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RESEARCH ARTICLE

KNOWLEDGE AND ATTITUDE TOWARDS OBESITY AMONG MALE SECONDARY SCHOOL STUDENTS IN TAIF, SAUDI ARABIA

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Abstract

Background: The number of obese subjects is especially bad in the Gulf countries, including Saudi Arabia because of the rapid pace of social and economic changes over the last few decades. However, there is a gap in knowledge that necessitates the need to investigate the knowledge and attitude of obesity among adolescent.

Objectives: To estimate the prevalence of obesity among male secondary school students in Taif city and to assess their knowledge, attitude and practice regarding obesity prevention.

Subjects and methods: A cross-sectional study was conducted in Taif among a representative random sample of male secondary school students. A valid data-collection questionnaire was used including four parts; personal characteristics, knowledge, attitude, and student' practices to prevent and control obesity questions. Weight (in kg) and height in meter of each student were measured to calculate body mass index (BMI).

Results: Out of 278 male secondary school students invited to participate in the study, 251 returned completed questionnaire giving a response rate of 89.9%. Their age ranged between 15 and 19 years with a mean of 17.7 years and standard deviation of 1.8 years. Majority of the students were Saudi (92.4%). Obesity knowledge was good in 12% of students, fair in 59% and bad in 29% of them. Knowledge regarding obesity was more reported among students whose fathers are professionals (21.2%) than students whose fathers are not working (5%) or working in business and trading (5.3%). The difference was statistically significant, $p < 0.001$. Similarly, good obesity knowledge was more reported among students whose mothers are working compared to those whose mothers are house wives (21% versus 9%), $p < 0.001$. Also, good knowledge about obesity was more

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significantly reported among students whose fathers and/or mothers are high educated, $p < 0.001$. More than half of male teachers (55.8%) had positive attitude towards obesity. Saudi students expressed more positive attitude towards obesity compared to negative attitude (57.8% versus 31.6%), $p = 0.027$. Positive attitude towards obesity was more reported among students whose fathers are professionals (77.3%) than students whose fathers are not working (10%). The difference was statistically significant, $p < 0.001$. Also, positive attitude towards obesity was more significantly reported among students whose fathers and/or mothers are high educated, $p < 0.001$. Normal subjects had more positive attitude towards obesity compared to obese subjects (76.8% versus 21.4%), $p < 0.001$. Almost one-third of the students (37.1%) tried to lose their body weight. Among them, 79.6% practiced physical exercise to lose weight while 39.8 reduced their food intake to lose weight. Only 17.2% of students went to weighting loss clubs. Among students who tried to lose their weight, 59.1 % claimed that they succeeded in that.

Conclusion: Students` knowledge of obesity ranged between fair and poor particularly in obesity-related diseases. A considerable proportion of them have negative attitude towards obesity.

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Introduction:-

Obesity is a major public health issue in developed countries and is emerging as a cause for concern in developing countries.^(1, 2) It has become a global epidemic over the last few decades.⁽³⁾ Obesity has assumed epidemic properties in the Arab countries. The numbers are especially bad in the Gulf countries, because of the rapid pace of social and economic changes over the last few decades. Obesity rates of 25-30% and even higher is typical in Bahrain, Kuwait and the United Arab of Emirates (UAE).⁽⁴⁾

Al-Hazzaa, (2004)⁽⁵⁾ and Al-Almaie (2005)⁽⁶⁾ stated that obesity is a major problem in the Kingdom of Saudi Arabia. The percentage of overweight and obesity increases with older age groups and this leads to more health problems. In the last three decades, obesity has increased and become a major health problem in Saudi Arabia.^(5, 6)

In 2003, a study showed that 21% of adults aged 15 years and over were obese/overweight, with an increase from 17% in 1997. Studies in 2000 on the prevalence of overweight and obesity among hypertensive and diabetic adult patients found that 46% of them were obese. There has been a consensus that the source of the obesity epidemic, is primarily due to environmental changes.⁽⁷⁾

