



The effectiveness of cognitive therapy based on mindfulness on emotion regulation and type D personality type symptoms in cardiac patients with ICD

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Background and Aim: Today, heart diseases are one of the main causes of death in most countries of the world. The present study was conducted with the aim of determining the effectiveness of mindfulness-based cognitive therapy on emotion regulation and personality type D syndromes in cardiac patients with ICD. **Methods:** The research method was a quasi-experiment with a pre-test-post-test design with a control group and a three-month follow-up. The statistical population of this study were cardiac patients who had referred to Rasht hospitals from the beginning of 2021 to the end of September 1400 for the purpose of ICD implantation. Using simple random sampling, a sample of 30 people was selected. The data collection tool was the emotion regulation scale (Gross and John, 2003) and the type D personality type scale (Denault, 1998). The experimental and control groups were pre-tested using research tools. Then cognitive therapy based on mindfulness was implemented during eight sessions for the experimental group, but the control group did not receive any intervention. At the end of the intervention, the experimental and control groups were post-tested using research tools. Three months later, a follow-up test was performed on both experimental and control groups. **Results:** The results of multivariate covariance analysis showed that cognitive therapy based on mindfulness on emotion regulation ($F=28.94$, $P<0.05$) and type D personality type symptoms ($F=4.66$, $P<0.05$) is effective in cardiac patients with ICD. These results were sustained in the three-month follow-up. **Conclusion:** Considering the economic, social and psychological burden that heart disease imposes on individuals, families and society, the results of this research can be promising for heart patients, health and mental health professionals.



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Introduction

Today, heart diseases are one of the main causes of death in most countries of the world (Irel et al., 2019), which requires long-term monitoring and treatment to prevent its progression to more complications. Cardiac arrhythmia is one of the common problems and the cause of half of the deaths related to heart problems (Lily & Braunwald, 2012) and the use of ICD is one of the important methods in its control and treatment (Torabi et al., 2018). Implantation of ICD and the entry of a foreign body into the heart cavity is an important event in the life of patients, and psychological complications caused by patients' dependence and reliance on the existence of this device for survival are among the problems of these pacemakers (Torabi et al., 2018). On the other hand, cardiovascular patients often suffer from anxiety and worry due to the sensitivity of the disease and the problems caused by it, which can cause difficulty in regulating emotions (Adibizadeh & Sajjadian, 2018). Emotional regulation is defined as the process of initiating, maintaining, adjusting, or changing the occurrence, intensity, or continuity of internal feelings and emotions related to social, psychological, and physical processes in achieving one's goals (Gross & Thomson, 2007). The emotion regulation model (Gross, 2001) classifies emotion regulation strategies into two categories: cognitive reappraisal and suppression. Cognitive reappraisal is a strategy in which a person thinks about a situation to change its emotional effect; On the other hand, expressive suppression refers to the inhibition of emotional expressive behavior (Keyghobadi, 2016). In cardiovascular diseases, the expression or suppression of emotions are among the effective psychological factors that can contribute to the occurrence or aggravation of the disease (Adibizadeh & Sajjadian, 2018; Nikdanesh et al., 2017). The chronic effects of inhibiting negative emotions increase the sympathetic activity of the cardiovascular system (Grandi & Malloy, 2017). Emotion regulation variables such as emotion acceptance may allow heart patients who are emotionally vulnerable to be in the present time and place. Therefore, instead of showing an excessive and anxious reaction to the situation, they gain a more objective understanding of the threat level (Hayes & Feldman, 2004). On the other hand, increasing the level of negative emotions is

