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ORIGINAL ARTICLE

Epidemiological Study on Overweight and Obesity among Adolescent Boys and Girls

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ABSTRACT

Background and Aim: Overweight and obesity has a great impact on individual health and quality of life. Most of the psychosocial and physical health problems are considerably related with overweight and obesity in adolescents. The incidence of overweight and obesity accelerated in the developing world over the last decade. The present study aims to evaluate the prevalence of overweight and obesity among Pakistani adolescents.

Methodology: This epidemiological study was conducted on 1764 Pakistani adolescents attending multi medical centers of Pakistan with an age ranges from 12 years to 19 years. The socio-demographic questionnaire was completed by each individual with a consent form. Demographic and anthropometric parameters were included in the questionnaire. The prevalence of overweight and obesity was determined based on body mass index calculation. Obesity and associated factors were analyzed through analysis of Univariate and multivariate logistic regression.

Results: Out of total adolescents, 885 (50.2%) were male and 879 (49.8%) were females. The prevalence of overweight and obesity was 14.1% (male 18.5%; female 11.4%) and 5.4% (male 8.3%; female 4.4%) respectively. Boys were prevalent in overweight and obesity compared to girls ($p<0.001$). Using Multivariate logistic regression, male gender (OR=1.89, 95% CI 1.37-2.56), eating fruits 3 or more times per week (OR=1.39, 95% CI 1.03-1.79), and fast eating (OR=1.29, 95% CI 1.03-1.68) were considerably related to the overweight and obesity. Adolescents whose parents were overweight or obese (0.69, 95% CI 0.49-0.93) were improbable to be overweight or obese.

Conclusion: Our study found a higher risk and prevalence of overweight and obesity among adolescent boys compared to adolescent girls in the recent few years. Gender, parental weight, and diet were key parameters for adolescents' obesity. There is a need for further intervention and national program establishment to decrease the incidence of overweight and obesity.

Keywords: Overweight; Obesity; Adolescents

INTRODUCTION

The rapid physical growth and body fat changes characterized adolescence. Obesity during childhood and adolescents is considered a risk factor for adulthood overweight and obesity causing adverse health outcomes which may lead to morbidity and mortality [1, 2]. In recent decades, adults, adolescents, and children have all been suffering from dramatic obesity increases [3]. Globally, the prevalence of obesity significantly increased from 4-5% in the 1980s to 19% in 2016 [4]. The proportion of overweight and obesity reached an alarming level in recent years as revealed by compelling evidence [5]. Many chronic diseases such as cardiovascular disease, musculoskeletal disorders, type 2 diabetes, respiratory diseases, and various types of malignancies are caused by overweight and obesity [6]. Rong et al [7] reported a higher incidence of non-alcoholic fatty liver disease with increasing body weight and obesity. Another study conducted by Sun et al [8] reported an 8.1% and 19.2% prevalence of obesity and obesity and overweight respectively in adolescents of age ranging from 7 years to 18 years. The incidence of overweight and obesity was 15.2% and 11.7% respectively among school children as reported by Zhang et al [9]. To prevent adolescent's from disease development, overweight and obesity risk factors need to reduce.

Understanding the epidemiology of childhood and adolescent obesity is a critical first step in developing an appropriate public health response. Data on the prevalence of overweight and obesity allows for a description of the scope of the problem, informing decisions about public health priorities and resource allocation. As public health priorities shift, it is also critical to monitor changes in the prevalence of overweight and obesity. In addition to tracking the prevalence of overweight and obesity among children and adolescents, it is important to look at the socio-demographic distribution of overweight and obesity in the general population. If it is discovered that certain groups of children and adolescents are more likely to be overweight, it may be appropriate to allocate health promotion resources differently to those groups and to design interventions to ensure they most closely match the characteristics of the target groups. We looked at the carnal health of adolescents aged 12 to 19 years old. The present study sought to ascertain the incidence of overweight and obesity, as well as to examine various risk factors for obesity.

METHODOLOGY

This epidemiological study was conducted on 1764 Pakistani adolescents attending multi medical centers of Pakistan with an age ranges from 12 years to 19 years. with an age ranges from 12 years to 19 years. Socio-demographic questionnaire was completed by each individual with consent form. Demographic and anthropometric parameters were included in the questionnaire. The prevalence of overweight and obesity was determined based on body mass index calculation. Obesity and associated factors were analyzed through analysis of Univariate and multivariate logistic regression. This cross-sectional survey included 1764 students aged 12–19 years; all the endocrine and metabolic diseases obese participants, mental or physical impairments that caused abnormal behavior, such as intellectual disability, congenital disease, or a psychiatric disorder were excluded [10].

Demographic details such as age, gender, parental education, dietary habits, sleep, exercise, paternal weight, and BMI classification and anthropometric parameters such as weight and height were all included in the questionnaire. According to various reports [11–14] on adolescent obesity, data on dietary habits and sleep duration were selected. Overweight and obesity was mainly determined based on BMI calculation as an indicator in adolescents. Weight categories were distinct using age and gender-specific cut-off points of BMI specifically developed for the adolescents. For both boys and girls aged 19 years, cut-off values of was set 24 and 28 for overweight and obesity.

