

Knowledge, attitude, and practice of bariatric surgery among adult Saudi community, Saudi Arabia, 2019

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ABSTRACT

The prevalence of overweight and obesity is higher in developed countries than in developing countries of all ages (data from 2013). This study is aimed at assessing the knowledge and attitudes of people in Saudi Arabia toward bariatric surgery. To do this, the specific objectives sought to determine the satisfaction of people who underwent bariatric surgery and to determine the importance of bariatric surgery among the community. **Methods:** The study is a cross-sectional, community-based study conducted among the Saudi adult population. The final sample size was 891 respondents from different regions of Saudi Arabia. Data collection was through online questionnaires that consisted of 26 questions to assess the perceived knowledge and attitudes toward obesity and bariatric surgery adopted from Abouhamda (2016). **Results:** More than 70% of the study participants were aged between 18 and 25 years. There were more males than there were females 76.0% versus 24.0%, while most of the respondents were living single. The proportion of respondents across listed regions of Saudi Arabia significantly varied at a 5% level ($P = 0.000$). Sixty percent of the study respondents were within the normal weight range (BMI 18.5–25), 9% were marked as obese (BMI >30). Age group was not significantly associated with knowledge of quantization and perceived the knowledge that quantization can cause death ($P > 0.05$ in both cases). **Conclusion:** The knowledge about obesity in Saudi Arabia is generally good and most Saudis would rather take the approach of proper diet as opposed to surgery, with the bigger percentage being in the normal range (BMI 18.5–25).

Keywords: Bariatric surgery, general surgery, Saudi Arabia

Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation that represents a risk to health. Obesity is one of the leading causes of preventable death. Body mass index (BMI), which is weight in kilograms divided by height in meters squared, is used to identify obesity. For adults, a BMI of 25.0 to 29.9 kg/m² is defined as overweight and a BMI of 30 kg/m² or higher is defined as obese.^[1] BMI is not used for children and adolescents from

ages 2 to 18 years; instead, it is recommended that a percentile scale based on the child's sex and age be used. In this population, overweight is defined as a BMI in the 85th to 94th percentile, and obesity is a BMI at or above the 95th percentile.^[1]

Worldwide, the prevalence rate for being overweight or obese between 1980 and 2013 increased 27.5% for adults and 47.1% for children, for a total of 2.1 billion individuals considered overweight or obese.^[2] These increases were seen in both developed and developing countries. However, the prevalence of overweight and obesity is higher in developed countries than in developing countries of all ages (data from 2013). In developed countries, more men were considered overweight or obese than women were;

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Table 1: Trends in gender-specific prevalence of obesity

Year	Men	Women	Overall
1992	12	20.7	16.4
1997	26.6	43.1	34.9
2002	29.3	46.3	37.8
2007	32	51.1	41.6
2012	35.1	58.7	46.9
2017	38.2	67.5	52.9
2022	41.4	77.6	59.5

the opposite was seen in developing countries.^[1] Table 1, shows the prevalence of obesity in Obesity prevalence (%) in KSA. Table 1 shows existing trends and future projections of gender-specific and overall obesity prevalence in KSA.^[3]

The national sample size in the Saudi reference was 19,371 healthy children and adolescents from 5 to 18 years of age, 50.8% of whom were boys. The prevalence of overweight, obesity and severe obesity in all age groups was 23.1%, 9.3%, and 2%, respectively, with boys having a significantly higher prevalence of obesity and severe obesity than girls.^[4]

The prevalence of obesity among American adults increased to 20.9% in 2001 from 19.8% in 2000, an increase of 5.6%. Since 1991 the percentage of those who were obese increased by 74% (1991 prevalence, 12%). That prevalence rate represents an estimated 21.4 million obese men and 22.9 million obese women, for 44.3 million obese in US adults. Since 1991, the percentage of overweight adults increased from 45% to 58%. Of those overweight in 2001, 65.9% were men and 49.9% were women.^[5]

Obesity can cause day-to-day health problems such as:

- i. Breathlessness
- ii. Increased sweating
- iii. Snoring
- iv. Inability to cope with sudden physical activity
- v. Feeling very tired every day
- vi. Back and joint pains
- vii. Low confidence and self-esteem
- viii. Feeling isolated

Overweight will lead to many complications, including type 2 diabetes mellitus, hypertension, coronary artery disease and strokes, dyslipidemia, sleep apnea, metabolic syndrome, osteoarthritis, fatty liver disease and pregnancy problems, such as gestational pregnancy and increased risk for cesarean delivery (C-section).^[2] Usually, there are three major phases to achieve a successful weight-loss program as follows:

- a. Preinclusion screening phase
- b. Weight-loss phase
- c. Maintenance phase

The treatment of obesity is either by a pharmacologic therapy. They are few and their effectiveness is limited to palliation rather than cure. They are used when it is justified to reduce the side

effects that they may cause or a surgical one. In patients with morbid obesity associated with comorbidities, bariatric surgery is the only available therapeutic modality associated with clinically significant and relatively sustained weight loss.^[6]

Study objectives

This study is aimed at assessing the knowledge and attitudes of people in Saudi Arabia toward bariatric surgery. To do this the following are the specific study objectives.

