

Comparison of the Effectiveness of Cognitive-behavioral Model Implementation by Peers and Nurses on Anxiety in Patients with Type 2 Diabetes

ARTICLE INFO

Article Type

Original Research

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How to cite this article

Kharamine Sh, Noorian Kh, Moosavi A, Afroughi S, Afrasiabifar A, Hosseini Nik S, Cheraghi S, Niknam A. Comparison of the Effectiveness of Cognitive-behavioral Model Implementation by Peers and Nurses on Anxiety in Patients with Type 2 Diabetes. Journal of Clinical Care and Skills. 2022;3(2):73-78.

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Article History

Received: May 4, 2022

Accepted: June 12, 2022

ePublished: June 20, 2022

ABSTRACT

Aims Many emotional problems including anxiety have been reported in diabetic patients. Different training methods have been used to reduce the patients' anxiety. This study aimed to compare the effectiveness of cognitive-behavioral model implementation by peers and nurses on anxiety in patients with type 2 diabetes.

Materials & Methods This randomized clinical trial study was performed on 75 patients with type 2 diabetes referred to Diabetes Clinic in Gachsaran, Iran in 2018. The samples were selected through purposive sampling method and randomly assigned to the three groups (intervention by nurses, intervention by peers and control). The Hazlett-Stevens protocol was implemented for the training groups by nurses and peers in 12 sessions. Data were collected through Hilton Anxiety Rating Scale and analyzed using SPSS 21 software and inferential tests.

Findings The mean anxiety score in the intervention groups by nurses and peers was significantly different compared to the control group after the intervention ($p < 0.05$). Also, a statistically significant difference was observed in the mean anxiety score of the post-test compared to the pre-test in the intervention groups by peers and nurses ($p < 0.05$). However, there was no significant difference between the anxiety scores of the intervention groups by peers and nurses after the intervention ($p > 0.05$).

Conclusion Cognitive-behavioral model training by both peers and nurses is effective on the anxiety of patients with type 2 diabetes.

Keywords Cognitive Behavioral Therapy; Peer; Nurse; Anxiety; Type 2 Diabetes

CITATION LINKS

[1] The effect of nutrition education on risk ... [2] Quality of life and disability in patients with ... [3] Standards of medical care ... [4] Relationship between personality characteristics ... [5] Assessment of health related quality of ... [6] The quality of life, research ... [7] Perceptions of people with type 2 ... [8] Brunner & Suddarth's textbook of medical-surgical ... [9] Quality of life in diabetic patients referred ... [10] Poor quality of life scores in persons ... [11] Self-efficacy and self-care behavior ... [12] Effectiveness of cognitive-behavioral therapy on ... [13] The effectiveness of cognitive-behavioral obesity group therapy on ... [14] Web-based cognitive behavior therapy for depression ... [15] Psychological interventions for the management ... [16] Comparison of the effect of face to face teaching ... [17] Patient education among nurses ... [18] Nonadherence with diet and fluid restrictions ... [19] Peer ... [20] The effect of the peers' support on ... [21] Development and pilot test of a peer-support ... [22] Peer support for patients with type 2 ... [23] Impact of community based ... [24] Anxiety rating scales in Parkinson's disease ... [25] Effect of reboxetine on reduction of anxiety ... [26] Relationship between the Beck anxiety ... [27] Psychological approaches to generalized ... [28] A comparison of the effect of training by ... [29] The effect of peer education on self-care ... [30] The effect of cognitive-behavioral therapy ... [31] A demonstration of peer support for ... [32] Diabetes distress and glycemic control ... [33] Effects of telephone-based peer support ...

Introduction

Diabetes is a chronic metabolic disease with multifactorial pathogenesis, which is one of the considerable health problems in the world [1]. Diabetic patients feel anxiety and failure following the treatment processes. The well-being of these patients is affected emotionally and socially, and many of them report feelings of fear, anger, and guilt in connection with the illness. Therefore, most diabetic patients are not motivated to self-care and follow the disease treatment processes [2]. Recovery from chronic illness is usually impossible, but death is not imminent. Therefore, diabetes control is very important to improve the quality of life [3].

