ORIGINAL ARTICLE

Examining the Effectiveness of Mindfulness-based Stress Reduction Program and Conscious Yoga on Quality of Life in Patients with Diabetes Type 2

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Abstract

Objective: Diabetes is a chronic disease that causes severe side effects in patients. According to the previous studies, the incidence of depression and anxiety is higher among patients with diabetes type 2. The present study was conducted with the aim of examining the effectiveness of mindfulness-based stress reduction program and conscious yoga on depression, anxiety and stress in patients with diabetes type 2.

Materials and Methods: The study was quasi-experimental with pre-test, post-test, control group and a 2-month follow-up. 24 patients among patients with diabetes who referred to Imam Hossein hospital were selected in an available way and were randomly assigned into experimental (n1=12) and control groups (n2=12). The level of quality of life was measured using Quality of Life Questionnaire (SF-36) in pre-test. Then, participants of the experimental group received group mindfulness-based stress reduction program and conscious yoga for 8 sessions. After completing the interventions, patients' quality of life level was measured again and data were analyzed using multivariate repeated measurement model.

Results: Findings showed there is a significant difference between experimental and control groups in terms of the quality of life level and mindfulness-based stress reduction program significantly increases the quality of life in the participants of the experimental group.

Conclusion: The result of this study suggests that mindfulness-based stress reduction program can be an appropriate therapeutic method for improving quality of life in patients with diabetes type 2.

Keywords: Conscious yoga, Diabetes mellitus, Mindfulness-based stress reduction program, Quality of life.

Introduction

Diabetes is a chronic disease and a major cause of death and disability throughout the world. It has various effects not only on the body, but also on mind and social functioning. Although medical treatments reduce symptoms, but they and their side effects, disrupt patients' quality of life and social communications(1). During the last decades, psychological aspects of diabetes have attracted several specialists' interest (2).

Conducted studies reported the risk of incidence of depression (3), anxiety (4) and low quality of life (5) is obvious in these patients. There is a significant relationship between diabetes and quality of life (6). Studies have shown diabetes can have negative effects on patients' general health, well-being and quality of life (7). Studies suggest that life quality is unpleasant in60% of patients with diabetes and pleasant in most healthy individuals (58.1%) (8).

The World Health Organization defines quality of life as individuals' understanding of their position in life in terms of culture and value systems in which they live, goals, expectations, standards and priorities. So, this concept is totally personal, cannot be seen by others and is based on individuals' understanding of the different aspects of their lives (9). Quality of life is a wide conception that is related to all aspects of human life. The use of this concept in medical care indicates the focus on the effects of disease and the treatment (10). In most studies, the dimensions of quality of life include physical, psychological and emotional health, feeling of mental health and the ability to work. The health-related quality of life includes an evaluation of individuals from their lives despite the effect of disease, injury or treatment on functioning, perceptions and social opportunities (11).

Several studies have been conducted on the effectiveness of mindfulness-based stress reduction (MBSR) program. MBSR model has shown success in treating cancer (12) and significant improvement in quality of life, stress symptoms and quality of sleep in patients with breast and prostate cancer (13). It also showed a significant effect on increasing mental clarity, mental health and decreasing physical stress (14).

Considering the physical and psychological problems in patients with diabetes and existing evidence about the effectiveness of mindfulness-based stress reduction program on life quality in patients with diabetes and chronic diseases, the present study aims to examine whether mindfulness-based stress reduction program is effective on improving life quality in patients with diabetes or not.

Materials and Methods

This study is quasi-experimental that is conducted with a randomized controlled clinical trial. All patients with diabetes who referred to Imam Hossein hospital in Tehran in 2014 consisted the statistical population of this study. Among them, 24 patients were selected and were randomly assigned into experimental (12 participants) and control groups (12 participants). Inclusion criteria are: individuals should suffer from diabetes type 2, they should have middle school education or higher, they should be 20 to 55 years old, they should be able to participate in group therapy sessions and be willing to cooperate in the study. Exclusion criteria are: suffering from other chronic diseases, having history of hospitalization due to neurological and psychiatric disease and being a drug abuser. Exclusion criteria for participants of experimental group is absence in intervention sessions more than two sessions.

