

## Awareness towards obesity and bariatric surgery in Tabuk region

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### ABSTRACT

**Background:** Bariatric surgery embodies as an effective mean for treating morbid obesity. Thus, the current study aimed to evaluate the awareness level towards obesity and Bariatric Surgery in Tabuk Region. **Methodology:** This descriptive cross-sectional study was conducted in the Tabuk region, Kingdom of Saudi Arabia, during 2020-2021. Subjects of this study were adults aged more than 18 years for both genders living in the Tabuk region, regardless of nationality, excluding adults below 18 years, medical staff, mentally disabled, younger than 18 years, and those living outside the Tabuk region. **Results:** On asking the participants, "Did you experience obesity," about 47% responded "Yes." On asking the participants "Did you experience bariatric surgery" around 86% replied "Yes." On asking the participants, "have you a family history of obesity" over 58% retorted, "Yes." On asking the participants, "Did you consider your current weight is harmful to your health" around 131(48%) answered "Yes." On asking the participants, "Are you curing about weight/physical appearance?", approximately 38% replied "Yes." **Conclusion:** Obesity/overweight health knowledge is poor among obese and those who have experienced bariatric surgeries in Saudi Arabia, which imposes further efforts at the community level. Knowledge of bariatric surgery-associated factors, including health benefits and complications, is low in the Tabuk area, necessitating educational interventions.

**Keywords:** Obesity, bariatric surgery, Tabuk, Saudi Arabia, awareness

## 1. INTRODUCTION

Recent years witnessed increased prevalence rates of obesity/overweight in Saudi Arabia, particularly among the relatively younger population. Studies in this context attributed the burden of obesity/overweight to several factors comprising food intake habits, physical inactivity, and recent rapid changing lifestyle pattern (Ahmed et al., 2020; Benammar, et al., 2020; Alreshidi et al., 2020a). Several obesity-related diseases have been reported, such as



cardiovascular disease, gastrointestinal, endocrine, and apnea (Alnohair, 2014). In obese people with body mass index (BMI) over 40kg/m<sup>2</sup>, lifestyle-based therapy is unlikely to succeed in weight loss, which necessitates the surgical means of weight loss (Runkel et al., 2011).

Weight-loss surgical treatment such as bariatric surgery is regarded as the most effective way to treat severe obesity (Chaudhari et al., 2021). However, bariatric surgery may embody a considerable new concern for entitled obese individuals due to the substantial rate of subsequent complications or collapse. Thus, the surgeon must be aware of indications and the outcomes of the different revisional procedures to guide the best treatment decision. The present contest selects the obese person for revisional surgery appropriately and picks up the most appropriate approach in each case. This further necessitates multidisciplinary management's role for candidate reassessment and preparation for intervention (Lee Bion et al., 2021).

Although bariatric surgery is on-going in Saudi Arabia as a treatment for increasing obesity, many obese individuals are still unaware of several issues associated with this type of weight-loss treatment (Alreshidi et al., 2020b). Therefore, the present study aimed to assess the awareness towards obesity and Bariatric Surgery in Tabuk Region.

## 2. MATERIALS AND METHODS

This observational analytical cross-sectional study was carried out in the Tabuk region, Kingdom of Saudi Arabia, during the year 2020-2021. Subjects of this study were adults aged more than 18 years for both genders living in the Tabuk region, regardless of nationality, excluding adults below 18 years, medical staff, mentally disabled, younger than 18 years, and those residing outside the Tabuk region. Data were collected by an electronic self-administered questionnaire, which included three main sections: Socio-demographic data, knowledge regarding obesity, and knowledge regarding bariatric surgeries.

### Statistical Analysis

Using Microsoft Office Excel sheet, data were tabulated, and by using SPSS (version 2), data were entered and analyzed. Before we started the study, approval was obtained from Ethical Committee.

