

Original article

Prevalence of overweight and obesity among Saudi primary school students in Tabuk, Saudi Arabia 2015.

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Abstract:

Background: At present, obesity is considered a chronic disease which must be treated like any other medical condition, and if not treated it leads, insidiously, to the development of numerous diseases. It has an epidemic-like nature and is not only one of the main causes of morbidity and mortality, Adolescence represents a sensitive period in the development of obesity, and obesity in adolescence is known to track into adulthood and be associated with several health problems. **Objectives:** To determine the prevalence of overweight and obesity and explore the association among the following variables: nutritional habits, physical activity, videogames, and the student perception towards obesity. **Materials and Methods:** A cross-sectional study was conducted among primary school students in Tabuk city, Saudi Arabia. **Study population:** 6th year primary school in private and public school in Tabuk city, sample size 200 school students in private and governmental schools involving male and female equally, firstly two schools for each gender were selected randomly and the whole classes of the selected schools were taken, data was collected through a self-administered validated questionnaire. Height and weight of each selected student were measured and BMI was calculated. We used WHO growth charts and definition - that based on widely different ethnic backgrounds and cultural settings. **Results:** 200 self-administered questionnaires were distributed to the students and collected, giving a response rate of 100%. Their age ranged between 10 and 14 Years (Mean=11.96 years) and (SD=0.5 years). 50% were male and 50% were female, 99% were Saudi, their BMI ranged between 13 and 41.33 (Mean=23.34) and (SD=5.80 years). The prevalence of overweight among primary school students in Tabuk city, according to the CDC growth chart, was 15.5% and that of obesity was 22%. The prevalence of overweight and obesity among male students were 13% and 17% compared to 18% and 27% among female students; respectively, higher prevalence was shown with reduced physical activities and higher total media time. Also there was a significant association with some related perceptions like (considering obesity as an illness, availability of family obesity and trial of losing weight). **Conclusion:** Our study concluded that there is apparent increase in the prevalence of overweight and obesity in primary private and public schools in Tabuk city and evidence based data on considerable associated factors.

Keywords: body mass index; international obesity task force

Bangladesh Journal of Medical Science Vol. 15 No. 03 July'16. Page : 329-334

Introduction: Obesity is the result of an imbalance of energy intake and expenditure and the main causes are linked to environment factors, mainly the factors related to sedentary lifestyles, used by children nowadays.

Besides energy expenditure may be reduced because less energy is required for videogames than required

for activities, such as bicycle-riding or swimming, reducing the level of energy expenditure is a powerful aetiological factor for the development of obesity in children and adolescents.¹⁻³

In Saudi Arabia the prevalence shows the rate of obesity among adults remained steady at 22.1% (males 17.8% and females 26.6%) in 1990 and

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1993 and increased thereafter to 35.6% (females 44% and males 26.4) in 1995 and 2000 . This trend can also be seen in overweight Saudis as the percentage of overweight adults in the Saudi Arabia increased from 31.2% (33.1% males and 29.4% for females) to 36.9% (42.4% of males and 31.8% of females) in the same time period.⁴

Obesity affects the functioning of many organs. Although the share of obesity in the pathogenic chain of diseases of many organs has not been clearly proven, there is no doubt that it fosters some of them and contributes to their aggravation and increases the incidence of complications.⁵

Adolescence represents a sensitive period in the development of obesity, and obesity in adolescence is known to track into adulthood and be associated with several health problems. The origin of obesity is complex and influenced by genetic and environmental factors. As the prevalence of childhood and adolescence obesity has increased in most parts of the world, we need to consider factors behind this development. One of them may be the increased use of information and communication technology, digital games (video, computer and console games) and computers.⁶

Commercials and mass media have a significant effect on our nutritional habits. The amount of time spent in using of information and communication technology, is a related reason for developing obesity, It takes away from the time children spend on physical activities and also leads to increased energy intake through snacking and eating meals.⁷ So we conducted this study for more exploration of the association of nutritional habits, physical activity, digital games, and obesity in 6th year primary school in private and public school in Tabuk city

Materials and Methods

Study designs and subjects

A cross-sectional study was conducted among Saudi primary governmental and private schools students in Tabuk city, Saudi Arabia during the school year 2015-2016. The study population included 6th year primary school in private and public school in Tabuk city, sample size 200 school students in governmental and private schools:50% of them are male and 50% are female, the selection technique of the random sample was conducted in two stages, firstly two schools for each gender were selected randomly and then in sampling for each school the whole classes participated.

