/obesity can be evaluated in school going children. The objective of this study is to evaluate the burden of obesity in school–going children.

METHODOLOGY

This descriptive cross sectional study was conducted in Department of Preventive Pediatrics, Children Hospital and Institute of Child Health, Multan from 1st November 2017 to 30th May 2018. School children aged 3-18 years were included in this study and data was collected from private and public schools of City District Multan. These schools were determined by their fee structure and their socioeconomic status spectrum. These 11 schools represented different localities of Multan city, ranging from low socioeconomic locality to high socioeconomic areas. Permission was obtained from administration of both Private and Public schools after through introduction and explanation of particular study. Simple random sampling technique was used to have proportionate representation of gender, socioeconomic status and area of residence and total 1872 children were enrolled in the study.

The data was collected from selected schools on pre-arranged dates by the students of B.S Nutrition, Intitute of Food and Nutrition, Bahauddin Zakariya University Multan, under supervision of nutritionists from Department of preventive pediatrics, Children hospital and Institute of Child Health Multan. After consent was taken, the children's (aged3-18 years) who were present on the day of data collection were included in the study. The written consent for children under 5 years of age were taken from parents previously and the questions were also answered by their parents. The children who were absent on the day of data collection, who were below or above 3-18 years of age, or who refused to give consent were excluded from this study.

A Questionnaire was developed to assess the prevalence of obesity in consultation with qualified nutritionist, factors as Anthropometric measurements, BMI, dietary evaluation, physical activity and demographic characteristics were included in the questionnaire to find out the prevalence of obesity and also the effect of these factors on overweight and obesity. NCHS/WHO standards for anthropometric measurements, BMI and dietary evaluation were used to design the questionnaire[10]. Questionnaire consisted of four sections.

Section-1 assessed Personal Information: name, school name, school type, gender, class and age. Section-2 assessed socioeconomic status like father's occupation, mother's education, father's education, mother working status, no. of sibling and family size Section-3 assessed Dietary intake, skipped meal, fast food consumption, physical activity and sedentary life style (including watching television, using computer, playing games on mobile. All of the above variables were used to find out association of these factors on overweight and obesity and to assess the main factors contributing to obesity.

Section 4 assessed weight (kg), height (cm), neck circumference (inches), waist circumference (inches), MUAC (cm). All instruments were standardized before the examination and the balances were zero calibrated. Height and weight were measured without shoes. Height measurement was in centimeters (cm) and weight was measured in kilogram (kg) with a range of 0-160 kg. Height and weight were measured to the nearest 0.1 cm and 0.5 kg respectively. Body weight was measured by using digital weight balance. Body height was measured in erect position without shoes and minimal clothing by using manual Stadiometer. Mid upper arm circumference (MUAC) was measured by using non elastic plastic MUAC tape. Children at or above 95th percentile were considered obese. The most frequently used and authentic measure for obesity is body mass index (BMI), defined as weight (kg)/height squared (m2), and BMI-for-age is the anthropometric index of relative weight recommended by the international expert committees

Operational Definitions:

Preoperational (2 to 7 years): "Development of language, memory, and imagination. Intelligence is both egocentric and intuitive."

Concrete operational (7 to 11 years): "More logical and methodical manipulation of symbols. Less egocentric, and more aware of the outside world and events."

Formal Operational (adolescence to adulthood): "Use of symbols to relate to abstract concepts. Able to make hypotheses and grasp abstract concepts and relationships"[11].

Data Analysis: All data was computed and analyzed by using SPSS version 21. Descriptive cross sectional analysis of complete data was analyzed and results are reported as frequencies and percentages. Chi square testes were also used accordingly.

RESULTS

Present study included the sample of 1872 school-going children of Multan aged 3-18 years. 30% children belong to each area and socio economic stratum (rural with low SES, urban with high SES, middle and low SES). Males were 52.9% and females were 47.1Overall 10% (n=188) children were overweight and 5% (n=93) children were obese (Table-I).

Dietary Pattern: Regarding the dietary habits of the children, children skipped the breakfast were significantly more likely to become overweight and obese. Mostly children consumed fast food one to two times per week (35.6%) which is directly associated with overweight and obesity (Table-II).

Physical activity and sedentary lifestyle characteristics: Among the total, 26 (9.3%) children were physically inactive. They did not do any physical activity after coming from school. 78 (27.7%) did physical activity less than two time per week. The children who were more physical active 177(63%) were negatively associated with overweight and obesity. Regarding sedentary lifestyle, 172(61.2%) were used television, computer, play games on mobile which is highly associate with overweight and obesity. (Table-III).