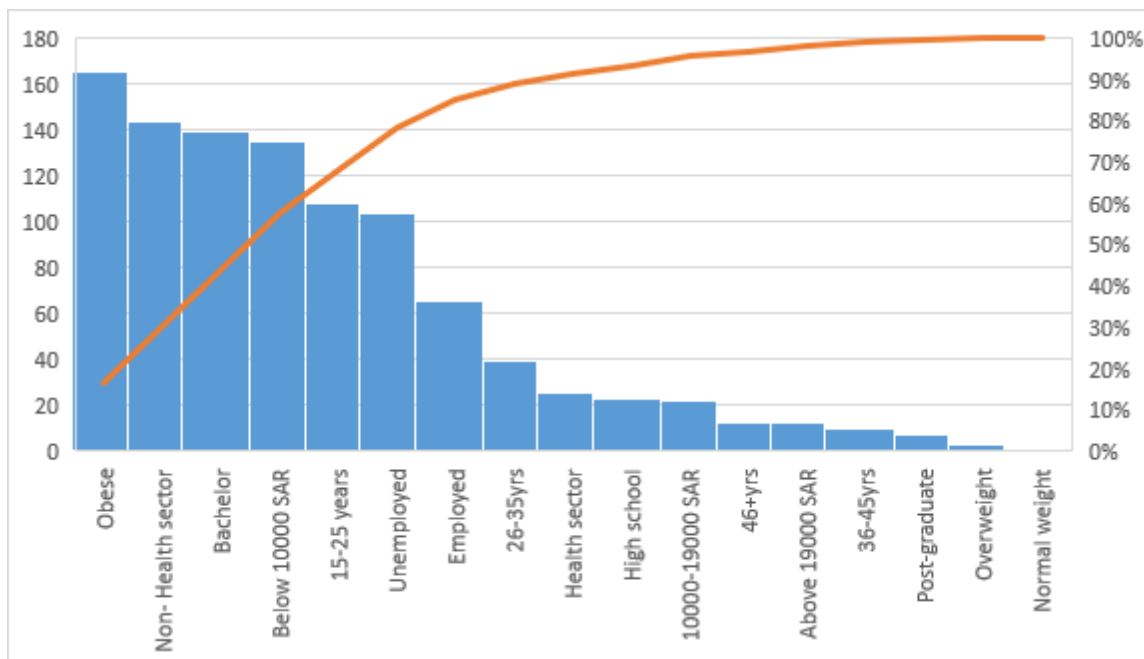
## 3. RESULTS

Out of the 274 participants recruited for the present study, 169/274(62%) were males, and 105/274(38%) were females. Many participants were aged 15-25 years, followed by 26-36 years, representing 177/274(65%) and 66/274(24%), respectively. Most participants were at the university level of education 222/274(81%). About 188/274(69%) were unemployed. Out of the 86 employees, 67/86(78%) worked in the health sector. About 220/274(80%) participants have an income below 10000 Saudi Riyals (SAR). Around 245/274(89.4%) of the participants were obese, and 22/274(8%) were overweight, as indicated in Table 1, Fig 1.

**Table 1** Distribution of the study subjects by demographical characteristics

Variable	Males (n=169)	Females (n=105)	Total (n=274)
Age			
15-25 years	108	69	177
26-35	39	27	66
36-45	10	8	18
46+	12	1	13
Education			
High school	23	18	41
Bachelor	139	83	222
Post-graduate	7	4	11
Work status			
Employed	65	21	86
Unemployed	104	84	188
Health sector			
Yes	25	42	67
No	144	63	207
Income			

Below 10000 SAR	135	85	220
10000-19000 SAR	22	17	39
Above 19000 SAR	12	3	15
Total	169	105	274
Body Mass Index (BMI)			
≤18	0	0	0
18.1-25	0	6	6
25.1-30	3	19	22
>30	165	80	245
Total	168	105	273



