INVESTIGATING THE RELATIONSHIP BETWEEN THE STRATEGIES OF MULTIDIMENSIONAL BODY-SELF RELATIONS WITH THE WEIGHT LOSS IN OBESE AND OVERWEIGHT WOMEN UNDER THE REGIMEN TREATMENT

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ABSTRACT

The main aim of this study was to investigate the relationship between the Strategies of Multidimensional Body-Self Relations with the weight loss in obese and overweight women under the regimen treatment. Eighty five 18-60 year-old women participated in this study. The participants were asked to respond to the Multidimensional Body-Self Relations Questionnaire before starting the treatment. The obtained results indicate that there is a significant correlation between the rate of weight loss with the strategies of Multidimensional Body-Self Relations. Furthermore, the results suggest that the rate of weight loss has a significant relationship with marital status, type of obesity, and regimen history. Based on the findings of this research it can be concluded that the physiological factors play the roles in women's weight loss along with the psychological factors.

KEYWORDS: Multidimensional Body-Self Relations, weight loss, regimen treatment, obesity, overweight

1. INTRODUCTION

Overweight and obesity refer to too much body fat or body mass according to the height and enhances the risk of disease among people (Kalarchian, et al, 2005). Except for the weight, the body mass index (BMI) is another technique which has been widely accepted for defining the obesity and is calculated from dividing the weight in kilogram by the square of height in meter (Williamson et al, 2006).

The obesity is a major global health problem which has been enhanced especially in developing and developed countries in recent decades due to the changed eating habits and activity level and is now considered as the largest health-threatening problem in these countries (Cooper and Fairburn, 2001). The World Health Organization (WHO) has declared the obesity as an Epidemic Phenomenon due to its growing process (Guerrieri et al, 2007). According to the last estimation
of WHO, 1.6 Billion adults are overweight and more than 400 million people are obese in the world. Iran Ministry of Health and Medical Education (MOHME) has reported that the prevalence of obesity is growing in Iran. The prevalence of overweight and obesity in Iran is 32% and 18.1% respectively and about 60% of adults in cities are overweight or obese (Janghorbani, 2007). It is worth noting that the prevalence of overweight in Iranian Women is more than the American ones and the prevalence of obesity is almost the same between the Iranian and American Women.

Despite a large amount of information about the physical variables of obesity, there is a little information about the psychological variables of obesity. The conducted studies on obesity declare that the mood and anxiety disorders are higher in people with obesity. In addition to the depression and anxiety, the body image and poor self-concept are other psychological complications of obesity (Myers and Rosen, 1999). The obesity enhances the individual vulnerability to social events (Allon, 1982).

Other studies indicate that apparently any kind of emotional reactivity increases the food intake in some of obese people and the change in emotional eating tendencies is a strong predictor of weight loss result. It seems that the emotional stress (anger, anxiety and depression) usher eating in some of obese people under the regimen treatment. On the other hand, the evidence indicates that the cognitive emotion regulations play an important role in increasing or decreasing the emotional and behavioral problems after dealing with the stressful events. Regulating the emotion through the individuals' thoughts and cognition is associated with their lives and helps to manage or regulate the emotions or feelings at the same time or after the stressful or threatening events. In fact, the cognitive emotion regulations strategies are the actions which reflect the individual ways of coping with stressful situations or mishaps (Garnefski and Kraaij, 2007). People utilize various cognitive strategies in coping with stressful situations and opportunities to maintain their mental and emotional health (Garnefski, Koopman, Kraaij, and Cate, 2009).

2. RESEARCH LITERATURE

2.1 THEORETICAL PRINCIPLES

Overweight and obesity: These are defined based on the body mass index (BMI) which is calculated through dividing the weight in kilogram by the square of height in meter. The BMI Overweight is from 25 and 29 and BMI obesity is from 30 and above.

Regimen Treatment: In this study, it means visiting a nutritionist who takes the individual daily Dietary Recall and designs a regimen in which 15% of daily calories is reduced and 30 to 60 minutes of daily walk is considered for each person.

Body Image: Body image is a multidimensional and complex psychological structure including the self perceptions associated with the body, and the self attitudes including the thoughts, beliefs, feelings and behavior. Inconsistency between the ego- real and ideal is the assessment aspect of body image (Cash, 2004). In this study, the body image structure is measured based on
the individual score in Multidimensional Body- Self Relations Questionnaire (MBSRQ) (Besharat, 2008).

