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## Effect of Peer Support Group on the Level of Depression in Type 2 Diabetic Patients: A Randomized Clinical Trial

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### Abstract

**Background:** Depression is one of the most common psychological problems in diabetic patients. Peer support groups focusing on shared experiences may affect patients' minds.

**Aim:** This study aimed to evaluate the effect of peer support groups on the level of depression in type 2 diabetic patients.

**Method:** This randomized controlled clinical trial was conducted on 64 patients with type 2 diabetes in Sabzevar, Iran, during 2018. The level of depression was assessed before and six weeks after the intervention using the Beck Depression Inventory-II. The intervention group attended peer support group sessions, whereas the control group received training by a nurse at the diabetes center. The data were analyzed in STATA software (version 12) using repeated measures ANOVA.

**Results:** According to the results, the mean ages of the patients were  $51.7 \pm 9.2$  and  $51.5 \pm 8.5$  years in the intervention and control groups, respectively. Moreover, the total depression scores in the intervention and control groups were obtained at  $24.7 \pm 2.9$  and  $23.3 \pm 2.8$ , respectively. However, these values changed to  $15.1 \pm 6.1$  and  $24.3 \pm 4.8$  immediately after the intervention, as well as  $15.8 \pm 6.1$  and  $24.7 \pm 4.3$  six weeks later, in the intervention and control groups, respectively. The repeated measures ANOVA revealed a significant difference between these two groups in terms of the effect of the group ( $P < 0.001$ ), the effect of time ( $P < 0.001$ ), and mutual effect ( $P < 0.001$ ).

**Implications for Practice:** Peer support group could decrease the level of depression in diabetic patients therefore, it is recommended that peer education be considered as a part of patients' therapeutic program with the aim of reducing mental symptoms.

**Keywords:** Depression, Diabetes Mellitus, Peer support group

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## Introduction

Depression, anxiety, and adjustment disorders are the most common psychiatric disorders in diabetic patients (1). The possibility of depression in diabetic patients is three times higher, compared to non-diabetic individuals (2). On the other hand, the course of depression in diabetic patients is more severe than that in other patients (3). It has been shown that depression increases the risk of type 2 diabetes. Conversely, the diagnosis of type 2 diabetes, the chronicity of the disease, and its physical complications increase the risk of incident depression (4). Recently, the conventional treatments used for depression include three methods, namely medication therapy, psychotherapy (i.e., indirect counseling, cognitive behavior therapy, interpersonal psychotherapy, and psychoanalysis), and psychosocial care (5-7).

Various types of psychological interventions, including mind-body medicine (8), perceived social support (9), and group therapy (10) have been introduced to control blood glucose more efficiently. Peer-led education is among the various types of patient education presented as a new and flexible learning model which can be used as a non-pharmacological and useful method. Today, the management of diabetes has been the responsibility of healthcare personnel (i.e., physicians, nurses, and other people) (11).

Due to the short period of the visit, inappropriate communication, and lack of face-to-face contact with each patient, healthcare personnel do not have sufficient time to answer all questions related to treatment and care of diabetic patients during the outpatient visit (12). Studies have investigated the effect of peer group education on different domains of diabetes mellitus. This method has a significant effect on blood glucose control in diabetic patients (13-15).

A study in Uganda revealed that the peer group could be involved in the improvement of glycosylated hemoglobin and nutritional behaviors of diabetic patients (16). Moreover, Liu et al. investigated the effect of peer group on diabetic patients with emotional disorders. The results showed that self-management and quality of life were improved in these patients. Accordingly, the peer group can reduce psychological stress and increase self-management skills (17). Moreover, the peer group improved the interaction between diabetic patients. Consequently, they can achieve blood glucose control and more control over their emotions by changing their lifestyle and self-management, which seems to play a role in reducing the level of depression.

