



Association of Visceral Fat Obesity with Body Image Dissatisfaction among Women

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ARTICLE INFO	ABSTRACT
<i>Article type:</i> Research Paper	Introduction: The prevalence of body image dissatisfaction has significantly increased in the last years, and most previous studies have focused on the body mass index. The present study aimed to examine the association between body image and body composition among women.
<i>Article History:</i> Received: 18 May 2020 Accepted: 24 Aug 2020 Published: 26 Aug 2020	Methods: This cross-sectional study was conducted on 384 women attending a nutrition clinic in Ardabil during 2019. Data were collected using the multidimensional body self-relations questionnaire, anthropometric measurement, and body composition analysis. The data were analyzed in SPSS software (version 21.0) through a two-tailed test. A p-value of less than 0.05 was considered statistically significant.
<i>Keywords:</i> Body composition Body image dissatisfaction Visceral fat Women	Results: Correlation analysis indicated a significant positive association of body composition with the subjective weight and overweight preoccupation subscales. The highest association of subjective weight subscale was found with body fat percentage followed by visceral fat level and trunk fat mass. Moreover, the highest association of overweight preoccupation subscale was with body fat percentage and visceral fat level followed by visceral fat area and trunk fat mass. The correlation between body composition components and the subjective weight subscale was stronger than that between body composition components and the overweight preoccupation subscale. Conclusion: Body image dissatisfaction was associated with body fat percentage, trunk fat mass, and visceral fat obesity among women attending a nutrition clinic. These results indicate the need for interventions designed to improve body composition, and consequently, body image dissatisfaction.

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Introduction

Body image is a multidimensional construct and cites one's concepts and attitudes, including feelings, thoughts, and behaviors related to the body, weight, and appearance. Body image is a subjective assessment of body satisfaction or body dissatisfaction.

Body image dissatisfaction is a risk factor for a broad range of mental and nutritional disorders. Poorer overall health status and various disorders, such as depression, social anxiety, low self-esteem, sexual dysfunction, body dysmorphic disorder, eating disorder, and unhealthy weight control behaviors were accepted to be associated with body image dissatisfaction. Such conditions can adversely affect the quality of life of the affected people. This problem is a global issue, and a high

prevalence of body image dissatisfaction has been regarded, particularly among women in recent years. The rate of dissatisfaction is reported by about 60% in women. Another study among women over 18 years of age, of different ethnicities, concluded that 70% of them were dissatisfied with their bodies. Among Iranian women, the dissatisfaction rates have also been reported by 70%. This degree of dissatisfaction is almost the same as that in global studies.

Due to the high prevalence and negative consequences of body image dissatisfaction, there is a necessity to determine the factors that affect body image. Previously conducted studies confirmed the association of body image dissatisfaction with body mass index, waist circumference, and waist to hip ratio. However, few studies have considered the association

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between body composition and body image. Therefore, the present study aimed to investigate the relationship between these two variables.

Materials and Methods

The statistical population of this cross-sectional study consisted of women attending a nutrition clinic in Ardabil, Iran, between October and December 2019. The present study was approved by the Ethics Committee of Ardabil University of Medical Sciences with code number IR.ARUMS.REC.1398.549. The sample size was calculated using the following formula:

$$n = z^2 pq / d^2 \text{ (where } z=1.96 \text{ at } 95\% \text{ confidence, } p=q=0.5 \text{ and } d=0.05).$$

Therefore, 384 healthy women (age range: 18-45 years and body mass index: 18.5-40 kg/m²) were selected using a convenience sampling method. Moreover, they were non-pregnant and non-lactating with stable body weight (weight change ± 2 kg) three months before the initiation of the study.

The participants' height was measured and recorded to the nearest 0.1 cm. Furthermore, body composition was assessed after standardized procedures using a bioelectrical impedance analysis (X-CONTACT 356; JAWON MEDICAL Co. Ltd., Republic of Korea). The validity of this method has been confirmed with a high relative agreement to estimate body composition. The body weight, body mass index, waist circumference, waist to hip ratio, soft lean mass, body fat percentage, visceral fat level, visceral fat area, and trunk fat mass were measured using this analysis. It is worth mentioning that the fat mass (body fat percentage) was calculated as body weight \times 100. The Multidimensional Body Self-Relation Questionnaire was used to evaluate self-attitudinal aspects of the body-image, physical activity, and health. This questionnaire is a 5-point Likert scale ranging from one (strongly disagree) to five (strongly agree). Its subcategories involve appearance evaluation (n=7), appearance orientation (n=12), fitness evaluation (n=3), fitness orientation (n=13), health evaluation (n=6), health orientation (n=8), illness orientation (n=5), body area

satisfaction Scales (n=2), subjective weight (n=2), and overweight preoccupation (n=4). The present study used the Persian version of the questionnaire with confirmed validity and reliability.