Emotional disorders such as anxiety, depression, and aggression have been reported in diabetic patients. Stress and anxiety cause the release of the hormone cortisol in the bloodstream, which its resistance increases blood sugar. As a result, controlling anxiety and stress is effective to decrease blood sugar. Diabetic patients suffer from psychological disorders after diagnosis of the disease and during treatment processes; they reported symptoms of anxiety and stress during the treatment processes. Based on the evidence, diabetes doubles the risk of developing psychological symptoms such as anxiety and depression and affects more than a quarter of diabetic patients [4]. Also, studies have shown that other diseases, including cardiovascular diseases, reduce optimal self-care and increase health care costs in patients with chronic illnesses, especially diabetic patients with disability [5].

Studies have shown that education plays a considerable role in improving awareness and coping with the disease, attitude and behavior of patients [5-10]. Stress management training is beneficial for disease control and preventing physical and physiological disorders. Stress management includes methods to reduce stress in patients or enhance their ability to cope with stress. These various strategies include the behavioral methods (such as relaxation, meditation, and regular desensitization) or cognitive-behavioral methods (such as training coping skills, training assertiveness, recording thoughts and cognitive reconstruction, time management, and educational and reasoning topics) [11].

Different studies have confirmed the effectiveness of cognitive-behavioral training on diabetic patients. Mohammad Zadeh *et al.* [12] mentioned the effect of cognitive-behavioral methods on improving physiological disorders and blood sugar control in children with type 1 diabetes. Faladvand *et al.* [13] confirmed the effect of cognitive-behavioral training method on weight and blood sugar decrease in women with type 2 diabetes. Newby *et al.* [14] found the positive effect of cognitive-behavioral training models on depression in people with diabetes, and

Chapman *et al.* [15] revealed its effect on improving Glycemic, depression, and anxiety.

There are various methods for patient training. Out of the methods, in-person training by nurses is considerable. In this method, ideas and emotions interact verbally and non-verbally between the learner and the educator. Behavioral characteristics change by talking and being affected by educators [16]. However, this method has some limitations such as high cost and time-consuming, low number of nurses in the medical wards of hospitals, short-term meetings, and irregular communication between parties, which decreases the communications [17, 18]. Training by peers is a solution for the mentioned problems; indeed the interaction of information, attitude and behavior is conducted by individuals who have not received special training but have some experience in this area. Based on the acquired experiences by the patients' peers, they can share their weaknesses and strengths and try to overcome each other's weaknesses. Patients and peers belonging to the same group increases the sense of empathy between them; in this way, the effectiveness of the model increases and patients accept the information of their peers better [19].

Numerous studies have been conducted on the effectiveness of peer education in medical sciences. Rashidi *et al.* [20] investigated the effect of peer support on the self-efficacy of patients with type 2 diabetes. They concluded that the peer support program improves the self-efficacy of diabetic patients. Wu *et al.* [21] investigated the effect of peer support on the self-management of diabetic people with cardiovascular disease and found that peer support program increases self-efficacy, self-care, and awareness level and reduces the re-hospitalization of patients.

Some studies have reported different results. Smith *et al.* [22] reported the lack of use of peer-based group intervention in patients with type 2 diabetes. Simmons *et al.* investigated the effect of community-based peer support in patients with type 2 diabetes; they concluded that this intervention had little effect on patients' blood pressure after 6 to 12 months and was not effective on other outcomes [23].

Due to the effect of anxiety on the quality of life of patients with type 2 diabetes and the need to educate patients to manage this anxiety, as well as the conflicting results in studies on the effectiveness of patient education methods, this study aimed to compare the effectiveness of cognitive-behavioral model implementation by peers and nurses on anxiety in patients with type 2 diabetes.