Due to the prevalence of depression in diabetic patients, it is essential to screen for depression and implement strategies (e.g., peer support) to improve the adaptation ability of these patients. Depression treatment using conventional techniques involves spending a lot of time and huge costs followed by major complications. Since there is a dearth of research on the evaluation of the effect of peer support groups on the level of depression in diabetic patients, this study aimed to assess the effect of peer support on the level of depression in type 2 diabetic patients

## Methods

This randomized controlled clinical trial was conducted on two groups with a pretest-posttest method. The study population included type 2 diabetic patients who referred to the Diabetes Clinic of Sabzevar University of Medical Sciences, Sabzevar, Iran, in 2018. According to the previous studies (18), the mean values of depression were reported as 20 and 23 in the control and intervention groups, respectively. The sample size was calculated to detect a difference of at least 10 scores of depression between the two groups using a G Power software to calculate the sample size.

The sample size was calculated to be 29 individuals for each group with a confidence interval of 95% and a test power of 90%. Finally, 32 patients were included in each group considering the 10% sample attrition. Totally, 64 patients were selected and assessed during May-August 2018. The inclusion criteria were: 1) the diagnosis of type 2 diabetes by an endocrinologist, 2) a minimum level of education (i.e., fifth grade at elementary school), 3) age range between 18 to 65 years, 4) lack of vision and hearing impairments, 5) lack of physical and mental debilitating diseases, 6) glycosylated hemoglobin levels above 7%, 7) lack of a severe or acute stressful experience (e.g., death of a first-degree relative, severe disease of family members, financial bankruptcy, accidents, and intense domestic dispute with the spouse) in the past six months, 8) Beck Depression Inventory-II (BDI-II) scores between 20 and 28 (i.e., moderate depression), 9) lack of severe depression or suicidal thoughts, 10) lack of age-related diseases that prevent learning (e.g., memory problems and

Alzheimer's disease), 11) lack of education in the fields of medical and paramedical sciences, and 12) lack of history of participating in similar studies. It should be noted that patients with severe depression were not allowed to participate in peer-group interactions. Furthermore, the effects of intervention may be less pronounced in mild depressions.

On the other hand, the patients who were absent for more than two sessions were excluded from the study.

According to the research objectives, the patients with type 2 diabetes were asked to complete the BDI-II. Out of 157 eligible patients, 64 individuals with moderate depression scores were selected through simple sampling. Subsequently, the participants were assigned to the intervention and control groups using a random assignment technique (i.e., permutation blocks method). In each block, four groups of blocks (n=16 per group) were used to determine the intervention and control groups; moreover, the letters A and B were indicative of the control and intervention groups, respectively. Each of these blocks was written into a sheet and thrown into a container. The first block was accidentally removed by first author and continued until saturation. In order to avoid participants meeting each other in the clinic and prevent distribution bias, the control and intervention groups were scheduled to refer to the clinic on separate days. Moreover, the statistical analyzer was blinded to the group allocation.

The research procedure and objectives were explained to the intervention group. Subsequently, the participants were selected and the next stage was the selection of an individual as the leader of the peer group. In the end, an eligible person was determined with the help of the physician and the nurse of the clinic based on specific characteristics (e.g., the willingness to cooperate with the researcher, the ability to manage sessions, better compatibility to control the disease, and the ability to express the contents). The peer group leader was a 52-year-old male with an associate degree. He was an athlete with properly controlled diabetes for 17 years. The coordination session was arranged by the researcher to discuss the contents of the sessions with research participants.

Based on the preferences of the participants in the intervention group, they were divided into three groups (n=10-12 per group) regarding the sample size and the most appropriate group size used in the medical texts (18). The session's day and time were determined based on the opinion of the members. Furthermore, they were requested to attend peer support sessions one hour per week for 6 weeks at the Diabetes Clinic of Sabzevar University of Medical Sciences, Sabzevar, Iran.

The topics of the peer support group were determined on the basis of the patients' priorities (e.g., physical, mental, psychological, and social problems) (12). They were then scheduled for the next five sessions in each group at the same meeting. In the peer group, the use of experiences and opinions of others was emphasized in each meeting. Individuals expressed their opinions guided by the determined leader and the researcher during the sessions. In the first session, the researcher explained the rules of participation in the group of peers (e.g., participating in a minimum of four sessions, respecting each other's ideas, allocating time and opportunity to all members to participate in the discussion, not judging each other, and not deviating from the group discussion).

