

The Effectiveness of Mindfulness-Based Eating Awareness Training (MB-EAT) on Perceived Stress and Body Mass Index in Overweight Women

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Abstract

Introduction: Being overweight is a serious threat to women's health, imposing enormous costs on the individual, national and global levels. The purpose of this study was to evaluate the effectiveness of mindfulness-based eating awareness training on perceived stress and body mass index in overweight women in Tehran.

Methods: The research design is experimental with pre-posttest and control group. The statistical population consisted of all women referring to health center in Niavaran, Tehran in the first trimester of 2019 due to being overweight. They were replaced randomly. Mindfulness group training was conducted in 8 sessions once a week. Before and after the intervention, participants completed a perceived stress scale and their BMI was calculated.

Results: Results of covariance analysis showed that mindfulness training significantly decreased perceived stress ($p<0.05$) and also significantly decreased body mass index in the experimental group compared to the control group ($p<0.05$).

Conclusion: Given these findings, it can be said that in addition to the usual therapeutic treatments for overweight, psychological training for women can play an effective role in their health beliefs and behaviors.

Declaration of Interest: None

Key words: Perceived stress, Mindfulness approach, Overweight women.

Introduction

Being overweight is a physiologic psychological problem that not only the biological factors and physical risk but also psychological factors play significant role in incidence and strengthening of it (1). Prevalence of obesity and overweighting is rising at a warning rate in Iran as the national investigation in various provinces has shown there is an abdominal obesity in 43% of women and 9% of men and also 28% of city residents and 23% of village residents (2). According to Braden (3),

simultaneity of obesity with other diseases is tripled from 1999. This means the obesity caused physical diseases such as cardiovascular diseases, diabetes, joints injury, lumbago, hypertension and various cancers (3).

In the past, the reason for obesity was considered from medical and physical perspective, but in last decade psychological reason of obesity and overweight was developed. Some psychological consequences are increasing isolationism (4), decreasing the quality of

life (5), and the most important is decreasing the level of self-esteem (6).

On other hand, stress is inevitable and inclusive phenomenon in today's life. The concept of perceived stress that derived from Lazarus and Folkman (7) is about the role of assessment in stress process. Furthermore, including the status that reflects general assessment of the difficulty of personal and environmental challenges (8). Perceived stress is a reflection of body to some changes that need compatibility or emotional, mental or physical response. According to Lazarus (9) findings, the process of stress is created by interpreting the event that imposes some pressure on individual. This interpretation of stressful event shows the concept of assessment that recognized threatening or safe situation (10). The assessment of stress level and methods of confronting with it, is important for an individual that coping with stressful situation. High level, long term and consistent stress can conduce incompatibility, emotional and physical problems as self-dissatisfying, failure feeling, anxiety, severe tension, frustration, depression and undesirable quality of life. Thus, how people confront with stress is more important than severity and frequency of it. People apply different methods to confront with stress; and use of psychological therapies is so important for decreasing the level of stress that leads to other disorder in their life (11).

It is important to point out that the amount of adipose tissue in women being overweight is high (12). Body Mass Index (BMI), is the first step to determine the obesity and overweight. People with 25 to 30 BMI suffered from being overweight. In general 39% of adults are overweight and this problem is more prevalent in women. The method of BMI is simple and

trustable and it is in relation with body fat mass (13). According to Delavari et al., 28.6% of Iranian have overweight. This shows warning documents in prevalence of overweighting in Iran especially among women (14).

On the other hand, change is necessary in behaviors and beliefs for the treatment of overweight and obesity. There are various factors in psychology that impact on achievement of changing healthy behavior (15). In general, there are four major evidence-based approaches for treating obesity, including diet therapy, pharmacotherapy, surgery and psychotherapy. It is believed that the use of psychotherapies caused decreasing similar psychological issues or obesity that facilitates weight loss in long term. Recently, third wave therapies have come into the field of obesity and overweight; the mindfulness therapy is the pioneer of this wave (15).

The mindfulness therapy approach is defined as the state of arousal and awareness of what is happening in the present moment (16). This is purposeful attention with acceptance without judgment about recent ongoing experiences. The mindfulness helps us to recognize that negative emotions may happen but they are not a permanent component of personality. Also, it prepares opportunity for an individual to response to events with contemplation rather than no thought (17). Studies of mindfulness show that this intervention has positive impacts on increasing mental health, decreasing mental symptoms and emotional reactivity, improving emotional and behavioral regulation and bringing vitality (15). The method of mindfulness-based eating awareness training (MB-EAT), is a therapy program which forms the theoretical basis

of disorder pattern, which also has a holistic approach to understand eating disorders and it is a combination of key aspects of three radical theories of chronic diet, affective regulation, pattern of attitudes, as well as components of the cognitive-behavioral approach (18). This program includes regulated exercises of mindfulness and it is up to the individual to improve his/her own capacity to pay attention to external and internal stimuli and to spread awareness of experience of the present; and it is a way of training attention for increasing attention of individuals from automatic patterns and then releasing from undesirable reactions. At the same time, this program is a way to increase the awareness of the healthier aspects of potential performance against the physiological symptoms of starvation and satiety, and to encourage this awareness to be used wisely to eat and to choose food (19, 20).