Materials and Methods

This randomized clinical trial study was carried out on patients with type 2 diabetes referred to the Diabetes Clinic in Gachsaran, Iran in 2018. The samples were selected through purposive sampling

method and randomly assigned to one of the study groups (training group by nurse, training group by peers, and control group). The sample size of 25 people in each group (N=75) was determined by considering the confidence level of 95%, the test power of 80%, the minimal significant difference in the mean score of outcome variable at the level of 0.5 and the statistical decline of 10% (based on the Cohen model).

Inclusion criteria included acquiring an anxiety score of more than 25 on the Hamilton Anxiety Rating Scale, affected by type 2 diabetes for more than a year, literacy for reading and writing, tendency to participate in the study, having enough time to participate in the study, and the patient's self-care ability. Exclusion criteria included debilitating physical and mental disorders, medical and paramedical education, and history of participating in similar research.

Data were collected using a demographic questionnaire and Hamilton Anxiety Rating Scale to determine anxiety levels. This scale was developed by Max Hamilton in 1960 and 1967 to assess the severity of anxiety as a clinical scale. Currently, this is one of the most well-known anxiety tests. The scale includes 14 items related to specific symptoms of anxiety. In this test, each item has 5 ranks in the range of 0-4 based on the severity of the symptoms. Zero indicates the absence of the symptom and 4 indicates the severity of the symptom in the patient. The questionnaire is scored by the researcher. This scale covers a wide range of symptoms, which are usually diagnosed as symptoms of an anxiety disorder. Symptoms include anxious mood, tension, fear, insomnia, difficulty concentrating, depression, muscle tension (tick or tremor), cardiovascular, gastrointestinal and urogenital symptoms, and other physical symptoms such as dry mouth and sweating during the interview. This scale has scores between 0 and 56, with 18 indicating mild anxiety, 19 to 25 indicating moderate anxiety, and 26 to 30 indicating severe anxiety. Leetjense *et al.* reported a reliability coefficient of 0.9 for this scale with the test-retest method [24]. In Iran, Tashakori *et al.* reported the reliability coefficient of this questionnaire as 0.84 [25]. Beck *et al.* [26] reported a correlation coefficient of 0.56 between the Hamilton Anxiety Rating Scale and the Beck Anxiety Inventory.

The aims and number of intervention sessions were explained to the subjects. Then, subjects filled out a written consent form, demographic questionnaire, and Hamilton Anxiety Rating Scale. 4 nurses and 4 patients with type 2 diabetes were trained by a licensed psychologist. At the end of the training, the two intervention groups were randomly divided between the two educator groups and received group training. In other words, each intervention group was divided into 4 groups including 6 subjects and each group was trained by one person (peer or nurse). In the first step, the Hamilton Anxiety Rating

Scale was distributed among the subjects of the intervention and control groups. One week after the cognitive-behavioral model intervention, Hamilton Anxiety Rating Scale was again given to the intervention and control groups as a post-test.

The protocol proposed by Hazlett-Stevens [27] was implemented for the training groups by nurses and peers (Table 1).

Table 1) Proposed Hazlett-Stevens protocol

Session	Content
1	Introducing members to each other, explaining goals and rules, psychological training and pre-test
2	Continuation and review of psychological education, logic and reason for deep breathing, deep breathing methods, primary cognitive treatment methods, logic and reason of cognitive therapy, Identifying anxious thoughts
3	Logic and reason of progressive relaxation training, implementation of progressive relaxation
4	Cognitive techniques to challenge anxious thoughts, creating alternative interpretations or predictions, examining the evidence and possibilities, panic, panic relief
5	Identifying worrying behaviors, identifying passive avoidance behaviors, mental relaxation training
6	Identifying and examining the main worrying metacognitive beliefs, creating new perspectives, practicing progressive relaxation
7	Continuation to identify and examine the main beliefs, identifying and examining metacognitive concerns, behavioral change in lifestyle, identification of neglected activities
8	Continuation of identification and study of main beliefs, continuation to identify and examine metacognitive concerns, progressive relaxation training, mental exposure
9	Continuation of identification and study of main beliefs, continuation of identification and study of disturbing metacognitive beliefs, progressive relaxation training, next mental exposure
10	Continuation of identification and study of main beliefs, continuation of identification and study of metacognitive beliefs, applied relaxation methods
11	Continuation of the previous treatment components, introduction of the recurrence prevention program, review of the progress of references, review of the psychological training
12	Continuation of the previous treatment components, design of recurrence prevention program

Data were analyzed using SPSS 21 software through descriptive statistics (mean and standard deviation) and inferential statistics including Paired sample t-test, One-way Analysis of Covariance (ANCOVA), and Tukey's post hoc test.

