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Effectiveness of Mindfulness Group Training Based on Stress Reduction on Emotional Self-Regulation and Self-Care in Diabetes Type 2

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Abstract

Objective: This study was conducted to investigate the effectiveness of mindfulness group training based on stress reduction on emotional self-regulation and self-care in type 2 diabetes people - Esfrain 2023.

Materials and Methods: This is an experimental research with a pre-test and post-test method and a control group. The statistical society included all type 2 diabetes people in Esfrain city, of whom 36 people were selected as the study sample. The participants were simple random placed in an experimental group and a control group. The experimental group received mindfulness group education based on stress reduction during eight 2-h sessions over 8 weeks, whereas the control group received no education. Before and after the education sessions, the two groups completed Hoffman and Kashdan's (2010) emotional self-regulation questionnaire and Tobert and Glasso's (2000) self-care questionnaire. Data were analyzed using the multivariate analysis of covariance test.

Results: The results showed that mindfulness group training based on stress reduction can improve emotional self-regulation scores and life expectancy in patients with type 2 diabetes(*P*: 0.0005).

Conclusion: According to the results of the research, mindfulness training based on stress reduction is suggested to diabetic patients as a complementary treatment with the aim of improving the level of emotional self-regulation and self-care.

Keywords: Social behavior, Emotional regulation, Mindfulness, Self-care, Diabetes

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Introduction

Diabetes, which is a complex chronic disease, has serious physical, mental, and clinical complications for those who suffer from it. Type 1 and 2 diabetes are the main and most important forms of this disease. (1). Today, approximately four million Iranians are suffering from the disease, half of whom are unaware of their severe condition (2). In 2015, of 415 million people who were recorded with diabetes, more than 90% suffered from type 2 diabetes (3). Diabetes is one of the most common and costly chronic diseases that limits the patient's activities. The characteristic of this chronic endocrine disease is malfunction in glucose metabolism, which is also caused by problems in the production or use of insulin hormone (4). Many other factors, including psychosocial support, self-efficacy, health beliefs, behavioral factors, and lifestyle, are effective in diabetes (5).

Considering that complete recovery is impossible in chronic patients, including those with diabetes, optimizing self-care can be considered as one of the most important therapeutic measures (6). Therefore, due to the rapid expansion of diabetes and the imposition of additional costs on the lives of both patients and their families and the inability of health care systems to meet the increasing needs of these patients, teaching self-care behaviors to promote self-efficacy of these patients is inevitable (7). Encouraging patients to adopt correct methods of self-care is another important factor that provides successful management of the disease; therefore, education is a special part of the care program that encourages the patients to participate actively in their care and come along better with the existing situation. Nowadays, the approach of educating patients has changed enormously from the traditional mode and has undergone extensive changes. Patients are considered as active people in the treatment process and should be able to make correct decisions, learn practical skills on their illness, and above all, achieve self-care (8).

Defects in emotional self-regulation processes include issues such as the difficulty of restraining inappropriate behavior in response to each positive and negative emotion, problems with focused attention due to intense emotions, and irregularity in coordinated behavior in response to emotional activation(9). Conducting self-care activities, including correct and timely insulin injections, following a diet, participating in regular sports activities, taking regular medications, and taking care of the feet, largely depends on the level of life expectancy in diabetic patients (10). A review of previous studies showed that patients with type 2 diabetes experienced a moderate level of hope (11).

Considering the biological, psychological, and social aspects of diabetes, conducting interventions to increase the psychological abilities of patients with type 2 diabetes, including increasing self-care skills and raising the life expectancy of these patients along with drug therapy interventions, is also essential (12). In recent years, the number of studies on psychotherapy interventions, especially mindfulness therapy based on stress reduction, has increased significantly. In general, mindfulness is defined as a receptive and judgment-free awareness of what is happening now. In the moment and accepting without judgment, which is one of the main elements of mindfulness, is critical in promoting executive control because it increases people's sensitivity to emotional signs in the context of their experiences (13). By cultivating emotions in a balanced way, mindfulness acts as an excellent process of information processing that protects people from excessive involvement in emotions or extreme avoidance of them (14). Mindfulness leads to the coordination of adaptive behaviors, psychological states, and the improvement of individual capabilities in line with individual and social activities (15). Brown et al. (16)

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describe mindfulness as a model of information processing in which the mind, like a mirror, reflects what has already happened without prejudice. Mindful people perceive and process events less than when they are distressing. Thus, they have a great ability to face several thoughts, emotions, and experiences. Such people process events more realistically than reacting impulsively or habitually (17). Mindfulness has positive therapeutic effects on all types of chronic diseases in patients and their caregivers (18). According to the findings of existing studies, based on mindfulness, interventions play a key role in reducing psychological symptoms, increasing hope, quality of life, mental health, and well-being (19). This study was conducted to investigate the effectiveness of mindfulness training based on stress reduction on self-care and life expectancy of type 2 diabetes people.

