Prevalence of Obesity Among Male intermediate School students in Al-Madina at 2015

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Abstract

Background *: Obesity in children and adolescents is a serious issue with many health and social consequences that continue into adulthood.*

Objectives*: To estimate the prevalence of obesity among male intermediate school students aged 12-15 years in al-Madina and To determine the relationship between BMI and life style factors among them*

Methods*: The study is a school-based cross-sectional study with self-administrated questionnaires. It was collected from intermediate school male students in Al-Madinah,2015.The Population was 32044 students (aged 12- 15 year-old).The study was involving 399 students using cluster random sampling technique. Measurements included B.M.I, weight and height.*

Results*: Our study reveals that the prevalence of obesity was 20.3% . The lowest percentage (2.5%) were from first intermediate grade student while the highest percentage (10.8%) were from third intermediate grade student.*

It shows that most of the obese live in their own home. We did not find a direct relation between other diseases and the occurrence of obesity; this may refer to the age of the subjects.

The opinions of our subjects regarding to the cause of obesity mostly was fast food (12.5%) .

Conclusion*: our study showed a high magnitude of obesity and related significant factors starting from sport activities and ending in parents education.*

INTRODUCTION

Obesity is a term used to indicate excessive deposition of fat in the body. It is the most common nutritional disorder in the developed countries and is assuming a significant proportion in the developing countries. [1]. According to the World Health Organization (WHO), there were about 1.6 billion overweight adults aged 12 years and above and at least 400 million adults are obese worldwide 2007[2].

The worldwide prevalence of childhood overweight and obesity increased from 4.2% (95% CI: 3.2%, 5.2%) in 1990 to 6.7% (95% CI: 5.6%, 7.7%) in 2010. This trend is expected to reach 9.1% (95% CI: 7.3%, 10.9%), in 2020(2) so The prevalence of obesity in childhood and adolescence is increasing rapidly and has reach an epidemic proportion worldwide.[2,3]

Obesity in childhood and adolescence has both immediate and future health consequences. [4,5] 60% of overweight children already suffer from hypertension, hyperlipidemia, and/or hyperinsulinemia.[6]

Childhood obesity was shown to be directly linked to abnormalities in blood pressure, lipid, lipoprotein and insulin levels in adults.[7] Moreover, increased obesity in childhood and adolescence is most often associated with type 2 diabetes mellitus.[8]

The causes of childhood obesity are multi-factorial including: genetics, the environment, behaviour, diseases, parent's psychological characteristics, television watching, physical activity, and nutritional habits (9, 10). It was proposed that increases in body weight and increases in fast food and snack consumption are concurrent events that potentially are causally related [11]

During the last three decades, Saudi Arabia has witnessed enormous lifestyle changes. Consequently, physical inactivity and sedentary living with associated rise in obesity are increasingly becoming prevalent in the society [12, 13].

LITERATURE REVIEW

For the literature review, we performed an exploratory search for the relevant search terms on the web and medical Journals and we found that Several studies were carried out to study the prevalence of overweight and obesity among Saudi children [14, 15, 16], but those assessed the association between eating habits, socio-demographic differentials and obesity in these children are very few [17]

In addition, another body composition assessments conducted on Saudi school children indicated a high prevalence of obesity among them. Cross-sectional as well as longitudinal observations indicated that the obesity level is on the rise among Saudi children and youth [18, 19, 20].

Some recent studies revealed increasing consumption of animal products and refined foods in the diet at the expense of vegetables and fruits [21,22].

Overweight and obesity, as well as their related noncommunicable diseases, are largely preventable. Governments, International Partners, Civil Society and the Private Sector have vital roles to play in shaping healthy environments and making healthier diet options for children and adolescents affordable, and easily accessible(2)

The objectives of this study were to assess the Prevalence and Risk Factors of obesity and overweight among male intermediate schoolchildren and to find the possible Relation between obesity/overweight with Dietary Habits and socio-demographic differentials among them.

Research objectives:

General objective:

To estimate the prevalence of obesity among male intermediate school students aged 12-15 years in al-Madinah.

Specific objectives :

1- to determine some associated life style of obesity in the study population.
2- To determine   the relationship between BMI , life style factors and the social demography differentials .

METHODS

Study design:
The study is a school-based cross sectional study .

Study Area:
The sample used in this research was taken from male Intermediate School Students at their schools from different places in Al-Madinah .