- To determine the satisfaction of people who underwent bariatric surgery
- To determine the importance of bariatric surgery among community.

Methods

The study is a cross-sectional, community-based study conducted among the Saudi adult population. The sample was desired at a minimum of 384 participants from different regions in Saudi Arabia but a final sample of 891 was collected. Data collection was conducted via randomly distributed electronic online Arabic questionnaires translated by the researchers including 26 questions to assess the knowledge of obesity and bariatric surgery in our community. Inclusion criteria were all adults aged 18 or older both male and female. The questionnaire was formulated and designed based on the previous study done by Abouhamda *et al.* (2016)^[7] about bariatric surgery. The online questionnaire was segmented into three parts; the first part aimed at collecting demographic data consisting of age, gender, nationality, residence area, marital status, educational level, employment status and income. The second part of the questionnaire aimed at understanding the knowledge and awareness of obesity among the study population. The final section aimed at collecting information about beliefs, consequences and efficacy of bariatric surgery. The questionnaire was a closed type questionnaire. For respondents who said they “don’t know” among some questions in the questionnaire were regarded as incorrect responses. Knowledge score for obesity questions was categorized into three levels good knowledge for those who correctly answered more than seven questions, less than four correctly answered to be with poor knowledge and average knowledge from (4–6). This was also done for bariatric knowledge but five correctly answered questions defined good knowledge, less than three to be with poor knowledge and average knowledge from (3–5).

The sample size was arrived at using the margin of error approach as seen in the equation below;

$$n = \frac{Z^2 Pq}{e^2} = \frac{(1.96^2)(0.5)(0.5)}{(0.05^2)} = 384.16.$$

The approach of analysis was descriptive where frequencies and corresponding percentages were given for each variable and the levels in each variable. *P* values that compared proportions in the levels of each variable were given as in the first table that presented demographic information. Tests for associations were carried out using Pearson Chi-square tests for associations. The

selected level of significance was 5% with analysis being carried out using Statistical Package for Social Sciences (SPSS) version 25. Data were stored in Microsoft Excel sheets.

Analysis and results

More than seventy percent of the study participants were aged between 18 years and 25 years, with only 12 of the respondents being above 50 years of age. Income levels were described as good, very good and excellent as seen in the below Figure 1.

The proportion of respondents from the Eastern region, the middle region, the northern region southern and the western region of Saudi Arabia significantly varied at 5% level $P = 0.000$. See Table 2.

Knowledge of whether obesity is a disease was significantly associated with education level, with respondents with higher education (undergraduate and postgraduate) correctly identifying that obesity is a disease. It was also the case when respondents were asked whether obesity affects children where all postgraduate respondents answered correctly, 94.8% of respondents correctly answered. Knowledge of whether obesity affects children was also significantly associated with education level. See Table 3.

60% of the study respondents were within the normal weight range (BMI 18.5–25), 9% were marked as obese (BMI > 30). See Figure 2 below for the pie chart of BMI.

Education level and knowledge of obesity being genetically linked, and knowledge that treatment of obesity helps cure other diseases were significantly associated where individuals with higher knowledge correctly answered most of the questions.

Income level was not associated with knowledge of whether obesity was genetic nor knowledge that curing obesity could help cure other diseases. See Table 4.

Knowledge of quantization was not significantly associated with the level of education but was significantly associated with the knowledge that quantization can lead to death. Gender and

knowledge that quantization can lead to death are not significantly associated with $P = 0.215$, while age group was not significantly associated with knowledge of quantization and knowledge that quantization can cause death. See Table 5.