Approximately 2.5 million deaths globally are attributable to obesity, of which one third occurs in developing countries.⁽⁸⁾ Regarding cost, it has been estimated that 2% to 7% of the total health care costs in developed countries are due to obesity.⁽⁹⁾

Adolescence is a period of heightened concern regarding obesity. The incidence of obesity increases during this age period⁽¹⁰⁾ and tends to persist into adulthood with increased morbidity and mortality risks.⁽¹¹⁾

In Saudi Arabia, adolescents` consumption of more energy-dense, nutrient-poor foods with high levels of sugar and saturated fats, combined with reduced physical activity (due to increased use of automated transport, technology in the home) and more passive behaviour were adopted.⁽¹²⁾ Obesity may be caused by number of social, cultural, behavior, physiological metabolic and genetic factors that are beyond the person`s control. Symptoms of obesity usually show up in the form of breathing trouble, excess accumulation of fat, insulin resistance increase in size or number of fat cells that rise in blood pressure, high cholesterol levels etc.⁽¹³⁾

There is a gap in knowledge that necessitates the need to investigate the knowledge and attitude of obesity among adolescent. Based on the findings, health education programmers can be conducted in different settings like schools,

colleges, and the community. This challenged the researcher to explore the importance of knowledge and attitudes of adolescent regarding obesity.

The present study aimed to estimate the prevalence of obesity among male secondary school students in Taf city and to assess their knowledge, attitude and practice regarding obesity prevention.

Subjects and methods:-

A cross-sectional study was conducted in Taif which is a city located in the western area of Saudi Arabia belonging to Makah Al Mokarrama Region. It is at an elevation of 1,879 m (6,165 ft) on the slopes of Sarawat Mountains (Al-Sarawat Mountains). It has a population of 1,200,000 people according to 2015 census. ⁽¹⁴⁾ In Taif, there are 37 male governmental secondary schools where the study was done. They included 9776 students representing the target population.

The sample size was calculated based on Bartlett et al. equation, ⁽¹⁵⁾ and accordingly, minimal sample size was 278 students. A random sample was followed to select two schools in Taif City. All students of all three levels of education in the selected schools were included in this study.

Based on thorough review of relevant literature, the researchers constructed a data-collection questionnaire. It includes the following four parts: personal characteristics: age, nationality, scholastic level, father`s job and education and mother`s job and education, knowledge about definition, obesity-related diseases, risk factors and prevention of obesity, attitude toward prevention of obesity (responses were measured according to a 5-point likert scale, i.e., strongly agree, agree, not sure, disagree, and strongly disagree) and student` practices to prevent and control obesity. The questionnaire was validated by three consultants of family medicine.

A score of "1" was assigned to a correct response to a knowledge item, while a score of "0" was assigned to wrong or do not know response. The knowledge of those who obtain 80% or more correct responses was considered as "good"; 60-79% was considered as "fair" while those who have <60% was considered as "poor".

The researchers measured the weight (in kg) and height of each student to calculate body mass index (BMI), which is defined as weight in kilograms divided by the height in meter square [weight(kg)/height(m²)], BMI used to identify overweight and obesity. Student`s BMI was classified as underweight: BMI <18.5 kg/m², normal/acceptable weight: BMI 18.5-<25 kg/m², overweight: BMI>25-<30kg/m² and obesity BMI> 30 kg/m²

A pilot study was carried out on a purposive sample of 20 male students enrolled from a school other than the selected two schools. The purpose of this pilot study was to test the wording and reliability of questions. Accordingly, some questions were removed or modified and thus, the final form of the questionnaire was adopted. Likert scale was used for assessment of attitude so, attitude was classified as: positive attitude and negative attitude depending on the total score of the eight questions assessing the attitude (those with median score or more were considered to have positive attitude while those with less than median score were considered to have negative attitude).

Before start of data collection, the objectives of the present study as well as the data collection tool were fully explained to all participant students.