RESULTS

Out of total adolescents, 885 (50.2%) were male and 879 (49.8%) were females. The prevalence of overweight and obesity was 14.1% (male 18.5%; female 11.4%) and 5.4% (male 8.3%; female 4.4%) respectively.

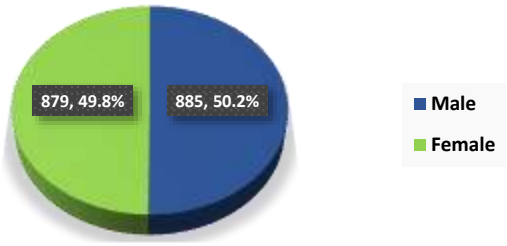

Figure-1 Gender distribution (n=1764)

Boys were prevalent in overweight and obesity compared to girls (p<0.001). Using Multivariate logistic regression, male gender (OR=1.89, 95% CI 1.37-2.56), eating fruits 3 or more times per week (OR=1.39, 95% CI 1.03-1.79), and fast eating (OR=1.29, 95% CI 1.03-1.68) were significantly associated with overweight and obesity. Adolescents whose parents were overweight or obese (0.69, 95% CI 0.49-0.93) were less likely to be overweight or obese. Gender distribution is shown in Figure-1 whereas Figure-2 describes age wise distribution. Based on demographic details, prevalence of overweight and obesity is shown in Table-I. Overweight and obesity is correlated among adolescents using univariate analysis as shown in Table-II whereas Table-III demonstrate the multivariate regression analysis in adolescents.

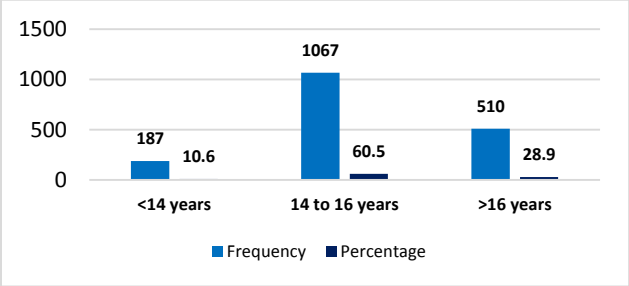

Figure-2 Age wise distribution (n=1764)

Table-I based on demographic details, prevalence of overweight and obesity

Parameters	Frequency (n)	Overweight		Obesity	
		PR (%)	p-value	PR (%)	p-value
Gender					
Male	885 (50.2%)	18.5 (14.5-20.1)	<0.001	8.3 (7.1-12.3)	<0.001
Female	879 (49.8%)	11.4 (8.4-12.5)	4.4 (3.9-10.8)		
Age (years)					
<14	187 (10.6%)	17.6 (12.8-25.2)	0.008	4.9 (2.3-9.5)	0.0762
14-16	1067 (60.5)	10.7 (8.7-12.8)	5.2 (4.1-7.2)		
>16	510 (28.9%)	14.8 (11.2-18.5)	4.7 (3.2-7.5)		
Fruit ≤3 times a week					
Yes	1217 (69%)	11.8 (10.4-12.9)	0.03	4.1 (3.7-5.9)	0.02
No	547 (31%)	15.3 (12.6-19.7)	7.3 (5.6-10.3)		
Physical Exercises					
No	437 (24.8%)	14.9 (12.6–18.9)	0.183	4.1 (2.8–6.6)	0.32
Sometimes	461 (26.1%)	11.8 (9.4–14.9)	5.6 (3.8–8.9)		
Often	866 (49.1%)	12.4 (9.7–14.2)	5.4 (4.3–7.9)		
Parental Education					
Up to high school	1379 (78.2%)	14.7 (11.4–18.5)	0.169	5.2 (4.3–8.7)	0.632
Up to University	385 (21.8%)	11.7 (8.6–15.7)	5.5 (3.6–8.7)		
Sleep (hours/night)					
<7	861 (48.8%)	12.4 (10.3–15.9)	0.71	5.1 (3.5–6.8)	0.21
7-10	903 (51.2%)	12.7 (10.2–14.9)	5.3 (4.1–6.8)		
Parental Weight					
Normal	803 (45.5)	14.3 (12.4–17.9)	0.02	7.3 (5.8–9.7)	0.001
Overweight or obese	961 (54.5%)	10.8 (9.3–12.6)	3.6 (2.8–5.1)		

Table-2 Correlation of overweight and obesity among adolescents using univariate analysis.