Material and methods

This is a semi-experimental pre-test-post-test study. The statistical population included people with type 2 diabetes who had medical records in the health centers of Esfrain city. From these people, 36 people (18 people from the experimental group and 18 people from the control group) were selected conveniently as the study sample. The inclusion criteria were: having a case in health centers, age range 20 to 50, willingness and informed consent to participate in the research project, and having a minimum level of cycle literacy. The exclusion criteria were: absence of more than two sessions in mindfulness group training sessions, the occurrence of acute stress symptoms, and unwillingness to continue treatment. In this research, SPSS-19 software was used for data analysis, descriptive statistics indicators such as mean and standard deviation were used in the data description, and multivariate covariance analyses were used in the inferential part. All the participants were present in all the meetings and finished the meetings willingly and willingly. Mindfulness training based on stress reduction on self-care and life expectancy sessions are explained in Table 1.

The collection tools used in the current research include:

1. Self-care questionnaire: This questionnaire was prepared by Tobert Voglasko in 2000. The questionnaire has 15 questions that examine the self-care criteria of patients and includesfoot care, diabetes treatment regimen, blood sugar measurement, insulin injection with antidiabetic sugar intake, exercise, and smoking status. The total score of the scale was between 0 and 99, and to determine the self-care status of diabetic patients, they were classified into three categories: weak self-care (0-33), moderate self-care (3-67) and strong self-care (68-99).

2. Emotional self-regulation: The emotional self-regulation questionnaire was prepared by

Table 1. Summary of the content of mindfulness-based stress reduction training sessions, Kabat-Zinn (2005) and Kabat-Zinn and Haneh (2009)

Session	Brief description of the session
1	Conducting the pre-test, introducing the group members, presenting goals and expectations, introducing mindfulness, explanations about stress and burnout. Discuss stress and people's usual reactions to difficult situations and attitudes
2	Raisin eating practice, breathing focused meditation practice, mindful walking meditation practice
3	Practicing body inspection, talking about the experience of mindfulness, discussing some features of mindfulness such as being non-judgmental, practicing thoughts and feelings, practicing sitting meditation focusing on breathing.
4	Short practice of seeing or hearing, sitting meditation paying attention to breathing, body, sounds and thoughts, practice of conscious body movements.
5	Practicing sitting meditation with attention to breathing, discussing acknowledging and accepting the reality of the present situation, the second practice of conscious body movements
6	A three-minute breathing exercise, discussing how our thoughts are often not the actual content.
7	Practicing open awareness (to whatever comes into awareness moment by moment), discussing what the best way to take care of yourself is, evaluating pleasant versus unpleasant daily activities, and learning to plan for pleasant activities.
8	Overview of the entire program, summary, conclusions, answers to questions, evaluation of the meetings, how to use these items in future decisions, thanking and appreciating the members for participating in the meetings and conducting the post-examination.

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Hoffman and Kashdan in 2010. The questionnaire has three components, concealment, compatibility, and tolerance, and includes 20 questions. Answers are based on a 5-point Likert scale. The validity of the content of the questionnaire was confirmed by psychology experts after translation. In internal research, the reliability of this research was reported to be above 0.80 (Karsheki, 2012).

Ethical considerations

The study was approved by the ethics committee of Payame Noor University, Tehran, Iran. (IR.PNU.REC.1402. 049).

