Body Size Perception and Obesity Knowledge in Saudi Arabia: A Cross-Sectional Study

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ABSTRACT

The aim of this study was to explore body size perception and obesity knowledge among the general public in Saudi Arabia. In Saudi Arabia, in April 2023, a cross-sectional online survey was undertaken to investigate body size perception and obesity awareness among the general population. Binary logistic regression analysis was used to identify predictors of knowledge. In this study, a total of 1,205 participants were involved. Only a small proportion of the study participants were able to identify the level of obesity. Almost half of the participants confirmed that they were obese and that they were unsatisfied with their current body weight. The majority of the study participants reported that their current body weight was either high or very high. The study participants showed a high level of knowledge of obesity. Young participants aged 24–30 years, those with higher education, high income (higher than 7500 Saudi riyal), and working in the medical field showed a higher probability of being knowledgeable of obesity compared to others. This study found a high level of knowledge of obesity among the study participants, especially among young participants aged 24–30 years, those with higher education and income, and those in the medical field. These findings may be attributed to an increase in the level of knowledge and awareness of overweight and obesity and their consequences.

Keywords: Knowledge, obesity, perception, Saudi Arabia

INTRODUCTION

In 2015, 12% of people globally were obese and having a high body mass index (BMI) was responsible for four million deaths worldwide. [1] Obesity is a well-known risk factor for several illnesses, such as type 2 diabetes mellitus (T2DM), hypertension, cardiovascular diseases, and various forms of cancer. It has a negative influence on life expectancy and is connected with rising medical expenditures. This has a direct negative effect on public health systems. [2,3] Despite this, it is a disorder with largely unmet medical requirements owing to a lack of consensus across different recommendations, deficiencies in obesity-related clinical training, and problems in funding for care.[4]

A representative quality of care assessment in ambulatory care settings in the United States indicated that over 50% of patients' record forms lacked full weight and height data, and obesity diagnosis was not recorded in 70% of patients with a BMI of 30. The frequency of counselling for diet, exercise, or weight loss rose from 37% among patients with a BMI of 30 to 55% among those diagnosed with obesity. [5] Therefore, underreported diagnosis or counselling activity in surveys could not represent the actual state of obesity treatment. The patient-doctor interaction is essential to this kind of treatment and is fairly complicated. Assessment should also include process measurements such as collaborative decision-making on whether the patient is ready to handle obesity based on his/her weight loss history and/or his/her presence at a certain stage of change. To improve the likelihood that obese patients will change their behaviour, general practitioners should address the patients' impression of obesity as a serious health concern and evaluate the actual weight status since visual biases in evaluating body weight have been reported. [6,7]

Health literacy may discriminate between those who are successful and unsuccessful at reducing weight. [8] This term refers to a person's ability to access, analyze, and comprehend fundamental health information and services required to make appropriate health choices. [9] People with a higher socioeconomic status are more likely to be in excellent health than those with a lower socioeconomic status [10], and health literacy is a possible modifiable risk factor in the route between socioeconomic inequalities and health. While lower health literacy is commonly noticed in those with less education, even those with a high level of education may have poor health literacy. [11] As confirmed by recent systematic reviews, low health literacy is consistently related to lower health outcomes; nevertheless, the research indicating its connection with obesity is inconsistent and lacking [12], particularly among European adults. [13] Thus, further research is required to explore potential associations between health literacy and obesity to get a better understanding of the significance of acquiring more information in maintaining good health. Adults indicate a need for more and improved health behaviour knowledge to avoid obesity, specifically concerning their weight. [14] This study aims to explore body size perception and obesity knowledge among the general public in Saudi Arabia.

METHODS

In Saudi Arabia, in April 2023, a cross-sectional online survey was undertaken to investigate body size perception and obesity awareness among the general population.

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The sample for this inquiry was chosen using a technique known as convenience sampling. This sort of sampling falls into the non-probability sampling category. The participants who matched our inclusion criteria and were willing to participate were included in this research. On the first page of the questionnaire, they were supplied with an informed consent form and given the option to continue participating or withdraw from the research. To ensure that the patients understood the significance of their involvement, the objectives of the research were presented in detail. In the study's invitation letter, the inclusion criteria were specified.

