

How Does Obesity, Self-efficacy for Eating Control and Body Image in Women Affect Each Other?

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ABSTRACT

Objectives. This study evaluates the interaction of obesity, self-efficacy for eating control and body image on each other in women.

Material and Methods. This is a descriptive analytic study performed on 300 healthy married women. Our sample included three groups of individuals including those with normal, high and very high BMI levels, with 100 consecutive cases in each group; the participants were asked to complete three questionnaires: Demographic Information Questionnaire, Weight Efficacy Lifestyle Questionnaire (WEL), and Multidimensional Body-Self Relations Questionnaire (MBSRQ).

Outcomes. A higher BMI level was correlated with older age ($r=0.304$, $p<0.001$). The WEL score was significantly and inversely correlated with the BMI level ($r=-0.817$, $p<0.001$). Participants of normal, overweight and obese BMI groups had a mean WEL score of 168.78 ± 9.17 , 136.69 ± 22.23 and 68.57 ± 17.55 , respectively. All MBSRQ subscale scores were significantly correlated with the BMI level.

Conclusions. A higher BMI level is associated with older age, lower weight self-efficacy and higher body image dissatisfaction among women.

Keywords: obesity, self-efficacy, body image, body mass index, women.

INTRODUCTION

The prevalence of obesity as a chronic health condition is increasing globally. The reports indicate that the mean body mass index (BMI) of the world population is raising which makes obe-

sity a global epidemic, threatening health of people in both developed and developing countries (1-3). It is estimated that 36.9% of men and 38% of women worldwide have a BMI ≥ 25 kg/m² (2). Obesity significantly increases morbidity and mortality (4). In addition, the risk of many disorders including hypertension, hyperlipidemia, di-

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abetes mellitus, cardiovascular diseases, stroke, sleep apnea and some cancers (4-8) increases with raising BMI. It is also believed that a higher BMI is associated with psychiatric diseases (9, 10) and poor quality of life (11-13). With the increasing burden of non-communicable diseases globally, it is important to assess all health dimensions of overweight and obesity.

It is also highly important to consider the psychological distresses that obesity may pose to patients. Understanding the concerns of patients and taking appropriate actions to reduce the psychological distresses may facilitate the success of weight management programs (14, 15).

Obesity may impair psychological well-being by distorting the body image, an element of self-image (16-19). The term of body image is the picture individuals can imagine of the physical appearance of their body. The body dissatisfaction happens when a person has negative thoughts and feelings about their own body. However, not all overweight and obese people are affected by a poor body image. Age, gender, race and comorbid diseases are among the factors that may influence the vulnerability of obese individuals for having a poor body image (19, 20).

In Iran, as a developing country in the upper-middle income group, age-standardized adjusted estimates of BMI level ≥ 25 kg/m² is estimated to be 56.1% in men and 62.8% in women (21). Regarding the emerging problem of raising BMI in Iran's society, we aimed to investigate the interaction of obesity, self-efficacy for eating control and body image on each other in married and healthy women in Urmia, Iran. $\square$

MATERIAL AND METHODS

Study Design and Population

This is a descriptive analytic study (Code of ethics: IR.UMSU.REC.1393.246) conducted in six primary health care centers of Urmia, Iran. Between October 2016 and March 2017, 300 healthy married women who had received primary care in these centers were included in this study. Our sample included three groups of individuals: obese (BMI > 30), overweight ($25 < \text{BMI} < 30$) and subjects with a normal BMI ($18 < \text{BMI} < 25$), with 100 consecutive cases in each group. Using the formula of the study by Kashani *et al.*, the sample size for each group

was estimated to be 72 cases; however, 28 extra cases for each group were included (22).

A list of women from each center was obtained, and samples were randomly selected; therefore, in each center, the number of samples was proportional to the number of women in that center and after one was assigned a number in the list of women, the random numbers were used for random selection.

Inclusion criteria were age between 18-49, ability to read and write, being married, lack of visible physical defect, lack of known physical and mental illness according to the participants' statement, not being pregnant, not being addicted, not having breastfeeding.

Study details were discussed with each woman and all of them became aware that their personal information would remain confidential.

Study variables

Demographic information questionnaire: age, education status, socioeconomic status, working status, number of children.

Weight Efficacy Lifestyle Questionnaire (WEL) (Clark *et al.*, 1991) includes 20 items, in which respondents rate their confidence to resist eating in certain situations on a 10-point Likert scale ranging from 0 (not confident) to 9 (very confident). This questionnaire yields five subscales, including negative emotions, availability, social pressure, physical discomfort, and positive activities. Five subscale scores as well as total score were calculated for each participant in our study sample. Internal consistency of the five subscales has ranged from .70 to .90. External validity of the WEL has also been supported, as changes in WEL scores were observed during obesity treatment. In the Persian version of this scale, reliability was evaluated by test-retest method and validity was assessed using different methods such as factor analysis, principal component analysis, items correlation with the total score and with Shrer general self-efficacy questionnaire and external validity. Test-retest reliability coefficient of WEL was 0/91. Using factor analysis revealed and confirmed five subscales of original WEL. Furthermore, the correlation of five factors with the total scores, the significant correlation of WEL with total scores of Shrer general self-efficacy questionnaire ($r=0.62$ $p<0.001$, all indicated the questionnaire's efficiency (23).