2.2 RESEARCH LITERATURE

Both men and women focus on body image, but it has a special place among women since the current social standards extremely focus on the tendency towards being slim for beauty in women. Numerous studies have referred to the considerable dissatisfaction with the body size and shape among women (Rodin, Silberstein, Striegel-Moore, 1984; Tiggemann, 2004). Therefore, the women are simply vulnerable to the predisposing factors of body image distress. (Schwartz and Brownell, 2004)

Accordingly, Wilson et al. (2005) have indicated that the BMI is the best objective predictor of disordered eating and body image. The negative body image is a structure exosted in problems such as depression, obesity and range of compulsive eating (Levine and Piran, 2004). This range covers different compounds and some degrees of Binge-eating in addition to the harmful forms of weight loss such as the limiting diets and self-forcing to vomiting the food. At the lower end of range, there are the symptoms including the Anorexia nervosa, Bulimia Nervosa, and binge-eating disorder which not only lead to the serious and widespread problems, but also their effective treatment is very difficult and less effective. In general, the negative body image is an independent predictor of compulsive eating (Levine and Piran, 2004; Stice, 2002).

According to the research by Sarwer et al (2003), the defect in body image is one of the most common psychological problems in overweight women in public health perspective. The physical appearance is an important part of body image because it is the first source of information applied by the other individuals for social interaction with person. Therefore, this factor plays the major role in determining the beliefs and attitudes about the individual body. The psychological effects of include factors of body image includes the perceptional, transformation and cultural-social factors.

Amidi, Ghofranipour and Hosseini (2006) also indicated in a research that there is a significant relationship between the body mass index and body image dissatisfaction, thus the increased BMI will lead to the lower body image satisfaction. They also pointed out that most of the girls were dissatisfied with their appearance despite the normal weight and height.

Teixeira, Going, Sardinha, and Lohman (2005) have indicated that there is a correlation between the psychological factors and the lack of completed treatment in management of weight loss. Undoubtedly, as the result of several factors, the people receive different results while attempting to lose weight; a part of these successes and lack of successes is affected by the treatment method and the other part by the psychological factors. The mental characteristic such as poor body image and depression are along with the weak treatment results.

3. MATERIALS AND METHODS

This research seeks to investigate the Multidimensional Body- Self Relations in predicting the weight loss in overweight and obese women under the treatment regimen. Therefore, this study is
non-experimental according to its subject and objectives and has the correlative research design. The correlative research design is a kind of descriptive designs in which the relationship between variables is examined.

3.1 RESEARCH METHOD

According to the routine procedure of nutrition office, the height, weight (calculated BMI) and daily dietary recall were taken from 85 women attending a nutritionist's office by nutrition experts before the treatment of obesity during the winter 2011 and they were asked to fill the forms about the medical information regarding the presence or absence of diseases or the use or disuse of a series of drugs in order to investigate if there was a disease or drug intervention in the treatment and then the regimen treatment was provided proportional to that drug or disease. The research sample was selected from those who had no disease or intervening drug.

Afterwards, before entering those samples into the treatment process, the Multidimensional Body- Self Relations Questionnaires were given to them to respond. After responding to the questionnaires, they visited the nutritionist and received the regimen based on the dietary recall and it was 15% less than their previous daily calorie and they also were recommended walking from 30 to 60 minutes per day.

After 4 months of treatment, their weight loss was calculated in kilogram compared to the beginning of treatment.

STATISTICAL METHODS OF DATA ANALYSIS

In this study, the descriptive statistics, namely, the percentage, frequency, mean and standard deviation, and the inferential statistics, namely, Pearson and Spearman correlation coefficients, Chi-square test, and stepwise regression analysis are utilized to analyze data. SPSS software version 18 is applied to respond to all stages.

3.2 STATISTICAL POPULATION

The statistical population of this study includes the overweight and obese 18-60 year-old women visited the nutritionists' offices in Tehran. The studied sample consists of 85 overweight and obese women visited one of the nutritionists, who have numerous visitors, in Tehran and they are voluntarily sampled.

The subjects' inclusion and exclusion in this study was according to the following criteria: The women who were between 18 and 60 years old, overweight or obese, visited the nutritionist for regimen treatment, not in pregnancy or lactation period, had no specific medical or psychological disease interfering the treatment, and not consume drugs interfering the treatment process.

