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Self-perception of body image among Saudi females at Princess Nourah University, Riyadh, Kingdom of Saudi Arabia

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ABSTRACT

Background: Women are influenced by many socio-cultural factors on how they perceive their body image. **Methodology:** This cross-sectional study assessed self-perception of body image, body mass index (BMI), and compared the agreement between actual and perceived BMI among Saudi female adults at Princess Nourah University (PNU) in Riyadh. A total of 336 participants aged 18-50 years were recruited, by randomly selecting one of the three colleges in PNU and from among the workers in the selected college. A structured self-administered questionnaire was used to obtain socio-demographic information, weight perceptions, body satisfaction and media influence on body image. Participants had to “give best description of your perceived weight and height”. **Results:** Majority of the participants were aged 18-29 years and unmarried. Mean BMI was $26.1 \pm 9.41 \text{ kg/m}^2$, and more than half of the participants (55.7%) belonging to 55-80 kg weight range were overweight. Their mean BMI by actual measurement was $24.2 \pm 8.26 \text{ kg/m}^2$ while their self-estimated BMI also fell in the normal BMI category. Cohen’s Kappa K value of 0.635 indicated a good agreement between the actual and perceived BMI categories. Positive body image perception was given by 68.6% of the participants; 83.9% felt appearance was very important in the context of body image perception; 47.1% agreed that changing their abdominal part was what they wanted to change most, while 52.8% opted to lose weight in improving their appearance. **Conclusion:** Overall, an underestimation of body weight in terms of BMI was found among the participants. Such misconceptions should be addressed in view of the high obesity prevalence in Saudi Arabia.

Keywords: Self-perception, body image, misperception, BMI, Saudi female

INTRODUCTION

Body image is defined “as a person’s mental representation of his/her own body, encompassing perceptual, affective, cognitive, and behavioural body aspects” (Lee, 2013). The perception of individuals of their own weight status

and body image often incorporates visualisation of their own body formed in their mind. It is also a multidimensional concept incorporating sociocultural, neurological and psychological elements (Shagar *et al.*, 2014). Preference for a particular body weight and attitude

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towards body image may be mediated by cultural, physical, interpersonal, and emotional factors that increase body image dissatisfaction leading to eating disorders (Makara-Studzinska, 2013; Calado, 2011).

Students reportedly perceived themselves as too thin or too fat (El Ansari *et al.*, 2010). Body image discrepancies were reported among Saudi students, in that 44.1% were “thinner” and 19.7% were “heavier” than their perceived body image (Khalaf *et al.*, 2015). Another study among Saudi female university students showed one-third misclassified themselves when compared with their actual weight (Epuru *et al.*, 2013). Underestimating one’s own weight is associated with prevalence of gaining weight, and associated with depression, low self-esteem, feelings of shame and anxiety, and social isolation. Studies in adults have also shown a decline in recognition of overweight in recent decades (Salcedo *et al.*, 2010). Weight perception is an important determinant of nutritional habits and weight measurement, regardless of whether a person is underweight, normal or overweight. Prevalence of obesity has been increasing progressively globally, and Saudi Arabia is no exception. Inaccurate recognition of weight status can pose a threat to healthy weight control.

Since significant weight misperception has been reported in Saudi Arabia, the present study is aimed at assessing self-perception of body image in terms of body mass index among Saudi females at Princess Nourah University (PNU) in Riyadh.

MATERIALS AND METHODS

A cross-sectional study was conducted at PNU located in Riyadh, Saudi Arabia. The PNU was chosen because of its accessibility and presence of Saudi

females from different socioeconomic backgrounds and ages.

Sample size was selected from open EPI website based on confidence interval of 95%, with 499 representing target population. A simple random sampling was used to select the participants. There are three colleges in PNU and the College of Sciences was randomly chosen, from which, participants were randomly selected.

A structured self-administrated questionnaire with close-ended questions was used to collect data. Some of the questions were derived from previous studies and modified to be in line with Saudi culture. It included socio-demographic and lifestyle information, assessment of self-perception, weight perception, body satisfaction and media influence. Perceived measurements were posed as “give the best description of your perceived weight and height”. The participants completed it while the researchers conducted measurements of weight, height and waist circumference. Body mass index (kg/m^2) was calculated and categorized as (underweight: BMI <18.5; normal weight: BMI 18.5-24.9; overweight: BMI 25.0- 29.9; obesity: BMI 30.0-34.9) (WHO, 2016).

Body image perception aligned with Saudi culture was assessed on a 10-point Likert scale from thinness to fatness. Regarding perception of ideal body image, a scale of 10 was used whereby scores of 1-4 were considered “thin”, 5-6 “moderate body weight”, and 7-10 “overweight/fat”.