Mindfulness-based stress reduction program is developed by Kabat-Zininin Medical Center of Massachusetts University in 1979 (15,16). It is a kind of structured clinical program. It is one of the therapeutic methods that focused on the interaction of mind and body and used broadly in clinics and hospitals around the USA and Europe to help managing the stress and adapting to chronic diseases. It is an 8-week program. Each session lasts about 120 to 150 minutes and mindfulness skills for coping with stress and developing awareness at the present time are taught. It includes thought-related meditations, relaxation and Hatha yoga (17). Mindfulness means paying attention to the present time in a special, purposeful and without judge way (18). One of the main goals of this program is to promote health and reduce stress (19). Meditation and mindfulness exercises lead to increase in self-awareness and self-acceptance abilities in patients (17). One core concept of mindfulness training is

that individuals are honest to themselves and their feelings. Along with the increase in individuals' ability for mindfulness, they can identify accurately what is happening in their bodies and minds as they are happening around them (20).

To collect data, the following questionnaires were used.

Demographic Information Questionnaire: This questionnaire was used to collect demographic data required as a basic information including age, marital status, education, socio-economic condition, educational background and employment history, as well as questions about the way of controlling diabetes by patients, the level of receiving insulin, alcohol consumption and smoking.

Quality of Life Questionnaire SF-36: This questionnaire is designed by Weir et al. (1998) (21). It is a comprehensive questionnaire to measure quality of life in all health-related issues. It examines eight dimensions of quality of life with 36 items that are completed by the patients or through interviews. It is implementable on different age groups and diseases. The reliability and validity of the questionnaire was approved by Weir et al. in 1988. The score range of this questionnaire is between0 and100. Score 100 shows the ideal situation and score 0 shows the worst situation in each dimension. Physical functioning, activity limitations due to the physical problems, physical pain, vitality, general health, mental health, activity limitations due to mental problems and social functioning are the dimensions of this questionnaire. It was translated by Institute of Health Sciences (SID) in Iran. Cronbach's alpha coefficient of 0.77 to 0.95 was obtained for all aspects of questionnaire except vitality and 0.65 for vitality dimension (22).

The interviews were conducted by two master clinical psychologists who were familiar enough with the intervention, according to the ethical standards of research such as informed consent and maintaining secrets of participants. Participants completed questionnaires in 3 stages, before intervention (pre-test), after intervention (post-test) and 2 months after intervention (follow-up). Treatment was done in 8 group sessions, each intervention session of this study was followed based on mindfulness-based stress reduction program (17) and were conducted once a week in 2 hours for participants of the experimental group. Participants of the control group did not receive any interventions. Due to ethical considerations, at the end of the research, participants of the control group were given a CD of yoga practices. A summary of functional instructions of mindfulness-based stress reduction program is presented in table1.

Results

In this study, 24 patients with diabetes type 2 (12 patients in the control group and 12 patients in the experimental group) aged 32-49years old were studied. The average age of participants of experimental group was 42 ± 5/32 years and the average age of participants of control group was 40 ± 4/56 years. The demographic characteristics of the population of the study are listed in Table 2. There was no significant difference between the control and experimental groups in terms of the mean of the demographic characteristics.

The mean and standard deviation of the life quality scores in the experimental and control groups in three stages of pre-test, post-test, and follow-up are reported in Table 3. In addition, in some cases the increase has been also continued at follow-up stage. However, the increase has not been stable in some other cases, including the components of emotional limits, energy and vitality and social functioning. The mean scores of these variables in the control group in the pre-test and follow-up showed no significant changes compared to the pre-test.