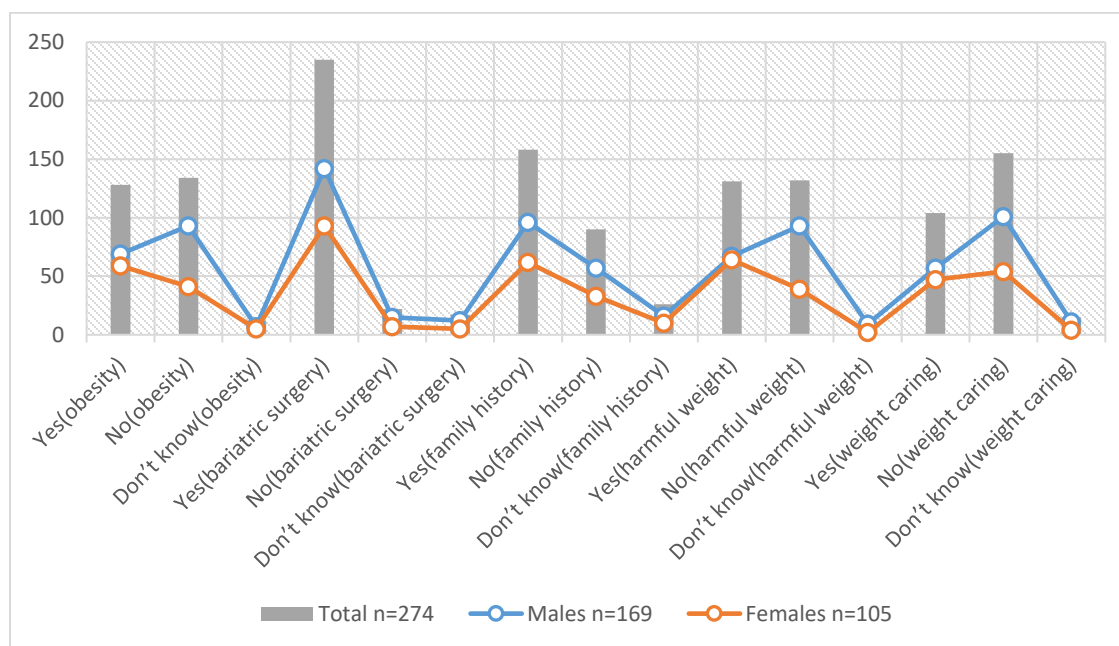
**Figure 1** Description of the study subjects by demographical characteristics

Table 2, Fig 2, summarized the participants' distribution by gender and personal attitude towards obesity-associated factors. On asking the participants, "Did you experience obesity" only 128(47%) answered "Yes." On asking the participants, "Did you experience bariatric surgery" about 235(86%) answered "Yes." On asking the participants, "have you a family history of obesity" around 158(58%) replied, "Yes." On asking the participants, "Did you consider your current weight is harmful to your health" around 131(48%) answered "Yes." On asking the participants, "Are you curing about weight/physical appearance?", only 104 (38%) answered "Yes."

**Table 2** Distribution of the participants by gender and personal attitude towards some obesity-associated factors.

Variable	Males n=169	Females n=105	Total n=274
Did you experience obesity?			
Yes	69	59	128
No	93	41	134
Don't know	7	5	12
Did you experience bariatric surgery			
Yes	142	93	235
No	15	7	22
Don't know	12	5	17

have you a family history of obesity			
Yes	96	62	158
No	57	33	90
Don't know	16	10	26
Did you consider your current weight is harmful to your health			
Yes	67	64	131
No	93	39	132
Don't know	9	2	11
Are you caring about weight/physical appearance?			
Yes	57	47	104
No	101	54	155
Don't know	11	4	15



**Figure 2** Participants by gender and personal attitude towards some obesity-associated factors.

Table 3 summarizes the distribution of the participants by gender and knowledge about bariatric surgery. On asking the study subjects, "Is surgery the only way for getting rid of obesity?" about 19/274(7%) replied "Yes" On asking the study subjects "Does surgery contribute to the reduction of body weight?" only 53/274(19.3%) responded "Yes." On asking the study subjects, "No complications could result from weight loss surgery?" only 99/274(36%) replied, "Yes." On asking the study subjects, "Do you consider surgery is the first choice for reduction of body weight without diet or exercise?" about 31/274(11.3%) replied, "Yes." On asking the study subjects, "Does weight loss surgery decrease the mortality rates?" about 227/274(83%) replied, "Yes." On asking the study subjects, "Could weight loss surgery result in death?" about 239/274(87%) replied, "Yes." On asking the study subjects, "Do you believe that surgery will cause a drastic change in your lifestyle?" about 115/274(42%) replied, "Yes." On asking the study subjects, "Do you believe that surgery will cause a drastic change in your eating habits?" about 100/274(36.5%) replied, "Yes."