Findings

Of all subjects, 49 (65.3%) were male and 26 (34.7%) were female. 9 people (12.0%) had a disease history of less than 5 years, 45 people (60.0%) had a disease history of 5-10 years, and 21 people (28.0%) had a disease history of more than 10 years.

There was no significant difference between the studied groups in terms of the mean anxiety score before the intervention ($p=0.8$). However, the mean

anxiety score between the three groups showed a significant difference after the intervention ($p=0.001$; Table 2).

Intragroup comparison of the mean anxiety of patients before and after the intervention showed that cognitive-behavioral model training by nurses and peers significantly reduced the anxiety level in type 2 diabetic patients. However, there was no significant difference between the anxiety of patients with type 2 diabetes in the control group before and after the intervention (Table 2).

Table 2) Intergroup and Intragroup comparison of the mean anxiety of patients in the three groups before and after the intervention

Groups	Before intervention	After intervention	Intragroup comparison**
Training by nurses	30.7±4.5	24.4±5.9	t=7.481; p=0.001
Training by peers	31.7±2.7	26.5±2.1	t=5.253; p=0.001
Control	29.6±8.9	29.3±6.7	t=0.237; p=0.8
Intergroup comparison*	F=0.2; p=0.8	F=7.9; p=0.001	-

*One-way ANCOVA; **Paired sample t-test

In the two-by-two comparison of the groups, there was a statistically significant difference between the two intervention groups compared to the control group ($p<0.05$), but there was no significant difference between the intervention groups with nurses and peers ($p=0.4$).

Discussion

The aim of this study was to compare the effectiveness of cognitive-behavioral model implementation by peers and nurses on the anxiety of patients with type 2 diabetes.

The findings showed that there is no significant difference between the mean anxiety scores of the two intervention groups by peers and nurses. This finding is consistent with the study of Mohammadpoor *et al.* [28], Ahmadi *et al.* [29], Rashidi *et al.* [20], and Wu *et al.* [21].

Also, the findings showed a significant difference in the mean score of anxiety between the control group and the intervention group by nurses after intervention. This finding is consistent with the study of Mohammad Zadeh Farahani *et al.* [12], who concluded that cognitive-behavioral therapy methods decrease the physiological problems and improve blood sugar control in the intervention group compared to the control group. Mohammad Zadeh Farahani *et al.* [12] mentioned cognitive-behavioral therapy as one of the new effective therapeutic interventions in diabetes, especially in diabetic children, along with other therapy methods. Consistent with our findings, Faladvand *et al.* [13] reported that cognitive-behavioral methods decrease blood sugar level and weight in patients

with type-2 diabetes. Samadzade *et al.* [30] showed that cognitive-behavioral therapy increases self-care behaviors and decreases depression and anxiety symptoms in women with type-2 diabetes, which is similar to our results. These findings showed the effective role of cognitive-behavioral therapy on type 2 diabetic patients. In addition, Champman *et al.* [15] concluded that psychological intervention improves glycemic symptoms, anxiety, and depression.

Also, the results showed a significant difference in the mean score of anxiety among the subjects of the intervention group by peers after the intervention. Baumann *et al.* [31] found that patients with type 2 diabetes experienced improvements in psychological consequences after participating in a short peer support program. This result follows our findings. Similar to our study, Mizokami-Stout *et al.* [32] found that empowerment through peer support in patients with type 1 diabetes improves diabetes-induced distress and hemoglobin A1C.