Table-I: Frequency of overweight and obesity among school going children (N=1872)

BMI Classification	Total participants (n=1872)	Preoperational (3 to 7 years) (n=290)	Concrete operational (7 to 11 years) (n=845)	Formal Operational (adolescence to adulthood) (n=737)
	n(%)	n(%)	n(%)	n(%)
Underweight (n=93)	93(4.97%)	30 (10.34%)	40 (4.73%)	23 (3.12%)
Healthy weight (n=1498)	1498(80.02%)	244 (84.13%)	689 (81.53)%	565 (76.66%)
Overweight (n=188)	188(10.05%)	14 (4.85%)	79 (9.34%)	95 (12.99%)
Obese (n=93)	93(4.96%)	2 (0.68%)	37 (4.40%)	54 (7.32%)

All percentages are calculated for their corresponding age groups.

Table-II: Meal frequency and fast food consumption of overweight and obese school going children aged (3-18) years (n=281)

Characteristics		Frequency, n (%)
Breakfast	Usually eat	223(79.4%)
	Skip	58(20.6%)
Lunch	Usually eat at home	250(89%)
	Skip	31(11%)
Dinner	Usually eat	253(90%)
	Skip	28(10%)
Fast food consumption	No	7(2.5%)
	Once a week	104(37%)
	1-2 times a week	100(35.6%)
	> 2 times a week	70(24.9%)

The chi-square test revealed that family size, no, of siblings, mother's working status, skipping breakfast, fast food consumption, physical activity and sedentary lifestyle were significantly (P value < 0.05) linked with overweight and obesity. The prevalence of obesity among female were more as compare to male due to skipping breakfast and highly consumption of fast foods.

Table-III: Physical activity and Sedentary lifestyle of school going children aged (3-18) years in Multan, Pakistan (n=281)

Characteristics		Frequency, n (%)
Physical activity[a]	Physically inactive	26(9.3%)
	<2 time per week	78(27.7%)
	>2 time per week	74(26.4%)
	2-4 time per week	50(17.8%)
	4-7 time per week	53(18.8%)
Sedentary lifestyle[b]	<1 hour per day	109(38.8%)
	> 1-3 hour per day	150(53.4%)
	> 3-6 hour per day	22(7.8%)

[a] physical activity include brisk walk, cycling, swimming, sports and aerobic exercise,

[b] sedentary lifestyle include sleeping, watching TV, play games on mobile.

DISCUSSION

The prevalence of overweight and obesity in Pakistan is still less than the developed countries[12]. However there is significant increase in the prevalence of obesity in urban cities of Pakistan[13]. This study concludes that the major contributing factors of overweight and obesity were high consumption of fast foods, lack of physical activity and lack of mother education. The results of this study are compare able and support the findings from researches previously conducted in developing countries such as India, Africa and a study conducted in Karachi, Pakistan[14-18]. All of these studies reveal an emerging trend of overweight and sedentary life style in school going children. The burden of overweight and obesity is also much higher in the urban areas with higher socio economic status as compared to rural areas with low socio economic status. These findings were also supported by different studies conducted in India, Nairobi and Egypt. The higher burden of obesity in school going children in urban areas could be due to easy availability of junk food and less opportunities and interest for physical exercise and sports due to unavailability of parks and sports complexes[19-23]. The energy expenditure of the children increased by physical activity and chances of overweight and obesity becomes less, but with the increase of screen time in school going children there is a substantial decrease in sports as recreational activity. The decline in physical activities promote sedentary lifestyle which is associated with high BMI (obesity)[24].

Skipping of meals especially breakfast is also linked with higher BMI. According to our findings, the children's who skipped the breakfast were overweight and obese and p-value was < 0.05. There were high chances of obesity in children who skipped the breakfast as compared to those who did their breakfast regularly. Another survey conducted by National Weight Control Registry (NWCR) also revealed that the children, who had their breakfast regularly, had fewer chances of overweight and obesity. There is significant independent inverse association between skipping breakfast and physical activity[25]. Another research on Eating disorders on preadolescent children also revealed that girls are far more sensitive to body image and engaged in lesser physical activities than boys[26]. Further researches are required to reveal the gender differences in body images and over weight in school going children in Pakistan. The results of our study are in compliance with that of other studies reported from different countries. There is a gradual and consistent increase in prevalence of obesity in school going children and physical inactivity, junk food consumption and skipping of meals are the key contributors to overweight and obesity.

CONCLUSION

Overweight and obesity among school going children of private and public schools in Multan was high and dietary behavior, physical activity and sedentary life style are major causes of higher burden of obesity among school going children.

CONTRIBUTION OF AUTHORS

Khan S: Conceived idea, Designed research methodology.
Abbas A: Literature review
Ali I: Design questionnaire, Data collection
Arshad R: Set the format and reference citation, Editing, Bibliography
Tareen MBK: Data collection
Shah MI: Data collection

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