The population for this study consisted of Saudi Arabians who were at least 18 years old and were members of the general public. No restrictions were laid down regarding gender or age. The link to the survey was shared on social media platforms to urge people to join the study.

This research used a previously designed questionnaire to examine body size perception and obesity knowledge. [15] The questionnaire asked about the age, gender, degree of education, and occupation of the responder. The survey questionnaire examined the participants' views and awareness of obesity. The questionnaire assessed: a) perceptions of the weight of others; b) perceptions of one's body weight; c) contentment with one's body weight, and d) knowledge of the reasons and health concerns connected with obesity. To assess the participants' capacity to identify obesity in others, they were shown two sets of figures depicting eight people in ascending order of BMI. One group of male figures and the other of female ones. The participants were asked to identify the point at which the image depicted an obese male/female figure. In all instances, the right response was a person with a BMI slightly more than 32. The participants were also shown identical images of females and males (where applicable) and asked to choose the image that best reflected their body size. In addition, they were asked how they saw their weight: Are you extremely underweight, underweight, at the ideal weight, slightly overweight, or very overweight? In addition, a list of 10 diseases (heart disease, high blood pressure, diabetes, stroke, arthritis, depression, certain malignancies, liver disease, asthma, and zoster) was provided, and the respondents were asked which conditions were more prevalent among obese people. The participants' knowledge of obesity was assessed through nine questions that examined their knowledge in terms of the importance of physical activities, calorie intake, adiposity location, and treatment. [14] The knowledge score was calculated for the first eight items, with each correct answer receiving a score of one and the total score was then estimated to examine their knowledge.

Physicians from the Faculty of Medicine at King Abdulaziz University evaluated and validated the questionnaire instrument. The participants were questioned about the clarity, comprehensibility, and face validity of the questions, as well as if any were difficult to comprehend. Also, they were questioned about any questions they deemed offensive or bothersome. They said that the questionnaire was simple to comprehend and complete. In addition, a pilot study was conducted with a limited sample of the study population to assess their comprehension of the questionnaire before its implementation on a broader scale.

The questionnaire tool was translated using forward-backwards translation to the Arabic language to facilitate the participation of the general public in Saudi Arabia.

The minimum required sample size was 385 individuals using a 95% confidence interval, a 0.5 standard deviation (SD), and a 5% margin of error.

This study was approved by the Research Ethics Committee at King Abdulaziz University, Jeddah, Saudi Arabia (HA-02-J-008). All participants gave their consent before being involved in this study.

Using SPSS version 27, the data from this research was analyzed. A histogram and normality metrics were used to analyze the knowledge score's normality. The knowledge score was presented using the median and interquartile range as the data was not normally distributed (skewed to the left). In a binary logistic regression analysis, the median knowledge score of the patients was used as the dummy variable to identify the factors affecting their knowledge. A two-sided p-value of less than 0.05 was used to assess statistical significance.

RESULTS

In this study, a total of 1,205 participants were involved. More than half of them were females (57.3%). Almost one-third (36.5%) were aged below 40 years. The majority of them were married (70.5%). More than half of them reported that they held a bachelor's degree (58.4%) and lay in the high-income category (64.6%). Almost one-third of the study participants were university students (36.3%). One-quarter of the study participants were smokers (25.1%). Almost one-third of the study participants reported that they had a chronic disease history (35.4%). See Table 1.

