Original Research Article

Prevalence and determinants of obesity among male secondary schools students in Al Bukhriyah, Qassim region, Saudi Arabia

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ABSTRACT

Background: Obesity is a condition associated with the presence of excess fat in the body. It is determined by genetic and environmental factors that are difficult to control when dieting.

Methods: The study population consisted of 254 students randomly drawn from five secondary schools which are present in Bukhriyah and the students were selected using systemic random sampling method.

Results: Overweight (21.26%) and Obesity (17.72%) was more prevalent in students who used vehicles as mode of transport. Overweight (19.29%) and Obesity (15.75%) was more prevalent in students who consumed carbonated drinks.

Conclusions: The conclusion of our study was that overweight and obesity were associated with various factors like physical inactivity, soft drink intake, fast food intake and less sleep.

Keywords: Obesity, Overweight, BMI, Exercise

INTRODUCTION

Obesity is a condition associated with the presence of excess fat in the body. It is determined by genetic and environmental factors that are difficult to control when dieting. Obesity is classified as a body mass index (BMI) of 30 or more. Body mass index is a method used to measure obesity.

Most of the people are not aware of obesity related effects.¹ Obesity is strongly associated with an increased risk of all causes of death.² Obese individuals are at risk of developing one or more of serious medical conditions that are associated with obesity. They include obesity-related diseases, the most common: High blood pressure,

Diabetes, High cholesterol, Heart disease, Stroke, Osteoarthritis, Gallbladder disease, Sleep apnoea, asthma, respiratory problems and some cancers type like breast, prostate, and colon.^{1,3}

According to The Centers for Disease Control in United States, there are 112,000 deaths related to obesity.⁴ And they were identified Behaviour, environment and genetics as the main causes to the complexity of the obesity epidemic.⁵ Obesity is worldwide problem. In 2014, there were over 1.9 billion adults, 18 and older, are overweight. Of them, more than 600 million are obese.⁶

Middle East and North Africa (MENA) includes 18 countries at different levels of economic development.

Like rest of the world, the documents show high prevalence of obesity in the region, with nearly a fifth of the adult population in the region are considered obese.⁷

A WHO report shows that Gulf countries have a higher incidence of obesity. Kuwait, Bahrain, Saudi Arabia and the United Arab Emirates are in the higher ten countries globally in terms of obesity. Obesity rates are higher among female than male in the Gulf countries.⁸

Obesity data from the Kingdom of Saudi Arabia (KSA) is scarce, but studies show that high obesity rates in all population sectors in Saudi Arabia. The results showed that most Saudis are physically inactive, and ate a few levels of fruits and vegetables.⁹ In addition to increase in fast food and soft drink intake and increased use of transport vehicles and less walking in last 20 years, obesity has increased alarmingly.⁸

Obesity has reached to epidemic proportions in childhood in the world.¹⁰ Obesity in school age is an escalating problem.¹¹ Typically, emotional or psychological problem is the first problem to face obese children, including low self-esteem.¹² Childhood obesity can be risk factor for many diseases such as: diabetes mellitus, hypertension, heart disease, sleep disorders, cancer, liver disease, eating disorders and asthma and other respiratory problems.¹³

According to the World Health Organization (WHO) that 22 million children under the age of 5 years are overweight and progressing steadily to obesity. And the rate of obesity increases with increase of age.¹⁴

House and school are more effective places at preventing obesity or overweight because they can give information and guide children and adolescents. In addition, children and adolescents spend most of the time there. Family and school can decrease the rate of obesity by encouraging and expanding opportunities for overweight children to participate in physical activity, established a healthy school meals program and develop healthful eating habits.

METHODS

Sample size calculation

$$N = z^2 p * q / d^2$$

$$P = 21\% (15), q = 100 - p, d = 5$$

$$n = 1.96 * 1.96 * 21 * 79 / 5 * 5 = 254$$

Total student population in secondary schools in Bukhriyah was 965.

Hence for each school, $254/5 = 51$

$965/254 = 3.79$. Hence every fourth student was chosen from each school to reach a sample size of 50 from each school.

Study design: Cross-sectional study

Study period: September 2016 to December 2016.

Setting: Approach

Study population: The subject to the study was male students of age between 15-19 years.

The study population consisted of 254 students randomly drawn from 5 secondary schools which are present in Bukhriyah. Out of the total 965 students, 25% of students were selected randomly from the 5 secondary schools in Bukhriyah, using systemic random sampling.

Sampling methods

Subjects for this study were selected by using the school enrolment lists. Students were chosen at random from each of the classes in the range of 10th grade–12th grade.