The overall obesity knowledge and awareness are summarized in Table 6. About half of the respondents correctly thought that

Table 2: Demographic information

Variable	Freq. (%)	P
Age Group (Years)		0.000
18-25	631 (70.8)	
26-34	150 (16.8)	
35-44	74 (8.3)	
45-50	24 (2.7)	
50>	12 (1.3)	
Gender		0.000
Female	677 (76.0)	
Male	214 (24.0)	
Region		0.000
Eastern	105 (11.8)	
Middle	534 (59.9)	
Northern	47 (5.3)	
Southern	58 (6.5)	
Western	147 (16.5)	
Social Status		0.000
Divorced	17 (1.9)	
Married	213 (23.9)	
Single	659 (74.0)	
Widowed	2 (.2)	
Education Level		0.000
Middle	36 (4)	
Postgraduate	37 (4.2)	
Primary	5 (.6)	
Secondary	200 (22.4)	
Undergraduate	613 (68.8)	
Employee		0.000
No	660 (74.1)	
Yes	213 (23.9)	
Income level		0.000
Excellent	174 (19.5)	
Good	341 (38.3)	
Very good	376 (42.2)	

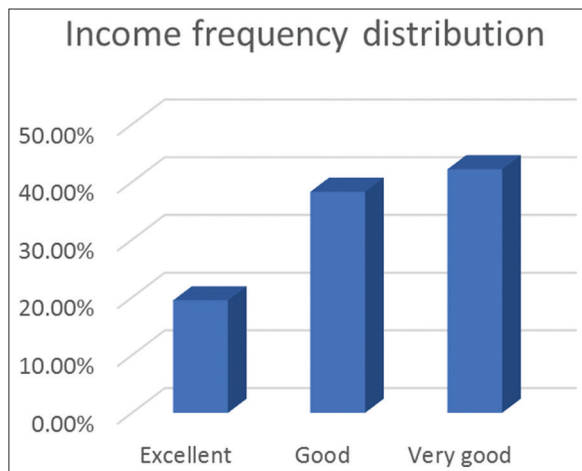


Figure 1: Bar chart of the income distribution

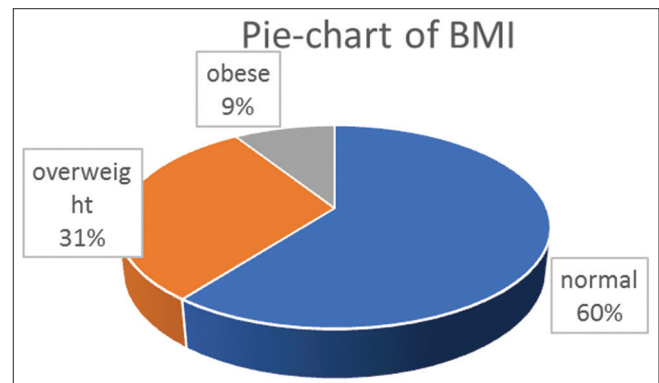


Figure 2: Bar chart of BMI

Table 3: Associations between demographic variables and obesity knowledge

Variables	Obesity is a disease	Obesity affects children	P
Education Level			0.000 ^A
Middle	58.3	72.2	0.000 ^B
Postgraduate	86.5	100	
Primary	80	91.9	
Secondary	84.5	90.5	
Undergraduate	90.4	94.8	
Income Level			0.684 ^A
Excellent	86.2	92.5	0.784 ^B
Good	88.3	92.4	
Very good	87.5	93.4	
Gender			0.000 ^A
Female	88.8	95.0	0.000 ^B
Male	83.6	86.0	
Age Group			0.032 ^A
18-25	87.2	92.6	0.255 ^B
26-34	92	93.3	
35-44	82.4	94.6	
45-50	95.8	95.8	
50>	66.7	83.3	

^AObesity is a disease. ^BObesity affects children

Table 4: Knowledge about obesity associations with demographics^C

Variables	Obesity is Genetic	Treatment of Obesity Cures Other Diseases	P
Education Level			0.000 ^A
Middle	33.3	66.7	0.000 ^B
Postgraduate	54.1	81.1	
Primary	40.0	100	
Secondary	37.5	73.5	
Undergraduate	56.1	83.0	
Income Level			0.031 ^A
Excellent	50.0	74.1	0.101 ^B
Good	45.2	83.3	
Very good	56.4	80.3	
Gender			0.000 ^A
Female	54.7	81.5	0.086 ^B
Male	38.8	76.2	
Age Group			0.373 ^A
18-25	50.2	78.4	0.020 ^B
26-34	54.7	86.0	
35-44	48.6	78.4	
45-50	54.2	87.5	
50>	41.7	100	

^AObesity affects children. ^BTreatment of obesity cures other diseases. ^CValues in the table are the percentage of correctly answered questions

obesity is genetic, while 87.7% of the respondents thought that obesity can be cured by a healthy diet as compared with 43.8% who thought surgical intervention is the best way to cure obesity.

