

ORIGINAL ARTICLE

Parental Health Attitudes and knowledge Factors Associated with Body Mass Index among Pakistani School-Aged Adolescents

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ABSTRACT

Aim: To investigate the most recent estimates of underweight, overweight, and obesity prevalence in Pakistani school-aged adolescents aged 12 to 17 years and association with parental attitudes and knowledge factors.

Methods: A cross-sectional study was conducted using a convenience sampling approach with 1,936 Pakistani from 42 schools in central Punjab province. The CDC US 2000 was used to define underweight < 5th percentile, overweight 85th ≤ BMI < 95th percentile, and obese 95th percentile ≤ BMI, the Chi-square test was used. The Pearson correlation coefficient (r) was used to determine the correlation. The statistical significance level was set at $p < 0.05$.

Results: prevalence of underweight U/W, overweight O/W, and obesity O/B was (24.5%, 4.6%, and 7.0%, respectively. The BMI had a positive relationship with gender, residency school kind and school level.

Conclusion: Underweight, overweight, and obesity were prevalent among Pakistani school-aged adolescents. Some parents graded their children in an unreasonable manner. It is recommended that additional research be done to assess and enhance parents' understanding, attitudes, and behaviors regarding their children's weight.

Keywords: Body Mass Index, School-aged adolescents, Parental health attitudes, Knowledge

INTRODUCTION

Children's obesity is one of the most serious public health challenges of the twenty-first century, affecting every nation. In recent decades, the prevalence of obesity among school-age children and adolescents has increased more than tenfold¹. Childhood obesity has reached epidemic levels in both high- and low-income countries, and since 1970, the prevalence of overweight and obese teens has increased by a factor of two to three^{1,2}. In 2016, 18% of children and adolescents aged 5 to 19 were overweight or obese globally, with significant regional disparities in obesity rates, according to the World Health Organization (WHO)^{1,2,3}. The most significant influence on a child's physical, mental, and emotional health is caused by childhood obesity and overweight^{1,2}. Since these habits and behaviors are formed early in life and can be changed, although much more difficultly in the future, it has become more important to study the role of demographic factors and the prevention of adolescent overweight and obesity. Additionally, it is much harder to deal with obesity and lose weight as an adult, especially after the age of 35^{2,4}.

Planning effectively to manage their children's weight requires an understanding of the parents' attitudes and knowledge⁵. Children's lifestyle habits are influenced by their parents' level of physical activity and sedentary behavior, including watching TV, as well as their understanding of nutrition, influence over food choices, household eating patterns, and modeling of healthy eating⁶. Parents who have better nutrition knowledge are more likely to choose nutritious foods for their children⁷. In fact, it has been discovered that better parental knowledge is associated to children's healthier diets and lower body weights⁸. Children learn from their parents and imitate their behavior when they see them engaging in healthy habits like eating fruits and vegetables⁸. Children who have parents who are generally less educated are more likely to be overweight and obese⁹. For the general health of the adolescent, parental perceptions and attitudes are crucial⁵. Parents have a serious influence on a child's dietary preferences, level of physical activity, sedentary behavior (including watching TV), and eating environment, and they are crucial in preventing obesity¹⁰.

A child develops their first healthy behaviors at home, and parents are crucial in promoting, teaching, and modeling healthy lifestyles for children¹¹.