Table 1. Participants' Demographic Characteristics

| Variable	Frequency	Percentage
Gender		
Females	691	57.3%
Age category		
18-23 years	124	10.3%
24-30 years	122	10.1%
31-40 years	194	16.1%
41-50 years	342	28.4%
51-60 years	292	24.2%
61 years and over	131	10.9%
Marital status		
Single	247	20.5%
Married	850	70.5%
Divorced	72	6.0%
Widowed	36	3.0%
Education		
Secondary school or lower	283	23.5%
Bachelor's degree	704	58.4%
Higher education	218	18.1%
Monthly income category		
Less than 2500 SAR	159	13.2%
2500-5000 SAR	146	12.1%
5000-7500 SAR	121	10.0%
Higher than 7500 SAR	779	64.6%
Employment		
Retired	221	18.3%
Unemployed	290	24.1%
Working in the medical profession	148	12.3%
Working in a non-medical profession	108	9.0%
University student	438	36.3%
Current smoker		
Yes	302	25.1%
Do you suffer from any chronic diseases such as heart disease, diabetes, hypertension, high levels of lipids, or others?		
Yes	426	35.4%

SAR: Saudi Riyal
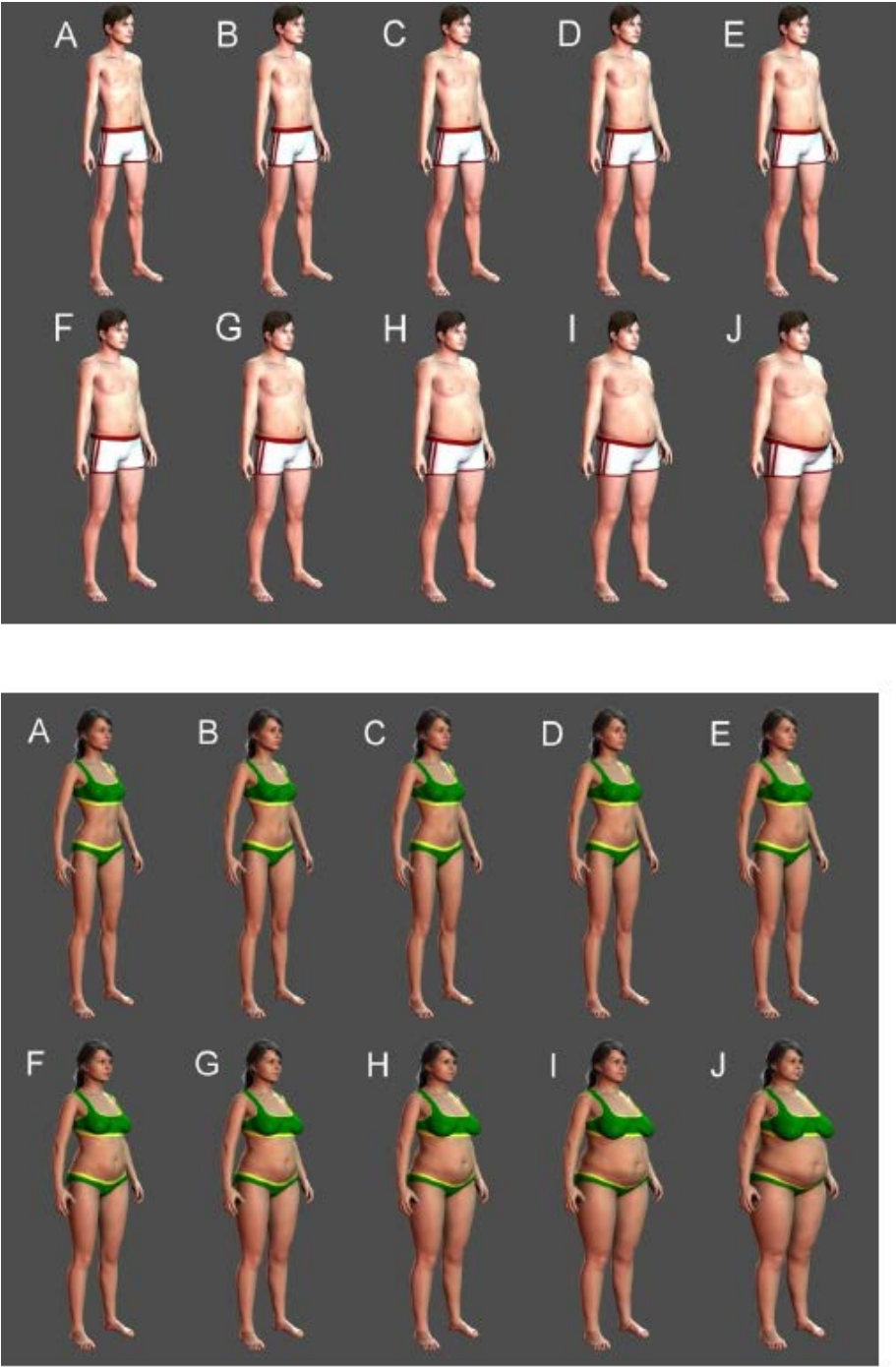
Figure 1. Male and female figures of increasing BMIs presented to respondents