Multidimensional Body-Self Relations Questionnaire (MBSRQ). The revised version of MBSRQ questionnaire (24) contains 46 items exploring cognitive, behavioral and affective aspects of body image. The six subscales of MBSRQ include appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, subjective weight, body-areas satisfaction, which are evaluated by answering 5-point Likert scale based questions (strongly disagree = 1 to strongly agree = 5). Subscale scores were calculated based on the answers provided by each of the participants of our study sample. In the Farsi version of this scale, Cronbach's alpha coefficients for AE, AO, FE, FO, SW, BAS subscales were reported as 0.71, 0.78, 0.66, 0.76, 0.80, and 0.74 in a sample of 385 students, respectively; these values indicated the internal consistency of the questionnaire. Correlation coefficients between the scores at two points in time (with a two-week interval) were as follows: 0.78 for appearance evaluation, 0.75 for appearance orientation, 0.71 for fitness evaluation, 0.69 for fitness orientation, 0.84 for subjective weight, and 0.89 for body part satisfaction; these values indicate the high reliability of this scale (25).

In a study performed by Kash in 1994, cited by Asar Kashani *et al*, internal consistencies of appearance evaluation and body part satisfaction were 88% and 77%, respectively. Also, the validities of appearance evaluation and body part satisfaction were 81% and 86%, respectively; it should be mentioned that validity was evaluated twice (22).

Statistical analysis

SPSS statistical package version 16 (SPSS, Chicago, IL) was used. The categorical data were presented as frequency and percent and com-

pared using the chi-square test or Fischer test as indicated. Continuous variables were presented as mean $\pm$ standard deviation. One-way ANOVA between-groups analysis of variance was conducted to compare WEL as well as MBSRQ scores among three BMI groups. Tukey HSD method was used for post-hoc comparisons. The relationship between BMI level, WEL and MBSRQ scores were evaluated using Pearson product-moment correlation coefficient. Partial correlation was used to control the effect of age and BMI. The level of significance was set at 0.05. $\square$

OUTCOMES

Baseline characteristics and comparison of demographic characteristics among three BMI groups

The mean age of participants was 32.69 ± 7.61 years and the mean BMI level was 27.21 ± 5.01 kg/m². The mean WEL score and mean MBSRQ score in our study sample were 124.68 ± 141.5 and 164.90 ± 17.37 , respectively.

The mean BMI level of the normal, overweight and obese groups were 21.37 ± 2.24 , 27.57 ± 1.54 and 32.71 ± 1.88 kg/m², respectively. Participants of higher BMI group were significantly older. The mean age of participants was 30.82 ± 7.26 , 31.19 ± 6.86 and 32.71 ± 1.88 years in normal, overweight and obese groups, respectively ($P < 0.001$). Higher BMI level was correlated with older age ($r = 0.304$, $p < 0.001$).

Comparison of weight efficacy lifestyle (WEL) score in three BMI groups

The WEL score was significantly and inversely correlated with BMI level ($r = -0.817$, $p < 0.001$). Participants of normal, overweight and obese BMI groups had mean WEL score of 168.78 ± 9.17 ,

	Normal	Overweight	Obese	P-Value	*r	P-Value
Negative emotions	33.92 $\pm$ 3.31	28.99 $\pm$ 4.69	14.82 $\pm$ 4.25	<0.001	-0.766	<0.001
Availability of food	32.74 $\pm$ 3.60	27.71 $\pm$ 4.13	14.76 $\pm$ 5.11	<0.001	-0.744	<0.001
Social pressure	33.78 $\pm$ 1.97	27.78 $\pm$ 3.63	13.03 $\pm$ 4.26	<0.001	-0.825	<0.001
Physical discomfort	34.39 $\pm$ 2.42	27.07 $\pm$ 6.44	14.61 $\pm$ 4.55	<0.001	-0.768	<0.001
Positive activities	33.95 $\pm$ 3.37	25.14 $\pm$ 5.47	11.35 $\pm$ 4.07	<0.001	-0.824	<0.001
Total score	168.78 $\pm$ 9.17	136.69 $\pm$ 22.23	68.57 $\pm$ 17.55	<0.001	-0.817	<0.001

TABLE 1. Comparison of three groups regarding Weight Efficacy Lifestyle (WEL) subscale and total scores and correlation of body mass index level with each subscale

