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OBESITY, BODY IMAGE PERCEPTIONS AND WEIGHT LOSS BEHAVIOR AMONG YOUNG ADULTS***Corresponding Author:**

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ABSTRACT

Background: Obesity is a major health concern. Body image perception is important. The study aimed to assess body image perceptions and weight loss behavior among young adults in University of Tabuk, Tabuk City, Kingdom of Saudi Arabia.

Subjects and Methods: This cross-sectional study was conducted among 400 medical students, Medical College, Saudi Arabia matched for age and sex. A structured questionnaire based on demographic data, body image perceptions, body shape concerns, and weight loss behaviors was used to interview the participants, the height in cm, and weight in Kg were measured to calculate the body mass index. The Statistical Package for Social Sciences (SPSS) was used for data analysis, a P-value of <0.05 was considered significant.

Results: In the present study, 20.8% of medical students were obese, 20.2% were overweight, and 8% were underweight, 55.9% were interested to lose weight, 59.1% were always taking a high calorie meal, 56.4% were practicing regular exercise, and 57.9% thought that obesity is a lifestyle. Regarding of anti-obesity medications is due to lack of knowledge (37.4%), side effects (39.9%), and lack of efficacy (18%), in the current study, 39.2% of medical students have not heard about metabolic (Bariatric) surgery. Males were more likely obese and consumed a high calorie diet, they were more likely to perceive their body image as overweight.

Conclusion: Obesity and overweight are common among medical students in Tabuk, they were more likely to perceive the same, the knowledge regarding obesity were suboptimal.

Keywords: Obesity, Body Image, Weight Loss, Students, Medical, Saudi Arabia.

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INTRODUCTION

Although obesity has been observed early in the history it was not until the 20th century that it became common, the World

Health Organization formally recognized obesity as a global epidemic in 1997 [1,2]. A study published in Lancet 2014 estimated that the number of overweight worldwide

was 2.1 billion in the year 2013 compared to 857 million in 1980. Once considered a problem in high-income countries with the dramatic increase in urban areas, obesity is on the rise worldwide [3,4].

At least 2.8 million adults die yearly from overweight or obesity. Also, 23% of the ischaemic heart disease burden, nearly half of the diabetes burden and 7% to 41% of certain cancer burdens are attributable to overweight and obesity [5].

In the United States of America (USA), despite substantial clinical and policy targeting obesity, there is no evidence in any age group that the prevalence of obesity is declining, furthermore 17.4% of children met the criteria for type 1 obesity [6].

A study published in Saudi Arabia estimated the prevalence in Hail region to be 63.4%, with near three-quarters of females being obese necessitating urgent measures to be undertaken [7].

Body image and weight loss behaviors are among the most important issues of concern among young people. Obesity poses a major public health challenge. Obese adults are at increased risk for many serious health conditions, including high blood pressure, high cholesterol, type 2 diabetes and its complications, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, and respiratory problems, and colon cancers. The most efficient way to the prevention of this common morbid disease is to assess and prevent its risk factors. The current study aimed to assess body image perceptions and weight loss behavior among young adults in University of Tabuk, Tabuk City, Kingdom of Saudi Arabia.

SUBJECTS AND METHODS

Ethical consideration

Ethical approval was obtained from the research ethical committee (IRB) at the University of Tabuk.

Study design and setting:

This cross-sectional study was conducted among medical students, Medical College, University of Tabuk, Saudi Arabia during the period from August 2018 to January 2019.

Inclusion and Exclusion criteria:

The study involves students whose ages is equal to or above 18 who are at risk of developing obesity and they can control it. Adolescence who are below 18 years old as well as those who are unable or unwilling to participate will be excluded.

Sample size:

Sample size was calculated using Kish formula through PS2 & Stat Calc software for sample size calculation.

$$\text{Kish formula: } N = (Z_{1-\alpha})^2 (PQ)/D^2$$

Where

N : is the sample size

$Z_{1-\alpha}$: = Z0.95 = 1.962 (from normal distribution table. This value is standard).

P : = prevalence of the phenomenon under study (maximum= 50% = 0.5)

D : = is the degree precision (3% - 5%) = (0.03 – 0.05)

Q : = 1-p

Accordingly, the sample size will be 384 and with the additional 10% for none response and missing values the total sample size would be: N = 422 participants

Sampling technique:

Probability sampling method of random sampling technique.

Variables and tool for data collection

A structured questionnaire was distributed to the undergraduate students in the Medical College, University of Tabuk. The questionnaire consists of three sections including demographic data, body image perceptions, body shape concerns (BSQ-16) and weight loss behaviors (WLBS). The questionnaire was prepared in English and then translated to Arabic. The questionnaire was validated before its administration.

The following sections were included in the questionnaires:

Body weight:

Body weight was assessed using an analog weighing scale (DEXA) with one decimal place. Subjects were weighed bare-footed in order to obtain accurate readings.

Body weight was measured to the nearest 0.1 cm using the digital TANITA balance HD312 (Tanita Corp, Japan).

Height:

Height was measured to the nearest 0.01 meter (m) using a portable stadiometer (Seca 213).