Table 2. Personal Assessment and Satisfaction with Current Body Weight

Variable					
	Very low	Low	Optimal	High	Very high
What is your assessment of your current weight?	1.2%	4.7%	17.8%	34.2%	42.0%
	Extremely unsatisfied	Unsatisfied	Neutral	Satisfied	Extremely satisfied
What is your level of satisfaction with your current weight?	18.0%	38.5%	25.6%	11.9%	6.1%

Table 3. Knowledge of Obesity

Item number	Variable	Frequency	Percentage
1	Regular physical activity reduces the accumulation of fat in the abdominal area. (Yes)	1080	89.6%
2	Natural products (tea, herbal products...) are a good remedy for obesity (No)	409	33.9%
3	Dietary supplements are useful for losing weight (No)	364	30.2%
4	Diuretics are a good treatment for obesity (No)	192	15.9%
5	Laxatives are a good remedy for obesity (No)	210	17.4%
6	Using a cling film wrap around the waist or thighs helps to lose weight (No)	167	13.9%
7	In general, to prevent weight gain, how many calories should a healthy, moderately physically active adult eat per day?		
	Fewer than 1200 calories	144	12.0%
	1201-1500 calories	424	35.2%
	1501-2500 calories*	310	25.7%
	2501-3500 calories	19	1.6%
	3501-4500 calories	4	0.3%
	Don't know	304	25.2%
8	Of the following body parts, where does fat accumulation pose greater health risks?		
	Thighs	48	4.0%
	Arms	4	0.3%
	Abdominal and waist area*	1063	88.2%
	Buttocks area	48	4.0%
	Don't know	42	3.5%
9	Which of the following diseases are obese individuals more likely to develop? (More than one answer could be selected)		
	Cardiovascular diseases	888	73.7%
	Diabetes mellitus	888	73.7%
	Hypertension	732	60.7%
	Osteoarthritis	648	53.8%
	Depression	446	37.0%
	Stroke	394	32.7%
	Liver diseases	227	18.8%
	Specific types of cancer	139	11.5%
	Asthma	125	10.4%
	Zoster	104	8.6%

When the participants were asked about their perception of obese males or females using figures of increasing BMI (see Figure 1), only 20.3% (n= 245) of them were able to identify that figure H was the first level of identifying an individual as being obese (having a BMI of 30 kg/cm² or over).

The figures were presented to the participants and they were asked which figure was the closest to their body dimensions at the time of their participation in the study, Figure H was confirmed by 18.3% as being the closest estimation to their body dimension. In total, 45.1% of the participants used the figure presented to them to confirm that they were obese (selecting either figure H, I, or J).

Table 2 presents the participants' assessment and level of satisfaction with their current body weight. Around 76% of the study participants reported that their current body weight was either high or very high. In addition, 56.5% of the study participants confirmed that they were unsatisfied with their current body weight (either unsatisfied or extremely unsatisfied).

Table 3 presents the participants' responses to items concerning their knowledge of obesity. When the participants were asked about practices, the percentage of participants who answered correctly ranged between 13.9% and 89.6%. The question most commonly answered correctly was that "regular physical activity reduces the accumulation of fat in the abdominal area". However, the answer least commonly answered correctly was that "using a plastic wrap around the waist or thighs helps to lose weight".