Statistical Package for Social Sciences (SPSS) software version 22.0 will be used for data entry and analysis. Descriptive statistics (number, percentage for categorical variables and mean, standard deviation and range for continuous variables) and analytic statistics using Chi Square tests (χ^2) to test for the association and/or the difference between two categorical variables were applied. P-value equal or less than 0.05 was considered statistically significant.

Results:-

Out of 278 male secondary school students invited to participate in the study, 251 returned completed questionnaire giving a response rate of 89.9%.

Table 1 presents the socio-demographic characteristics of the participants. Their age ranged between 15 and 19 years with a mean of 17.7 years and standard deviation of 1.8 years. Majority of the students were Saudi (92.4%). They were almost equally distributed between the three scholastic levels. More than one fourth of their parents were professionals (26.3%) and 23.5% were militaries. Most of their mothers were house wives (75.3%). Almost half (47%) and one thirds (34.2%) of their fathers and mothers, respectively were highly educated. Overweight and obesity were reported among 11.2% and 12.4% of the participants, respectively as shown in figure 1

As clear from figure 2, obesity knowledge was good in 12% of male secondary school students, fair in 59% and bad in 29% of them. Table 2 shows that good knowledge regarding obesity was more reported among students whose fathers are professionals (21.2%) than students whose fathers are not working (5%) or working in business and trading (5.3%). The difference was statistically significant, $p < 0.001$. Similarly, good obesity knowledge was more reported among students whose mothers are working compared to those whose mothers are house wives (21% versus 9%), $p < 0.001$. Also, good knowledge about obesity was more significantly reported among students whose fathers and/or mothers are high educated, $p < 0.001$.

Overall, as obvious from figure 2, more than half of male teachers (55.8%) had positive attitude towards obesity while 44.2% had negative attitude. Saudi students expressed more positive attitude towards obesity compared to negative attitude (57.8% versus 31.6%), $p = 0.027$. Positive attitude towards obesity was more reported among students whose fathers are professionals (77.3%) than students whose fathers are not working (10%). The difference was statistically significant, $p < 0.001$. Also, positive attitude towards obesity was more significantly reported among students whose fathers and/or mothers are high educated, $p < 0.001$. Normal subjects had more positive attitude towards obesity compared to obese subjects (76.8% versus 21.4%), $p < 0.001$.

Table 4 shows that slightly less than half of male students (45.8%) measured their body weight in the last 6 months while 16.7% measured it since more than one year. Almost one-third of the male secondary school students (37.1%) tried to loss their body weight. Among them, 79.6% practiced physical exercise to lose weight while 39.8 reduced their food intake to lose weight. Only 17.2% of students went to weighting loss clubs. Among students who tried to loss their weight, 59.1 % claimed that they succeeded in that.

Table 1:- Socio-demographic characteristics of the participants (n=251).

Socio-demographic data	Frequency	Percentage
Age in years		
≤17	121	48.2
>17	130	51.8
Range	15-19	
mean±SD	17.7±1.8	
Nationality		
Saudi	232	92.4
Non-Saudi	19	7.6
Scholastic level		
First	77	30.7
Second	92	36.6
Third	82	32.7
Father`s job		
Professional	66	26.3
Manual	28	11.6
Business/trading	19	7.6
Military	59	23.5
Retired	31	12.4
Others	28	11.6
Not working	20	7.0
Mother`s job		
House wife	189	75.3
Working	62	24.7
Father`s education*		
Low	61	24.3

Moderate	72	28.7
High	118	47.0
Mother`s education		
Low	85	33.9
Moderate	80	31.9
High	86	34.2

Low: Illiterate, primary Moderate: Intermediate, secondary High: University and above

Table 2:- Factors associated with obesity knowledge among male secondary school students.

