



The effectiveness of acceptance and mindfulness-based therapy on physical activity increment and obesity decrement in the patients suffering from heart disease

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ABSTRACT

This research is aimed at determining the role of acceptance and mindfulness therapy on physical activity increment and obesity decrement in the patients suffering from heart disease in Bandar Abbas. In terms of type, the research is applied one and in terms of research method, it is a quasi-experimental study along with a pretest-posttest with a control group. The statistical population of the research involves all the patients suffering from heart disease being overweight who had visited Bandar Abbas' hospitals during (2016-2017) and according to angiographic reports, the eclipse was more than 50% and BMI ≥ 30 . An available sampling method was used in the study. The population size was 20 that 10 were assigned to the experimental group and 10 to control group. The data were collected through making use of physical activity level, body mass index (BMI) questionnaire. The obtained data were analyzed using covariance analysis and SPSS software. The results showed that acceptance therapy had been effective in physical activity increment and body mass decrement of the patients suffering from heart disease. Based on the obtained results, it can be concluded that mindfulness-based therapy can be considered as a non-invasive treatment. This clinical trial will result in more effective mindfulness-based interventions as a complementary treatment in primary care for people with overweight and obesity.

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1. Introduction

Obesity is a chronic disease or disorder that its prevalence has increased in the United States and the other western countries so that obesity increases the danger and risk of heart disease, diabetes, and liver problems. Obesity mechanism originates from our body's inclination towards storing energy in the form of fat and its root goes back to very far ancestors of human. In the current modern life, with the availability of telephone and even online food orders that an individual does not even bother himself for taking the food, the accessibility to food has become convenient and permanent. Accordingly, late or hunger day hardly ever happens, and saving excess energy on our daily needs has created obesity. The issue of obesity is increasing not only in high-income countries but also this process is in the same manner in the urban areas with low and high incomes (1). Obesity is a chronic disease which provides the background for most of the disease particularly cardiovascular and diabetes disorders and soon it decreases

individuals' work capacity and ability and makes them vulnerable with regard to most of the disease. The consequences that obesity creates, results in life duration reduction. The number of overweight and obesity is increasing worldwide (2). Inactive lifestyle is to some extent the reason behind obesity prevalence increment (3). Obesity is accompanied with a wide range of health problems including heart disease, type 2 diabetes, high blood pressure and high blood sugar and high cholesterol. Moreover, high expenses are spent on obesity people's treatment in general health area yearly, so that approximately 12 percent of the yearly budget of the United States' general health is used in treating the problems related to obesity (4). According to the regular reviews which have been carried out, the prevalence of obesity and overweight is increasing rapidly and reaching an alarming rate worldwide. In Iran, 61.6% of the adult population were overweight and 25.8% were obese in 2016. It has been proven well that exercise is important for physical and mental health (5). The results of the researches show that regular physical

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activities are beneficial and effective for all and inactive lifestyle results in early death rate increment (6). Accordingly, it seems that the best way with regard to weight reduction and health maintenance is increasing physical activities among individuals. For increasing physical activity and decreasing obesity and body weight, there are sever treatments that three of them are investigated here: (i)-Surgical treatment: this method is so aggressive that it is only recommended for the patients suffering from high overweight. Of course, this method has many risks and disadvantages that most of the therapists make attempt to use it as the last resort (7, 8); (ii)-Drug Therapy: This method is appropriate for the patients who commit to treatment and drug which results in 5-10 percent weight loss. Of course, permanent use of the drugs is impossible due to the dangerous consequences; (iii)-Psychological treatment: These types of treatments have been created for the first time since 1960 with forms of moral treatments and after that, many other treatments have been created. Among the recent psychological treatments which have attracted many people nowadays and are used in obesity treatment is cognitive behavioral and mindfulness therapy. Included among the effective treatments for overweight people who start eating in response to their feelings and reflections is acceptance and commitment therapy (9). From acceptance and commitment therapy's perspective, people consider most of their feelings, excitements, and inner thoughts as annoying; therefore, they make an attempt to change or avoid them and acceptance and commitment therapy is aimed at preventing avoidance by helping to accept and sense commitment. Growing interest has been created with regard to mindfulness-based therapy about expansion of behaviors related to balanced body weight maintenance and reducing obesity like physical activities (10). Reducing mindfulness stress is a referential-based systematic perspective which educates the mind-meditation and the ability to respond subtly to experiences which can result in emotional disorder or incompatible behavior. Among the incompatible behaviors, it can be referred to gourmet. Included among the other proposed treatments with regard to eating disorder treatments of adults, is mindfulness therapy (11). Recently, mindfulness-based therapy has been used widely in curing obesity and eating behaviors¹² that one of its significant and essential concepts is purposeful focus. Purposeful focus has rarely been investigated in epidemiological (12) but, the studies reveal that there is a negative relationship between purposeful focus and body weight increase (12). Generally, some of the particular mental and behavioral mechanisms along with purposeful focus can be effective in the risk of cardiovascular disease and obesity treatment. The probable effective mechanisms include craving (for instance, for delicious food and passive activities), controlling emotions (for instance, an individual's feelings of effectiveness in achieving the goals of diabetes prevention, such as diet or physical activity, and adherence to the diet) and being aware of the present time's experiences (for instance, being aware of body with regard to use of some particular food and involving in physical activity) and feeling manner (13). Based on Bieber et al. (4) investigations, making use of