Body Mass Index (BMI):

Body Mass Index (BMI) was calculated and classified based on formulation outlined by World Health Organization, WHO (1995). The BMI category was divided into four categories, which are underweight, normal, overweight and obese.

Overweight and obese were arranged in a single category and considered as unhealthy excess body weight.

Body Image Perceptions Tools:

The Contour Drawing Rating Scale.

Participant's current/ real/own body:

The male and female versions of the Contour Drawing Rating Scale (Thompson & Gray, 1995) [8].

Modified contour drawing rating scale for males (1 - 5).

Participants were asked to indicate which picture they thought looked like. o Picture range from 1 = very thin to 9 = very overweight.

Participant's desired/ideal body:

The male and female versions of the Contour Drawing Rating Scale(Thompson & Gray, 1995).

Modified contour drawing rating scale for females (1 - 5).

Participants were asked to indicate which picture they would like to look like.

Picture range from 1 = very thin to 9 = very overweight.

Weight Loss/Control Behavior (WLBS):

Tools:

Weight Loss/Control Behavior Scales (WLBS)(WLBS; Smith, Williamson, Womble, Johnson, & Burke, 2000).

The original WLBS consist of 35-item.

It is a brief measure of changes in eating and exercise habits over the course of weight loss treatment.

The modified version of WLBS used in this present study consisted of three subscales measuring concern for dieting and weight, exercise, and avoidance of fattening foods and sweets.

For the scoring, a higher score indicates that the students were prone to engage in weight loss behavior whereas a lower score shows the students were less likely to take action for weight loss.

Data analysis plan

Data were analyzed using SPSS version 16. Data were screened for mistakes and errors using exploratory data analysis and cleaned accordingly; then descriptive analysis, bivariate and multivariate analysis were carried out to assess the prevalence, distribution and determinants of obesity, body image perceptions and weight loss behavior among the respondents.

RESULTS

There were 400 medical students matched for age and sex, their mean age was 21.57 ± 2.09 years, the mean body weight perception was 2.45 ± 1.11 , the majority were single (95.8%), 3.8% were married, while a minority were divorced (0.5%), 15.8% were first class, 24.8% were from the second class, 17.8% were from the third class, the fourth class constituted 16%, the fifth class were 16%, while the sixth class were only 9.8%. In the current study, 7.8% were suffering from a chronic disease, it is

Table 1. Characteristics of the study group

| Character | No % |
|---|-------------|
| Age | 21.57±2.09 |
| Weight perception | 2.45±1.11 |
| Marital status | |
| Single | 383 (95.8%) |
| Married | 15 (3.8%) |
| Divorced | 2 (0.5%) |
| Class | |
| First | 63 (15.8%) |
| Second | 99 (24.8%) |
| Third | 71 (17.8%) |
| Forth | 64 (16.0%) |
| Fifth | 64 (16.0%) |
| Sixth | 39 (9.8%) |
| Chronic disease | 31 (7.8%) |
| Plan | |
| Gain weight | 54 (13.5%) |
| Lose weight | 224 (55.9%) |
| Keep weight constant | 122 (30.4%) |
| High calorie meal | |
| Always | 237 (59.1%) |
| occasionally | 149 (37.3%) |
| Never | 14 (3.5%) |
| A lot of time sitting | |
| Always | 93 (23.2%) |
| occasionally | 289 (74.3%) |
| Never | 9 (2.2%) |
| Buy fat products | |
| Always | 86 (21.4%) |
| occasionally | 19 (4.7%) |
| Never | 295 (73.6%) |
| Physical exercise | |
| Always | 226 (56.4%) |
| occasionally | 42 (10.5%) |
| Never | 132 (32.9%) |
| Regular medications | 33 (8.2%) |
| Use of fat burning products | 105 (26.3%) |
| Obesity is | |
| A lifestyle | 232 (57.9%) |
| A chronic disease | 168 (41.9%) |
| Anti-obesity medications | |
| Lack of efficacy | 72 (18.0%) |
| Lack of knowledge | 150 (37.4%) |
| Side effects | 160 (39.9%) |
| Other | 18 (4.5%) |
| Knowledge regarding bariatric (metabolic surgery) | |
| Yes | 243 (60.6%) |
| No | 157 (39.2%) |

Table 2. Body mass index of the study group

| Character | No % |
|-------------|------------|
| Underweight | 32 (8%) |
| Normal | 204 (51%) |
| Overweight | 83 (20.8%) |
| Obese | 81 (20.2%) |

interesting to note that 55.9% were interested to lose weight, 30.4% desire to keep their weight constant, and 13.5% wasted to gain weight, 59.1% were always taking a high calorie meal, 23.2% were always sitting for a long time, 21.4% always buy fat products, 56.4% were practicing regular exercise, 26.3%, and 8.2% were using fat burning products and chronic medications respectively. The current data showed that 57.9% thought that obesity is a lifestyle and 42.1% thought it is a chronic disease, this implies the poor knowledge regarding obesity, the current sample of medical students thought that the underuse of anti-obesity medications is due to lack of knowledge (37.4%), side effects (39.9%), and lack of efficacy (18%), in the current study, 39.2% of medical students have not heard about metabolic (Bariatric) surgery. Table 1.

