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PREVALENCE OF OBESITY AND AWARENESS OF BARIATRIC SURGERY AMONG THE GENERAL POPULATION IN TAIF CITY

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Abstract:

Background: According to previous studies conducted in Kingdom of Saudi Arabia (KSA), the prevalence of obesity was more than 35%. During the last few decades, the importance of bariatric surgery for weight reduction had continuously been increasing. Compared to non-surgical interventions, bariatric surgery was associated with greater improvement in reducing obesity as well as associated morbidity and mortality.

Objective: The current study aimed to estimate the prevalence of overweight and obesity among the general population in Taif City in addition to assessing the level of awareness and knowledge about bariatric surgery among the same population.

Settings and Design: This was a cross-sectional observational study conducted in Taif city, Saudi Arabia.

Methods and Material: Data were collected using a designed questionnaire which was published online among the general population of Taif City. Data were collected during the period from February 2018 to March 2018. The questionnaire was consisted of 4 parts including the demographics data, anthropometric measurements, knowledge about obesity and its complications and knowledge about bariatric surgery and its complications.

Results: A total of 664 participants took part in this study. The prevalence of overweight and obesity among the studies population were found to be 24% and 33.6% respectively with a mean± SD BMI of 28.3± 15.8 kg/m. This study revealed a good level of knowledge about obesity but low level of awareness about bariatric surgery among participants.

Conclusions: Our results suggested that we still need more health education programs for the general population to raise the level of awareness about obesity and bariatric surgery and to minimize the prevalence of obesity and its complications among the general population in Taif City.

Key-words: *Obesity, Body mass index, Bariatric surgery, Awareness, Taif city*

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INTRODUCTION:

Overweight and obesity are now considered as a global epidemic. [1] In Saudi Arabia, one in each three adults is obese and at least one in every ten adults suffers from morbid obesity.[2] Obesity is defined as the excessive accumulation of body fat due to an imbalance between the calories intake and output.[3]

Overweight and obesity are not synonymous conditions. An adults with a body mass index (BMI) from 25 to 29.9 kg/m^2 is overweight while an adult with a BMI above 30 kg/m^2 is obese. [1]

The common complications of obesity include type 2 diabetes mellitus, hypertension, certain types of cancers, cardiovascular diseases and dyslipidaemia. [1] According to previous studies conducted in Kingdom of Saudi Arabia (KSA) from 1995 to 2000, the prevalence of obesity in Saudi Arabia is 35.5%. [4] Obesity can be managed by adjusting lifestyle, doing exercise, eating healthy food and using medication therapy. [5]

In the last two decades, the importance of bariatric surgery in weight reduction and controlling obesity-associated morbidity and mortality has been increasing. [5] The majority of morbidly obese patients with hyperlipidemia, diabetes, obstructive sleep apnea and hypertension experienced improvement or complete resolution after undergoing bariatric surgery. [6] In comparison with non-surgical interventions, bariatric Surgery leads to greater improvement in the reduction of body weight and controlling obesity-associated comorbidities. [7]

Approximately 15,000 weight loss surgeries are performed every year in Saudi Arabia. [8]

When nonsurgical treatments of weight loss fails, bariatric surgery is indicated for patients with severe obesity (BMI > 40 kg/m2) or those with BMI more than 35 kg/m2 but with significant comorbidities. [9] Contraindications for weight loss surgery include chronic obstructive airways disease of a significant degree, poor myocardial reserve, significant psychological disorders or non-compliance with medical treatment, severe hiatus hernia and respiratory dysfunction. [10]

There are three methods for decreasing the weight by bariatric surgery. The first method is a gastric restriction which is achieved by creating a small gastric pouch. The gastric pouch leads to early satiety and subsequent reduction in the food intake. The second method is called malabsorption which reduces the body weight by decreasing the absorption in the gut. The third method is a combination of the first and second methods. The banding procedures and gastric partitioning are examples of purely restrictive surgeries while the intestinal bypass is considered as an example of malabsorption and biliopancreatic diversion with duodenal switch and gastric bypass surgery is considered as restrictive and malabsorption surgery. [11]

In spite of being associated with a significant weight reduction, there is an increasing concern that bariatric surgery has negative effects on the health of the individual. [12] Short term complications of bariatric surgery include bleeding, surgical leak, wound infection, pulmonary embolism after deep venous thrombosis while the late complications include marginal ulcers, stomal stenosis, internal and incisional hernias, nutritional deficiencies, cholelithiasis, short bowel syndrome and dumping syndrome. [12] Dumping syndrome occurs due to hormonal and mechanical changes that commonly occur after any gastric drainage procedure. The symptoms of dumping syndrome include palpitations, dizziness, sweating nausea, vomiting, diarrhea and abdominal pain. [13] The deficiency of vitamins and nutrients and accordingly the need for nutritional supplements are more common after the mal-absorptive procedures such as biliopancreatic diversion with or without duodenal switch (BPD and BPD-DS) and Roux-en-Y gastric bypass (RYGBP). [14] Iron deficiency anemia and vitamin D deficiency are major metabolic consequences of weight loss surgeries. [15] However, the overall risk of adverse outcome and death after bariatric surgery is low. [16] Still, there are no enough studies to assess the level of awareness about bariatric surgery among the general population in Taif city. In this study, we aimed to estimate the prevalence of overweight and obesity and to assess the awareness and knowledge about obesity and bariatric surgery among the general population in Taif city.