Data collection and ethical consideration

Study was approved by the research committee of faculty of medicine university of Tabuk, Permission from The Educational authorities in Tabuk was obtained with the help of the school health department in Tabuk military hospital, written consent was taken from each school head master, verbal consent was taken from the students who participated and responses was strictly confidential. Data was collected through a self-administered validated questionnaire. Height and weight of each selected student were measured and BMI was calculated. The unique feature of our study was the use of new growth charts which could be more appropriate for our children i.e. recently published WHO growth charts which were prepared using data from different countries. The questionnaire is designed to measure relationship between obesity and nutritional habits, new technology and digital games, physical activity and student perceptions.

Data entry and analysis

Data entered by researcher using computerized system and analyzed by SPSS (the statistical package of the social sciences) version 21. Chi-square test was utilized to test for the difference and/or association between categorical variables (BMI and associated factors), also we used t test. A p-value less than 0.05 was considered statistically significant.

Results:

Of 200 self-administered questionnaires distributed to the students and collected, giving a response rate of 100%. Their age ranged between 10 and 14 Years (Mean=11.96 years) and (SD=0.5 years). 50% were male and 50% were female, 99% were Saudi Their BMI ranged between 13 and 41.33 (Mean=23.34) and (SD=5.80 years).

Discussion:

The overweight is defined as excess of body weight, where as obesity refers to an excess of fat (8).

The International Obesity Task Force (IOTF) criteria, by categorizing individuals according to their body mass index (BMI) (kg/m²); the accuracy of this approach relies on the relation of this measure to the percentage of body fat. (9) Obesity is the result of an imbalance of energy intake and expenditure and the main causes are linked to environment factors, mainly the factors related to sedentary lifestyles, used by children nowadays.¹⁰

The rapid increase in the prevalence of obesity cannot be attributed to genetic makeup because the gene pool did not change substantially between 1980 and 1994; therefore, our main concerns should be

Table (1) t-test for Equality of Means for Body mass index of primary school children according to physical activity practices

Physical activity	N	Mean	Sd	Std. Error Mean	Levene's Test for Equality of Variances	t-test for Equality of Means		
					F	Sig.	T	Df
Yes	166	22.9813	5.45879	.42368				
No	33	24.8997	7.14175	1.24322		1.746		197
					4.924	.028	-1.461	39.761

Table (2:B) sex and allocation of a period per week for physical exercise in schools Crosstabulation

		sex and allocation of aperiod per week for physical exercise in schools Crosstabulation						Total
		2	None	one	two	three	four	
sex	Male	1	0	9	85	4	1	100
	female	0	93	2	2	3	0	100
Total		1	93	11	87	7	1	200

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	178.781 ^a	5	.000
Likelihood Ratio	238.222	5	.000
N of Valid Cases	200		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is .50.

in the changes in diet and activity that occurred simultaneously with changes in prevalence. Obesity is the sixth most important risk factor in terms of the number of deaths in the world.¹²

According to studies carried out by the Food and Nutrition Institute under the National Programmes for Prevention and Treatment of Obesity, the problem of overweight and obesity refers to about 12%–14% of children and is different in respective regions.(12) the rate of obesity among adult in the United States is 30.5% in 2000, the percentage of overweight is 64.5¹³

The prevalence of overweight among primary school students in Tabuk according to the CDC growth chart and it was 15.5% and that of obesity was 22%. The prevalence of overweight and obesity among male students were 13% and 17% compared to 18% and 27% among female students, respectively. Results of the study supported the recent review by Wang and Lobstein confirmed that children and adolescents, are facing a significant and rapidly growing epidemic of childhood obesity.¹⁴ Several studies have reported prevalence of overweight or/and obesity in school children with

ages ranging from 7-14 years, applying the 85th percentile and 95th percentile as cut-off points for overweight and obesity, respectively, with rates generally ranging from 6%-30%.¹⁵

The prevalence of overweight and obesity among male students were 13% and 17% compared to 18% and 27% among female students, respectively. However, this difference was not statistically significant, $p=0.108$.