Socio-demographic data	Obesity knowledge			p-value
	Good N=30	Fair N=148	Bad N=73	
Age in years				
≤17 (n=121)	13 (10.7)	73 (60.3)	35 (28.9)	0.835
>17 (n=130)	17 (13.1)	75 (57.7)	38 (29.2)	
Nationality				
Saudi (n=232)	27 (11.6)	136 (58.6)	69 (29.7)	0.680
Non-Saudi (n=19)	3 (15.8)	12 (63.2)	4 (21.0)	
Scholastic level				
First (n=77)	10 (13.0)	41 (53.2)	26 (33.8)	0.220
Second (n=92)	12 (13.0)	50 (54.3)	30 (32.6)	
Third (n=82)	8 (9.8)	57 (69.5)	17 (20.7)	
Father`s job				
Professional (n=66)	14 (21.2)	50 (75.8)	2 (30.0)	<0.001
Manual (n=28)	2 (7.1)	7 (25.0)	19 (67.9)	
Business/trading (n=19)	1 (5.3)	8 (42.1)	10 (52.6)	
Military (n=59)	6 (10.2)	50 (84.7)	3 (5.1)	
Retired (n=31)	4 (12.9)	18 (58.1)	9 (29.0)	
Others (n=28)	2 (7.1)	13 (46.4)	13 (46.4)	
Not working (n=20)	1 (5.0)	2 (10.0)	17 (85.0)	
Mother`s job				
House wife (n=189)	17 (9.0)	105 (55.6)	67 (35.4)	<0.001
Working (n=62)	13 (21.0)	43 (69.3)	6 (9.7)	
Father`s education*				
Low (n=61)	2 (3.3)	35 (57.4)	24 (39.3)	<0.001
Moderate (n=72)	6 (8.3)	32 (44.4)	34 (47.3)	
High (n=118)	24 (20.3)	81 (68.6)	13 (11.1)	
Mother`s education				
Low (n=85)	3 (3.5)	42 (49.4)	40 (47.1)	<0.001
Moderate (n=80)	9 (11.3)	48 (60.0)	23 (28.7)	
High (n=86)	18 (21.0)	58 (67.4)	10 (11.6)	
Body mass index				
Underweight (n=31)	4 (12.9)	21 (67.7)	6 (19.4)	0.453
Normal (n=142)	16 (11.3)	79 (55.6)	47 (33.1)	
Overweight (n=50)	6 (12.0)	28 (56.0)	16 (32.0)	
Obese (n=28)	4 (14.3)	20 (71.4)	4 (14.3)	

Table 3:- Factors associated with obesity attitude among male secondary school students.

Socio-demographic data	Obesity attitude		p-value
	Positive N=140	Negative N=111	
Age in years			
≤17 (n=121)	68 (56.2)	53 (43.8)	0.897
>17 (n=130)	72 (55.4)	58 (44.6)	
Nationality			
Saudi (n=232)	134 (57.8)	98 (42.2)	0.027
Non-Saudi (n=19)	6 (31.6)	13 (68.4)	
Scholastic level			
First (n=77)	41 (53.2)	36 (46.8)	0.762
Second (n=92)	54 (58.7)	38 (41.3)	
Third (n=82)	45 (54.9)	37 (45.1)	
Father`s job			
Professional (n=66)	51 (77.3)	15 (22.7)	<0.001
Manual (n=28)	8 (28.6)	20 (71.4)	
Business/trading (n=19)	13 (68.4)	6 (31.6)	
Military (n=59)	38 (64.4)	21 (35.6)	
Retired (n=31)	17 (54.8)	14 (45.2)	
Others (n=28)	11 (39.3)	17 (60.7)	
Not working (n=20)	2 (10.0)	18 (90.0)	
Mother`s job			
House wife (n=189)	101 (53.4)	88 (46.6)	0.193
Working (n=62)	39 (62.9)	23 (37.1)	
Father`s education*			
Low (n=61)	25 (41.0)	36 (59.0)	<0.001
Moderate (n=72)	29 (40.3)	43 (59.7)	
High (n=118)	86 (72.9)	32 (27.1)	
Mother`s education			
Low (n=85)	30 (35.3)	55 (64.7)	<0.001
Moderate (n=80)	41 (51.2)	39 (48.8)	
High (n=86)	69 (80.2)	17 (19.8)	
Body mass index			
Underweight (n=31)	9 (29.0)	22 (71.0)	<0.001
Normal (n=142)	109 (76.8)	33 (23.2)	
Overweight (n=50)	16 (32.0)	34 (68.0)	
Obese (n=28)	6 (21.4)	22 (78.6)	

Table 4:- Practice of male secondary school students in Taif city regarding obesity control (n=251).