In the present study quality of life includes various aspects of public health, physical limitations, physical functioning, emotional limitations, body pain, vitality, social functioning and mental health. In this study, the scores of quality of life in experimental

Table1. Summary of operating instruction sessions of mindfulness-based stress reduction program

Session	Topic
The first session	Introducing an automatic guidance system/knowing how to use present moment awareness of bodily sensation, thoughts and emotions in reducing stress/practicing eating raisins*, giving feedback and discussing the practice/three-minutes breathing, giving an assignment for next week and distributing leaflets of the first session and CDs of meditation
The second session	Re-examining body workout/ giving feedback and discussing examining body workout/ practicing breathing, mindfulness meditation/ yoga stretching exercises/distributing leaflets of the second session and CDs of meditation
The third session	Having conscious sitting with awareness of breathing (the sitting meditation) /practicing yoga exercises (in the hospital chapel) / practicing three -minute breathing /distributing leaflets of the third session and video tape of yoga practices
The fourth session	Re-examining body workout /practicing exercises related to conscious yoga (in the hospital chapel) /5-minute practicing of "seeing or hearing"/ re-practicing conscious session with awareness of breathing and body/ distributing leaflets of the fourth session and CDs of meditation
The fifth session	Practicing breathing /re-practicing conscious session (awareness of breathing, body, sounds and thoughts) /explaining the stress and identifying participants' reactions to stress/examining awareness of pleasant and unpleasant events on feeling, thoughts and bodily sensations/practicing conscious yoga exercises/practicing 3-minute breathing /distributing leaflets
The sixth session	Practicing conscious yoga/practicing sitting meditation (mindfulness of sounds and thoughts) /distributing leaflets of the sixth session and number4 video tape to participants
The seventh session	Practicing mountain meditation/sleep hygiene/ repeating exercises of the previous session/making a list of enjoyable activities/distributing leaflets of the seventh session
The eighth session	Examining body workout /over viewing program/examining and discussing programs /practicing stone, beads and marbles meditation

*: Object attention training

and control groups were analyzed using repeated measures analysis of variance. Prior to the analysis, first the research hypotheses were examined. Table 4 shows the results of multivariate analysis for examining the significance of the independent variables interaction effect in the model. According to the F value and significance level (*P*-value), the results of this analysis showed that the models in time and time interaction had a significant effect on quality of life. This result showed that the present intervention had a significant effect on improving quality of life.

Considering F and significance level, it was found that Sphericity assumption was not approved and Sphericity assumption of the dependent variable variance - covariance cannot be accepted for all aspects of quality of life except for bodily pain and social functioning components. Table 5 shows the results of correction for each Epsilon values. This table shows the univariate tests for within subject factors and their interaction. Considering the significance level, it can be stated that the Sphericity assumption is established for other components in corrected

Table 2. Patient's characteristics

Variable	Group	Variables	Frequency	Percent
Marital status	Control	Married	11	91.7
		Single	1	8.3
	Experimental	Married	11	91.7
		Single	1	8.3
Level of education	Control	Middle and secondary	3	25
		University	9	75
	Experimental	Middle and secondary	4	33.3
		University	8	66.7
Income	Control	The average	6	50
		High	6	50
	Experimental	The average	8	66.7
		High	4	33.3
Status of work	Control	Housewife	4	33.3
		Employed	8	66.7
	Experimental	Housewife	6	50
		Employed	6	50

results.

The results of the repeated measures variance analysis in examining quality of life components showed that there is a significant difference in groups in three evaluation stages in general health, physical limitations, physical functioning and social functioning components. Eta square also shows the amount of effectiveness of mindfulness-based stress reduction program on quality of life in patients with diabetes.