At the beginning of each session, the researcher explained the topic for five min, and the remaining of the discussion was managed by the members of the group. The researcher provided necessary scientific information when needed and prevented deviation from the main subject. At the end of each session, one of the members was asked to present a summary of the discussion and a conclusion. In the control group, the usual intervention was conducted by a nurse at the diabetes center along with the peer group sessions. At the end of the course and six weeks after the final session, BDI-II was completed by all participants one more time.

The data were collected using BDI-II and demographic form which sought information, such as age, gender, body mass index, marital status, level of education, monthly income, number of family members, duration of disease diagnosis, source of obtaining information about the disease, and medicine used for diabetes.

Moreover, the BDI-II consists of 21 items scored on a 3-point scale. In this inventory, the minimum and maximum scores are 0 and 63, respectively. The scores between 0-13 indicate a lack of or the lowest level of depression, whereas the scores ranging from 14 to 19, 20 to 28, and 29 to 63 demonstrate mild, moderate, and severe levels of depression, respectively. Furthermore, the validity of the questionnaire was confirmed by the content analysis method in a study conducted by Dabson and Mohammakhani (19). In order to evaluate reliability, 20 participants were asked to complete the

questionnaire. Following that, the internal consistency was assessed using Cronbach's alpha coefficient, and the reliability was confirmed at the Cronbach's alpha of 0.87.

The study protocol was approved by the Ethics Committee of Sabzevar University of Medical Sciences, Sabzevar, Iran (Ir.medsab.Rec.1396.82). Written informed consent was obtained from all participants. The objectives, possible benefits and values, tools and instruments, and conditions to withdraw from the study were explained to patients directly. The data were analyzed in STATA software (version 12) using repeated-measures ANOVA, Chi-square, independent t-test, Mann-Whitney U test, and Fisher's exact test. A P-value less than 0.05 was considered statistically significant.

## Results

According to the results, no significant difference was observed between the groups in terms of age, body mass index, gender, time of diagnosis of the disease, history of consuming oral medicine and insulin, and marital status (Table 1). The results of the Kolmogorov-Smirnov test showed that the data distribution was normal at all three-time points. Repeated measures ANOVA was performed to investigate the effects of time and group, as well as the mutual effect. Before the intervention, the mean±SD scores of total depression in the intervention and control groups were 24.7±2.9 and 23.3±2.8, respectively.

However, the values changed to 15.1±6.1 and 24.3±4.8 immediately after the intervention and 15.8±6.1 and 24.7±4.3 six weeks after the intervention, respectively. The repeated measures ANOVA showed a significant difference between the two groups in terms of the mean scores of depression (i.e., effect of the group) (P=0.001). Moreover, a significant difference was observed between the two groups regarding depression scores of three consecutive measurements (i.e., the effect of time) (P=0.001). Additionally, the repeated measures ANOVA revealed a significant difference between the two groups regarding the mean depression score at each time point (i.e., mutual effect) (P=0.001). There was a significant difference between the two groups regarding the total scores "immediately before and after the intervention" (P=0.001) and "before and six weeks after the intervention" (P=0.001). The results of comparison between groups showed that there was a significant difference between the two groups (P<0.001) regarding depression scores before intervention (P<0.001), immediately after the intervention (P<0.001), and six weeks after the intervention (P<0.001) (Table 2, Figure 1).