*r denotes Pearson correlation coefficient r value

	Normal	Overweight	Obese	P-Value	*r	P-Value
Appearance evaluation	4.13±0.83	4.21±0.64	3.61±0.82	<0.001	-0.269	<0.001
Appearance orientation	3.74±0.87	3.51±0.87	3.28±0.72	0.001	-0.191	0.001
Fitness evaluation	3.27±1.25	3.23±1.18	2.87±0.87	0.007	-0.145	0.012
Fitness orientation	3.35±0.81	3.28±0.78	3.01±0.75	<0.001	-0.130	0.024
Subjective weight	1.53±0.64	3.28±0.54	4.45±0.69	<0.001	0.820	<0.001
Body area satisfaction	4.57±0.63	4.30±0.71	3.65±0.43	0.023	-0.474	<0.001

TABLE 2. Comparison of three study groups regarding the Multidimensional Body-Self Relations Questionnaire subscales and correlation of the BMI level with each subscale

*r denotes Pearson correlation coefficient r value

136.69±22.23 and 68.57±17.55, respectively, which were significantly different among three groups ($P<0.001$). As shown in Table.1, the score for all subscales of WEL questionnaire were also significantly different among participants of three BMI groups. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for all subscales were significantly different between all three groups.

Comparison of multidimensional body-self relations questionnaire (MBSRQ) score in three BMI groups

As shown in Table 2, all MBSRQ subscale scores were significantly correlated with the BMI level. Except subjective weight score, all other subscales were inversely correlated with BMI level. Subjective weight score and body area satisfaction score had the strongest correlation with the BMI. Although, all subscales of MBSRQ score were significantly different between three groups in ANOVA test (Table 2), post-hoc comparisons using the Tukey HSD test indicated that the normal and overweight groups did not differ in terms of appearance evaluation, appearance orientation, fitness evaluation and fitness orientation domains. In addition, overweight and obese group did not differ in appearance orientation and fitness evaluation domains.

Correlation of weight efficacy lifestyle score and Multidimensional Body-Self Relations score in each BMI group:

Considering all study population, total WEL score was significantly correlated with all MBSRQ subscales after controlling for BMI and age in partial correlation analysis. As illustrated in Table 3, appearance evaluation, appearance orientation and body area satisfaction subscales were positively and fitness evaluation, fitness orientation and subjective weight were inversely correlated with the total WEL score. □

DISCUSSION

According to the results of our study, a higher BMI level was associated with older age, lower weight efficacy lifestyle score and higher body image dissatisfaction among women. The correlation of BMI with weight efficacy lifestyle score is stronger than the correlation with multidimensional body-self relations questionnaire subscale scores.

As our study indicates, normal weighted women have significantly higher WEL score than overweight and obese women. WEL score was inversely correlated with the BMI level even after controlling for age. Similar results were found in the study investigating obese individuals who

	Total WEL	Appearance evaluation	Appearance orientation	Fitness evaluation	Fitness orientation	Subjective weight
	Pearson correlation	0.362	0.317	-0.127	0.011	-0.765
	P-Value	<0.001	<0.001	0.028	0.849	<0.001
Controlling for age and BMI*	Pearson correlation	0.253	0.276	-0.424	-0.159	-0.290
	P-Value	<0.001	<0.001	<0.001	0.006	<0.001

TABLE 3. Correlation of total weight efficacy lifestyle (WEL) score with Multidimensional Body-Self Relations Questionnaire subscale scores with and without controlling for age and body mass index

*BMI: Body Mass Index

were seeking weight management programs (26). It should be noted that our study sample included women with no intention for weight-loss at the time of the survey. This emphasizes the role of weight efficacy in body weight status in the long run, which is also highly important for maintaining weight after weight-loss programs. Accordingly, behavioral therapy for improving weight efficacy is shown to higher the success rate for maintaining body weight after participation in weight loss programs (27).

In our sample, all subscales of WEL questionnaire were strongly correlated with the BMI level, social pressure and engaging in positive activities had the strongest correlation with BMI level. Navidian *et al* reported similar findings in a different part of our country. However, in their study, negative emotions and physical discomfort did not differ among BMI groups (28).

Regarding the association of multidimensional body-self relations questionnaire subscales with the BMI level, appearance evaluation and orientation as well as fitness evaluation and orientation were significantly and inversely correlated with the BMI level, though the correlation was not strong. We found the strongest association in subjective weight and body area dissatisfaction subscales. Studies evaluating the body satisfaction in patients seeking weight loss programs, found higher prevalence of body image disorders in these population (20, 29). On the other hand, body image dissatisfaction was as-

sociated with poor outcomes after engaging in weight loss programs and behavioral interventions for body dissatisfaction in weight management programs have revealed promising results (30). Body image dissatisfaction was related with eating disorders, denoting the relation of eating regulatory behaviors with self-perception (31). Body image dissatisfaction may also increase the risk depression, which further lower self-efficacy in general and eating efficacy in particular (31, 32).

Our study suggest, lower weight efficacy was associated with lower appearance evaluation and orientation as well as lower body area satisfaction even after controlling for age and BMI level. In contrast, lower weight efficacy was related to higher fitness orientation and evaluation. □

CONCLUSION

Higher BMI level is associated with older age, lower weight self-efficacy and higher body image dissatisfaction among women. □

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