**Table 3** Distribution of the participants by gender and knowledge about bariatric surgery

Variable	Males n=169	Females n=105	Total n=274
Is surgery the only way to get rid of obesity?			
Yes	13	6	19
No	156	99	255
Does surgery contribute to the reduction of body weight?			

Yes	37	16	53
No	132	89	221
Could no complications result from weight loss surgery?			
Yes	68	31	99
No	101	74	175
Do you consider surgery as the first choice for reduction of body weight without diet or exercise?			
Yes	23	8	31
No	146	97	243
Does weight loss surgery decrease the mortality rates?			
Yes	136	91	227
No	33	14	47
Could weight loss surgery result in death?			
Yes	146	93	239
No	23	12	35
Do you believe that surgery will cause a drastic change in your lifestyle?			
Yes	69	46	115
No	100	59	159
Do you believe that surgery will cause a drastic change in your eating habits?			
Yes	55	45	100
No	114	60	174

The participants' distribution by gender and perception about bariatric surgery complications was summarized in Table 4, Fig 3. On the question "Do you believe these factors scheduled in Table 4, are complications of bariatric surgery?", about 223(81.4%) replied, "Yes." Out of the 274 contributors in this study, 222, 262, 243, 98, 158, 235,163, and 169 believe that Nutritional Deficiencies, Dumping & Vomiting, Behavioural/Psychosocial Changes, Haemorrhage, GIT Diseases, Ulcers, Hernias, and Infection, respectively are the major complications of bariatric surgery.

**Table 4** Distribution of the participants by gender and perception about bariatric surgery complications

Variable	Males n=169	Females n=105	Total n=274
Do you believe these are complications of bariatric surgery?			
Yes	146	77	223
No	23	28	51
Nutritional Deficiencies			
Yes	133	89	222
No	36	16	52
Dumping & Vomiting			
Yes	161	101	262
No	8	4	12
Behavioral/Psychosocial Changes			
Yes	149	94	243
No	20	11	31
Haemorrhage			
Yes	70	28	98

No	99	77	176
GIT Diseases			
Yes	116	42	158
No	53	63	116
Ulcers			
Yes	147	88	235
No	22	17	39
Hernias			
Yes	94	69	163
No	75	36	111
Infection			
Yes	106	63	169
No	63	42	105