Results

The summary of the characteristics of the statistical sample is provided: based on the results of the present study, the number of employees in the intervention and control groups is 36 (18 in the experimental group and 18 in the control group). In terms of demographic variables, out of 18 people in the experimental group, 15 were women and 3 were men. Out of 18 people in the control group, 13 were women and 5 were men. Also, out of 18 people in the experimental group, 5 people were between 36 and 40 years old, 5 people were between 41 and 45 years old, 1 person was between 46 and 50 years old, 4 people were between 51 and 55 years old, and 3 people were between 56 and 60 years old. Out of 18 people in the control group, 4 people were between 36 and 40 years old, 5 people were between 41 and 45 years old, 2 people were between 46 and 50 years old, 2 people were between 51 and 55 years old, and 5 people were between 56 and 60 years old. For data analysis, descriptive indices including mean and standard deviation were used, and in the inferential part, multivariate covariance analysis was used as follows. According to Table 2, the descriptive data including the mean and SD of the scores indicate that in the pre-test stage, the mean scores of self-care and emotional self-regulation in the experimental group (mindfulness based on stress reduction) and the control group are close in the post-test stage, there was a change in the scores of the subjects of the experimental group. Next, in the inferential dimension, the findings were analyzed using multivariate covariance analysis along with the test of its presuppositions, so that the correctness and correctness of the assumptions could also be statistically investigated.

The underlying assumptions of covariance analysis for Emotional self-regulation and self-care scale, the results of the Kolmogorov-Smirnov test of data normality, and the Levin homogeneity of variances test, the pre-test factor of the research variables with the post-test stage of the homogeneity of the regression line slopes, the homogeneity of the variance-covariance matrices. With Box's M= 9.27 test, (F= 1.40), sig= 0.21. The assumptions of multivariate covariance analysis were confirmed and the results indicated that the assumptions were met. For the significance of the group effect on the research variables, the results of Pillai's test (*P*= 0.005, F= 139.03), Wilks's Lambda (*P*= 0.005, F= 139.03), and Hotelling's (*P*= 0.005, F= 139.03), showed

Table 2. Descriptive index (average and standard deviation) Emotional self-regulation and life expectancy of diabetic patients in separate groups

Variable	Group	Pre-exam		*P*-value	Past- test	
		Mean	SD		Mean	SD
Self-care	Mindfulness	23.83	3.67	0.50	41.72	3.92
	Control	23.83	3.67		3.72	3.59
Emotional self-regulation	Mindfulness	59.36	5.77	0.50	72	6.51
	Control	59.39	5.77		59.39	5.39

Table 3. Summary of the results of multivariate analysis of covariance (MANCOVA)

Variable	Sum of squares	Degrees of freedom	Square	F	*P*-value	Degree of influence	Power
Emotional self-regulation	1431.36	1	1431.36	55.13	0.0005	0.64	1
Self-care	2961	1	2961	318.54	0.0005	0.61	1

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that there was a significant difference between the two experimental and control groups, at least in one of the research variables. Based on the results of Table 3, the value of F in the self-regulation variable with the value (*P*= 0.0005, F= 55.13) and the self-care variable with the value (*P*= 0.0005, *P*= 0.0005, F= 318.54) was significant at α=0.05 level. Based on these findings, in the post-test stage, there is a significant difference between the average post-test scores of the experimental and control groups after removing the effect of the pre-test, it is concluded that the average post-test scores of the experimental group is significant from the control group, and in the experimental group, group training Reducing stress based on mindfulness has significantly increased research variables in the post-test stage.

Discussion

The results of multivariate covariance analysis showed that mindfulness group education based on stress reduction has the greatest effect on emotional self-regulation and self-care in patients with type 2 diabetes. Research evidence in recent decades has shown that mindfulness interventions have a significant impact on people's psychological health. In this regard, the results obtained also with the findings of Naghizadeh Alamdar and Najarpour Ostadi (1401), Azari Qahfarkhi et al. (1401), Naseri Gorgon et al.), Keyvan et al. (2018) are consistent. In this approach, patients sit motionless for a long time and focus on pain sensations in the body and joints, and without moving or showing emotional reactions, they observe these pains. They note that this observation can reduce emotional responses evoked by pain. Therefore, practicing mindfulness skills increases clients' ability to tolerate negative emotional states and enables them to cope effectively. It seems that such a state can lead to more self-care and subsequently improve the psychological condition of patients and increase their life expectancy. Previous studies have shown that increasing the presence of the mind has a significant relationship with various health outcomes, such as reducing pain and anxiety, depression, and stress. The patients participating in the experimental group increased their self-acceptance by receiving mindfulness education based on stress reduction and with the help of meditation exercises and paying attention to the awareness of self-awareness (20). In this way, the patients became aware of the daily activities and the automatic functioning of the mind in the world of the past and future, gained control over them through awareness, and were freed from the daily and automatic mind focused on the past and future (21). This result can also be explained as that interventions based on mindfulness, in order to focus on moment-to-moment awareness and away from judgment, according to the specific method of this intervention, i.e., presence in the moment, acceptance, desensitization, increasing awareness, and non-judgmental observation can reduce the symptoms and consequences of stress and improve the mental health of patients. In mindfulness, seven techniques of non-prejudice, patience, initiatory mind (initiator state of mind), trust, not trying, acceptance, and release (let it pass) are used. All of these techniques are effective in dealing with stress. In addition to the techniques used, because the treatment was in a group, the patients benefited from each other's experiences and talking about the disease together, so that this experience can be mentioned as a factor that has led to a reduction of stress in the patients. In fact, reducing stress based on mindfulness by lowering the patient's stress, increasing cognitive and psychological awareness, and focusing on the present can free patients suffering from depressive symptoms from automatic thoughts and replace them with efficient cognitive processing.