	Frequency	Percentage
Last time of measuring body weight		
<6 months	115	45.8
6 months-one year	94	37.5
>one year	42	16.7
Having trials to lose body weight		
Yes	93	37.1
No	158	62.9
Method/s practiced to loss body weight*		
Physical exercise	74	79.6
Attending weight loosing clubs	16	17.2
Regular fasting	6	6.5
Reduce food intake	37	39.8
Using weight loosing medications	4	4.3
Outcome of trials to loss body weight		
Success	55	59.1
Failure	38	40.9

*More than one answers was possible (the sum exceeded 100%).

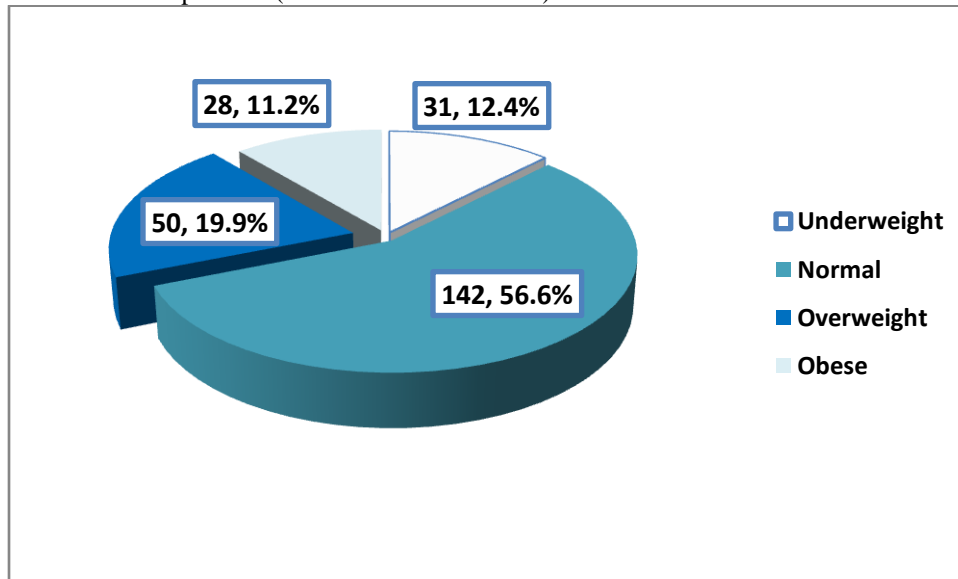
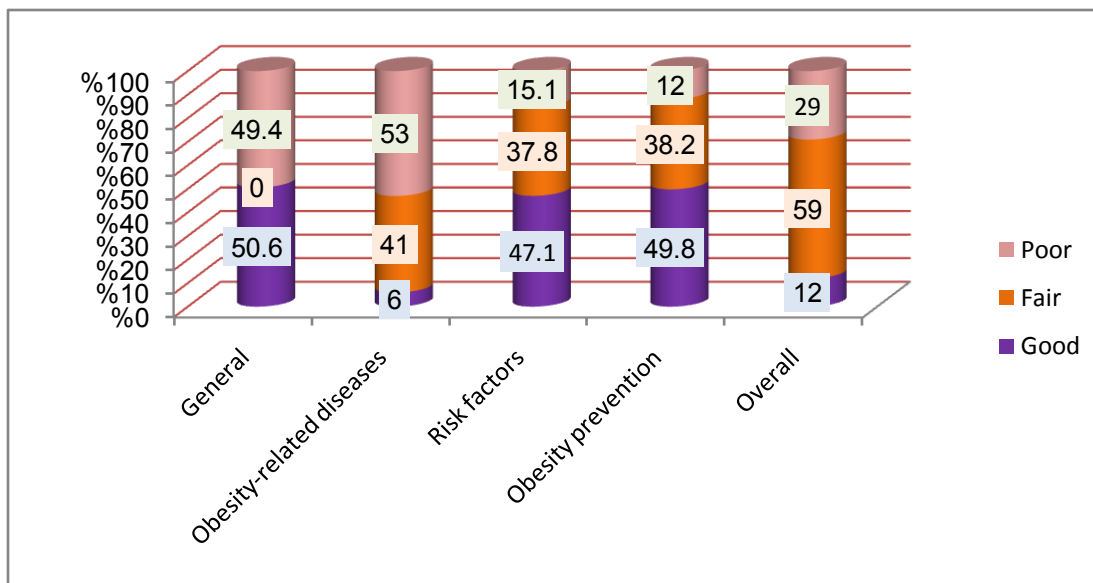