The data were analyzed in SPSS software (version 21.0) through the Kolmogorov-Smirnov test to examine the distribution of variables performed by a histogram. Regarding the normal distribution of the data, parametric tests were used to analyze the quantitative variables. Moreover, the continuous variables were reported as mean and standard deviation, and the Pearson correlation coefficient was employed to investigate the association among variables. All statistical tests were two-tailed, and a p-value of less than 0.05 was considered statistically significant.

Results

The mean age of the women was 30.01 \pm 7.20 years. According to body mass index classification, 14.3%, 27.9%, and 57.8% of the women were normal, overweight, and obese, respectively. The anthropometric and body composition characteristics of the subjects were shown in Table 1.

Table 2 tabulates the mean subscale scores of the Multidimensional Body Self-Relation Questionnaire. The results showed that appearance orientation and subjective weight subscales obtained the highest mean score. On the other hand, overweight preoccupation and body areas satisfaction gained the lowest mean score.

The association between body composition components and body image subscales were shown in Table 3. Based on the results, there was a significant positive relationship between body composition and the two subscales of subjective weight and overweight preoccupation. Moreover, the results showed that subjective weight was highly correlated with body fat percentage, visceral fat level, visceral fat area, trunk fat mass, and fat mass. However, the appearance orientation subscale showed a negative relationship with body fat percentage, visceral fat level, and visceral fat area.

Table 1: The anthropometric and body composition characteristics of participants

Variable	Mean± SD
Weight(kg)	78.47±14.11
Body mass index(kg/m ²)	30.21±5.17
Waist circumference(cm)	91.39±10.19
Waist to hip ratio	0.87±0.06
Percent body fat (%)	37.55±5.51
Soft lean mass (kg)	43.98±5.30
Visceral fat level	12.76±3.78
Visceral fat area (cm ²)	113.57±43.36
Trunk fat mass (kg)	15.57±4.46
Fat Mass (kg)	30.39±8.51

Table 2: The mean subscale scores of the Multidimensional Body Self-Relation Questionnaire

Variable	Mean± SD
Appearance Evaluation	3.60±0.58
Appearance Orientation	4.01±0.51
Fitness Evaluation	3.45±0.86
Fitness Orientation	3.35±0.66
Health Evaluation	3.23±0.58
Health Orientation	3.51±0.52
Illness Orientation	3.69±0.81
Body Areas Satisfaction	2.96±0.73
Subjective Weight	4.01±1.01
Overweight Preoccupation	2.87±0.73

Table 3: The association between body composition components and body image subscales

Variable	AE	AO	FE	FO	HE	HO	IO	BAS	SW	OWP	PBF	SLM	VFL	VFA	TMF	FM
AE	1															
AO	0.19**	1														
FE	0.26**	0.18**	1													
FO	0.25**	0.17*	0.62**	1												
HE	0.15*	0.01	0.23**	0.33**	1											
HO	0.23**	0.18**	0.48**	0.52**	0.26**	1										
IO	0.20**	0.32**	0.37**	0.41**	0.22**	0.51**	1									
BAS	0.54**	0.06	0.29**	0.17*	0.17*	0.22**	0.14*	1								
SW	-	-	-	-	0.11	0.01	-	-	1							
WP	0.05	0.16*	0.04	0.02	0.11	0.16*	0.11	0.08	0.44**	1						
PBF	-	-	-	-	0.12	0.04	-	-	0.87**	0.40**	1					
SLM	-	-	0.0	-	0.08	-	-	0.0	0.64**	0.29**	0.64**	1				
VFL	-	-	-	-	0.11	0.07	-	-	0.85**	0.40**	0.99**	0.61**	1			
VFA	-	-	-	-	0.06	0.08	-	-	0.77**	0.39**	0.93**	0.55**	0.95**	1		
TMF	-	-	-	-	0.09	0.02	-	-	0.83**	0.38**	0.93**	0.85**	0.92**	0.89**	1	
FM	-	-	0.0	-	0.09	0.05	-	-	0.82**	0.34**	0.93**	0.84**	0.91**	0.88**	1.00**	1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Abbreviations: AE: Appearance Evaluation, AO: Appearance Orientation, FE: Fitness Evaluation, FO: Fitness Orientation, HE: Health Evaluation, HO: Health Orientation, IO: Illness Orientation, BAS: Body Areas Satisfaction, SW: Subjective Weight, OWP: Weight Preoccupation, PBF: Percent Body Fat, SLM: Soft Lean Mass, VFL: Visceral Fat Level, VFA: Visceral Fat Area, TMF: Trunk Fat Mass, FM: Fat Mass.