Study Population and Sampling Technique:
The population of the study is Male Intermediate School Students. The total population is 32044 students. The study is involving **399** randomly selected Intermediate School Students Male (12-15 year-old) from Al-Madinah **by** using Cluster random sampling technique.

Sampling Size:
We calculated the sample size using this Website; http://www.raosoft.com/samplesize.html   which calculated the sample size for a 32044 population to be 380 students, with a confidence interval of 95%, a "D" value(Margin of error) is 0.05, and a response distribution of 50%. But we took 399 students as sample.

Measurements:
The data were collected in 2015 by the sixth year medicine students .

The structured questionnaire was introduced to the students by Arabic language and included information about life style , sociodemographic condition ,physical activities ,disease that related to the study , food and drinks .

The Body Mass Index (B.M.I) was calculated as **kg/m²**. It is used to express the obesity by measuring weight and height . The weight and height were taken following the questionnaire filling. We measured the weight in Kg by using digital scale after removing the shoes and heavy clothing(such as sweaters). And measuring the height by using the standardized wall-mounted height boards with a sliding head piece. The calculated BMI was classified into categories:
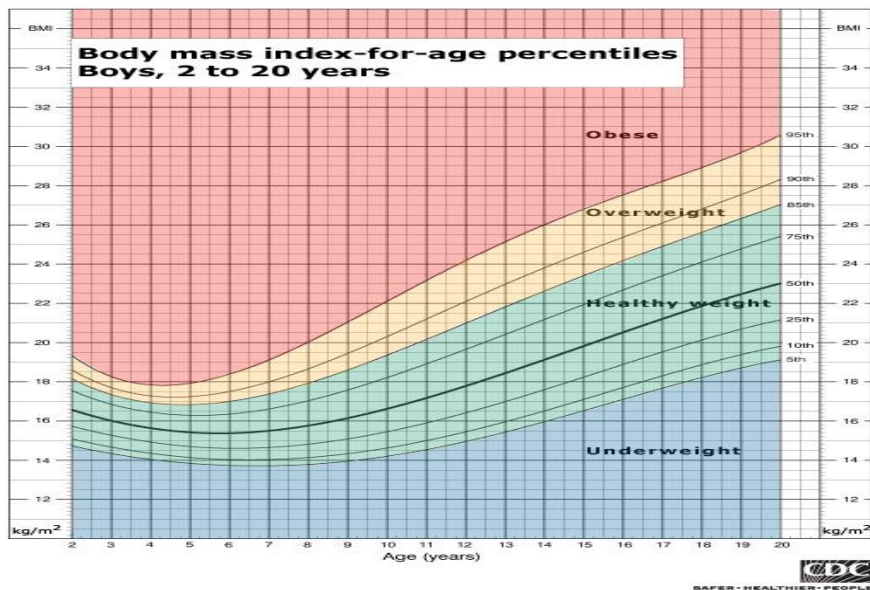
Disclaimer :The plotted point on the graph is accurate to within 0.5 of the BMI calculation generated by the calculator   .
Source :Based on graphs developed by the National Health Center for Statistics in collaboration with the National Centre for Chronic Disease Prevention and Health Promotion (2000).

Statistical Analysis of Data:
Data were coded, validated, and analyzed by using SPSS(version 14.0).

Ethical consideration:
Ethical clearance and approval to conduct the field survey was obtained from the College of Medicine in Taibah University and Ministry of Education in Almadinah. We wrote that in The structured questionnaire "all the information in this paper will be secrecy. So, there is *No* needing to write your name ".

RESULTS

Table (1): Prevalence of Obesity Among intermediate School male students, al-Madinah , 2015

Category of Body mass	Education level of subject	Total	P Value

index	First Intermediate Grade (12- Years)	Second Intermediate Grade (14- Years)	Third Intermediate Grade (15- Years)		
Underweight	11 (2.8%)	25 (6.3%)	28 (7.0%)	64 (16.0%)	0.008*
Normal	16 (4.0%)	56 (14.0%)	118 (29.6%)	190 (47.6%)	
Overweight	15 (3.8%)	24 (6.0%)	25 (6.3%)	64 (16.0%)	
Obese	10 (2.5%)	28 (7.0%)	43 (10.8%)	81 (20.3%)	
Total	52 (13.0%)	133 (33.3%)	214 (53.6%)	399 (100.0%)	

*Significant value (P < 0.050)

Table (1) shows that 20.3% of the total students are obese.2.5% are from first intermediate grade student (12-<14 years),7% are from second intermediate grade student (14-<15 years) and 10.8% are from third intermediate grade student (15-<16 years).