Just over one-quarter of the study participants (25.7%) correctly identified that to prevent weight gain, a healthy, moderately physically active adult should eat 1501-2500 calories per day. The vast majority of the study participants (88.2%) identified correctly that fat accumulation in the abdominal and waist area poses greater health risks. Cardiovascular diseases, diabetes mellitus, and hypertension were the most commonly reported diseases obese individuals were more likely to develop with 73.7%, 73.7%, and 60.7%, respectively.

The median knowledge score was 6.0 (IQR: 3.0) out of 8 (equal to 75%), reflecting a high level of knowledge of obesity among the study participants. Young participants aged 24-30 years, those with higher education, high income (higher than 7500 SAR), and working in the medical field showed a higher probability of being knowledgeable of obesity compared to others ($p \leq 0.05$), Table 4.

DISCUSSION

The key findings of this study are: 1) only a small proportion of the study participants were able to identify their level of obesity; 2) almost half of the participants confirmed that they were obese and that they were unsatisfied with their current body weight; 3) the majority of the study participants reported that their current body weight was either high or very high; 4) the study participants showed a high level of knowledge of obesity, and 5) young participants aged 24–30 years, those with higher education, high income (higher than 7500 SAR), and working in the medical field showed a higher probability of being knowledgeable of obesity compared to others.

Table 4. Binary Logistic Regression Analysis

Variable	Odds ratio of having a higher level of knowledge	95% confidence interval
Gender		
Females (Reference category)	1.00	
Males	0.95 (0.76-1.19)	0.663
Age category		
18-23 years (Reference category)	1.00	
24-30 years	1.50 (1.02-2.20)	0.038*
31-40 years	1.24 (0.91-1.69)	0.173
41-50 years	1.02 (0.79-1.31)	0.880
51-60 years	0.90 (0.69-1.17)	0.422
61 years and over	0.52 (0.36-0.76)	<0.001
Marital status		
Single (Reference category)	1.00	
Married	0.87 (0.68-1.12)	0.285
Divorced	0.83 (0.51-1.33)	0.433
Widowed	0.52 (0.26-1.03)	0.062
Education		
Secondary school or lower (Reference category)	1.00	
Bachelor's degree	1.25 (0.99-1.57)	0.061
Higher education	2.28 (1.67-3.11)	<0.001
Monthly income category		
Less than 2500 SAR (Reference category)	1.00	
2500-5000 SAR	0.77 (0.54-1.09)	0.135
5000-7500 SAR	0.85 (0.58-1.23)	0.382
Higher than 7500 SAR	1.72 (1.36-2.19)	<0.001
Employment		
Retired (Reference category)	1.00	
Unemployed	0.65 (0.50-0.84)	0.001**
Working in the medical profession	2.45 (1.69-3.56)	<0.001
University student	1.40 (0.94-2.09)	0.101
Working in a non-medical profession	1.10 (0.87-1.39)	0.433
Current smoker		
No (Reference category)	1.00	
Yes	1.26 (0.97-1.63)	0.087
Do you suffer from any chronic diseases such as heart disease, diabetes, hypertension, high levels of lipids, or others?		
No (Reference category)	1.00	
Yes	0.59 (0.46-0.75)	<0.001

SAR: Saudi Riyal

Previous studies on obesity have shown that excess weight has a severe effect on morbidity and mortality [16], and obesity is considered a chronic disease resulting from the abnormal accumulation of fat in the adipose tissue in a way that adversely affects health. [17] Meanwhile, it is a well-known risk factor for other chronic diseases, including diabetes mellitus type 2, dyslipidaemia, and hypertension. [18] This study aimed to explore body size perception and obesity knowledge among the general public in Saudi Arabia.