In addition, it seems that mindfulness by influencing the creation and regulation of thoughts, increases levels of acceptance and life expectancy in patients with chronic diseases. Therefore, it is not far from expected

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to report that mindfulness group education based on stress reduction has been able to increase self-care and life expectancy in patients with type 2 diabetes. To clarify the result, it seems that patients with diabetes need to learn mindfulness skills in the process of group education and be more aware of the present time due to increasing mindfulness, of emotions and thoughts that cause them stress, they become aware and consciously experience a deeper sense of peace by reducing them. Mindfulness helped them to see and understand their pain and to reduce the intensity of their pain. They learn how to calmly face life's problems, avoid responding to the environment in unhealthy ways, and escape difficult situations. Mindfulness-based stress reduction therapy makes patients aware of their habitual reactions to situations to have a better and different relationship with themselves, their thoughts, and feelings. According to Kabat-Zinn's theory, this allowed them to break this repetitive cycle and give themselves more options. By participating in a mindfulness-based stress reduction course, patients learn to remove the obstacles they have created for themselves due to unreasonable fears in life and improve their quality of life. In turn, they look optimistically at the future and the events that may happen to them and experience more hope. Life expectancy strengthens physiological and psychological functions, and its lack leads to early disorders in the person's function. Hope, reducing stress based on mindfulness by using techniques such as meditation, perception without prejudice, teaching patience and trust, and increasing acceptance in patients could make people focus more deeply on their bodies. Paying full attention to current events without judging them, reducing prejudice, not retaining or rejecting personal experiences, and increasing intimacy with oneself and not criticizing oneself also increased the hope levels of the patients participating in the research. In fact, the upcoming intervention led to an expansion of the belief of acceptance and lack of complete control over life in patients with type 2 diabetes. Furthermore, searching for positive and constructive experiences and encouraging them, distinguishing between thoughts and feelings with reality, creating intimacy with oneself and not blaming oneself for the current situation, and perceiving the existing situation in a non-judgmental way in the form of mindfulness intervention based on stress reduction, through making changes in the attitude towards the existing conditions and consequences, increased hope in diabetic patients. Therefore, mindfulness group education based on stress reduction has been shown to increase self-care and life expectancy in patients with type 2 diabetes. Considering the significant effect of mindfulness education based on stress reduction on the level of self-care of patients with type 2 diabetes, mindfulness-based education along with drug therapy as a complementary treatment and facilitator of the treatment process of these patients with the aim of improving the levels of self-care and hope and the spirit of these people are suggested (22).

Finally, Future research needs to establish why MBCT is effective only for those with three or more prior episodes and assess its broader acceptability in real-world settings. In the past 10 years, theory development and treatment research has extended to people with chronic fatigue, current depression, bipolar disorder, parenting stress and suicidality. Most recently, Mindfulness: A Practical Guide to finding peace in a frantic world sets out a psychological account of human stress and how MBCT can enhance people's resilience (23).

Conclusions

According to the results of the research, mindfulness training based on stress reduction is suggested to diabetic patients as a complementary treatment with the aim of improving the level of emotional self-regulation and self-care.

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Conflict of Interest

The authors of this article declare that there are no conflicts of interest.

Authors' contributions

MR. A: conceived and designed the analysis, collected the data, contributed data, performed the analysis, prepared first drafts of the manuscript.

J. Sh: conceived of the presented idea, planning methodology to reach the conclusion, contributed data and performed the analysis.

All authors have accepted responsibility for the entire content of this manuscript and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved and approved the version to be published.

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