The results showed significant association between overweight and obesity and physical activity: By comparing means of students who practice regular physical activity and the others are 22.98 and 24.89 respectively. This difference was statistically significant, $p=0.028$ as shown in table (1).

The family and home environment are often implicated in the development of childhood obesity. A number of studies highlighted the association between environmental factors, mainly factors related to sedentary lifestyle (like eating unhealthy food or physical inactivity), and childhood obesity.¹⁶ Low level of physical activity in children is also influenced by the amount of physical activity undertaken by parents. Children with active parents

Table (3) BMI category and preferred program Crosstabulation

		preferred program				Total
		social communication	the news	reading for knowledge	playing or films	
BMI category	underwt	2	2	0	1	5
	normal	28	17	28	47	120
	overwt	14	1	3	13	31
	obese	13	7	3	21	44
Total		57	27	34	82	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.117 ^a	9	.034
Likelihood Ratio	19.503	9	.021
N of Valid Cases	200		

a. 5 cells (31.3%) have expected count less than 5. The minimum expected count is .68.

Table(4:A) BMI category and perception of obesity as illness Crosstabulation

		obesity is illness			Total
		Yes	No	4	
BMI CATEGORY	underwt	4	0	1	5
	normal	77	43	0	120
	overwt	25	6	0	31
	obese	32	12	0	44
Total		138	61	1	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	44.249 ^a	6	.000
Likelihood Ratio	14.259	6	.027
N of Valid Cases	200		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is .03.

Table (4:B) BMI category and thinking of loss of wtCrosstabulation Count

		thinking of loss of wt		Total	Chi square test	Value	Df	Asymp. Sig. (2-sided)
		Yes	no					
BMI CATEGORY	underwt	3	2	5	Pearson Chi-Square Likelihood Ratio N of Valid Cases	8.438 9.982 200	3 3	.038 .019
	normal	93	27	120				
	overwt	30	1	31				
	obese	38	6	44				
Total		164	36	200				

were six times more likely to be active compared with parents who are not active.¹⁷

Time spent on watching TV or computer screens and video games appears to be an important index of sedentariness which could increase the risk of obesity. Television viewing is cross-sectional and

prospectively related to obesity in children.^{18, 19}

Reducing television viewing and computer use may have an important role in preventing obesity and in lowering BMI in young children.²⁰

The health benefits of physical activity are achieved through engagement in moderate to- vigorous

physical activity (MVPA), which is strongly related to overall physical activity and is commonly achieved through sport participation and allocation of fixed period for physical exercise.

The lack of a consistent relationship between PA and body weight could be related to several factors. First, many studies have not accounted for socioeconomic status (SES), Second, many of the studies have used small sample sizes, limiting the universality of their results. Third, many of the questionnaires used to estimate PA may not have been sufficiently precise to determine a strong relationship. The assumption from these questionnaires is that a low score indicates "inactivity," whereas a high score indicates an elevated level of PA.

As shown in table(2:b) by our results the relationship between sex and allocation of a period per week for physical exercise in schools and it is obvious that

girls schools have no physical exercises in their timetable.

We tested playing video games and total media time, we found a significant association between overweight and obesity and the preferred program which can be an indicator for the total media time.

Also from results of this study we found a significant association between overweight and obesity and some related perceptions like (is obesity an illness, availability of family obesity and trial of losing weight).

Conclusion:

Our study concluded that there is apparent increase in the prevalence of overweight in primary private and public school in Tabuk city and evidence based data on considerable associated factors, So there is a need for rapid and effective action to restrict this problem burden.

Conflict of interest: None

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