Globally, obesity is on the rise^{1,2,12}. 54 percent of Pakistan's population is under the age of 19 and lives in a low-income nation¹³, according to data from 2014¹⁴. Pakistan ranks 92nd out of 116 nations in the 2021 Global Hunger Index, indicating a severe hunger issue^{1,2,15}. In Pakistan, malnutrition and excess malnutrition are problems¹⁶. Pakistan is ranked tenth out of 188 countries in terms of obesity, with 50% of the population being overweight or obese¹⁷. Early mortality linked to obesity is becoming more common among both men and women in Pakistan over time¹⁸. By 2030, 5.4 million school-age children in Pakistan will be obese, predicts the World Obesity Federation^{1,2,19}. According to the WHO Diabetes country profiles, Pakistan has not yet adopted a policy to address overweight and obesity as well as physical inactivity²⁰. Even though Pakistan has done minimal research on the subject, there is still a gap. Baseline data are needed in order to evaluate the prevalence of obesity among Pakistani school-aged adolescents. The prevention of underweight, overweight, and obesity in Pakistan may be improved with the use of these public health insights^{1,2,21}. This can offer public health insights into how to prevent underweight, overweight, and obesity in Pakistan^{1,2}.

The aim of this study was to estimate the prevalence of weight status of Pakistani adolescents aged 12 to 17 years old, as well as to further investigate its association with Parental health attitudes and knowledge factors, in order to contribute to the development of evidence-based recommendations for the prevention and management of underweight, overweight, and obesity in this age group.

METHODS

Study design, setting, and participants: In the summer of 2021, a convenience sampling strategy^{1,2,15} was used to perform a cross-sectional survey among school-aged children and adolescents from central Punjab area. Adolescents in (grades 4-5 primary), (grades 6-8 middle), (grades 9-10 secondary), and (grades 11-12 higher secondary) were sampled^{1,2}.

Public schools were selected after receiving permission from the Punjab school education department; they were given a letter of permission, whilst private school administrations obtained permission on their own. If the school's administration refused to take part in the research, an alternative institution was picked at random. Rescue-1122 departments volunteered to participate in this survey^{1,2}.

The Shanghai University of Sport, Institutional Review Board authorized the study protocol [1816111009-2019]^{1,2}, and permission to conduct the study was acquired from the participating schools' teachers and principals. All of the children and adolescents in the study, as well as their parents or guardians, were told that participation was completely voluntary^{1,2}.

Measure: Sampled schools were visited on pre-arranged dates. In the classroom, members of Rescue-1122 took anthropometric weight and height measurements. For students, the survey was conducted in Urdu. We used the back-translation technique to make sure that the meanings were equivalent. By a multilingual researcher in management, the scale was first translated from English into Urdu and then, for verification, back into English. Finally, a management professor compared the Urdu and English versions and made modest adjustments to resolve any differences. First, the students' weight and height were measured. Students then completed the survey questionnaire on paper in a classroom environment. Students self-reported questionnaire paper version were used. Demographic information about adolescents from public and private schools, as well as school levels (primary, middle, secondary, and higher secondary), was used, including gender (boy or girl), age (12 to 17) years, grades (4 to 12), religion (Muslim or Non-Muslim), and residence location (urban or rural)^{1,2}. Parents questionnaire was noted in the students' homework diary. Some students did not return the questionnaire on collection day, resulting in an 82% response rate. Students' questionnaire was excluded with the same serial number of parents. Six questions were about parental attitudes and knowledge factors with Yes or No options.

Parents questionnaire: Do you think your child daily dietary behavior is healthy? (The alpha value was 0.82). 2 Do you think your child physical activities are normal? (The alpha value was 0.88). 3 Do you think your child screen time (e.g., watching TV mobile phones and other electronic devices etc.) is normal? (The alpha value was 0.74). 4 Do you think your child sedentary behavior (e.g., leisure, sitting or laying down timing) is normal? (The alpha value was 0.81). 5 Do you think your child is getting enough sleep? (The alpha value was 0.77). 6 Do you think using tobacco products is normal at child age? (The alpha value was 0.84).

Weight status: BMI weight to the nearest 0.1 kg for the purpose of the measured weight and height to the nearest 0.5 cm^{1,2}. BMI was calculated as body weight (kg) divided by height (m) squared (kg/m²). Underweight, normal weight, overweight, and obese classifications were based on BMI percentiles based on age and gender (CDC-US 2000). Underweight (<5th percentile), healthy weight (5th BMI to <85th percentile), overweight (85th ≤ BMI <95th percentile), and obese (95th percentile ≤ BMI) BMI for children and adolescents aged 2 to 20 years^{1,2}. Trained rescue professionals took all of the measurements.