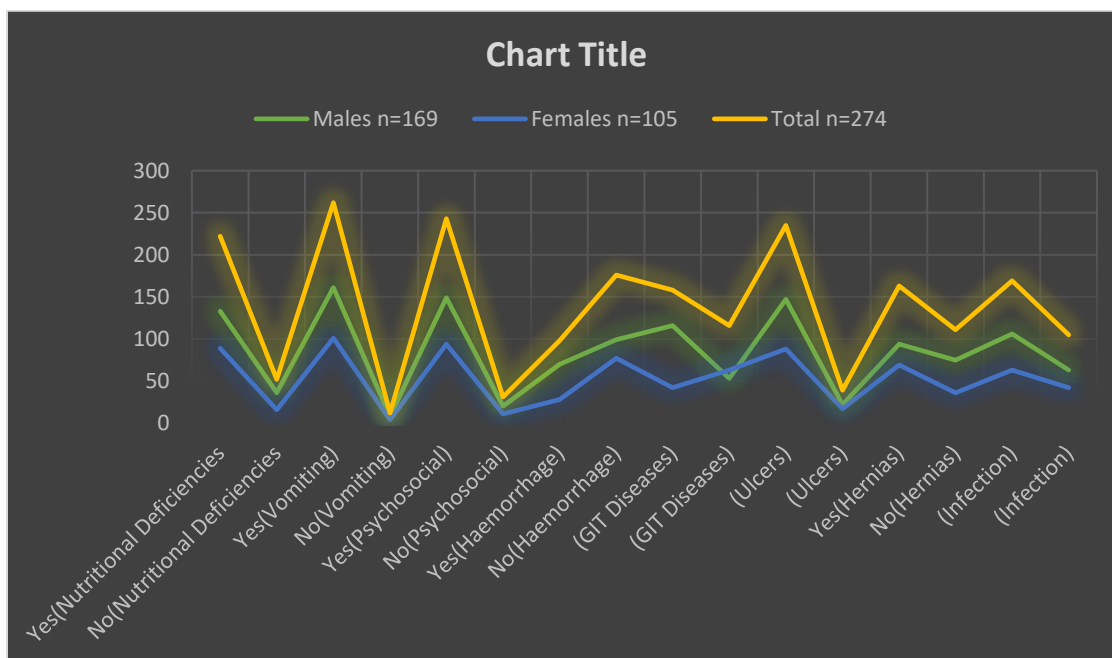


Figure 3 Participants by gender and perception about bariatric surgery complications

The participants' distribution by gender and perception about bariatric surgery and chronic complications was summarized in Table 5, Fig 4. About 6.2%, 7.3%, 7.3%, and 14.2% of the participants believe that bariatric surgery can result in disturbed Liver functions, Renal diseases, Diabetes mellitus & insulin resistance, Blood clotting, in that order.

Table 5 Distribution of the participants by gender and perception about bariatric surgery and chronic complications

Variable	Males	Females	Total
Disturbed Liver Functions			
Yes	12	5	17
No	107	78	185
Don't know	50	22	72
Renal Diseases			
Yes	13	7	20
No	98	72	170
Don't know	58	26	84
DM and Insulin Resistance			
Yes	12	8	20
No	121	81	202

Don't know	36	16	52
Blood Clotting			
Yes	29	10	39
No	59	45	104
Don't know	81	50	131

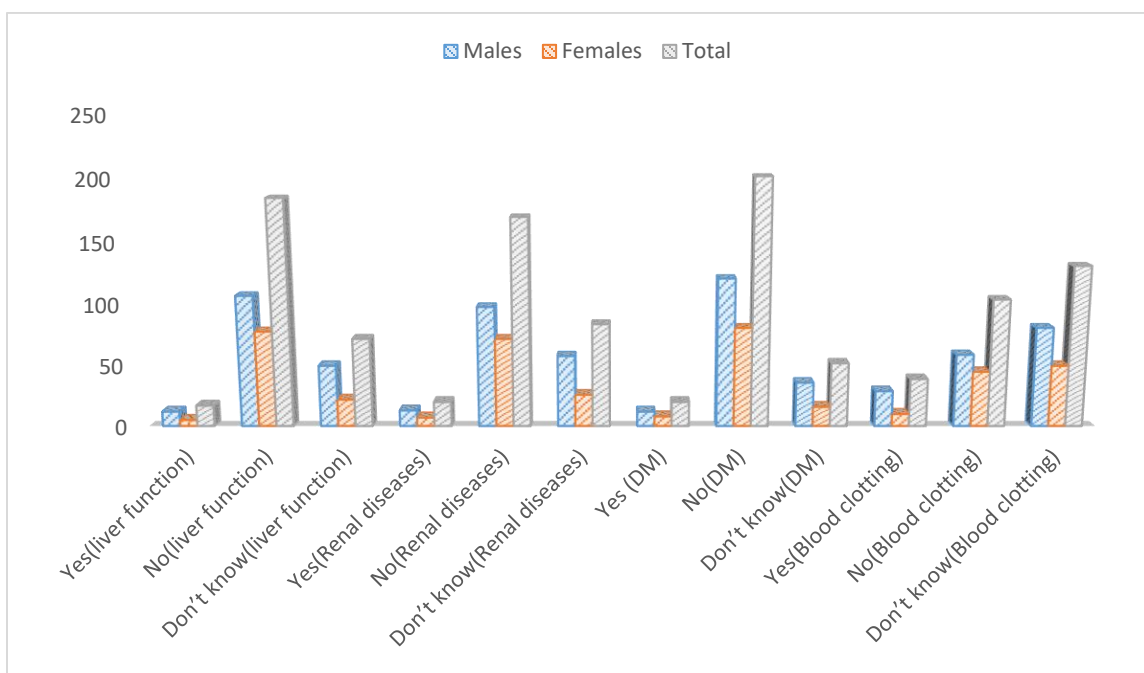


Figure 4 participants by gender and perception about bariatric surgery and chronic complications

