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Obesity, A Preventable Burden of Disease among Children

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Abstract

Background: In last few decades, childhood obesity has become a burdensome challenge globally. The most important long-term consequence of childhood obesity is its persistence into adulthood, with all the associated health risks. Persistent obesity is established before the age of 11. ***Methods:*** A descriptive cross sectional study with non-probability convenient sampling was carried out over a period of three month in a private sector school Islamabad, Pakistan. The sampling frame was 250 students of grade 4 of roots school system. The response rate was 67%. ***Results:*** Mean age in our sample was 10 years. Mean BMI was 18.14 with a standard deviation of 4.4. The frequency of obesity in children was 22% (more than 97th percentile and equivalent to BMI of 30kg/m 2) and that of overweight was 32% (more than 85th percentile and BMI of). Among obese children 28% were reasonably physically active the past week. Regarding eating habits 52% children ate their breakfast every day, 16% of the children never had their breakfast because they didn't like breakfast or because they were never given breakfast at home. 55% of the children thought that obesity can be prevented by making sure that children are into sports and games, by promoting healthy snacks and banning fast foods, by launching fitness programs and by health education. ***Conclusion:*** We found a high frequency of obese and overweight children in the private sector school of Islamabad. Physical inactivity and relationship with other factors like watching TV, gaming and over consumption of junk food was found to be associated with overweight and obesity adds some useful data to the previous researches.

Keywords: Childhood obesity, preventable disease, burden of disease, NCD.

INTRODUCTION

In last few decades, childhood obesity has become a burdensome challenge globally. According to WHO report, obesity has almost tripled since 1975. Around 1.9 billion people above 18 years and more were overweight and 650 million were found to be obese and overweight in 2020 [1]. Estimated childhood obesity prevalence in Pakistan is from 15% to 20% [2, 3]. Obesity is a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired [4]. Almost all the developing and developed countries are experiencing an epidemic of obesity but great variation is found between and within countries [5]. In more affluent countries, obesity is not only common in the middle-aged, but is becoming increasingly prevalent among younger adults and children as well. Increase in Weight leads to variety of non-communicable diseases like diabetes, coronary artery disease, hypertension, sleep apnea, risk of gout and many surgical complications. So there is great deal of overlap in prevention approaches for controlling obesity. Many researches highlight multiple diseases prevalence is attributable to obesity [6]. According to

the literature search Pakistan is also facing a non-communicable disease surge [7]. The most important long-term consequence of childhood obesity is its persistence into adulthood, with all the associated health risks. Obesity is more likely to persist when its onset is in late childhood or adolescence and when the obesity is severe [1-3]. Persistent obesity is established before the age of 11 [8]. Overweight children have 50% chance to Progress to overweight adults [9] therefore, knowing that obesity is preventable, prevention strategies need to be targeted at children aged under 11. Although we realize that the causes of childhood obesity are complex. Obesity and its preventive strategies are poorly understood by the general population in Pakistan. And there is a dearth of evidence about successful interventions to prevent obesity. [9] Increasing number of obese children and adolescents all over the world demand considerable political strength, to tackle obesity an investment on primary and secondary preventive measures is required.

There are a lot of methods to measure obesity in children, especially across different ages and degrees of maturity, as it is for adults who have attained their peak height. For children (5–19 years of age) obesity, overweight, ideal and underweight can be defined by the WHO BMI-for-age 5–19 years' percentiles charts [9]. There are also clinical charts available as BMI for age for infants and older children by CDC and IOTF. According to the WHO, all children falling between the 15th and 85th percentile are defined as normal, between the 85th and 95th percentile as overweight, and greater than 95th percentile as obese. On the other side of the scale, those falling between the 3rd and 15th percentile are defined as underweight whereas those below the 3rd percentile as severely underweight [10].

Pakistan is also facing an increasing trend in childhood obesity despite the fact that it includes in those countries where majority of the population are undernourished. According to National Health Survey Pakistan, prevalence of obesity is more in urban population as compared to rural population. Childhood obesity is strongly associated with sedentary lifestyles and increased caloric intake, less physical activity and high socioeconomic status [11, 12]. Awareness about balanced diet, improvement in the level of education and socioeconomic conditions and increased physical activity could help in decreasing the obesity in children.

Our study intended to augment the very little information available nationally by using the WHO percentile charts. Moreover we explored the risk factors associated with obesity.