Height and weight were being taken at the school using accurate scales in each school. After the recording of the height and weight of each student, the subjects were asked to complete the questionnaire provided. This information was coded to match the height and weight data.

Statistical analysis: Percentage, proportion, chi square test.

RESULTS

Our results indicated overweight and obesity was prevalent in 23% and 19% of students respectively (Table 1).

Table 1: Prevalence of obesity in different schools.

Name of the School	Obesity				Total
	Underweight	Normal	Overweight	Obese	
Udai bin Hatim	1.18	11.02	5.51	2.76	20.47
Tanawiya_Buk	3.94	9.84	3.94	2.76	20.47
Tafizul Quran	2.36	7.87	3.15	4.72	18.11
Al Enjaal	3.94	7.87	4.33	4.33	20.47
Al Afaq Al Namodajiya	3.15	7.48	5.91	3.94	20.47
Total	14.57	44.09	22.83	18.50	100.00

$\chi^2 = 12.004$, $df = 12$, Not significant.

Table 2: Obesity in different types of schools.

		Obesity (%)				Total
		Underweight	Normal	Overweight	Obese	
Types	Private School	7.09	15.35	10.24	8.27	40.94
	Government School	7.48	28.74	12.60	10.24	59.06
Total		14.57	44.09	22.83	18.50	100.00

$\chi^2 = 1.293$, Degrees of freedom= 3, p-value=0.7307.

Table 3: Association of transportation and obesity.

		Obesity				Total
		Underweight	Normal	Overweight	Obese	
Vehicle		12.99	37.01	21.26	17.72	88.98
	walk	1.57	7.09	1.57	0.7	10.93
		14.57	44.09	22.83	18.50	100.00

$\chi^2 = 2.535$, Degrees of freedom=3 p=0.4691.

Table 4: Sleep and obesity.

		Obesity				Total
		Underweight	Normal	Overweight	Obese	
Duration of sleep	More than 8 hours	4.33	14.17	6.30	5.12	29.92
	Less than 8 Hours	10.23	29.92	16.54	13.39	70.08
		14.57	44.09	22.83	18.50	100.00

$\chi^2 = 0.2083$, Degrees of Freedom=3, p=0.9762.

Table 5: Carbonated drinks intake and obesity.

		Obesity				Total
		Underweight	Normal	Overweight	Obese	
	Yes	13.78	38.98	19.29	15.75	87.80
	No	0.79	5.12	3.54	2.76	12.20
Total		14.57	44.09	22.83	18.50	100.00

$\chi^2 = 0.9985$, Degrees of freedom=3, p=0.8016.

Table 6: Fast food intake and obesity.

		Obesity				Total
		Underweight	Normal	Overweight	Obese	
	Yes	14.17	39.76	22.26	16.54	91.34
	No	0.39	4.33	0.57	1.97	8.27
Total		14.57	44.09	22.83	18.50	100.00

$\chi^2 = 1.967$, Degrees of freedom=3, p=0.5793.

Students were slightly more overweight and obese in government schools than in private schools (Table 2). Overweight (21.26%) and obesity (17.72%) was more prevalent in students who used vehicles as mode of transport (Table 3). Also it was found that physical activity like walking was less associated with overweight and obesity. Overweight (16.54%) and obesity (13.39%) was more prevalent in students who slept for less than 8 hours daily (Table 4). Overweight (19.29%) and obesity (15.75%) was more prevalent in students who consumed carbonated drinks (Table 5). Overweight (22.26%) and obesity (16.54%) was more prevalent in students who consumed fast food (Table 6).

DISCUSSION

The study found a prevalence of overweight or obesity of 22.83% and 18.5% respectively. These prevalence rates of overweight or obesity are similar to that found by Shaikh et al.¹⁵ Prevalence of overweight was much similar to that of the national prevalence of 23.1% are higher than findings from other Gulf Countries like Kuwait.^{16,17} This study found a higher prevalence rate of overweight or obesity in government schools than private schools. Potential reasons for this may be that private schools promote exercise and discourage the use of fast food.

We examined health-risk behaviours that could influence energy metabolism such as soft drink intake and fast food intake. Soft drink intake was in this study associated with overweight or obesity. Malik in her review has found an association between obesity and soft drink intake.¹⁸

The effect of physical inactivity and sedentary behaviour was also considered in this study. Our study shows that the most of the adolescents were physically inactive, as was found that overweight and obesity was more in adolescents who used some or the other mode of transportation rather than walking. There are a multitude of studies found to explain the relationship between obesity and physical exercise.^{19,20}

This lack of physical activity in our study might be due to low level of knowledge regarding the causative factors of overweight and obesity and their resulting consequences. Overweight status was in this study also associated with the less sleep. This is similar to the finding of Abri et al.²¹

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