The study found that only 20.3% of the study participants were able to identify an individual as obese using the presented figures (the first level of identifying an individual as obese being having a BMI of 30 kg/cm2 or over). This low percentage of accurate body size assessment and identification is suggested to be due to a shifted perception of the normal body size toward larger body sizes [19], which leads individuals to think that they are thinner than they are. [20] Nevertheless, around 45% of this study's participants confirmed that they were obese using the figures presented to them. This may be considered an overestimation of the self-body sizes with multiple factors, including feelings about being overweight or feelings about certain body areas and shapes, playing a role in the meaning of body size satisfaction [21] that affect body size perception and estimation.

Meanwhile, almost 76.0% of the study participants reported that their current body weight was either high or very high, and this led about 56.5% of the study participants to confirm that they were either unsatisfied or extremely unsatisfied with their current body weight. This high percentage of dissatisfaction is mostly related to multiple factors, including the ideal body image presented by the media and its relation with weight status [22], where body size perception is affected by obesity through psychological distress and strongly impacts an individual's quality of life. [23]

About one-quarter of the study participants correctly identified that to prevent weight gain, a healthy, moderately physically active adult

should eat 1501-2500 calories per day. By defining a certain calorie intake, one may correct the diet with small changes in physical exercise which would be enough to prevent excess weight gain. [24] The vast majority of the study participants (88.2%) were able to identify correctly that fat accumulation in the abdominal and waist area posed greater health risks, with the diseases obese individuals most commonly reported were cardiovascular diseases, diabetes mellitus, and hypertension, with 73.7%, 73.7%, and 60.7%, respectively. This is in line with other studies which show that cardiovascular diseases, diabetes mellitus, and hypertension are health consequences most prevalently associated with obesity. [25] This is especially so for type 2 diabetes, where obese adults with increased BMI are about 20 times more likely to develop diabetes than normal BMI individuals. [25] Obesity is one of the most common risk factors for patients with cardiovascular diseases, including myocardial infarction or ischaemic heart disease. [26] Also, hypertension is significantly associated with obesity. [27] Indeed, cardiovascular diseases, diabetes mellitus, and hypertension have an increased association with obesity along with an increased prevalence in the Saudi population. [28]

Among the study participants, the median knowledge score was equal to 75%, reflecting high levels of knowledge of obesity, especially among young participants aged 24-30 years, those with higher education, high income, and those working in the medical field. These findings are mostly due to schooling and increased health knowledge. [29] Indeed, the environment plays a major role in the awareness and knowledge of any disease. In a community with a median age of 26.5 years in Saudi Arabia [30], which is considered to be a young population, their health actions have led to a significant increase in obesity-related diseases. [31] Furthermore, a recent increase in certain cultural changes in Saudi Arabia has led to an increase in the level and percentage of knowledge and awareness of being overweight and obesity and their consequences. [28]

Meanwhile, with this increase in the prevalence of obesity, the need to increase awareness on the topic has become mandatory. This awareness can be achieved by promoting campaigns for healthier lifestyles and raising health education among the public [28], along with targeting the environment to facilitate healthier decisions with easy healthy choices to be made by individuals. [32] There is also a need for government intervention to manage the obesity epidemic. [33] Finally, the establishment of early obesity prevention programmes by healthcare providers is believed to help prevent the epidemic in younger and older ages. [34]

CONCLUSION

The findings of this study show that there was a low level of accurate body size assessment and identification among the study participants. This may be due to the shifted perception of normal body size toward larger body sizes. However, a relatively high number of participants confirmed that they were obese, indicating an overestimation of self-body sizes. Moreover, a high percentage of participants reported dissatisfaction with their current body weight, which may be related to the ideal body image presented by the media and its relationship with weight status. This study also revealed that most participants correctly identified that fat accumulation in the abdominal and waist areas poses greater health risks, and they were aware of the health consequences associated with obesity, including cardiovascular diseases, diabetes mellitus, and hypertension. However, only one-quarter of the participants correctly identified the daily calorie intake needed to prevent weight gain. The study found a high level of knowledge of obesity among the study participants, especially among the young participants aged 24–30 years, those with higher education and

income, and those working in the medical field. These findings may be attributed to schooling, increased health knowledge, and recent cultural changes in Saudi Arabia.

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