Figure 1:- Body mass index distribution of the male secondary school students, Taif city, KSA.



P<0.001

Figure 2:- Level of obesity knowledge among male secondary school students, Taif city, KSA.

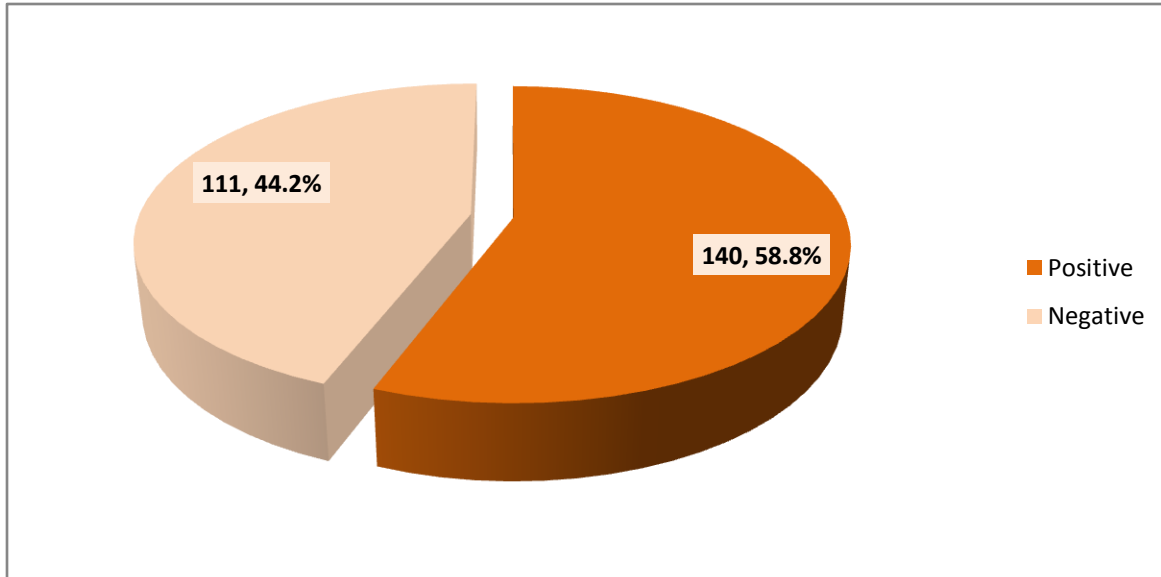


Figure 3:- Attitude of the male secondary school students towards obesity and overweight, Taif city, KSA.