Table (2) : Sociodemographic Characteristics of Obesity Among intermediate School male students, al-Madinah , 2015

Sociodomographic	BMI			P Value
Region of subject living	Obese	Overweight	Normal	
East	27 (6.8%)	13 (3.3%)	97 (24.3%)	0.258
West	22 (5.5%)	22 (5.5%)	61 (15.3%)	
South	32 (8%)	29 (7.3%)	94 (23.5%)	
Type of subject home	Obese	Overweight	Normal	P Value
Rent	37 (9.3%)	30 (7.5%)	125 (31.4%)	0.710
Own	44 (11.0%)	34 (8.5%)	129 (32.4%)	
Parents of the subject	Obese	Overweight	Normal	P Value
Both are alive	75 (18.8%)	58 (14.5%)	236 (59.1%)	0.497
One of them are alive	4 (1%)	6 (1.5%)	17 (4.3%)	
Both are dead	2 (0.5%)	0	1 (0.3%)	
Education level of subject's father	Obese	Overweight	Normal	P Value
Primary school	10 (2.5%)	0	11 (2.8%)	0.032*
Intermediate school	10 (2.5%)	12 (3%)	31 (7.8%)	
High school	20 (5.0%)	18 (4.5%)	63 (15.8%)	
College	27 (6.8%)	23 (5.8%)	113 (28.4%)	
Higher	14 (3.5%)	11 (2.8%)	36 (9.1%)	

Education level of subject's mother	Obese	Overweight	Normal	P Value
Primary school	9 (2.3%)	5 (1.3%)	13 (3.3%)	0.506
Intermediate school	10 (2.5%)	10 (2.5%)	39 (9.8%)	
High school	23 (5.8%)	16 (4%)	65 (16.3%)	
College	26 (6.5%)	27 (6.8%)	110 (27.6%)	

Higher	13 (3.3%)	6 (1.5%)	27 (6.8%)	

*Significant value (P < 0.050)

Table (2) shows that the obese students that live in own home represent 11% while 9.3% live in rent one. The parents of the obese students are still alive in 18.8%. Obese fathers education level was college in 6.8% while 6.5% obese mothers education level was college.

Table (3) : Comparison of intermediate School male students by Live Style ,al-Madinah ,2015

Life Style	BMI			P Value
Subject relatives obesity	Obese	Overweight	Normal	
Close Related	20 (5.0%)	12 (3%)	32 (8%)	0.106
Far Related	10 (2.5%)	12 (3%)	31 (7.8%)	
No	51 (12.8%)	40 (10%)	191 (47.9%)	
Duration of watching TV	Obese	Overweight	Normal	**P Value**
Low Hours	42 (10.5%)	35 (8.8%)	122 (30.6%)	0.111
Moderate Hours	19 (4.8%)	20 (5%)	56 (14.1%)	
High Hours	20 (5.0%)	9 (2.3%)	76 (19.1%)	
Subject eating during watching TV	Obese	Overweight	Normal	**P Value**
Always	9 (2.3%)	10 (2.5%)	54 (13.6%)	0.061
Sometimes	62 (15.5%)	44 (11%)	157 (39.3%)	
No	10 (2.5%)	10 (2.5%)	43 (10.8%)	
Duration of sleep	Obese	Overweight	Normal	**P Value**
Low Hours	11 (2.8%)	12 (3%)	45 (11.3%)	0.556
Moderate Hours	52 (13.0%)	32 (8%)	134 (33.6%)	
High Hours	18 (4.5%)	20 (5%)	75 (18.8%)	
Type of sport	Obese	Overweight	Normal	**P Value**
Football	18 (4.5%)	21 (5.3%)	110 (27.6%)	0.028*
Swimming	9 (2.3%)	5 (1.3%)	18 (4.6%)	
Walking	7 (1.8%)	4 (1%)	10 (2.5%)	
Others	1 (0.3%)	2 (0.5%)	8 (2%)	
More than one type	42 (10.5%)	29 (7.3%)	91 (22.8%)	
No	4 (1%)	3 (0.8%)	17 (4.3%)	
Eating Vegetables	Obese	Overweight	Normal	**P Value**
Yes	53 (13.3%)	50 (12.5%)	188 (47.1%)	0.337
No	28 (7.0%)	14 (3.5%)	66 (16.5%)	
Eating Fruit Daily	Obese	Overweight	Normal	**P Value**
Yes	35 (8.8%)	33 (8.3%)	134 (33.6%)	0.495
No	46 (11.5%)	31 (7.8%)	120 (30.1%)	
Drinking Soft Drink	Obese	Overweight	Normal	**P Value**
once daily	34 (8.5%)	32 (8%)	104 (26%)	0.598
two or more	38 (9.5%)	23 (5.8%)	113 (28.3%)	
No	9 (2.3%)	9 (2.3%)	37 (9.3%)	
Times of eating fast food weekly	Obese	Overweight	Normal	**P Value**