SUBJECTS AND METHODS:

After the approval of the ethical committee of Taif University, this cross-sectional study was conducted among the general population in Taif City during the period from 29-March 2018 to 27-April 2018. Informed consent was taken from all participants before participation in the study. The sample size was calculated by using Raosoft-Inc, Raosoft sample size calculator. [17] Assuming a response rate of 50% and 99% confidence interval, the sample size was calculated to be 664 participants. Subjects aged less

than 15 years old and those with incomplete data were excluded from the study.

A self-administered questionnaire was designed guided by a previous study by Alqurashi et al. [15] The questionnaire included 4 parts. The first part was about socio-demographic data such as age, gender, education, employment status and income. The second part was about anthropometric measures. The third and fourth parts included questions to assess the awareness of participants about obesity and bariatric surgery and their complications. The collected data were validated and statistically analyzed using the Statistical Package for the Social Science (SPSS) for windows, version 22.0.

RESULTS:

Socio-Demographic data:

A total of 663 participants from Taif City were included in the statistical analysis of which 64.6% were males. Most of the patients (71.3%) were aged 15 to 30 years, 20.2% were 31 to 40 years old and 8.4% were above 40 years of age. Demographic characteristics, education, employment status and monthly income of the participants are presented in table 1.

Table 1: Socio-demographic data (N= 663)

Parameters	Subgroups	Count	Percentage
Gender	Male	428	64.6
	Female	235	35.4
Age	15- 30 year	473	71.3
	31- to 40 years	134	20.2
	Above40 years	56	8.4
Education	Illiterate	4	0.6
	Primary - Secondary	121	18.3
	Collage degree	490	73.9
	Post-graduate	48	7.2
Employment status	Employed	241	36.3
	Unemployed	422	63.7
Income	Low : below 10’000 SR	486	73.3
	Medium: 10’000-19’000 SR	142	21.4
	High: above 20’000 SR	35	5.3

Prevalence of obesity and overweight:

The mean± SD body weight was 74± 22.7 kg and the mean± SD height was 164.8± 15.5 cm. Body Mass Index (BMI) was calculated for all participants using the formula (BMI= weight in kg/height in m²) where the mean± SD value was found to be 28.3± 15.8 kg/m^2.Data showed that most of the patients (41.6%) had normal body weight, 24% were overweight, 12.5% were obese (Class I), 7.8% were underweight, 7.1% had class III obesity and 6.9% of the participants had class II obesity. More details are shown in figure 1 and table 2.

Table 2: Body Mass Index (BMI) categories (N=663)

BMI (kg/m^2)	Category	Frequency	Percent
< 18.50	Underweight	52	7.8
18.50- 24.99	Normal	276	41.6
25- 29.99	Overweight	159	24
30-34.99	Obese Class I	83	12.5
35-39.99	Obese Class II	46	6.9
>40	Obese Class III	47	7.1
	Total	663	100.0

Awareness about obesity and bariatric surgery:
Most of the participants (83.4%) thought that obesity was a disease, 90.8% thought that obesity was an increase in body fat, 93.2% thought that lack of physical activity and too much sleep were risk factors for obesity, 74.1% thought that hereditary factors were contributed to obesity, 81.7% thought that bad habits could result in obesity, 92.8% thought that physical activities decrease the risk of obesity, 71.2% thought that drinking water could decrease body weight and 91% of the participants thought that obese subjects were vulnerable to diabetes and hypertension. When the participants were asked about the complications of obesity from their point of view, diabetes mellitus type 2 was the most frequently reported complication (77.2%) followed by knee and back pain (74.66%), cardiac diseases (69.83%) elevated cholesterol level (68.33%), hypertension (60.94%), osteoporosis (22.32%) and gallstones as reported by 18.40% of the total sample. More details are provided in table 3.

Table 3: Perceptions about obesity (N= 663)

Perception about obesity:	No	Yes	I Don't Know
Obesity is a disease	69 (10.4%)	553 (83.4%)	41(6.2%)
Obesity is an increase in body fat	39 (5.9%)	602 (90.8%)	22(3.3%)
Lack of physical activity and too much sleep are risk factors for obesity	27 (4.1%)	618 (93.2%)	18(2.7%)
Hereditary factors contribute to obesity	79 (11.9%)	491 (74.1%)	93(14%)
Bad life style habits could result in obesity	81 (12.2%)	542 (81.7%)	40(6%)
Physical activities decrease the risk of obesity	30 (4.5%)	615 (92.8%)	18(2.7%)
Drinking water could decrease body weight	88 (13.3%)	472 (71.2%)	103(15.5%)
Obese subjects are vulnerable to diabetes and hypertension	11 (1.7%)	603 (91%)	49(7.4%)

Regarding the knowledge about bariatric surgery, most of the subjects (86.4%) did not believe that surgery is the only way for getting rid of obesity, 60.9% believed that bariatric surgery can decrease the body weight, 70.7% had inadequate knowledge about the complications of weight loss surgery, 86.9% of the participants didn't consider surgery as the first choice for reduction of body weight without diet or exercise, 36.8% did not think that bariatric surgery decreases the mortality rate and 53.1% believed that weight loss surgery could result in death. More than three quarters of the subjects (75.1%) believed that surgery will cause a drastic change in their eating habits, while 73.5% believed that surgery will cause a drastic change in their lifestyle. More details are shown in table 4.