associated with the worsening of cardiovascular diseases. These findings led researchers to suspect that emotion regulation may play a role in the outcomes of these diseases (Gross, 2013). On the other hand, in their studies, researchers pointed out a significant relationship between behavioral concepts of personality and the prevalence of diseases affected by stress, especially cardiovascular diseases (Etemadi et al., 2019). D personality type is associated with more than 3 to 6 times increased risk of impaired quality of life in cardiac patients (Pederson et al., 2007). Coronary patients with personality type D have high stress and due to the suppression of negative emotions, despite receiving medical measures similar to other coronary patients, they show a slower recovery process and frequent heart attacks (Karimi, Emadi, and Mohsenzadeh, 2021). According to Denault (2005), type D personality type expresses two general and stable personality traits, which are negative affect and social inhibition (Danault, 2005). Negative emotions mean a person's tendency to experience negative emotions in different times and situations, while social inhibition refers to a person's tendency to avoid expressing these negative emotions in social interactions. A high score in both characteristics indicates him as a person with D personality type. Social inhibition is a distinct component of negative emotion in the construction of type D personality, and social inhibition and negative emotion simultaneously increase vulnerability to emotional distress in cardiovascular patients (Timmermans et al., 2019). Pedersen, Middle, and Larsen (2002) have shown that D personality type predicts depression up to 5 years later in a mixed group of cardiac patients. By studying 777 patients, Leo et al. (2019) investigated the effect of personality type D on the clinical outcomes of patients with coronary artery disease, and the results showed that this personality type is a strong predictor of this disease. In the study by Denolt, Vanflius, Lauder, Mamrastig, Gowartz, Pasmirs et al. (2018), the results indicated that personality type D has an adverse effect on endothelial (intravascular) dysfunction in patients with coronary arteries. Aluja et al. (2019) and Malas et al. (2018) showed in their research that among personality dimensions, type D personality type is a strong predictor of heart diseases. They showed that using the D personality scale can be useful and practical to

distinguish people with high risk of coronary heart disease from healthy people. Dunman et al. (2010) showed in a study that 26% of heart patients had D personality type before surgery, while 11% showed D type characteristics both before and after surgery. Williams, Stark and Foster (2008) showed that personality type D is a risk factor for cardiovascular disease that is associated with poor prognosis, impaired well-being and emotional distress.

Non-pharmacological and psychological treatment methods focusing on increasing emotion regulation and modulating type D personality type symptoms can play a role in controlling disease or reducing mortality, improving quality of life, expanding abilities, creating satisfaction with life and ultimately improving the psychological well-being of heart patients. Among these interventions is mindfulness-based cognitive therapy (MBCT), which is adapted from Kabatzin's mindfulness-based stress reduction model (1980) and the principles of cognitive therapy are added to it. According to Kabatzin et al. (2002), mindfulness is defined as moment-to-moment awareness without judgment, and the side effect of mindfulness training is the ability to observe the nature of thoughts without necessarily engaging in their contents (Kabatzin, 2005). MBCT, proposed by Segal, Williams, and Teasdel (2002), includes various meditations, body-viewing exercises, and some cognitive therapy exercises that show the connection between mood, thoughts, feelings, and bodily sensations. All of these processes enable attention to bodily situations and surroundings in the present moment and reduce automatic processing, which is indicative of how MBCT works (cited in Segal, Williams, & Teasdel, 2018). Mindfulness requires special behavioral, cognitive, and metacognitive strategies to focus the attention process, which, in turn, reduces negative thoughts and the tendency to worrisome responses and anxiety, and leads to the emergence of pleasant thoughts and emotions (Johnson et al., 2018). Self-awareness as it occurs in the MBCT process is considered a prerequisite for using reappraisal as an adaptive emotion regulation strategy (Sabir-Varana et al., 2014). The effectiveness of MBCT has been shown on the following: emotion regulation in women with type 2 diabetes (Alizadeh & Poursharifi, 2016); negative emotions and emotions such as worry,

anxiety and anger in women with breast cancer (Ailes et al., 2015); regulation of emotion and anxiety sensitivity of the elderly with a history of heart disease (Hatamian, Heydarian, and Ahmadi Farsani, 2020; Hatamian & Tabatabai, 2020); reducing the anxiety of coronary heart patients (Farhadi et al., 2013); Better emotional regulation in presymptomatic Huntington's patients (Eckles et al., 2021); reducing anxiety and depression in chronic fatigue syndrome (Tahri & Sajjadian, 2018); multiple sclerosis disease (Rahimdelo et al., 2017); Fibromyalgia disease (Parra-Delgado & Latour-Postego, 2013). However, no study has been conducted on heart patients with ICD. Also, several studies have mentioned the relationship between mindfulness and personality (especially neuroticism) (Rashidi Assal & Dastpak, 2019; Barnhafer, Dugan, & Griffiths, 2011). Azimian's study (2013) showed that cognitive therapy training based on mindfulness is effective in improving the components of personality type D in patients with coronary arteries. Shabani (2017) also showed in his study that mindfulness-based stress reduction treatment has a significant effect on reducing perceived stress and reducing the components of personality type D, i.e. negative affect and social inhibition in heart failure patients.