ETHICAL CONSIDERATIONS

The study was approved by the Ethical Committee of Rawal Institute of Health Sciences. Personal information in the questionnaires was kept optional to ensure complete anonymity.

TYPE AND TOOLS OF STUDY

A descriptive study with sample size of 100 children conducted over a period of three months in a private sector school of Islamabad. Information was gathered by the help of a pre-designed questionnaire after getting formal consent from parents. Children included in the study were healthy with no reported chronic illnesses. Body weight was measured in minimal clothing using a weight scale, in erect posture without shoes using a stadiometer. Obesity, underweight and overweight were defined by plotting BMI against age (in months and years) on WHO BMI-for-age 9-10 years percentiles charts.

AIM

To assess the frequency of obese and overweight school children of 9-10 years (grade 4) of all the sections of the Roots school system, Islamabad.

OBJECTIVES

To explore the associated risk factors of obesity.

MATERIAL AND METHODS

A descriptive cross sectional study was carried out over a period of three months, from June to August 2019 in a private sector school Islamabad, Pakistan. Non probability convenient sampling was done. Permission was sought from the administration of school after thorough introduction and explanation of the study. All sections of class 4 were selected for the survey.

The sampling frame was 250 students of grade 4 of roots school system. With the help of Sample size calculator sample size of 152 was calculated with 95%confidence level and 5% margin of error. A total number of 152 students were initially enrolled. Consent forms with information sheet were handed out to the students. 100 students got written permission and then became part of our study. So the response rate was 67%. A self-designed questionnaire was used after pre-testing on students of the same age group, following which the study's questionnaire was updated accordingly. Form filling took place in school auditorium. Questionnaires were filled under direct supervision of the researchers in groups of 6-8 students. No student was reported to be chronically ill.

RESULTS

Questionnaire comprised of demographic information which includes name, age, height, weight, gender, class and school name. BMI was calculated with the help of weight /height^2 and was also obtained from the BMI charts of the students provided by the student administration.

Second section of the questionnaire was based on the information about specific food intake such as junk food like chocolates, cold drinks, burgers, pizza, chips and fries.

Third section of questionnaire explored about the physical activity, hours spent in watching television, participation in the sports activities and regularity in the breakfast intake were also included.

Obesity, underweight and other criteria were defined by plotting BMI against age in months and years on WHO BMI-for-age 5–19 years percentiles charts. Descriptive analysis was done. Results are reported as frequencies and percentages below under the results heading. Out of the 100 children, 59 were boys and 51 were girls. Mean age in our sample was 10 years. Mean BMI was 18.14 with a standard deviation of 4.4. The frequency of obesity in children was 22% (more than 97th percentile and equivalent to BMI of 30kg/m^2) and that of overweight was 32% (more than 85th percentile and BMI of). Among obese and overweight children, 23% had a family history of obesity either one of their parents were obese. Age of onset of obesity of their parents could not be recalled in some children so no result could be established regarding family history.

The significant level was set at 5% that is p value of less than 0.05. Among obese children 28% were reasonably physically active the past week while 20% remained physically inactive the whole past week. Regarding eating habits 52% children ate their breakfast every day, 16% of the children never had their breakfast because they didn't like breakfast or because they were never given breakfast at home. 55% of the children thought that obesity can be prevented by making sure that children are into sports and games, by promoting healthy snacks and banning fast foods, by launching fitness programs and by health education.

Fig 1: Obesity among children according to nutritional status

CLASSIFICATION	PERCENTAGES
Obese	22%
Overweight	32%
Normal	30%
Underweight	16%

Fig 2: Types of foods consumed by the children

FOODS CONSUMED	PERCENTAGES
Juices &fizzy drinks	36%
Burgers, Sandwiches& Pizzas	23%
Chocolates, sweets &jellies	12%
Potato chips& derivatives	7%
Lunch from home	2%

Fig 3: Outdoor physical activity in past week

OUTDOOR PHYSICAL ACTIVITY	PERCENTAGES
Physically Inactive	20%
Once last week	24%
Twice or thrice last week	28%
Four times a week	20%
Weekend only	8%

Fig 4: Breakfast Routine

BREAKFAST ROUTINE	PERCENTAGES
Daily	52%
Irregular	32%
Never	16%

Fig 5: Pocket Money

POCKET MONEY & EAT FROM CANTEEN	PERCENTAGE
Daily	46%
Weekly	26%
Monthly	16%
Whenever required	4%
Homemade lunch	8%