These findings indicated the importance of overweight and obesity and its associated complications and also showed the limited effectiveness of radical treatment programs. Therefore, it prompted the researcher to investigate the effectiveness of mindfulness therapy approach on adherence to treatment and BMI of overweight women.

Method

The research design is experimental with pre-test, posttest and control group. Variables of research are as follow: Independent variable was the mindfulness training approach, and dependent variables were adherence of treatment, BMI, and control variable were gender (women), and age (25-50 years).

The statistical population consisted of all women referred to health center in

Niavaran, Tehran in the first trimester of 2019 due to being overweight. From this population, 30 women between the age of 25-50 years who have a high school diploma degree and up, were selected by random and they were replaced into two experimental and control groups (15 subjects each), randomly. Experimental group (mindfulness training) was conducted in 8 sessions once a week. Before and after the intervention, participants completed a perceived stress scale and their BMI was calculated.

Criteria of entering to groups include: female gender, age of 25-50 years, no medication for weight loss, no pregnancy or menopause, no bulimia nervosa (based on clinical interview), no drug or alcohol use, not having any diseases related to hormones involved in metabolism such as diabetes, hyperthyroidism or hypothyroidism; and individual satisfying of attending in research. Also exiting criteria are absence for more than two session, physical illness during sessions and unwillingness of continuing sessions.

Instruments:

Perceived stress scale (PSS):

This scale is created by Cohen, Kamrak and Mermelstien (21), and includes 14 phrases that is scored by Likert spectrum (0-4 points). The range of individual's scores is between 0 and 56; and higher scores show higher PSS. The validity and reliability of this scale is reported by using Cronbach's alpha that is between 0.74 and 0.93.

Body mass index (BMI):

The participants were weighted using digital scale and measured their height then placed numbers in BMI formula (weight in kilogram divided to square of height in meter).

Mindfulness-Based Eating Awareness Training (MB-EAT)

This treatment method is created by integrating mindfulness therapy and cognitive behavioral therapy and guided eating meditation to

decrease the stress; this method applied for problems with body shape, weight, and eating process such as appetite and the like. It is designed to create and maintain the internal

changes (22). For the first time in Iran Hampa (23), translated and standardized this interference. This is considered in 8 session of 90 minutes as below:

Table 1. The training steps and the contents of the training sessions of (MB-EAT)

Steps	The contents of the training sessions
1	Introductin and relationship building, determining group rules, introducing mindfulness and mentioning differences between mindfulness and meditation, performing the technique of eating raisin, awarness of breathing technique
2	Discussing about automatic behaviors in routine activitis specially. during eating, investigating obstacles in moment experience. Introducing mindfulness exercises: formal, informal and guided. Internal wisdom: mindful eating of chalenging food (sweets). External wisdom: training the amount of calories and recording daily calories, introducing informal exercises based on mindful eating practice.
3	Training and performing body scan technique, investigating habitual eating, Emotional and inhibited eating, discussing about the way of helping mindfulness to decrease this kind of eating, describing kinds of hunger, introducing the practice of discovering the distinction of physical hunger versus emotional hunger, introducing the practice of imagining thought cloud to decrease craving, introducing the practice of awareness of craving.
4	Describing physical satiety and emotional satiety, practicing the experience of feeling satiety,fullness or drinking water,consciously eating challenging food (chocolate), external wisdom: 500 calories challenge.
5	Describing and performing the practice of healing self touch, introducing chain reaction, external wisdom: encouraging more activities with pedometer and changing the scedual of daily activities.
6	Discussing about conscious vegetables and fruities selection, performing self-acceptance meditation, introducing and performing mindful walking, external wisdom: discussing about fiber and its role in healthy nutrition.
7	Practicing values, introducing and performing chair yuga, introducing wisdom and internal wisdom.
8	Reviewing, conclusion and performing post-test.

Results:

Sample of this research include 30 women that suffered from being overweight in Tehran who referred to Niavaran health center. 15 subjects participated in experimental group (mindfulness training) and 15 subjects in control group.

Table 2- The descriptive indices of perceived stress and BMI

Variable	Test	Treatment group		Control group	
		Mean	SD	Mean	SD
Perceived stress	Pretest	33.94	7.22	31.87	7.09
	Posttest	26.91	6.57	30.66	7.02
BMI	Pretest	29.73	2.51	28.18	2.85
	Posttest	26.12	2.02	29.38	3.11

Comparison of mean and standard deviation of variables in two groups at pretest and posttest

showed that in experimental group, the mean of perceived stress was lower than control group and also the BMI of experimental group after mindfulness interference was lower than control group.