The data was edited for inconsistencies, and descriptive and analytical results were obtained. Data were tested for normality using the Kolmogorov-Smirnov test, skewedness and Kurtosis. Descriptive statistics such as mean and standard deviation were calculated for the continuous variables (height, weight and waist circumference) and frequencies for categorical data.

Chi square test was used for the bivariate analysis to determine the association between BMI classification and misperception of own weight status using significant *p*-values for categorical variables. Agreement between actual BMI and perceived BMI categories was checked using Cohen's Kappa. The confidence interval was based on 95% and the level of significance was *p*-value ≤ 0.05 . Analysis was done through SAS/JMP statistical analysis program (Version 13).

RESULTS

This study included 336 respondents, majority of whom were aged 18-29 years and unmarried. According to actual measurements, the mean BMI was 24.2 ± 8.26 kg/m² while, based on self-estimated weight and height, their BMI was estimated as 23.3 ± 9.17 kg/m² (Table 1).

with a mean estimated BMI 21.0 ± 10.9 kg/m², which is in the normal weight category. Such a discrepancy of BMI was found high (90%) among aged 18-29 years (Table 2). The result from Cohen's Kappa was 0.635, indicating a good agreement between the actual and perceived BMI categories, and it is statistically significant at $p < 0.001$. Agreement between actual and perceived BMI was highest (51.4%) in the normal weight category, followed by overweight (13.3%), underweight (8.5%) and obese (5.7%) categories (Table 3).

Out of the total participants, 68.6% showed positive body image perception. The difference between positive and negative body image perceptions was statistically significant at $\chi^2(3) = 53.53$, $p < 0.001$ (Table 4). Majority of the participants (83.9%) felt that their appearance was very important in the context of body image perception.

Table 1. Social background, actual and self-estimated body weight and height of subjects (*N*=336)

Variables	<i>N</i> (%)	Mean \pm SD
Age (years)		
18-29	301 (90)	
30-42	35 (10)	
Marital status		
Married	48 (14.3)	
Not married	288 (85.7)	
Measurements (actual)		
Height (cm)		156.62 \pm 7.59
Weight (kg)		58.73 \pm 12.64
BMI (kg/m ²)		24.2 \pm 8.26
Measurements (self-estimation)		
Height (cm)		159 \pm 6.0
Weight (kg)		58 \pm 12.0
BMI (kg/m ²)		23.3 \pm 9.17

More than half (55.7%) with actual weight range of 55-80 kg showed a mean BMI of 26.1 ± 9.41 kg/m², which falls in the overweight category. In comparison, more than half (58.0%) self-perceived their weight in the range 33-58 kg,

Nearly half of them (47.1%) agreed that changing their abdominal part was what they wanted to change most, while 52.8% opted to lose weight in improving their appearance (Table 5).

Table 2. Weight range and BMI classifications on females at Princess Nourah University (N=331)

Weight categories	N	%	BMI Mean±SD
Weight categories (kg) based on actual measurements			
29-54	131	39.2	20.0±2.10
55-80	186	55.7	26.1±9.41
81-105	15	5.0	35.0±3.65
106-131	2	0.1	44.0±3.19
Weight categories (kg) based on self-estimations			
33-58	196	58.3	21.0±10.90
59-84	130	38.7	25.8±3.27
85-110	9	2.7	34.9±4.14
111-136	1	0.3	43.4 [†]

[†]has no SD because it's only one participant

Table 3. Assessing agreement between actual and self-estimated BMI categories (N=331)

Self-estimated BMI categories	Actual BMI categories								K	p	
	Underweight		Normal weight		Overweight		Obese				
	N	%	N	%	N	%	N	%			
										0.635	<0.001*
Underweight	28	8.5	18	5.4	0	0.0	0	0.0			
Normal weight	1	0.3	170	51.4	29	8.8	3	0.9			
Overweight	0	0.0	6	1.8	44	13.3	8	2.4			
Obese	0	0.0	1	0.3	4	1.2	19	5.7			
Total	29	8.8	195	58.9	77	23.3	30	9.1			

*Significance difference $p < 0.05$.

Table 4. Distribution of positive and negative body image perception according to BMI classification among females

BMI classification (based on actual measurements)	Body image perception				χ^2	p
	Positive		Negative			
	N	%	N	%		
Underweight	18	5.4	11	3.3	53.53	<0.001*
Normal weight	162	48.9	33	10.0		
Overweight	38	11.5	39	11.8		
Obese	9	2.7	21	6.3		
Overall	227	68.6	104	31.4		

*Significant difference $p < 0.05$

About half (52.7%) reported that social media sometimes affects their body image perception, but 44% reported no such media influence. Approximately more than one third (38.6%) stated that sometimes they compared their body

shape with others. Lowered self-esteem was the highest (47.9%) consequence of having a negative body image perception, followed by feelings of being insecure around people, general unhappiness and embarrassment. On the other hand,