The third wave of cognitive and behavioral approaches to psychological problems, especially mindfulness, have provided promising perspectives on the behavioral medicine of chronic diseases. Nevertheless, the effectiveness of third wave interventions in improving well-being and mental health in chronic diseases, although promising, is still unclear. Chronic diseases are an increasing and prevalent problem among the world's population, which has a great impact on mental health, quality of life, and social functioning (Trinidad & D'Almeida, 2018). Therefore, neglecting the adoption of psychological treatment approaches causes the continuation of mental, social and physical injuries in these patients. In the present study, the question was raised whether cognitive therapy based on mindfulness is effective on emotion regulation and type D personality type symptoms in heart patients with ICD?

Method

This study was a quasi-experimental study with a pre-test-post-test design with a control group and a three-month follow-up phase. The

statistical population of this study were cardiac patients who had referred to the hospitals of Rasht city that had a heart department and performed ICD implantation surgery from the beginning of 2021 to the end of September 2022 for the purpose of implanting an ICD or permanent pacemaker. The number of these people was 118 (N=118). The selection from the statistical population was made based on these criteria: 1) receiving ICD for the first time; 2) at least 3 months have passed since installation; ICD, 3) no surgery at the same time as implantation; ICD, 4) no concurrent chronic physical illness; 5) having a minimum age of 18 years and a maximum of 65 years; 6) a score one standard deviation higher than the mean on the D type personality type scale; 7) A score one standard deviation below the mean on the emotion regulation scale. The present study included two experimental and control groups. Therefore, the required sample size for each group was determined to be 15 people and a total of 30 people (n = 30). Sample selection for experimental and control groups was done by simple random method. The subjects of both groups were asked to answer the questions of emotion regulation scale (Gross & John, 2003) and type D personality type scale (Denault, 1998).

Materials

1. Emotion regulation scale: The emotion regulation scale was prepared by Gross and John (2003). This scale consists of 10 sentences that have two subscales of reappraisal and suppression. The reappraisal subscale is measured with sentences No. 1, 3, 5, 7, and 10, and the suppression subscale is measured with sentences No. 2, 4, 6, 8, and 9. The scoring method of this scale is based on a 7-point Likert scale, where 1 point is considered for completely disagree, 2 points for disagree, 3 points for somewhat disagree, 4 points for no opinion, 5 points for somewhat agree, 6 points for agree, and 7 points for completely agree. The minimum score in this scale is 10 and the maximum score is 70 and the average score is 40. This scale has a total score and to get the total score, the sum of sentence scores are calculated. Gross and John (2003) calculated Cronbach's alpha coefficient of 0.79 for reappraisal and 0.73 for suppression, and reported retest reliability of 0.69 for the entire scale after three months (Gross & John, 2003). The internal consistency coefficient of this scale

in state employees and Catholic University of Milan students for re-evaluation in a range of state and Catholic University of Milan students for re-evaluation in a range of 0.48 to 0.68 and for suppression was obtained from 0.42 to 0.63. . The Persian version of the Gross and John emotion regulation strategies questionnaire in Iranian culture has been standardized by Qasimpour, Ilbigi and Hassanzadeh (2012), and the reliability of the scale was calculated based on the internal consistency method with Cronbach's alpha ranging from 0.60 to 0.81. These researchers reported the instrument's validity through principal component analysis using varimax rotation, correlation between two subscales ($r=0.13$) and favorable criterion validity.

2. Type D personality type scale: Type D personality type scale was created by Denault in 1998 and has 16 items. This scale includes two subscales of negative affect and emotional inhibition. The negative affect subscale is measured with sentences No. 1, 2, 6, 9, 10, 12, 15, and 16, and the emotional inhibition subscale is measured with sentences No. 3, 4, 5, 7, 8, 11, 13, and 14. The scoring method of this scale is based on a 5-point Likert scale, which is considered as 0 points for never, rarely 1 point, sometimes 2 points, often 3 points and always 4 points. This method of scoring is reversed for sentences number 1, 3, 6, 7, 11 and 13. The minimum score in this scale is 0 and the maximum score is 56 and the average score is 35. This scale has a total score. DeJong (2007) reported the Cronbach's alpha coefficient of the negative affect subscale of 0.88, emotional inhibition of 0.86, and the concurrent validity coefficient of this scale with the personality attraction scale A, 0.63 (Shafi et al., 2013). In the study by Zarbakhsh Bahri et al. (2019), the reliability of the test-retest method for the subscale of negative affect was 0.72 and for social inhibition was 0.82. In their study, Zarbakhsh Bahri et al. (2020) used the confirmatory factor analysis method to evaluate the construct validity of the personality type D questionnaire, and two factors in the original version were confirmed. These researchers stated that the significant positive correlation of the scores of this scale with the neuroticism subscale and its significant negative correlation with the extraversion subscale of the Eysenck Personality Questionnaire indicate the concurrent validity of this tool. In Azimi and

Soleimani's study (2020), Cronbach's alpha was 0.83, which indicated the good reliability of this tool.