Statistical Analysis: IBM SPSSv.26 Statistical Analysis was used to analyze the data. Underweight (<5th percentile), healthy weight (5th BMI to <85th percentile), overweight (85th BMI <95th percentile), and obese (>95th percentile) BMI calculated using the CDC US 2000 BMI chart Children and adolescents between the ages of 2 and 20^{1,2,18}. For the present prevalence of body-weight status, a frequency distribution analysis was performed. to compare the prevalence of body-weight status (dependent variable) with parental attitudes and knowledge factors (independent variables) using the chi-square test as the trend test^{1,2}. To measure the relationship between the dependent and independent variables, The Pearson correlation coefficient (r) was used to determine the degree of correlation between independent variables with body-weight dependent variable^{1,2}. Linear regression

analysis was used to explore the predictive power of, parental attitudes and knowledge factors as (independent variables) in relation to body-weight (dependent variable). The statistical significance was determined using $p < 0.05$.

RESULTS

Table 1 showed sample sizes and weighted demographic information for all four levels of schools in the research population. primary 178 (9.2%), middle 851 (44.0%), secondary 603 (31.1%), and higher secondary 304 (15.7%). boys 62.6% of the participants, while girls were 36.4%. Muslims were 95.6% of students, while non-Muslims were 4.4%. Students 58.4% of urban areas and 41.6% from rural areas. Students from 76.7% public schools and 23.3% from private schools.

Fig. 1 depicts the current prevalence of body mass index among Pakistani school-aged adolescents. depending on the total number (N = 1936): (Underweight 24.5%), (Overweight 4.6%), and (Obesity 7.0%).

According to Table 2 Weight status and parental knowledge of daily screen time ($r = 0.019$), sedentary behavior ($r = 0.010$), sleep duration ($r = 0.017$), and use of tobacco ($r = 0.013$) had a positive relationship. While the dietary behavior and physical activity had a negative relation with weight stats.

Table 3 showed that 7.2% of obese students and 26.2% of underweight students' parents believed that their children's behavior was undesirable. Parents were told that their children's physical activity was not ideal because 25.6% of them were underweight and 7.3% were obese. Parents said that giving their children too much screen time is bad, with 24.2% of students being underweight and 8.1% being obese. Parents said that their children's sedentary behavior is not healthy because 25.9% of students were underweight and 7.8% were obese. Parents reported that their children's sleeping patterns are not good, with 25.3% of underweight students and 7.6% of obese students. Parents said that smoking is not normal for children of this age by 83.1%.

In this study, the parental attitudes and knowledge factors were used as the predictors and the BMI as the dependent variable for regression analysis. The impact of parental attitudes and knowledge factors influences on school-aged students' body-weight; the R^2 value of 0.010. The data showed that hypotheses 1,2,3,4,5 and 6 were not appear to had a significant association with weight status, according to the data.

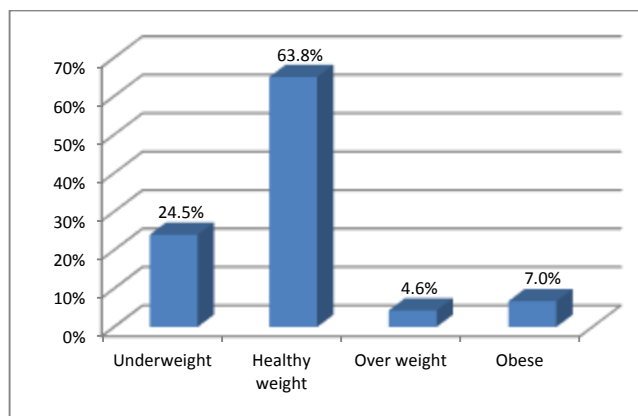


Figure 1: Descriptive Statistics analysis for current Prevalence of body mass index (N=1,936).