Table 4: Knowledge about bariatric surgery (N= 663)

Knowledge about Bariatric surgery:	No	Yes	I Don't Know
Is surgery the only way for getting rid of obesity?	573 (86.4%)	52 (7.8%)	38 (5.7%)
Does surgery contribute to reduction of body weight?	157 (23.7%)	404 (60.9%)	102 (15.4%)
No complications could result from weight loss surgeries?	45 (6.8%)	469 (70.7%)	149 (22.5%)
Do you consider surgery is the first choice for reduction of body weight without diet or exercise?	576 (86.9%)	57 (8.6%)	30 (4.5%)
Does weight loss surgery decrease the mortality rates?	244 (36.8%)	205 (30.9%)	214 (32.3%)
Could weight loss surgery result in death?	84 (12.7%)	352 (53.1%)	227 (34.2%)
Do you believe that surgery will cause a drastic change in your lifestyle?	64 (9.7%)	487 (73.5%)	112 (16.9%)
Do you believe that surgery will cause a drastic change in your eating habits?	74 (11.2%)	498 (75.1%)	91 (13.7%)

Based on participant's opinions, nutritional deficiencies were the most frequently reported complications of bariatric surgery (66.97%) followed by behavioral/psychosocial changes (53.39%), hemorrhage (47.21%), GIT diseases (38.16%) and ulcers (37.86%). Other complications were reported with fewer frequencies as shown in table 5.

Table 5 : Perceptions about the complications of bariatric surgery (N= 663)

Do you believe these are complications of bariatric surgery?	N	%	Rank
Nutritional Deficiencies	444	66.97	1
Dumping & Vomiting	233	35.14	6
Behavioral/Psychosocial Changes	354	53.39	2
Hemorrhage	313	47.21	3
GIT Diseases	253	38.16	4
Ulcers	251	37.86	5
Hernias	169	25.49	8
Infection	114	17.19	11
Disturbed Liver Functions	164	24.74	9
Renal Diseases	89	13.42	12
DM and Insulin Resistance	152	22.93	10
Blood Clotting	195	29.41	7

Determinants of obesity and bariatric surgery awareness:

By examining the potential effect of age, gender, education status and BMI on the awareness level about obesity and bariatric surgery, it was found that female participants had a significantly higher level of awareness compared to males (p=0.01). In addition, the BMI had a significant effect on the overall awareness of the participants where a higher level of awareness was found among overweight and obese participants compared to the normal and underweight groups (p=0.023). Moreover, the higher degree of education was associated with a higher level of awareness (p<0.001). On the other hand, participant's age showed no significant effect on the awareness level about obesity and bariatric surgery (p=0.138).

DISCUSSION:

Our results demonstrated that the prevalence of overweight and obese patients were relatively high (24% and 33.6%) respectively. These results go beyond the results of previous studies which indicated that the problem of overweight and obesity is continuously growing in Saudi Arabia.[4,5,19] However, a higher prevalence was reported in a previous study conducted in Albaha city, Saudi Arabia where the prevalence of pre-obese and obese were 26.6% and 42.6% respectively.[8] This variation may be due to the socio-cultural and geographical variations. In addition, the prevalence revealed in our study was lower than that reported in a previous study conducted in Hail City where the overall prevalence of obesity was 63.6%.[21] This may be because the majority of our participants were males who in general have a lower body weight compared to females.[22] Overall, our results demonstrated a good knowledge about obesity among participants, but low level of awareness about bariatric surgery. We examined the potential effect of age, gender, education status and BMI on the awareness about obesity and bariatric surgery. Our data showed that female participants were significantly more aware about obesity and bariatric surgery compared to males (p=0.01). In addition, overweight and obese participants showed a higher awareness level (p=0.023). Moreover, participants with higher education levels were found to have a higher level of awareness about obesity and bariatric surgery (p<0.001). However, age did not have a significant effect on the awareness level (p=0.138).There are some limitations in this current study including the online distribution of the questionnaire and accordingly, the weight and height of participants were self reported. In addition, participants who were younger than 15 years old were excluded from the study and accordingly, the results of this study cannot be generalized to the whole population in Taif City.

Our results suggested that we still need more health education programs for the general population in order to raise the level of awareness about obesity and bariatric surgery and accordingly minimize the prevalence of obesity and associated morbidity and mortality among the general population in Taif City.

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