3. Cognitive therapy: The content of cognitive therapy based on mindfulness was as follows:

Table 1. Cognitive therapy sessions based on mindfulness

Session	Content
1	introduction and session of mindfulness and automatic guidance; Familiarizing the members with each other, familiarizing with the concept of mindfulness and its philosophical foundations, cultivating awareness, practicing eating raisins (presence of the mind causes departure from automatic guidance) and its consequences (living in the present and reducing time travel), practicing conscious attention to daily activities
2	Mindfulness session of breathing; Familiarity with the concept of awareness of breathing, familiarity with the types of exercises of conscious attention to breathing, familiarity with the concept of wandering mind.
3	session of another method of awareness to put aside the ruminating mind; Getting to know the concept of abandoning the ruminating mind, getting to know the two ways of communicating with the body (through a direct lens and direct communication), practicing conscious awareness of the hands (with the aim of awareness)
4	emotional reconnection session; Getting to know the concept of reconnecting with emotions, getting to know the concept of internal barometer, practicing internal barometer
5	meeting to become friends with your feelings; Getting to know how to become friends with emotions, getting to know the concept of trusting body awareness, calendaring pleasant and unpleasant thoughts, practicing creating a problem and working on it through the body.
6	Thoughts are not facts and are creations of the mind; Explaining the concept of considering thoughts as creations of the mind, practicing conscious attention to listening and thinking, practicing choiceless awareness.
7	attention to awareness in everyday life; Explanation of the concept of awareness attention in daily life, description of three-minute pause stages (1- becoming aware, 2- focusing, 3- expansion), three-minute pause practice
8	use of learnings; Using the learnings and that the presence of mind helps to have a balanced life, summing up

Implementation

Cognitive therapy based on mindfulness was implemented for the experimental group during 8 weekly sessions of 120 minutes for two months between January 2021 and March 2021 (pre-test stage). During this period, the subjects of the control group did not receive any psychological intervention. After completing the training sessions, the subjects of the experimental and control groups were once again asked to answer the mentioned questionnaires (post-test stage). After three months, in order to follow up the results and effectiveness of mindfulness-based cognitive therapy, all the subjects were again asked to answer the research questionnaires (follow-up phase). In the end, in order to fully comply with ethical standards, the control group subjects were invited to participate in intensive sessions of cognitive therapy based on mindfulness. In

this study, data analysis was done using multivariate analysis of covariance (MANCOVA) and SPSS software.

Results

Descriptive findings about the characteristics of the subjects showed that out of 15 people in the mindfulness-based cognitive therapy group, according to age, the 58-65 years old class had the most people with 40%, and the 18-27 years old age class had the least number of people with 6.67%. Of the 15 people in the control group, the age group of 58-65 years old, with 40%, is the most, and the age group of 28-37 years old, with 6.67%, is the least number of people. Out of 15 people who received cognitive therapy based on mindfulness according to their education, the highest number of people in the post-diploma class with 40% and the lowest number of people in the post-graduate class and above with 13.33%. Out of

the 15 people in the control group, the lowest number of people in the sub-diploma class with 40% and the lowest number of people in the post-graduate class and above with 6.67%. Also, out of 15 people who received cognitive therapy based on mindfulness by gender, the male class with 60% is more than the female

class with 40%. Out of 15 people in the control group, the male class, with 53.33%, is more than the female class, with 46.67%.

Descriptive findings about the dependent variables in the pre-test, post-test and follow-up stages of the experimental and control groups are shown in Table 2.

Table 2. Mean and standard deviation of dependent variables in experimental and control groups

Variable	Experimental group						Control group					
	Pre-test		test-Post		Follow-up		Pre-test		test-Post		Follow-up	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Emotion Regulation	47/39	1/41	50/13	2/26	10/67	2/41	41/80	1/26	42/60	1/30	0/80	0/41
Type D Personality	93/30	1/62	24/80	1/90	-6/27	2/15	23/47	1/88	22/47	1/88	-1	0/003

The results of Table 2 show that there is a difference between the average of the dependent variables of emotion regulation and type D personality type symptoms in the experimental group of cognitive therapy based on mindfulness and the control group. These differences in the dependent variables are a sign of the effectiveness of the experimental group. The follow-up scores were calculated based on the differential difference of the follow-up scores from the pre-test in order to estimate the durability of the effectiveness of mindfulness-based cognitive therapy. The results of Table 2 also show that there is a difference between the average of the dependent variables of emotion regulation and type D personality type symptoms in the experimental group of mindfulness-based cognitive therapy and the control group in the follow-up phase, which

indicates the durability of mindfulness-based cognitive therapy.