3.3 VALIDITY AND RELIABILITY OF QUESTIONNAIRE

Multidimensional Body- Self Relations Questionnaire (MBSRQ)- It is a 46-question test designed by Cash (1997) to assess the Multidimensional Body- Self Relations. The questions of test measure six Body- Self Relations dimensions, namely, the appearance evaluation,
appearance orientation, fitness evaluation, fitness orientation, subjective weight, and body areas satisfaction according to the five-point Likert scale from 1 (totally disagree) to 5 (totally agree) points. The psychometric characteristics of Multidimensional Body-Self Relations Questionnaire are confirmed in foreign studies (Cash, 1997). In Persian form of this scale (Besharat, 2008), the Cronbach's alpha for the questions of each subscale of a 215-student sample was equal to 0.88, 0.85, 0.83, 0.79, 0.91, and 0.94, respectively, indicating the proper internal consistency of scale. The correlation coefficients for 67 subjects' scores were measured two times with an interval of two weeks equal to $r=0.78$ for appearance evaluation, $r=0.75$ for appearance orientation, $r=0.71$ for fitness evaluation, $r=0.69$ for fitness orientation, $r=0.84$ for subjective weight, and $r=0.89$ for body areas satisfaction, thus the test-retest reliability of scale was satisfactory. The concurrent validity of Multidimensional Body-Self Relations Questionnaire was measured through concurrent implementation of General Health Questionnaire and the Mental Health Inventory about the subjects (Besharat, 2007). The results of Pearson correlation coefficient declared that there was a significant negative correlation from $r=-0.65$ to $r=-0.72$ between the scores of six dimensions of Multidimensional Body-Self Relations Questionnaire with the total score of General Health. The correlation coefficients were from $r=0.64$ to $r=0.77$ between the scores of six dimensions of Multidimensional Body-Self Relations Questionnaire with the scores of psychological well-being, and from $r=-0.62$ to $r=-0.71$ with the scores of psychological distress at the significance level of $p<0.001$. These results confirm the concurrent validity of Multidimensional Body-Self Relations Questionnaire.

4. DATA ANALYSIS

4.1 RESEARCH HYPOTHESES TEST

<table>
<thead>
<tr>
<th>TABLE 1: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE EDUCATIONAL LEVEL AND WEIGHT LOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pearson chi-square</strong></td>
</tr>
<tr>
<td>Educational Level</td>
</tr>
</tbody>
</table>

Table (1) shows the results of Chi-square test for investigating the relationship between the educational level and weight loss. As shown, this difference is not significant.

<table>
<thead>
<tr>
<th>TABLE 2: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE AGE AND WEIGHT LOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pearson chi-square</strong></td>
</tr>
<tr>
<td>Age</td>
</tr>
</tbody>
</table>

Table (2) shows the results of Chi-square test for investigating the relationship between the age and weight loss. As shown, this difference is not significant.
### TABLE 3: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE TYPE OF OBESITY AND WEIGHT LOSS

<table>
<thead>
<tr>
<th>Type of obesity</th>
<th>Pearson chi-square</th>
<th>Significance level</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>140.26</td>
<td>0.048</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Table (3) shows the results of Chi-square test for investigating the relationship between the type of obesity and weight loss. As shown, this difference is significant.

### TABLE 4: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE ONSET OF OVERWEIGHT AND WEIGHT LOSS

<table>
<thead>
<tr>
<th>Onset of overweight</th>
<th>Pearson chi-square</th>
<th>Significance level</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>170.72</td>
<td>0.76</td>
<td>0.57</td>
</tr>
</tbody>
</table>

Table (4) shows the results of Chi-square test for investigating the relationship between the onset of overweight and weight loss. As shown, this difference is not significant.

### TABLE 5: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE EMPLOYMENT STATUS AND WEIGHT LOSS

<table>
<thead>
<tr>
<th>Employment status</th>
<th>Pearson chi-square</th>
<th>Significance level</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed or housewife</td>
<td>40.35</td>
<td>0.36</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Table (5) shows the results of Chi-square test for investigating the relationship between the employment status (employed or being a housewife) and weight loss. As shown, this difference is not significant.

### TABLE 6: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE BACKGROUND IN REGIMEN AND WEIGHT LOSS

<table>
<thead>
<tr>
<th>Background in regimen</th>
<th>Pearson chi-square</th>
<th>Significance level</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>113.97</td>
<td>0.000</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Table (6) shows the results of Chi-square test for investigating the relationship between the background in regimen and weight loss. As shown, this difference is significant.
### TABLE 7: RESULTS OF THE CHI-SQUARE TEST FOR EXAMINING THE RELATIONSHIP BETWEEN THE MARITAL STATUS AND WEIGHT LOSS

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Pearson chi-square</th>
<th>Significance level</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45.36</td>
<td>0.19</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Table (7) shows the results of Chi-square test for investigating the relationship between the marital status and weight loss. As shown, this difference is significant.