The one-way covariance analysis was used to assess MB-EAT and MBI of overweight women. Thus, first the mindfulness training on perceived stress of overweight women was investigated. Pre-assumption of this test was investigated before the conclusion of covariance analysis test. The first pre-assumption showed the normality of independent variable distribution; the results of Kolmogorov Smirnov test showed that this test was not significant for perceived stress ($p>0.05$). Results of leven test for investigating variance homogeneity pre-assumption were not statistical significant (post-test: $p=0.23$,

$f=1.53$), and this meant the hypothesis is established. Therefore, the use of covariance analysis test is true (table 3).

Table 3. One way covariance analysis test of perceived stress for comparison of two groups

Source of variations	Changes source	Sum of square	Degree of freedom	mean square	F	P	Eta coefficient
Group	Pretest	1227.23	1	1227.23	12.44	0.002	0.54
	group	512.40	1	512.40	5.17	0.02	0.37
	error	1243.63	15	84.90			
	total	95127	18				

According to results of table 3, following the treatment in experimental group rather than control group showed significant increasing so the hypothesis is approved. The second

After investigating assumptions and obtaining the necessary assurance, the one way covariance analysis test was used to check the

hypothesis: mindfulness training has significant effect on decreasing BMI of overweight women. Results of Kolmogorov Smirnov test showed that recent test was not significant for BMI ($p>0.05$).

significance of effectiveness of mindfulness training on BMI (table 4).

Table 4. One-way covariance analysis test results of BMI for comparison of two groups

Source of variations	Changes source	Sum of square	Degree of freedom	Mean square	F	P	Eta coefficient
Group	Pretest	115.12	1	115.12	650.57	0.001	0.96
	Group	2.32	1	2.32	17.43	0.001	0.55
	Error	2.58	15	0.16			
	Total	15422.15	18				

Discussion:

Recent study with the aim of investigating the effectiveness of mindfulness-based eating awareness training (MB-EAT) on perceived stress and body mass index in overweight women. According to results and findings of research, the mindfulness training is effective on decreasing perceived stress in these women. This finding is compatible with latest researches (7, 8, 9, and 20). In declaration of this finding, it can be said that mindfulness training can lead to self-esteem feeling and self-sufficiency in patients and individuals, which can achieve the power, energy and ability for doing daily activities and self-protection. Thus, they find positive attitude to their ability and environment so they experience lower stress.

In this study the amount of perceived stress in experimental group was significantly lower than control group after mindfulness interference. The mindfulness training can neutralize some stressors impact and help individuals with stress responses to psychological and physiologic function.

Technics that is used in this method can change individuals' attitude to stressful accidents, improve confronting strategies, and decrease physical responses to stress then maintain their health. The mindfulness program can increase control feeling, self-sufficiency, self-esteem, compatible confronting and social protection that is effective on cognitive, safety, neurotic and psychological process. It seems the changes can decrease negative mood status and social isolation and improve the quality of life. The function of this training is to reduce the discomfort and improve general health in overweight women and it has a positive impact on the body's metabolism. Also, based on findings of studies, mindfulness training results in temporary, external and limited documentation to unpleasant accidents and this is the main factor for adjusting to stressful events.

Findings of research showed that mindfulness training was effective on decreasing BMI of these women. This finding was coordinated with last studies (14, 24, 25).

It can be said in declaration of the effectiveness of the interference, this intervention reduces food consumption and subsequently reducing the BMI with an effect

on inappropriate eating behaviors (emotional eating, outside eating, inhibited eating). This effect is caused by different mechanisms such as increasing sensitivity to inner symptoms of hunger and satiety that is coordinated with findings of researches completed; it reduces external eating (26). Starving causes high motivation to eat calorific foods unconsciously. When we feel hungry, we see delicious food and our thought of eating is more pleasant than satiety feeling. The body scan practice creates inconsistent imagination that reduces cognitive capacity for spreading craving imagination. Therefore, it decreases the desire of craving unhealthy food. Another related mechanism is impulsivity reduction. Impulsivity reduction is a mediator variable among mindfulness and lower scores of external and emotional eating (27). The mindfulness instructs moment attention or non-judgmental attitude to thought and feeling; this kind of attention is in contrast with impulsivity. Also, the body scan exercise and other mindfulness exercises cause that participants observe and accept their thought and feeling in a non-judgmental way; and this way of attention increases the ability of participants to resist impulsive function against hunger feeling (28).

Some limitations of this study were the difference between education level of participants and small sample size, so the generalizability of the research should be considered. This research was done for overweight women, considering the high level of stress in society and lack of protecting organs in this field, it is suggested that, this kind of research will perform for other chronic physical patients. In applied dimension, considering the result of this study due to the high prevalence of overweight and other chronic diseases and the lack of psychologist and also in order to prevent treatment costs, group mindfulness training and short-term training and also self-protection training can be beneficial and help people to reduce their problems.

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