Discussion

This study aimed to examine the association between body image subscales and body composition components in women attending a nutrition clinic. According to the results, there was a significant positive relationship between body composition components (i.e., body fat percentage, soft lean mass, visceral fat level, visceral fat area, trunk fat mass, and fat mass) and subjective weight as well as overweight preoccupation subscales.

Although the mean body mass index of the participants was 30.21 ± 5.17 kg/m², the findings indicated more investment in the ideal appearance, inappropriate overweight perception, and low body satisfaction among the studied women. Body image dissatisfaction has been reported in different body mass index categories and even among normal or overweight women. On the other hand, a higher mean score in the appearance orientation subscale was also a confirmation of low body satisfaction. The low mean score in the overweight preoccupation subscale may have been influenced by hiding the perceived imperfection. It has been shown that weight misperception, defined as the diversity between a person's realized and actual weight status, can affect health-based behaviors. In such situations, individuals have less healthy weight management behaviors and may adopt behaviors that lay them at higher risk for weight gain and weak general health status. It is worth mentioning that this is more prevalent in females, compared to males.

Body image dissatisfaction has long been considered a problem for young individuals. It has recently been reported that this problem persists throughout life and needs more attention in middle age. In the current study, the association between body composition components and subjective weight subscale was stronger than that between body composition components and overweight preoccupation subscale. Since women often overestimate their weight, their subjective weight subscale score

will increase, which leads to the stronger correlations between these two variables. It should be noted that social pressures, media, and family resulted in an imbalance in an individual's actual, perceived, and ideal weight, which has negative consequences for public health. Therefore, it is necessary to implement appropriate interventions to correct it.

Subjective weight and overweight preoccupation subscales correlated significantly with body fat percentage and visceral fat level. On the other hand, the lowest correlation was observed between these preoccupations and soft lean mass. According to the findings, it can be deduced that an increase in body fat percentage, visceral fat level, and visceral fat area leads to a reduction in appearance orientation among women. Therefore, different dimensions of body image were differentially associated with body composition components. The relationship between body fat percentage and body image dissatisfaction has also been obtained in previous studies. These results suggest that body composition components, the same as body mass index, may be reliable indicators of body image dissatisfaction among the studied population. Moreover, these associations indicate the effect of fat distribution and abdominal obesity on body image dissatisfaction. This result is consistent with the findings of other studies showing that body image dissatisfaction was significantly linked to inflammation processes and may promote the increased level of C-reactive protein and tumor necrosis factor-alpha.

These biomarkers are risk factors for many prevalent diseases; moreover, obesity, and especially abdominal obesity, is strongly correlated with the increasing level of these biomarkers. It seems that due to the increasing prevalence of obesity in Iran, increased body image dissatisfaction will be experienced in the coming years. Therefore, more attention needs to be paid to the correction of body composition and body image for health promotion.

Although the assessment of the relationship between body composition and body image is

one of the strengths of the present study, it has some limitations that should be taken into consideration. Due to the cross-sectional design of this study, it does not permit to investigate a causal relationship between variables. Moreover, the self-report questionnaires were completed in the nutrition clinic environment which is considered another limitation that may affect responses due to social desirability and environmental conditions. Furthermore, some participants reported the lengthy and time-consuming process of questionnaire completion, which could reduce the focus on the answers. Therefore, it is necessary to use objective and longitudinal observations in future studies to examine the interaction between anthropometric, body composition, emotional, and social aspects of body image.

Despite the limitations of the present study, it seems that body composition components may be reliable indicators of body image dissatisfaction among women. These findings also indicated the need for interventions to improve body composition, and consequently, body image dissatisfaction.

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Conflict of interest

The authors declare that they have no competing interests.

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