### 4.2 RESEARCH MODEL ESTIMATION

### TABLE 8: R, R² AND ADJUSTED R² FOR PREDICTING THE RATE OF WEIGHT LOSS BASED ON THE MULTIDIMENSIONAL BODY-SELF RELATIONS INDEX

<table>
<thead>
<tr>
<th>Model</th>
<th>Multivariate correlation coefficient (R)</th>
<th>Coefficient of determination (R²)</th>
<th>Adjusted R²</th>
<th>Standard error of estimate</th>
<th>Change in R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.66</td>
<td>0.4350</td>
<td>0.425</td>
<td>3.76</td>
<td>0.4350</td>
</tr>
<tr>
<td>2</td>
<td>0.72</td>
<td>0.516</td>
<td>0.500</td>
<td>3.51</td>
<td>0.516</td>
</tr>
<tr>
<td>3</td>
<td>0.75</td>
<td>0.557</td>
<td>0.534</td>
<td>3.38</td>
<td>0.557</td>
</tr>
</tbody>
</table>

Table 1 shows the results of stepwise regression analysis for predicting the scores of weight loss rate based on the Multidimensional Body- Self Relations index. As shown, the regression correlation coefficient is obtained equal to 0.66 and the coefficient of determination 0.435 in model 1 by inclusion of the "fitness orientation" component as the predictive variable. In other words, it can be concluded that 43% of changes in the scores of weight loss rate can be predicted by fitness orientation component. In model 2, the "subjective weight" component is included in the regression equation as the predictive variable in addition to the "change in attention" component; thus the regression correlation coefficient is obtained equal to 0.72 and the coefficient of determination 0.52. In this case, it can be concluded that 52% of changes in the scores of weight loss rate can be predicted by fitness orientation and subjective weight components. In model 3, the body areas satisfaction component is also included in the equation in addition to both former components; thus the regression correlation coefficient is obtained equal to 0.75 and the coefficient of determination 0.56. In other words, 56% of changes in the scores of weight loss rate can be predicted by fitness orientation, subjective weight and body areas satisfaction components.

### TABLE 9: REGRESSION COEFFICIENTS FOR PREDICTING THE SCORES OF WEIGHT LOSS RATE BASED ON THE MULTIDIMENSIONAL BODY-SELF RELATIONS INDEX

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable coefficient (B)</th>
<th>Standard error of coefficient</th>
<th>Standardized coefficient (β)</th>
<th>t statistic</th>
<th>t Probability</th>
</tr>
</thead>
</table>

(Please note that the table is not fully visible in the provided text and might contain placeholders for specific values that are not shown.)
Table (9) shows the regression coefficients for predicting the scores of weight loss rate based on the Multidimensional Body-Self Relations index. Based on the results listed in the table, from the Multidimensional Body-Self Relations components, three components, namely, the fitness orientation, subjective weight, and body areas satisfaction, are the appropriate predictors for the scores of weight loss. Based on these results, the prediction equation is as follows:

\[
\text{reduce} = -17.59 + 0.269MBRSQFO + 0.536MBRSQSW + 0.243MBRSQBAS
\]  

EXPLAINING THE RESEARCH HYPOTHESES ABOUT THE CORRELATION BETWEEN THE WEIGHT LOSS AND MULTIDIMENSIONAL BODY-SELF RELATIONS

Based on the results of correlation matrix, there is a positive significant correlation between the samples’ weight loss and all subscales of Multidimensional Body-Self Relations Questionnaire:

1. There is a significant correlation between the appearance evaluation and weight loss. \( R = 0.38, \alpha < 0.05 \)
2. There is a significant correlation between the appearance orientation and weight loss. \( R = 0.39, \alpha < 0.05 \)
3. There is a significant correlation between the fitness evaluation and weight loss. \( R = 0.22, \alpha < 0.05 \)
4. There is a significant correlation between the fitness orientation and weight loss. \( R = 0.51, \alpha < 0.05 \)
5. There is a significant correlation between the fitness orientation and weight loss. \( R = 0.39, \alpha < 0.05 \)
6. There is a significant correlation between the subjective weight and weight loss. \( \alpha > 0.05 \)

These results suggest that the people, who are more satisfied with their appearance and fitness and different parts of their body (height, hair, etc) at the beginning of treatment and spent more time to improve their appearance and fitness, will achieve greater weight loss.
The results of this study are consistent with those studies which consider the body image as the positive predictors in weight loss programs, so that the people gain more weight loss as the result of more desirable body image (Teixeira et al, 2002; 2004)

4.3 SUGGESTIONS FOR FUTURE STUDIES

1. Since the predictive variables in weight loss can be associated with the type of treatment, it is suggested investigating the variables studied in this research in other types of treatment (sports medicine, psychological treatments, medication and surgery) as well as comparing the results.

2. As stated in some of the studies, there is a difference between the obesity and overweight in some of the predictors. On this basis, it is it is suggested investigating two groups of overweight and obesity separately in order to achieve more accurate results through comparing them.

3. To control the variability of body image structure, it is suggested evaluating before and after treatment in future studies.

4. To eliminate bias in examining only those who have completed the treatment, the future studies can compare the results in two groups of out-of treatment and during-treatment samples.

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