Parameters	OR	95% CI	p-value
Gender Male Female	 2.06 1	 1.53-2.61	 <0.001
Age (years) <14 14-16 >16	 1 0.58 0.79	 0.39 to 0.87 0.43 to 1.21	 0.069 0.72 0.79
Fruit ≤3 times a week Yes No	 1 1.51	 1.10-1.78	 0.002
Physical Exercises Never Sometimes Often	 1 0.76 0.89	 0.53 to 1.3 0.71 to 1.24	 0.69 0.501 0.476
Parental Education Up to high school Up to university	 1 1.2	 0.62-2.19	 0.423 0.61s
Sleep (hours/night) <7 7-10	 1 0.89	 0.81-1.31	 0.897 0.879
Parental Weight Normal Overweight	 1 0.67	 0.49-0.85	 0.001

Table-3 Correlation of overweight and obesity using Multivariate regression analysis in adolescents

Parameters	OR	95% CI	SE	β	p-value
Gender Male Female	 1.89	 1.37-2.56	 0.11	 0.71	 <0.001
Age (years) <14 14-16 >16	 1 0.61 0.71	 0.39 to 0.98 0.43 to 1.11	 0.19 0.21	 -0.39 -0.41	 0.029 0.122
Fruit ≤3 times a week Yes No	 1 1.40	 1.08-1.82	 0.13	 0.34	 0.012
Slowness in eating Yes No	 1 1.28	 1.03-1.68	 0.12	 0.33	 0.21
Parental Weight Normal Overweight	 1 0.67	 0.49-0.85	 0.12	 -0.39	 0.001

DISCUSSION

The present epidemiological survey was conducted on adolescents aged 12–19 years to determine incidence of overweight and obesity and analyze the impelling causes in adolescents. Our

study reported that parental weight, dietary habits, and sex had a substantial sway on the weight of the adolescents. We discovered that the incidence of overweight was 14.1% (male 18.5%; female 11.4%) and obesity was 5.4% (male 8.3%; female 4.4%) among data base adolescents. As per previous research conducted on school aged children, the overall prevalence of obesity was 4.11%, and overweight among adolescents was 6.6%; both of these prevalence's were inferior than in our study. This disparity could be attributed to sample size, gender, and age of the population under study. [15, 16] Furthermore, distribution of and environmental and demographic factors are likely factors. [16].

According to a Swedish report [17], the incidence of overweight and obesity in adolesents is on the rise, which resemble our findings. Contrary, in traditional culture, boy's preference may explain the dietary differences, and their faith that fat and obese boys are stronger than tinny boys. According to our survey, adolescents who ate more fruits, picky, and ate quickly were prone to overweight or obese. Recent studies [18, 19] reported that a higher intake of fruit was a shielding aspect against obesity, which contradicted our findings. To support our arguments that state that fructose found in a variety of fruits and sugar beverages is the leading cause of rising obesity [20, 21]. A high fructose intake may decrease the bacterial species such Eubacterium eligens abundance, slow monosaccharide metabolism, and impair the fat large consumptions [22]. The threshold fructose intake is 75 g/day. Teenagers consume more fructose without unbearable glycogen in a timely manner, fructose is transformed into faster rate of fat. [23, 24] Based on our findings, it was judicious to assume that the children had excessive high sugar content consumption of fruits.

Parents of obese children believe that increasing fruit consumption will help them lose weight. The higher intake of fruits explain why the adolescents in our study were overweight. However, our findings contradict with previous studies, [25, 26] it is unclear whether this is due to classifications differences. Another study found that preference of food was a childhood obesity independent risk factor [27] However, the occurrence of fast food and dessert ingesting had no substantial effect, possibly due to lack follow up of children by their parents regarding fast food and sweets. Numerous researches have concluded that prime aspect in determining body weight is food intake [28].

In our study, we discovered that children of overweight and obese parents had lesser chance of obesity which contradicted former findings. [29] Case Studies [30, 31] discovered that having a father with a higher BMI increased the overweight/obesity risk in adolescents. These results, however, mismatched across studies where the researchers discovered that there was no association between BMI of parents and children whereas BMI changes over 4 years were performed. [32] Berge et al [33] discovered that parents who were overweight or obese were plausible to implement a stern dietary constraint to avoid their adolescent from obesity.

Furthermore, growing environments and lifestyle choices will influence obesity levels of their own of children, which will affect our results. [34] More studies assessing both energy intake and expenditure in children are plausible to shed light on this concept. Overweight and obesity affect approximately 23% and 6% of Australian children and adolescents, respectively [35]. In the United States, the behavioral risk factor surveillance system discovered in 2000 that more than half (> 56 percent) of American adults were overweight and one in every five was obese, representing a 1.7-fold increase in less than a decade [36]. The changing lifestyle has been blamed for the global epidemic of increasing overweight and obesity in both adults and children [37].

Health professionals can play an important role in encouraging regular physical activity. Other interventions may include health education via mass media in order to influence nutritional norms and practices. Such interventions, which aim to increase health awareness and physical activity, should be evaluated for effectiveness.

CONCLUSION

Our study found a higher risk and prevalence of overweight and obesity among adolescent boys compared to adolescent girls in the recent few years. Gender, parental weight, and diet were key parameters for adolescents' obesity. There is a need for further intervention and national program establishment to decrease the incidence of overweight and obesity.

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