#### 4. DISCUSSION

Obesity/overweight represents a significant challenge to the health system in Saudi Arabia, as it the prime cause of several comorbidities that has burden economic and health system load. Such challenges necessitate interventions at a community level as well as a medical level. The introduction of surgical weight controls may be the easy and rapid way of getting weight loss, particularly among those with morbid obesity. Thus, the present study focused on individuals nominated to acquire weight loss; 89.4% of the current study participants were obese BMI >30. The overall knowledge and awareness of the relatively obese participants in the current study were low regarding obesity. Only 47% of participants believe that they are obese, and 58% of study subjects had a family history of obesity. A recent study from Saudi Arabia reported high prevalence rates of overweight/obesity and has attributed that to the dietary unhealthy habits, unhealthy lifestyle, and poor awareness, which necessitates the implementation of educational and awareness programs at educational entities and community (Syed et al., 2020).

In the present study, approximately 86% of the study subjects have experienced bariatric surgeries. Reports from Saudi Arabia regarding bariatric surgery are limited. This further limited the treatment outcomes, whether effective weight loss means minimum life-threatening complications for Saudi patients (Al-Nbaheen, 2020). However, factors regarding bariatric surgery knowledge indicated in Table 3 show overall low levels of knowledge regarding this mean of weight loss. Recent studies from Saudi Arabia in this context reported similar poor knowledge about bariatric surgery (Alqahtani et al., 2019; Alfadhel et al., 2019). In a Study from Western Saudi Arabia, 22.7% of the study subjects were unaware of the bariatric surgery to treat obesity. About 19% of the participants regarded it as cosmetic, and 50% were ignorant of the exact signs for the bariatric treatment, and 41.2% were reluctant to pursue bariatric surgery to get rid of their morbid obesity. These point-views correlate with a person's level of education. Such indications correlate with the limited Saudi community perception towards obesity and bariatric surgery, which necessitates multidisciplinary intervention, including public awareness, healthcare givers, health educators, and surgeons (Altaf and Abbas, 2019).

A broad set of bariatric surgery associated complications have been reported by the present study participants as most of them have experienced bariatric surgery. Numerous complications after bariatric surgery were widely reported, including nausea, vomiting, diarrhea, abdominal pain, intestinal obstruction, infection, nutrition deficiencies, etc. (Al-Nbaheen, 2020). Although

bariatric surgery is a safe and effective procedure for weight loss among those with morbid obesity, experience and facilities may significantly decrease the subsequently expected complication. However, the overall safety, practicability, and determining outcomes still unknown for Saudi experience (Ba Mehriz et al., 2020).

Although the present study has provided useful updates towards obesity and bariatric surgery in the Tabuk area, it has some limitations, including its cross-sectional setting and its involvement of a specific study population (obese).

## 5. CONCLUSION

Obesity awareness is low among obese and those who have undergone bariatric surgeries in Saudi Arabia, which necessitates further efforts at the community level. Knowledge of bariatric surgery-associated factors, including health benefits and complications, is poor in the Tabuk area, necessitating educational interventions.

### Acknowledgement

We thank the participants who were all contributed samples to the study.

### Author Contributions

Alrashid FF: Conception, administration, analysis, drafting, approval of the final version.

Alfriedy RFA; Albdair RAM; Alsulami EAAA; Alazaima AMS; Alshehri AHA: Conception, design, data acquisition, approval of the final version.

Ahmed HG: Consultation, analysis, drafting, approval of the final version.

### Ethical approval

All procedures performed in studies involving human participants were following the institutional and/or national research committee's ethical standards and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval number is Nr 20455/5/42.

### Funding

This study has not received any external funding.

### Informed consent

Informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

### Data and materials availability

All data associated with this study are present in the paper.

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