Table 5. Assessment of body image perception

<i>Assessment of body image perception</i>	<i>n</i>	<i>%</i>
Assessment of body appearance		
I. Importance of appearance (n=335)		
Very important	281	83.9
Moderately important	48	14.3
Slightly important	5	1.5
Not important	1	0.3
II. Body part wants to change (n=333)		
Upper part	46	13.8
Abdominal part	157	47.1
Lower part	85	25.5
Nothing	45	13.5
III. Prefer to (n=335)		
Do nothing	23	6.9
Lose weight	177	52.8
Gain weight	44	13.1
Maintain as it is	91	27.2
Social media effect on body image perception		
I. Media affect (n=334)		
Always	106	31.7
Sometimes	176	52.7
Never	52	15.6
II. Social pressure (n=334)		
Always	58	17.4
Sometimes	129	38.6
Never	147	44.0
Psychological considerations of body image		
I. Comparing body shape with others (n=334)		
Always	36	10.8
Sometimes	208	62.3
Never	90	26.9
II. Consequences relate to negative perception of BI (n=334)		
Being insecure around people	112	33.6
Embarrassment	46	13.8
General unhappiness	68	20.4
Lowered self-esteem	159	47.9
Undesirable to the opposite sex	15	4.5
Gaining motivation to exercise, eat healthier.	118	35.4
III. How often do you think a negative thought about your body (n=333)		
Always	31	9.3
Sometimes	200	60.1
Never	102	30.6

positive feelings of motivation to exercise and to eat healthier were also reported as outcomes of having a negative body image perception. The feeling of being undesirable to the opposite sex was reported by lowest percentage of

the participants arising from having a negative perception of body image (Table 5).

The majority in the overweight BMI (71%) perceived themselves as having moderate body size to the Likert scale.

Also, 60% among the obese ranked themselves as being moderate. This underestimation of perception towards body image may lead to obesity complications in the long term.

DISCUSSION

In the present study, self-estimated body mass index was significantly lower than that actually measured. Over-estimation of body weight among normal-weight adolescents is reportedly uncommon (Jackson *et al.*, 2015; Yang *et al.*, 2014; Hayward *et al.*, 2014; Edwards *et al.*, 2010). A study in Spain showed that the prevalence of underestimation of actual weight was more prevalent among middle-aged adults than younger ages (Bibiloni *et al.*, 2017). Body image misconceptions are more common among overweight and obese people, leading to depressive symptoms and psychological distress (Gavin *et al.*, 2010).

Nonetheless, this study found a significantly higher prevalence of positive body image perception than feelings of negative perception. This finding may be due to the majority of the participants being young, educated and unmarried adults, who tend to be more open-minded.

Females tend to overestimate their body weight than what they actually are (Hancock *et al.*, 2012). Physical appearance is more important in females than males, regardless of higher prevalence of excessive weight among males and females (Yaemsiri *et al.*, 2011). The majority of the female respondents in this study agreed that body appearance is highly important.

In the present study respondents agreed that media sometimes has an effect on body image perceptions. In many cultures, thinness is desired as ideal body image. The effect of mass media images favouring models resulted on both genders suffering with anorexia

(Ro & Hyun, 2012; Ratanasiripong & Burkey, 2011; Brennan *et al.*, 2010). On the other hand, based on Bahraini findings, Arab women consider the midrange of fatness to be the most socially acceptable, while very thin or obese body sizes were least accepted (Khalaf *et al.*, 2015).

CONCLUSION

Discrepancy between actual and self-perceived perceptions of body weight found among the Saudi females may potentially contribute to an increased risk of overweight in the population. The prevalence of overweight and obesity in the Kingdom of Saudi Arabia (KSA) has increased in recent decades, with females having a higher prevalence rate (75-88%) than males (70-85%) (Ng *et al.*, 2011). Obesity is strongly associated with chronic diseases in Saudi Arabia. With the increase in life expectancy, obesity is causing more years of disability (Kelsey *et al.*, 2014). Hence, the increased cost of obesity and its sequelae will put a strain on the resources of governments and individuals (Withrow *et al.*, 2011).

Authors' contributions

Layam A, principal investigator, conceptualized and designed the study, prepared the draft of the manuscript and reviewed the manuscript; conducted the study, data analysis and interpretation, assisted in drafting of the manuscript, reviewed the manuscript; Hind Q, statistical expert, conceptualized and designed the study; Asma AA, led the data collection, data processing, assisted in drafting of the manuscript and reviewed the manuscript; Hessah IS, led the data collection, data processing, assisted in drafting of the manuscript and reviewed the manuscript; Hessa FA, led the data collection, data processing, assisted in drafting of the manuscript and reviewed the manuscript; Rehab AA, led the data collection, data processing, assisted in drafting of the manuscript and reviewed the manuscript; Shima AA, led the data collection, data processing, assisted in drafting of the manuscript and reviewed the manuscript.

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