In order to test the hypothesis of the research, due to the existence of pre-test and post-test, in order to control the effect of pre-test, covariance analysis method was used. Also, due to the existence of dependent variables of emotion regulation and type D personality type symptoms, the appropriate statistical test is MANKOVA. Assumptions of linear relationship between scores, equality of covariances (Mbox test), equality of variances (Levene test), homogeneity of regression slopes in the post-test, normality of scores of dependent variables (Shapiro-Wilk test) and existence of correlation between dependent variables were investigated. It was found that there is no obstacle to using Mankva for data analysis.

Table 3. Multivariate covariance analysis of mindfulness-based cognitive therapy on emotion regulation and personality type D in the post-test

Source	SS	Df	ME	F	Sig.	ET
Emotion Regulation	83/635	1	83/635	28/942	0/0005	0/527
Error	75/134	26	2/890			
Type D Personality	10/541	1	10/541	4/664	0/040	0/152
Error	102/823	26	2/636			

The results of Table 3 show that there is a significant difference between the experimental group that was influenced by mindfulness-based cognitive therapy and the control group that did

not receive any training, in the adjusted average of the variable of emotion regulation and type D personality type symptoms.

Table 4. Multivariate analysis of variance of mindfulness-based cognitive therapy on emotion regulation and personality type D in follow-up

Source	SS	Df	ME	F	Sig.	Effect size
Emotion Regulation	730/133	1	730/133	244/153	0/0005	0/97
Error	86/733	28	2/990			
Type D Personality	208/033	1	208/033	89/706	0/0005	0/762
Error	64/933	28	2/319			

The results of Table 4 show that there is a significant difference between the cognitive therapy group based on mindfulness and the control group, which did not undergo any intervention, in the mean differential scores of the pre-test follow-up in the variable of emotion regulation and type D personality type symptoms. According to the results obtained from the data analysis based on the statistical test used, with a probability of 0.99, it can be said that the hypothesis of the research that cognitive therapy based on mindfulness is effective in the regulation of emotion and personality type D symptoms in heart patients with ICD is confirmed.

Conclusion

The present study was conducted with the aim of determining the effectiveness of mindfulness-based cognitive therapy on emotion regulation and personality type D syndromes in cardiac patients with ICD.

The findings of this study showed that cognitive therapy based on mindfulness is effective on emotion regulation in heart patients with ICD in post-test and three-month follow-up. This finding was in line with the research of Hatamian et al. (2020) and Hatamian and Tabatabai (2020) that MBCT is effective in increasing emotion regulation strategies in heart patients. Moreover, this finding was consistent with the study of Alizadeh and Poursharifi (2016) and Eccles et al. (2021). They showed that cognitive therapy based on mindfulness led to better emotional regulation in patients with type 2 diabetes and presymptomatic Huntington's patients, respectively, in one-month and one-year follow-up. The results of the study by Taheri and Sajjadian (2018), Rahimdel Meibdi and Nasirian (2017) and Parra-Delgado and Latour-Postigo (2013) are also consistent with the findings of the present study. These researchers showed that cognitive

therapy based on mindfulness is effective in reducing anxiety and depression in chronic fatigue syndrome, multiple sclerosis and fibromyalgia in one-month and three-month follow-ups. In this regard, Ayles et al. (2015) showed that mindfulness treatment led to a lower response to emotional distress and greater acceptance of psychological disturbances in women with metastatic breast cancer at a four-month follow-up. Cardiac patients with ICD live in stressful conditions and have many limitations caused by chronic medical illness, they have difficulty in regulating their emotions. Therefore, they use negative emotion regulation strategies more because of the complications that living with the disease has imposed on them. In explaining the effectiveness of MBCT on emotion regulation in these patients, one of the important aspects of the aforementioned treatment is that people learn to deal with their emotions and negative thoughts and experience mental events in a positive way. Another important point is that MBCT causes the mental representation of objects in life that are out of immediate human control, and this is taught through deep breathing and thinking. Cardiac patients with ICD cope with the negative emotions caused by this disease by using mindfulness-based training and represent it mentally in their life path, and instead of avoiding it, they accept it and use more adaptive strategies. Therefore, emphasizing conscious attention to the present and being exposed to unpleasant emotions and thoughts and not avoiding them will cause cognitive changes and as a result reduce and improve symptoms. Perhaps one of the reasons for reducing the use of maladaptive strategies such as blaming oneself, blaming others, and rumination in these patients is the change in their coping strategy, from avoiding to accepting emotions and thoughts. The effectiveness of MBCT on