Fig 6: Frequency of children eating lunch and dinner

LUNCH & DINNER CONSUMPTION	PERCENTAGE
Both	84%
Only lunch	6%
Only dinner	10%
Skipped both	0%

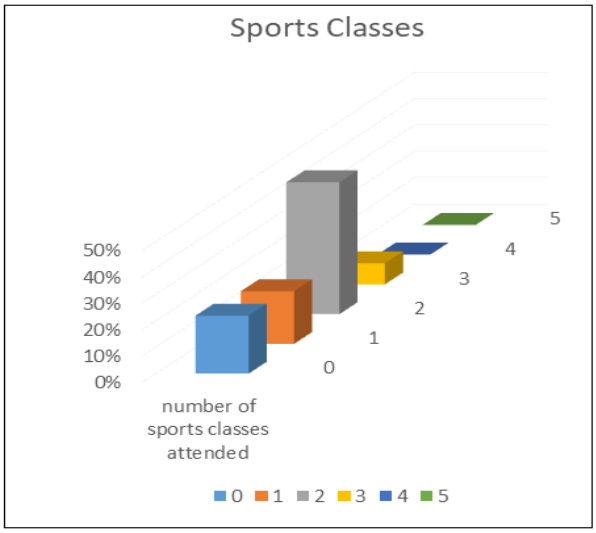

Fig 7: Frequency of sports classes attended in the past week

DISCUSSION

As Cut-off values set for BMI for age regarding obesity in children depends on the criteria used in the research. We had three available criteria's which include, USCDC BMI for age percentile growth charts (2000) criteria, Extended International (IOTF) Body Mass Index Cut-Offs for Thinness, Overweight and Obesity in Children (2012) and WHO BMI-for-age 9-10 years percentiles charts. So we chose WHO BMI-for-age 9-10 years percentiles chart (2007) which was the most appropriate for Pakistani settings, as proved by many researches, conducted on Pakistani 9-12 years old children [13]. We chose WHO BMI percentile charts as Freedman and Berenson found out that BMI *z* scores are weaker when compared with that of $\%BMI_{p95}$ especially among children [14].

Although there are many variations in the results on the same subject, when we try to support a result with available researches we must take into account the limitations of the study conducted with different sample size and different population. We have studied children from age 9-12 years in a private school of Islamabad. 30% of the children fall in healthy category of BMI-for-age (between 15th and 85th percentile), 22% were obese and 32% were overweight while 16% were underweight.

Childhood obesity is observed with less physical activity as it can also be seen from our study. Relating this data of our research to previous available researches show that some researchers have suggested that childhood obesity is largely the result of a decline in regular physical activity. Review of other literature suggests that overweight among preschool children, as well as older children, may be associated with low physical activity [15].

According to our study we also found out that children viewing screen as TV, mobile or other gadgets for more than 4 hours as routine are obese. Many of the studies have found relatively weak, positive associations, but others have found no associations or mixed results; however, the weak and variable associations found in those studies may be the result of limitations in measurement. Children spend a major portion of their time watching screen. Researchers have hypothesized that watching television is a risk factor for obesity [16].

The respondents were also made to choose frequency ranges of consumption (days of consumption per week) from different food groups. However, it is noted from our study that most of the children are consuming junk food adequately. Low intake of vegetables and fruits consumption is seen. This phenomenon is also proved in many studies conducted [17, 18].

We also found out that children who are in healthy category take their breakfast regularly majority of obese and overweight also skip their breakfast as a routine practice. Moreover, according to our results, those in healthy category follow a definite eating schedule.

Children and adolescents who are breakfast eaters (whether school breakfast or breakfast elsewhere) are less likely to be overweight [19].

CONCLUSION

We found a high frequency of obese and overweight children in the private school 'Roots school system' of Islamabad. Physical inactivity and relationship with other factors like watching TV, gaming and over consumption of junk food was found to be associated with overweight and obesity adds some useful data to the previous researches.

RECOMMENDATIONS

Relating to this data we recommend that integration of health education in teaching curriculum in primary school and associated risk factors of obesity can be a strategy for primordial prevention to this preventable epidemic. Parents' attitude towards outdoor physical activities and their lack of dietary control on a child's obesity can be addressed with proper counselling of parents, will prove to be an important intervention. Further studies are yet needed to project the role of type, quality and quantity of food on obesity. Unhealthy food should be banned at the schools. Children should be encouraged to participate actively in sports and should be encouraged to take proper meals i.e breakfast, lunch and dinner.

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