Discussion:-

The BMI is widely accepted as providing a convenient measure of a person's fatness. It gives an index that is broadly independent of height and equally applicable to men and women. A few individuals who are exceptionally muscular may be misclassified as overweight or obese, but otherwise the BMI provides a rather robust index which has proved exceptionally useful for large scale epidemiological work.⁽¹⁶⁾

In the current study, overall prevalence of overweight among male secondary school students in Taif city was 11.2% and that obesity with its different grades was 12.4%. These figures are comparable to those reported by Al-Nozha (2005)⁽¹⁷⁾ in Riyadh who showed that the prevalence of overweight was 13.8% and that of obesity was 20.5% among Saudi male adolescents. This shows that obesity is increasingly becoming a public health problem, something that should no longer be ignored in KSA. In other Saudi studies among adolescents, overweight ranged between 8.7% to 24.8% whereas obesity rate ranged between 5% and 29.7%.⁽¹⁸⁾ However, comparisons of the prevalence of overweight and obesity in adolescents from different studies, even in the same country are somewhat challenging due to several reasons, including the use of non-representative samples, age variation of the sample and the use of different cutoff reference standards of BMI.

International studies showed relatively lower rates of overweight and obesity among adolescents. In Egypt, prevalence of overweight and obesity among intermediate school students in Ismailia city were 7.7% and 5.1%, respectively.⁽¹⁹⁾ In Tanzania, among primary school children in Dar es Salaam, prevalence of obesity was 5.2%.⁽²⁰⁾ In India, the prevalence of overweight and obesity among a group of male school children aged 12-18 years were 14.3% and 2.9%, respectively.⁽²¹⁾

Saudi Arabia has undergone major economical changes in the last three decades. This has resulted in significant changes in lifestyle. Use of cars for even-short distances like for going to market or the mosque, routine consumption of meat, meat products, Kabsa (a traditional high-fat feast), dates and readymade, highly refined carbohydrate preparations are very common. In addition, most of the physical work were performed inside the house and outdoors by foreign manpower as well as exercise and jogging are rare.⁽²²⁾ All these factors together with social acceptance of obese habits and a possible genetic susceptibility also contribute to this relatively high prevalence reported in this study.

Results of the study revealed that the overall level of knowledge about obesity among male secondary school students ranged between fair to poor in most of them particularly their knowledge regarding obesity-related diseases. It is really a great concern that the majority of the students, who should have an important role in educating their colleagues and community were not enough aware about harmful effects of obesity. Given the fact that any effort to

control the situation can only be successful if people are aware, there is a need to take immediate action to raise their awareness.

Similar findings were reported from Tanzania⁽²⁰⁾ as less than half (45.4%) had knowledge about the risk factors for childhood obesity and correctly defined obesity (44.6%). However, a good number of the children (72.1%) were aware that they can be affected by obesity. Badgujar et al⁽²³⁾ conducted a community-based study in Malaysia to determine the intensity of obesity and knowledge, factors of rising obesity, awareness, reasons of ignorance and practice amongst obese Malaysians. Although obese Malaysians are aware about obesity and its complications their practice towards it is not extensive. In the current study, BMI status of students was not significantly associated with their obesity-related knowledge.

Approaching 44% of male teachers in the current work had negative attitude towards obesity. Similarly, in Tanzania,⁽²⁰⁾ majority of schoolchildren had negative attitude towards obesity and various factors leading to or resulting from childhood obesity. Numerous investigators have suggested that providing education programs to address the complex etiology and treatment of obesity, as well as the dietary and psychosocial effects associated with the stigma of obesity, may help to decrease negative attitudes.⁽²⁴⁻²⁶⁾

The important contribution that adolescents have to offer in the prevention of child obesity is a fundamental issue.⁽²⁷⁾ Thus, there is a current need to specifically examine how they may be best trained and prepared for such a preventive role.

In conclusion, results of this study indicates that there are reasons to worry that obesity is becoming a public health problem among male secondary school students in Taif, KSA and probably in many other places in KSA. Students' knowledge of obesity ranged between fair and poor particularly in obesity-related diseases. A considerable proportion of them have negative attitude towards obesity.

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