coronary heart patients in the research of Farhadi et al. (2013) has shown that this treatment is effective in reducing the anxiety of patients in the post-test and two-month follow-up stages. In the third wave of cognitive behavioral therapies, including MBCT, it is believed that cognitions and emotions should be considered in the conceptual context of phenomena. Moreover, the conditions and characteristics of the disease and the way of life of heart patients with ICD are different from other chronic medical diseases. Therefore, it can be concluded that MBCT has been able to help these patients in changing their cognitions and emotions so that they can benefit from adaptive emotion regulation strategies.

The findings of the present study showed that cognitive therapy based on mindfulness is effective on type D personality type symptoms in heart patients with ICD in the post-test and three-month follow-up. This finding is in line with the study of Shabani (2017) that reducing stress based on mindfulness has a significant effect on reducing the components of personality type D, i.e. negative affect and social inhibition in heart failure patients. Moreover, this finding is in line with Azimian's (2013) study that cognitive therapy based on mindfulness is effective in improving personality type D components in patients with coronary arteries in the follow-up phase. Leo et al. (2019), Denault et al. (2018), Aluja et al. (2019), Malas et al. (2018), Dunman et al. (2010) and Williams et al. (2008) showed: D personality type is a strong predictor of heart diseases. In the present study, type D personality was measured by means of a tool with subscales of negative affect and emotional inhibition. In this regard, Timmermans et al.'s findings (2019) showed that social inhibition is a distinct component of negative emotion in the construction of type D personality, and social inhibition and negative emotion are associated with increased vulnerability to emotional distress in cardiovascular patients. In conscious states, information is broadcast from faulty cycles to current experience. Mindfulness teaches people how to unlearn habitual skills and prepare for change by redirecting information processing resources to neutral goals (such as breathing). Therefore, reapplying attention in this way prevents automatic processing and makes defective processing less available, inhibition is reduced and the chance

to see the environment again and make correct choices is increased. On the other hand, mindfulness, by increasing people's awareness of the present, through techniques such as paying attention to breathing and the body and directing awareness to the here and now, affects the cognitive system and information processing and reduces rumination and ineffective attitudes. It makes people aware of their unnecessary thoughts and again directs their thoughts to other aspects of the present, such as breathing, walking with the presence of the mind with environmental sounds, and in this way it causes an increase in positive emotions and a decrease in negative emotions. The founders of MBCT believe that mindfulness therapy has an effect on the psychological components of patients; In other words, these researchers believe that mindfulness treatment using techniques such as meditation, body scanning and self-compassion reduces the amount of negative emotions in patients. As a result of MBCT, by reducing negative emotional and emotional inhibition, it reduces the symptoms of type D personality type in patients with ICD.

MBCT had favorable effects for previous ICD patients. Therefore, the use of the techniques of this intervention was strengthened, so that the implementation of these techniques caused the previous patients with ICD to benefit from the benefits of MBCT, and this caused the positive results of the treatment to last longer. The durability of this treatment is a characteristic that is referred to as the effectiveness of a successful therapeutic intervention. Therefore, according to the numerous studies conducted on the significant effectiveness of cognitive therapy based on mindfulness, the stability of its favorable outcomes in the three-month follow-up can be explained.

In general, the result of this research indicated the effectiveness of cognitive therapy based on mindfulness on improving mental health, including increasing emotion regulation and reducing type D personality type symptoms in cardiac patients with ICD; Therefore, this intervention can be used as a complementary method of medical treatment to improve the general health of these patients. In general, cognitive therapy based on mindfulness introduces a person to stress and how to deal with it, and can help a person's physiological and psychological functioning by neutralizing

the effect of some stress and anxiety. Therefore, it seems that by applying the third wave interventions of cognitive-behavioral therapies, a step was taken in the direction of providing treatment for heart patients with ICD and reducing the severity of their disease.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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