Discussion

The study while being a cross-sectional study that included respondents selected randomly, inferences made from

the research lack internal validity because of the lack of randomness and lack of treatment effects. Thus, the study could be considered descriptive in nature. Obesity is a factor that affects individuals in all age groups but because of the consent and ethics in research, only adults were included in the present study. The general description of the sample is that most of the respondents are within the normal BMI range while about 40% of the respondents being either overweight or obese. This is in comparison to the studies by Ayman *et al.* (2016); Alqami (2016); Alghamdi *et al.* (2018) where obesity among adults was found to be less than 30% of the respective populations.^[3,7,8]

A study by Bucher *et al.* (2018) indicated that one of the effective strategies against the problems of being overweight is knowledge and campaigns that show the harmful effects of obesity and excessive weight gain Weaver *et al.* 2019.^[9,10] The perspective of knowledge is anchored on the prevention of obesity rather than trying to find ways to reduce obesity later. This could explain the association in some aspects of obesity with formal knowledge and to some degree age group. Individuals in the youth age groups of below 35 years appear to be more knowledgeable and with higher formal education which was found to be statistically associated with the knowledge or prevalence of obesity. However, our study found no association in the level of income and knowledge of obesity, its causes and benefits of being within the normal weight range $P > 0.05$ in seven out of eight investigated cases. This observation is consistent with existing literature where people with higher incomes tend to consume sweeter yet high calorie foods as suggested by Aggarwal and Drewnowski (2019).^[11] The income levels represented in the present study indicated were all at least good.

In terms of quantization, the phenomenon appears to be a new one given that respondents with higher education appeared to have knowledge of its role in curing obesity. However, there was no significant association between education level and knowledge of quantization. Age group was not associated with knowledge of quantization or knowledge that quantization actually can cause death. As in the case of knowledge about obesity, income level was not significantly associated either. Overall, knowledge about quantization appears scarce within Saudi Arabia from our study findings. Nonetheless, this could be explained by the fact that 87.7% of respondents think that the best approach against obesity is via nutrition as opposed to 51.7% who think surgery is the better option (Macmillan and Olson 2019).^[12]

Based on the previous study was done approximately 22.7% of the participants were unaware of the bariatric surgery procedure and 18.9% considered it to be a cosmetic procedure. Moreover, 50% were unaware of the correct indications for bariatric surgery and 41.2% were unwilling to seek a bariatric surgeon's help if diagnosed with morbid obesity. We can conclude that the public perception of obesity and bariatric surgery in Saudi Arabia need more concern. Effective interagency coordination between

Table 5: Knowledge of quantization across demographic variables^C

Variables	Knowledge of Quantization	Quantization can cause death	P
Education Level			0.077 ^A
Middle	67.9	33.3	0.013 ^B
Postgraduate	91.9	62.2	
Primary	51.2	40.0	
Secondary	76.4	52.0	
Undergraduate	87.3	57.6	
Income Level			0.133 ^A
Excellent	94.8	64.9	0.337 ^B
Good	97.4	50.7	
Very good	94.4	55.3	
Gender			0.000 ^A
Female	54.7	57.0	0.215 ^B
Male	38.8	50.0	
Age Group (Years)			0.782 ^A
18-25	95.4	55.3	0.328 ^B
26-34	96.7	58.0	
35-44	94.6	75.0	
45-50	95.8	58.3	
50>	100	55.4	

^AKnowledge of quantization. ^BQuantization can cause death. ^CValues in the table are the percentages of correctly answered questions

Table 6: Overall knowledge and awareness

Variable	Correct (%)
Obesity is a disease	87.5
Obesity is the deposition of excessive body fat	90.5
Obesity is genetic	50.8
Obesity occurs in children too	92.8
Obesity is a lifestyle disease	93.8
Curing obesity reduces risks to other diseases	80.2
Surgical intervention is always the best	51.7
Healthy diet s best way to cure obesity	87.7
Exercise regularly is the best way to cure obesity	43.8

surgeons, health educators and other health care providers is required to improve public awareness. In addition to the educational programs about obesity and Bariatric surgeries that can be done in the primary health care centers are essential for controlling obesity and its complications.^[13,14,15]

In conclusion, knowledge about obesity in Saudi Arabia is generally good but does not seem to vary with income level. Most Saudis would rather take the approach of proper diet as opposed to surgery, with the bigger percentage being in the normal BMI bracket.

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Conflicts of interest

There are no conflicts of interest.

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