Discussion

It was concluded that group MBSR program increases the quality of life in patients with diabetes. This result is consistent with the results of the previous studies that showed this program can be an effective psychosocial intervention in improving quality of life (23).The study by Carlson and Space showed that mindfulness meditations, in addition to reducing stress, significantly increases mental clarity, mental health and reduces physical stress in patients. These researchers concluded that MBSR program has an important role in improving symptoms and positive results for patients following this treatment program (24). Promoting mental health has different definitions such as the balance between positive and negative emotions and pleasant quality of life. So, according to different definitions, it can be concluded that mental health is associated with different factors such as quality of life, coping strategies in dealing with life challenges and managing stress (25). Quality of life is a multidimensional concept. World Health Organization defines it as individuals' perception of their lives, values, goals, standards and personal interests. Sense of security, emotional conflicts, personal beliefs, goals and the amount of frustration tolerance are all effective in determining one's perception of self (feeling good or feeling bad) (26).

Group MBSR program causes mindfulness. Meditation and mindfulness practices lead to self- awareness and self-acceptance in patients. Mindfulness is not a method or technique. It is defined as an available way to reduce pain and expand positive qualities such as consciousness, insight, wisdom and sympathy (27). Applying relaxation training broadly and high emphasis on it as a valuable stress management skill should be regularly

Table 3. Descriptive statistics of quality of life dimensions in patients with Diabetes Mellitus

Variable	Experimental Group (n=12)			Control Group (n=12)		
Modality	**pre-test**	**post-test**	**Follow-up**	**pre-test**	**post-test**	**Follow-up**
Public health	7.66±0.88	5.50±0.67	6.58±0.66	7.25±0.45	7±1.12	7.25±0.62
Physical limitations	22.83±1.58	25.91±1.16	27±1.53	22.16±0.71	23.66±1.43	25.41±1.67
Physical functioning	4.50±0.67	6.16±1.11	5±0.95	4.33±0.49	4.58±0.90	4.50±0.67
Effect limitations	3.33±0.49	4.83±0.71	3.50±0.52	3.75±0.86	3.91±0.66	3.75±0.86
Physical pain	10.08±1.78	7.41±1.31	7.58±0.90	9.58±1.97	8.83±1.78	9.58±1.67
Energy and vitality	32.66±2.10	35.41±1.56	33.66±1.23	33.91±2.01	33.66±2.06	33.91±2.01
Social performance	2.91±0.28	3.91±0.66	2.91±0.51	2.83±0.38	2.50±0.66	2.83±0.38
Mental health	12.33±1.49	14.41±1.67	13.08±1.31	13.25±1.86	12.58±1.31	12.33±1.49

Table4. Results of multivariate analysis to assess the significance of the effects of time and time interaction

Modality		Value	F	Significance level	Eta square
Time	**Pilai trace test**	1.691	26.021	0.0001	0.845
	Wilks Lambedai test	0.022	26.279	0.0001	0.850
	Hotelling effect test	11.785	26.515	0.0001	0.855
	Largest root test	7.582	36.013	0.0001	0.883
Time and Groups	**Pilai trace test**	1.301	8.845	0.0001	0.651
	Wilks Lambedai test	0.086	11.178	0.0001	0.707
	Hotelling effect test	6.158	13.856	0.0001	0.755
	Largest root test	5.307	25.209	0.0001	0.841

used in individuals' life and be a sustained part of individuals' coping skills.

Expressing emotions during all sessions of the program has treatment benefits. Mindfulness affects emotional and sensory components of the body by self-regulating attention through meditation. The regular practice of Hathayoga increases skeletal– muscular flexibility and helps the individual to experience deep states of relaxation and awareness (28). In explaining this result, it can be said that when individuals under standdeep feelings of calmness resulted from mindfulness, do not ask themselves what is the meaning and the aim of living. They will understand obviously that calmness, love and pleasure exist inside them. They will understand that all pains and sadness that exist in the world are because humans deprive themselves of understanding and applying the internal source of calmness, love and happiness. They will understand that bad and unpleasant feeling that sometimes they feel are because of their wrong point of view about the world. When they understand that their goal is to access deeply to internal sources within them and this is not only for them, but also for all people around them, in that case life will have a beautiful and deep meaning for them. Meeting similar individuals develops relief and reassurance in patients and can make them learn coping techniques to overcome the problems and solve them. When individuals with high blood sugar communicate, they show their empathy to each other and discuss broadly about their problems and experiences. So, a supportive environment develops for conveying knowledge and awareness. In general, group treatment factors, including catharsis, feeling of being accepted, altruistic, public approval, empathy, identification, imitation, insight, interaction, learning, reality, transfer, universal concept and many other factors increase creating hope, being more responsiveness to treatment and thus reduction of anxiety and increase of quality of life (29).