1-2	55 (13.8%)	50 (12.6%)	169 (42.5%)	0.169
3-5	23 (5.8%)	9 (2.3%)	65 (16.4%)	
>5	3 (0.8%)	4 (1%)	20 (5%)	
Smoking	Obese	Overweight	Normal	**P Value**
Yes	4 (1%)	1 (0.3%)	11 (2.8%)	0.667
No	77 (19.3%)	63 (15.8%)	243 (60.9%)	

*Significant value (P < 0.050)

Table (3) shows that sometimes obese students eat food during watching TV represent 15.5%. Obese students that sleep moderate hours (5-<8 hours) represent 13%. Obese students that eat vegetables represent 13.3% while 11.5% don't eat fruit daily. Obese students that drink two or more soft drink per day represent 9.5% while 8.5% only drink one. Obese students that eat one to two fast food weekly represent 13.8 %. Obese students that don't smoke represent 19.3%.

Table (4) : Health status of obese intermediate School male students , al-Madinah , 2015

Health status	Obese
Hypertension	1 (0.3%)
Bone disease	1 (0.3%)
Sleeping disorder	5 (1.3%)
Depression	3 (0.8%)
Asthma	11 (2.8%)
Others	6 (1.5%)
No	54 (13.5%)

Table (4) shows that Obese students that are not suffering from any chronic disease represent 13.5% while 2.8% are suffering from asthma and 1.3 % are suffering from sleeping disorder. No one is suffering from heart disease or diabetes .

Table (5) : Major cause of obesity in obese subject opinion

Major cause of obesity in subject opinion	Obese
Fast food	50 (12.5%)
never exercise	27 (6.8%)
Smoking	1 (0.3%)
Sociologic factor	1 (0.3%)
Others	2 (0.5%)

Table (5) shows that Obese students that think the major cause of obesity is fast food represent 12.5% while 6.8% think it is because not doing exercise.
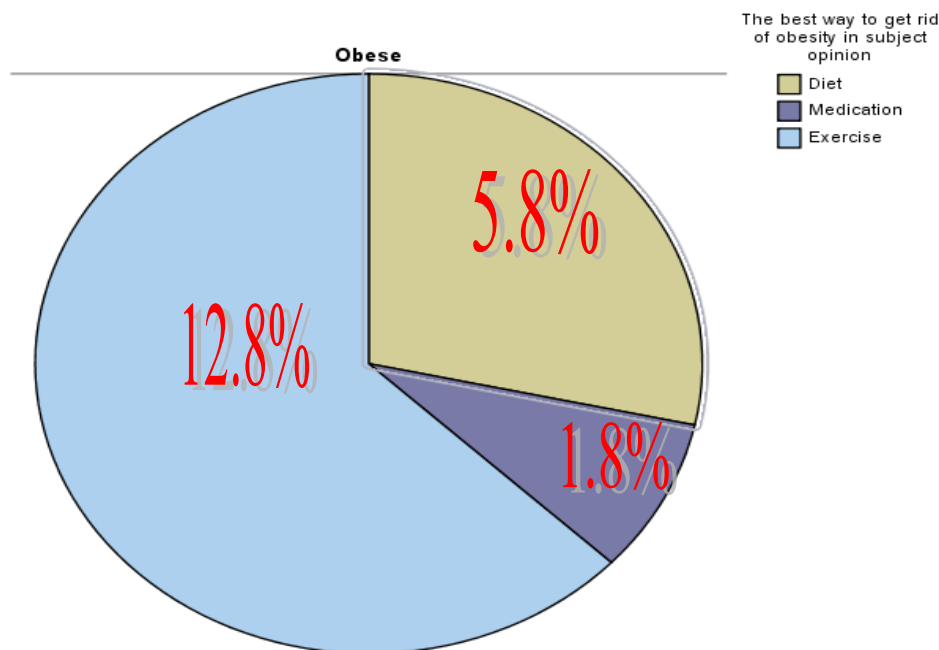
Pie Chart (1) : The best way to get rid from obesity in obese subject (N = 81) opinion. It shows that Obese students that think the best way to get rid from obesity is exercise represent 12.8% while 5.8% think it is diet.