Table 1: Descriptive statistics on demographic characteristics (n (%)). (N=1,936).

Variable	Primary School	Middle School	Secondary School	Higher Secondary school	P-value
Sample size 1,936 (n %)	178 (9.2)	851 (44.0)	603 (31.1)	304 (15.7)	
Age (year, mean ± SD)	12.47 ± 0.74	13.62 ± 1.28	15.23 ± 1.16	16.87 ± 0.37	
Gender					

Boy	126 (10.2)	556 (45.2)	370 (30.1)	179 (14.5)	0.025
Girl	52 (7.4)	295 (41.8)	233 (33.0)	125 (17.7)	
Religion					
Muslim	164 (8.9)	810 (43.3)	578 (31.2)	298 (16.1)	0.021
Non-Muslims	14 (16.3)	41 (47.7)	25 (29.1)	6 (7.0)	
Residence					
Urban	140 (12.4)	461 (40.8)	407 (36.0)	123 (10.9)	<0.001
Rural	38 (4.7)	390 (48.4)	196 (24.3)	181 (22.5)	
School kind					
Public	162 (10.9)	662 (44.6)	367 (24.7)	293 (19.7)	<0.001
Private	16 (3.5)	189 (41.8)	235 (52.2)	11 (2.4)	
BMI (kg/m ² , mean \pm SD)	16.10 \pm 2.53	17.93 \pm 3.31	19.49 \pm 3.96	20.32 \pm 3.41	

Table 2: The correlation between Body mass index and parental attitudes and knowledge factors.

	Mean	SD	1	2	3	4	5	6	7
Weight status	1.94	0.75	1						
Daily dietary behavior	1.37	0.48	-0.011	1					
Daily physical activities	1.50	0.50	-0.010	0.229**	1				
Daily screen time	1.44	0.49	0.019	0.239**	0.204**	1			
Daily sedentary behavior	1.40	0.49	0.010	0.282**	0.242**	0.315**	1		
Daily getting enough	1.47	0.49	0.017	0.274**	0.224**	0.219**	0.243**	1	
Daily tobacco products	1.83	0.37	0.013	0.073**	0.078**	0.036	0.045*	0.062**	1

Note; N =1,936; *p < 0.05, **p < 0.01

Table 3: Chi-square test to compare the prevalence weight status with parental attitudes and knowledge (independent variable) (N = 1,936).

Characteristics	Body Mass Index					X ²	P-value
	Under weight n (%)	Healthy weight n (%)	Overweight n (%)	Obesity n (%)	Total n (%)		
Do you think your child daily dietary behavior is healthy?							
Yes	287 (23.6)	792 (65.0)	55 (4.5)	84 (6.9)	1218 (62.9)	2.25	0.522
No	188 (26.2)	443 (61.7)	35 (4.9)	52 (7.2)	718 (37.1)		
Do you think your child physical activities are normal and he is spending enough time in sports activities?							
Yes	115 (23.4)	625 (65.0)	46 (4.8)	65 (6.8)	960 (49.6)	1.63	0.653
No	250 (25.6)	611 (62.6)	44 (4.5)	71 (7.3)	976 (50.4)		
Do you think your child screen time (e.g., watching TV mobile phones and other electronic devices etc.) is normal?							
Yes	268 (24.8)	689 (63.7)	57 (5.3)	67 (6.2)	1081 (55.8)	4.50	0.212
No	207 (24.2)	546 (63.9)	33 (3.9)	69 (8.1)	855 (44.2)		
Do you think your child sedentary behavior (e.g., leisure, sitting or laying down timing) is normal?							
Yes	270 (23.6)	747 (65.2)	54 (4.7)	74 (6.5)	1145 (59.1)	3.24	0.355
No	205 (25.9)	488 (61.7)	36 (4.6)	62 (7.8)	791 (40.9)		
Do you think your child is getting enough sleep?							
Yes	244 (23.8)	670 (65.4)	43 (4.2)	67 (6.5)	1024 (52.9)	3.02	0.388
No	231 (25.3)	565 (62.0)	47 (5.2)	69 (7.6)	912 (47.1)		
Do you think using tobacco products is normal at child age?							
Yes	88 (26.8)	200 (61.0)	18 (5.5)	22 (6.7)	328 (16.9)	1.99	0.574
No	387 (24.1)	1035 (64.4)	72 (4.5)	114 (7.1)	1608 (83.1)		