Since, mindfulness-based stress reduction program emphasizes on here and now, 'the present ' time is the only true thing. Being at the present time and enjoying it is the most important technique applied in this method.

Table 5. Results of Sphericity Mauchly's sphericity test

	Between-group effect	Mauchlys test	Chi-square estimate	Df	Significance level	Epsilon		
	Factor					Greenhouse-glycerate	Huynh - feldt	Lower limit
Time and Groups	Public health	0.558	12.263	2	0.002	0.693	0.759	0.500
	Physical limitations	0.659	8.750	2	0.013	0.746	0.824	0.500
	Physical functioning	0.638	9.453	2	0.009	0.724	0.809	0.500
	Effect limitations	0.571	11.754	2	0.003	0.700	0.767	0.500
	Physical pain	0.820	4.180	2	0.124	0.847	0.952	0.500
	Energy and vitality	0.537	13.071	2	0.001	0.683	0.746	0.500
	Social performance	0.888	2.506	2	0.286	0.899	1	0.500
	Mental health	0.778	5.269	2	0.072	0.818	0.915	0.500

Table 6. The summary of the repeated measures variance analysis to examine the effectiveness of mindfulness-based stress reduction program on quality of life.

Variable	Sum of squares	DF	Mean of square	F	Significance level	Eta square
Public health	2.042	1	2156.540	4.975	0.036	0.184
Physical limitations	13.500	1	930.299	10.340	0.004	0.320
Physical functioning	4.741	1	551.076	16	0.0001	0.421
Effect limitations	0.042	1	158.481	0.122	0.730	0.006
Physical pain	5.671	1	18.100	2.364	0.138	0.097
Energy and vitality	0.167	1	40.764	0.064	0.801	0.003
Social performance	1.167	1	18.100	2.0791	0.001	0.486
Mental health	1.185	1	40.764	0.710	0.409	0.031

Mindfulness training, patience (patience means having a tendency to make things appear in their own time and having a tendency to stay with what is happening at the moment). Patience is the ability to endure problems with a state of tranquility or self-control. It extends the view that individual endures perceived failures of the current situation. This period is helpful in dealing with anxiety. In mindfulness the individuals confidently let the thoughts, feelings, emotions, habits and reactions show themselves. Meanwhile, they do not stick themselves to their thoughts, feelings, ideas and imaginations and do not consider them the same as themselves. It means they do not crave their identity of them. For an individual with mind fullness, thought is one thing and reality is another thing and thought is not necessarily the fact of life. Mindfulness helps individuals manage their negative emotions better, gain more adaptive coping skills and be able to reassess stresses (for example, consider fighting with the problem as an opportunity to grow, not a threat). In explaining this hypothesis, it can be said that what mindfulness does is that individuals are one step away of all the thoughts, both positive and negative. Thoughts are just thoughts and are not facts. Individuals cannot completely control their thoughts. All that can do is that they look at the thoughts, take away from them and stop their spontaneous reaction to them. The more they are able to do that, the more they feel in control of it. Therapeutic effects of group mindfulness-based stress reduction program increases by group-related factors. This program increases the ability of adaptive coping, creating hope and greater responsiveness to treatment. So, more therapeutic consequences are affected (30). According to the results of the present study, it is recommended mindfulness-based stress reduction program be applied to enhance the quality of life in patients with diabetes.

Conclusion

According to the results, group mindfulness-based stress reduction program is an effective method in improving quality of life in patients with diabetes type 2

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