Chan *et al.* [33] concluded that peer support in patients with type 2 diabetes does not improve their mental health problems, which is inconsistent with our findings. A possible reason for the difference between the aforementioned study and ours is that in Chan *et al.*'s study, peer support was provided by telephone rather than face-to-face [33]. Simmons *et al.* [23] also studied the effect of peer support on secondary outcomes, including quality of life, diabetic distress, and hypertension in type 2 diabetic patients through a cluster-randomized controlled trial study and found no significant difference in the complications, 8 to 12 months after the interventions, which does not follow our findings. Despite the more sample size in the study by Simmons *et al.* [23], the possible reason for the differences is the lack of use of a special protocol and the low number of in-person sessions for intervention. Another reported difference between the results of this study and most studies is the use of the cognitive-behavioral model in this study.

The cognitive-behavioral model believes that negative cognition leads to the onset of anxiety and depression in the stressful background of life. Since not all people are under the same conditions of stress, depression and anxiety, cognitive-behavioral therapy aims to change the negative cognitions and improve their anxiety symptoms. Educating patients about their disease and helping them to acquire the technical skills (such as controlling and interpreting blood sugar) is necessary to improve self-care skills in patients with type 2 diabetes; however, it does not guarantee success.

According to the cognitive-behavioral model, people's beliefs affect their feelings and behaviors. Awareness and attitude of diabetic patients also has a significant effect on their self-care behaviors. Negative disease control reduces a person's self-care behaviors. One of the basic principles of the

cognitive-behavioral model is the mutual effect between the person's cognitions or beliefs about the disease (thoughts), feelings, behaviors, and relationships with others. According to this model, for a diabetic with poor disease control, identifying automatic thoughts, discovering the influence of thoughts on mood and behavior, and challenging thoughts and beliefs are very useful and reduce negative emotions and lead to adaptive coping with the disease. Therefore, it is expected that patients will show a significant increase in self-care behavior after the intervention and thus reduce anxiety.

This research has some limitations that require caution in generalizing the results, including the use of a self-report method to examine the research variable (anxiety), the study of type 2 diabetic patients, and the small size of the statistical sample. Therefore, it is recommended to use a large statistical sample size with different types of diabetes in one study to access better results. It is also suggested to use interviews in addition to self-report tools in future studies. Moreover, based on the results, it is suggested to use cognitive-behavioral model training along with pharmacological treatment to influence the anxiety of patients with type 2 diabetes.

Conclusion

Cognitive-behavioral model training by both peers and nurses is effective on the anxiety of patients with type 2 diabetes.

Acknowledgment: The authors would like to thank the specialists and staff of Gachsaran Clinic and the Research Vice-Chancellor of Yasuj University of Medical Sciences who cooperated and supported this study.

Ethical Permission: Necessary license was obtained from Yasuj University of Medical Sciences. Participants were also informed about the aims of the study and the voluntary nature of their participation in the study. Participants had the right to leave the research. Also, two cognitive-behavioral training sessions were applied to the control group after the study. Written consent was obtained from the subjects to participate in the study. The confidentiality of information was emphasized and the collected information was used only for the research. The research project was approved by the Ethics Committee of Yasuj University of Medical Sciences with the code IR.YUMS.REC.1397.140. Also, the above study was registered in the Iranian clinical trial website with code IRCT20190211042681N1.

Conflict of Interest: There is no conflict of interest.

Authors' Contribution: Kharamine S. (First author), Original researcher/ Introduction author/ Methodologist/ Discussion author (20%); Noorian K. (Second author), Assistant/ Data collection/ Introduction author/ Discussion author (9%); Moosavi A. (Thirst author), Introduction author/ Methodologist/ Discussion author (8%); Afroughi S. (Fourth author), Assistant/ Statistical analyst/ Discussion author (9%); Afrasiabifar A. (Fifth author), Assistant/ Statistical analyst/ Discussion author (8%); Hosseini Nik S. (Sixth author), Assistant/

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Funding: This study is extracted from the master's thesis that was carried out with the financial support of the Research Vice-Chancellor of Yasuj University of Medical Sciences.

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