In the present study, 20.8% of medical students were obese, 20.2% were overweight, and 8% were underweight. Table 2.

Table 3. Depicted a comparison between males and females in which no significant statistical difference was evident regarding age (21.49 ± 2.09 vs. 21.65 ± 2.09 , $Pvalue=0.460$, and $95\% CI=-0.56-0.25$) and weight loss control behavior (4.19 ± 1.01 vs. 4.10 ± 1.04 , $P-value=0.393$, and $95\% CI= -0.11-0.29$), a high significant statistical differences were found regarding the BMI (27.10 ± 7.34 vs. 23.63 ± 4.68 , $Pvalue=0.000$, and $95\% CI= 2.25-4.68$, and body image perception (2.74 ± 1.15 vs. 2.17 ± 0.99 , $Pvalue=0.000$, and $95\% CI=0.36-0.78$).

Table 3. A comparison between males and females regarding age, body mass index, body weight perception, and weight loss control behavior

| Character | Males | Females | P-value | 95% CI |
|------------------------------|------------|------------|---------|------------|
| Age | 21.49±2.09 | 21.65±2.09 | 0.460 | -056-0.25 |
| BMI | 27.10±7.34 | 23.63±4.68 | <0.001 | 2.25-4.68 |
| Body image perception | 2.74±1.15 | 2.17±0.99 | <0.001 | 0.36-078 |
| Weight loss control behavior | 4.19±1.01 | 4.10±1.04 | 0.393 | -0.11-0.29 |

In the present survey, males were more likely to consume high calories compared to females with significant statistical difference(59.1% vs. 40.9%, P-value 0.019), no significant statistical difference was evident regarding physical inactivity (47.6% vs. 52.4%, P-value=0.945), other comparison regarding weight control behavior were shown in table 4.

DISCUSSION

In the present study, obesity was reported in 20.2% and overweight in 20.8% and were higher than a study conducted in Malaysia and found obesity in 14.8% and overweight in 5.2%, underweight were reported in 8% of the current sample which is lower than the Malaysian study [9], the obesity rate observed in the current sample is higher than a study conducted in Sudan [10] (6.5%), however the prevalence of overweight is in line with the current findings, the present data calls for an urgent intervention to increase the awareness regarding the negative health consequences of obesity and overweight. The current findings were similar to a study published in Alqasim, Saudi Arabia [11], the high prevalence of physical inactivity was in similarity to a study conducted in China [12]. Unhealthy eating behavior including consumption of a high calorie diet and fat are established risk factors for obesity and underweight, the current findings of high calorie intake and buying fat products supported the previous findings in Riyadh, Saudi Arabia [13]. In the current study, nearly two thirds of participants would like

to lose weight, in fact nearly one thirds used a fat burning products, this positive attitude needs to be enforced with intensive educational programs and crash course to improve obesity prevention, including obesity earlier in the curriculum could be of great help. Evidence is emerging for influential factors of obesity beyond the personal choice [14], obesity is a chronic disease and should be viewed similar to other diseases like diabetes mellitus and high blood pressure [15,16]. The misconception observed among the current sample viewing obesity as a lifestyle is alarming and should be addressed among this important sector (they are the doctors of the near future). Obesity is an undertreated and under-diagnosed disease [17], in the current study, more than one third of medical students did not hear of anti-obesity drugs, a considerable percentage thought that they are not effective, and more than one thirds thought that there are considerable side effects, more extensive education regarding obesity and its effective FDA approved medications is needed. It is interesting to note that, two out of five of medical student did not hear about bariatric surgery which is not acceptable and should urgently be addressed. In the present study, males were more likely perceived their weight as overweight than females, this mirror their actual body weight and may be more influential in the engagement of weight control programs, previous studies [18] showed that women are more likely to perceive themselves as being overweight.

However, ethnicity and location could be influential. The present study showed that no differences in weight control behavior among males and females in line with Azzouzi et al. [19], in the present study males were more likely to consume a high calorie diet which is mirrored by a higher body mass index compared to females counterparts in line with Yahiya et al. [20] who conducted a study in Lebanon and observed similar findings.

The results of the current study should be viewed in the light of following limitations. The small size of the study sample, the fact that the study was conducted at a single College, so generalization to the whole Kingdom of Saudi Arabia cannot be insured, and the reliance on a self-administered questionnaire which is more prone to subjectivity.

CONCLUSION

Obesity and overweight were common among medical students in Tabuk City, more than half of students perceived themselves as overweight and would like to lose weight. However, they were consuming high calorie diet, less likely to engage in exercise, and stay long time sitting. The misconception regarding obesity as a lifestyle. A suboptimal knowledge regarding obesity medications and metabolic surgery. Males were more likely obese and overweight and more likely to consume a high calorie diet.

RECOMMENDATIONS FOR FURTHER RESEARCH

Further larger multi-center studies assessing the magnitude of this morbid disease and investigating its risk factors and complications are recommended.

CONFLICTS OF INTEREST

None to declare.

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