mindfulness-based therapy has been reported effective in eating disorder treatment. In a study carried out by Mousaviyan et al. (14) entitled the effectiveness of mindfulness-based therapy in body weight reduction and obesity, reach to the conclusion that mindfulness-based therapy has been effective in body weight reduction and obesity. In a research which was done on patients having eating disorder by research in a comparison between psychological and mindfulness-based therapy, they announced that there is a significant difference between these two treatment methods in the patients suffering from eating disorder with weight loss (1). Very briefly put, the goal of this research is investigating the effectiveness of mindfulness-based therapy in physical activity increment as well as body weight decrement of patients suffering from heart disease. Therefore, this research is aimed to answer the question that does acceptance and mindfulness-based therapy affect physical activity increment and body weight decrement in the patients suffering from heart disease in Bandar Abbas?

2. Material and methods

The present study in a quasi-experimental study in terms of research along with pre-test, post-test and control group. The statistical population of this research involves all the patients suffering from heart disease as well as being overweight who have visited Bandar Abbas' hospitals during 2018-2019 and based on the angiographic reports, they have eclipse more than 50 percent and BMI \geq 30. Available sampling method was used in the study and among 20 individuals, 10 were assigned randomly to experimental and 10 to control group. For data analysis, covariance analysis method was used.

2.1. Tools

2.1.1. Body Mass Index (BMI)

Body mass index is calculated through dividing body weight (kilogram) into squared height (meter). Body weight will be measured using digital scale having 100 g sensitivity and height will be calculated using non-expandable strip with a precision of 1 cm.

2.1.2. Physical activity level questionnaire (CHAMPS)

The questionnaire has been created by Stewart et al. (2001), which evaluates physical activity in 4 levels of inactivity, low intensity physical activity, moderate physical activity, and high intensity physical activity and it involves the activities which have been done by the individual during a week. The intensity of the physical activity in CHAMPS questionnaire is calculated through MET which is a unit for estimating metabolic costs in physical activity. According to investigations, the face validity of the questionnaire is 96 percent, internal consistency of components is 0.61 and content validity equals 0.79. Mindfulness based therapy's schedule (8 sessions): The schedule involves 8 sessions and its

time is changeable dependent on the volume and structure of the class. Sessions' presentation planning is based on Kabat-Zinn treatment plan with the aim of reducing stress and interventions with regard to nutrition and physical activity. This education encompasses main exercises (checking, sitting, eating, and walking) and sub-exercises (controlling attention, being in the moment, and selecting answers to daily

happenings). In addition, classroom exercises are performed in order to increase consciousness, artistic raiders and verbal communication. Besides, home exercises are encouraged for practicing and deepening classroom education. The participants will receive a notebook, including self-contained leaflets and sheets (Table 1).

Table 1. The headings and the goals of mindfulness-based therapy.

First Session Automatic Pilot	1. Mindfulness exercise/ ever silent place 2. Creating basic rules, 3. Presentation of mindfulness-based therapy experiences based on eating (eating experience considering mindfulness)
Second session More concentration on mental whisperings (confronting obstacles)	1. Investigation with main and sub-exercises, 2. Discussion over the way of scheduling time for home exercises, 3. Paying attention to the amount which we are in the past or future, 4. Eating-based treatment (focus on emotions and thoughts) in relation with eating
Third session The presence of the mind of the breath	1. Continuing deepening the experiences of the main exercises and sub-exercises, 2. Creating the capacity to observe your thoughts and emotions, 3. presence in the body, 4. Mindfulness-based therapy (signs of hunger and fullness)
Fourth session Remaining in the present time (prevention from stress' severity and durability)	1. Checking the thoughts and emotions of unpleasant experiences, 2. Checking perception, 3. Suggestion of yoga as a way to practice mindfulness, 4. Eating treatment (food history).
Fifth session Permission/ presence document	1. Investigating how to resist and how to request situations, 2. Making ourselves or others bothered in a different way, 3. Investigating how ridiculous mind is usually untrue, negative, or seeks trouble; 4. Creating emotional stability or the ability to be aware of feelings without resistance or excess, 5. Eating-based treatment (the influence of unpleasant happenings).
Sixth session The thoughts are not realities.	1. Increasing the capacity of observing thoughts and emotions, 2. Creating the capacity response instead of reaction, 3. Eating-based treatment (Purchase with Mindfulness)
Seventh session How to take care of yourself in the best way?	1. Mindfulness application in problematic communications, 2. Continuing creation of capacity of response till reactivity, 3. Initiation of kindness exercise, 4. Mindfulness treatment (behavior transition)
Eighth session Making use of what you have acquired for resisting against next stressed manners:	1. Creating the capacity to send and receive love and kindness, 2. Would you like to make use of mindfulness in your life? How? Repetition of the available instructions

3. Results

Table 2 shows the frequency of participants' ages. As it is clear from Table 3, the interaction between the pretest group and scores is not statistically significant ($p < 0.05$, $F = 0.547$).