DISCUSSION

The purpose of this study was to assess the prevalence of overweight and obesity among male intermediate school students in Almadina and to find a possible association with their life style . We did not find other study to estimate the prevalence of overweight and obesity among 12-15 year old students and determines their associated factors in Almadina. The results of this study was no doubt provide a high prevalence of obesity among the adolescent population in Almadina, Overweight students represented 16% of the sample whereas, 20.3% were obese (P<0.008).

our findings compared to similar studies conducted in Saudi Arabia at different regions showed a higher prevalence of overweight than that observed in Jeddah 13.4% (23), Riyadh 13.8%(24). The prevalence of obesity also showed a higher results than a school based survey in the Kingdom with overall prevalence of overweight 11.7% and obesity 15.8% among male student aged between 6 and 18 years (14). Our figures were also higher than those among school children in KSA.(25,14,26).This difference might be attributed to the use of a different definition of obesity, or due to a gradual increase in the prevalence of obesity among adolescents since that time. Same findings were reported in other studies. (27, 28, 29).

The prevalence of overweight and obesity observed in this study are within the range of national prevalence of obesity observed in other studies.(30,31,26). Body mass index was observed to be increased with age with a statistically significant difference , as table (1) shows 20.3% total obese student,2.5% were (12-years) ,7% were (14- years) and 10.8% were (15- years) in agreement with those studies(30,32)

In this study, no significant association was found between time spent on watching TV and BMI. These results disagree with the results which emerged from WHO/HBSC survey which found that prevalence of obesity increased by 2% in 12-17 years old for each additional hour of television viewed.

Obesity incidence increases in children who viewed more than 4 hours per day (33). Kruger *et al.*, (2005) found that overweight children were the least active, mainly watching TV all the time (34). In addition, with Khader *et al.*, (2008) also found that the prevalence overweight (obesity) is more if sitting more than two hours/day (35).

Al-Sabbah *et al.*, (2008) found that of overweight boys were significantly less physically active than non-overweight (36). This difference is probably due to cross sectional study type where there are suggestions that there is delayed effect of TV viewing on body fatness, which may not be evident when examining cross sectional data. In addition, it may be due to inaccurate measurement since this part of questionnaire was self-reported by student.

Data from Table (3) do not support any association between BMI and sleep duration. The results are agreement with a study conducted in Hong Kong showed a negative association between sleep duration and BMI (41) also agreement with other (42) but are disagreement with findings from previous research supporting the existence of relationship between BMI and sleep.

This difference is probably due to some limitations. First, the wording used in the insufficient sleep question is open to interpretation. For instance, respondents may interpret "enough" to mean at least a specific number of hours or rather sufficient time to awaken refreshed.

The question also does not distinguish between "rest" and "sleep". Finally, the cross sectional nature of the survey prevented us from attempting to determine the causal relationship between BMI and sleep. Also in this study, our results shows number of non-obese students playing football were more than those who are obese and sport was significantly associated with BMI. This is in agreement with Sibia *et al.*, (2003)(43). The less active child increases the probability to be overweight since activity is the major modifiable component of energy equation that consumes energy.

we studied the relationship between cigarette smoking and excess body weight using data collected from a large male student sample. Most previous studies that have reported a negative association between smoking and body weight have been conducted in Western countries.(37).

The results of the present study indicated that those who currently smoke had no significantly increase BMIs than never smokers or those who had quit smoking (p = 0.667). The finding is consistent with several previous studies that found that smokers tended to have lower BMIs and lower weights than non-smokers or ex-smokers (38,39-40) .

CONCLUSION

Obesity constitutes an important public health problem among male adolescents in Al-Madina . Our study revealed that the prevalence rate is 20.3% of the sample. On the other hand the study correlated between obesity and several life style factors, it was found that there is a significant relationship between the number of sport activities and obesity (p. 0.028) . Another relationship was reveled between obesity and parent's education level. (p.0.032) , all of these findings reassures the severity of the obesity problem.

Recommendations:

The study recommends policy makers to focus on educating both parents and students about the optimum ways of living a healthier life and we insist the introduction of a wider range of sports in schools to ensure that all students have the Opportunity to enjoy exercising finally the study recommends the availability of healthy meals in schools food outlets.

Acknowledgment

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