Table 4: linear regression analysis of parental attitudes and knowledge factors (independent variables) and weight status (dependent variable) was conducted.

Variables	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	SE	β	t	
Constant	1.885	0.112		16.853	0.000***
Daily dietary behavior	-0.025	0.039	-0.016	-0.657	0.511
Daily physical activities	-0.021	0.037	-0.014	-0.580	0.562
Daily screen time	0.035	0.037	0.023	0.943	0.346
Daily sedentary behavior	-0.002	0.039	-0.001	-0.046	0.963
Daily getting enough	0.018	0.037	0.012	0.486	0.627
Daily tobacco products	0.027	0.046	0.013	0.581	0.562

Note, p < 0.001***

DISCUSSION

According to this study estimates, 24.5% among Pakistani school-aged adolescents were underweight, normal weight 63.8%, overweight 4.6%, and 7.0% were obese. Most recent study from this region showed 21.9% were underweight, overweight 5.8%, and 5.4% were obese¹. Another study from this region showed 24% among Pakistani school-aged adolescents were underweight, normal weight 65%, overweight 4.3%, and 6.7% were obese². Another study was from the Hyderabad urban region in 2013 found that 12% of students in grades 6 to 10 were obese, and 8% were overweight²³. An additional study conducted in Karachi among school children aged 11 to 15 years old found that 19.1% of the children were overweight and 10.8% were obese²⁴. A local survey conducted in Lahore founded that 11.9% of students in private schools in grades 6 and 7 were obese, while 21.8% were

overweight²⁵. In 2018, another local study was conducted on children aged 3 to 18 years in Multan, with the results showed that 10% of the students were overweight and 5% were obese²². According to the World Obesity Federation estimated in 2018, that 6.6% of Pakistani children were obese, and 10.7% were overweight²³.

This study is a comprehensive examination of all demographic factors, try to include minorities, urban and rural areas, age, public and private schools, and the four levels of education. Based on this foundation, BMI correlates of parental attitudes and knowledge factors in Pakistani school adolescents can be used to develop intervention programs for afflicted children and to inform the development of official guidelines for the treatment and prevention of BMI difficulties in Pakistani school adolescents using empirical data.

First, it is impossible to draw any causal conclusions about the structural associations that have been discovered due to the cross-sectional data. The second issue is that children 5 to 11 years were not patriated in this study. Therefore, particular socio-demographic influences of school or community-related factors among Pakistani school-aged adolescents are yet unknown, necessitating further research.

CONCLUSIONS

Parents must take extra care to recognize their children's proper body shapes. Additional research that focuses on practical solutions are required to develop strategies for parents to adopt in order to combat the epidemic of childhood obesity and overweight.

Programs for preventing obesity at the regional, provincial, and national levels should place a strong emphasis on educational partnerships between parents, schools, and health facilities. Multifaceted and localized interventions and policies are needed to prevent and manage the epidemic of childhood obesity. But parents still have a significant and influencing role to play in such extensive and thorough programs. Parents should be directly involved in interventions from the very beginning of their child's development and growth in order to implement healthy changes at home and to reinforce and promote a healthy diet and regular exercise.

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Data Availability Statement: The corresponding author can provide the data used in this work upon request.

Competing interests: The authors have declared they have no competing interests.

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