Table 2. The frequency of participants' ages.

Variable	Frequency	Percentage
40 years old	4	13.3
50 Years old	7	23.3
More than 50	9	63.3
Total	20	100

Therefore, the homogeneity hypothesis of regression slopes is accepted and there is a linear relationship between the

pretest and posttest scores. Moreover, examining of the distribution chart of the scores of auxiliary random variables (pretest scores) and dependent variable (posttest scores) showed that there is a linear relationship between these two variables. Accordingly, the covariance analysis test can be performed. At first, an analysis of the assumption of equality of variance errors was performed using the Levene's Test of Equality of Error Variances and also the study of normal distribution of scores using Kolmogorov-Smirnov test. As it is observed in Table 4, the absence of significant difference $p > 0.05$, is indicator of the point that error variance is equal among all the group's variable levels. Moreover, through observing Table 4 and considering the obtained significant difference level, it can be concluded that variables have normal distribution.

Table 3. Investigating the interaction between pre-test scores (auxiliary random variable) and physical activity and body mass (independent variable).

Change source	Sum of squares	df	Mean of squares	F	Sig.
Correlated model	234.815	5	428.09	84.14	0.000
Coordinates axis' width	101.228	1	101.228	4.353	0.064
Group	83.591	2	41.245	1.550	0.024
Pretest	2651.244	1	2651.244	87.900	0.000
Pretest group	46.322	2	23.161	0.547	0.320
Errors	2530.896	57	30.162		
Total	184850.744	30			
Total correlation	5860.744	29			

Table 4. Results of the Levene's Test of Equality of Error Variances.

F	Df1	Df2	Sig.
0/357	2	67	0.714

3.1. Hypothesis 1

Mindfulness acceptance-based therapy has a significant effect on patients' physical activity increment. The mentioned data in Table 5 is indicator of the point that after balancing the scores of the pretest scores, the difference is statistically significant among experimental and control group concerning physical activity ($p < 0.05$, $F = 17.67$). It implies that mindfulness base therapy has been effective in patients' physical activity that through considering ETA coefficient of the parabola, it can be indicated that the effectiveness rate of this education is 0.61.

Table 5. The results of covariance analysis scores of posttests of physical activity variable.

Change source	Squares sum	df	Squares mean	F	Sig.	Parabola's ETA coefficient
Pretest	3214.14	1	3214.14	14.83	0.000	0.970
Groups	784.412	1	799.321	17.67	0.005	0.61

Table 6. The results of the posttest scores of covariance analysis of body mass variable.

Change source	Sum of squares	df	Mean of squares	F	Sig.	Parabola's ETA coefficient
Pretest	368.67	1	368.67	12.137	0.003	0.778
Groups	3631.906	1	559.906	15.76	0.001	0.31

Investigations of Mousaviyan et al. (13) titled the effectiveness of mindfulness-based therapy in body weight and obesity reduction, reached to the conclusion that mindfulness-based therapy has been effective in body weight and obesity reduction. In interpreting these findings, it can be indicated that physical activity is one of the major and main components in mental and physical health. On the other hand, the effects of physical activity, such as exercise, have been proven. Obstacles which can be considered for physical activity are fear of inability to continue, persistence, fear of

3.2. Hypothesis 2

Mindfulness acceptance-based therapy has significant effect on body mass decrement in patients suffering from heart disease. As it is shown in Table 6, after balancing pretest scores, the difference between scores of experimental and control groups in body mass is not significant ($p < 0.005$, $F = 15/76$). This implies that teaching mindfulness acceptance-based therapy has been effective in body mass reduction in the patients suffering from heart disease that by considering parabola's ETA coefficient, it can be indicated that the effectiveness rate of this education is 0.31.

4. Discussion and conclusion

First hypothesis testing demonstrated that mindfulness acceptance-based therapy has significant effect on physical activity increment in the patients suffering from heart disease. This finding is in line with the findings of researches done by (1, 2, 3, 7, 13). Growing interest has been created concerning mindfulness-based therapy with regard to the behaviors related to balanced body weight maintenance and reducing obesity such as physical activity (10). Based on the researches of Bieber, Fletcher and Hayes4, making use of mindfulness-based therapy has been reported as effective in eating disorder treatment.

judgment of others, etc. that acceptance-based therapy increases individual's accepting rate and commitment which in turn increases physical activity and continuity of exercise, which results in decrease in overweight; moreover, patients from heart disease sometimes refuse to accept their disease that acceptance therapy provides a great help in admitting the disease. In second hypothesis testing, it was shown that mindfulness acceptance-based therapy has significant effect in body mass reduction of patients suffering from heart disease. This research is in line with the results of (1, 2, 9, 11). In

interpretation of this research, it can be indicated that inclination toward exercise and physical activity results in body fat and subsequently in body mass reduction; so that, in the research carried out by Hojjati and Alipour (14), it was revealed that the lower the physical activity, the more BMI that high BMI leads to heart disease and heart - failure increment.

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