**Table 1. Demographic characteristics of diabetic patients in the intervention and control groups**

Variables	Groups		P-value	
	Intervention	Control		
Age (Mean±SD)	51.7±9.2	51.5±8.5	P=0.9**	
Body mass index (Mean±SD)	29.1±4.5	28.5±3.1	P=0.97***	
Time of diagnosis of the disease (month) (Mean±SD)	89.8±57.3	87.8±48.1	P=0.91	
History of consuming oral medicine and insulin injection	N (%)	N (%)	P=0.97****	
	Oral medicine (Number %)	22 (68.75)		18 (56.25)
	Insulin injection (Number %)	1 (3.13)		2 (6.25)
Gender	Both (Number %)	9 (28.13)	12 (37.5)	P=0.11*
	Female (Number %)	25 (78.13)	19 (59.38)	
Marriage status	Male (Number %)	7 (21.88)	13 (40.63)	P=0.31****
	Single (Number %)	0 (0)	2 (6.25)	
	Married (Number %)	30 (93.75)	29 (90.63)	
	Divorced (Number %)	0 (0)	0 (0)	
	Widowed (Number %)	1 (3.13)	2 (6.25)	

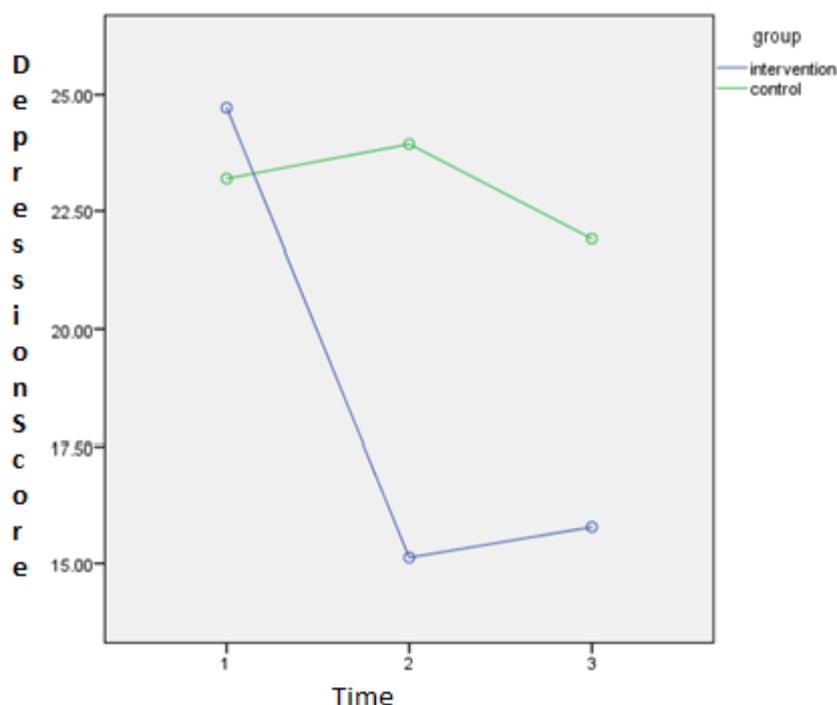
\*: Chi-square test, \*\*: Independent t-test, \*\*\*: Mann-Whitney U test, and \*\*\*\*: Fisher's exact test

**Table 2. Mean±SD of depression scores before, immediately after, and six weeks after the intervention**

Depression Mean±SD	Before intervention	Immediately after the intervention	Six weeks after the intervention
Intervention	24.7±2.9	15.1±6.1	15.8±6.1
Control	23.3±2.8	24.3±4.8	24.7±4.3

Analysis of variance with three consecutive measurements

Group P<0.001  
Time P<0.001  
Mutual P<0.001

**Figure 1. Comparison of mean scores of depression between intervention and control groups in terms of three consecutive measurement**

## Discussion

According to the results of the present study, the mean depression score decreased in the intervention group after the peer support sessions. There is a lack of studies investigating the effect of a support group on diabetic patients in the literature. Therefore, the results of this study were compared to those of similar studies on other diseases and scientific texts in Iran to evaluate the effect of peer group approach on various diseases, which were consistent with the results in this study. The results of some studies showed that peers were more effective in teaching the principles of acquired immune deficiency syndrome (AIDS) prevention, compared to health professionals with the exception of physicians (20-22).

Moreover, education by peers led to reduced levels of anxiety and depression in patients with multiple sclerosis (MS) (23), the improvement of life quality after mastectomy (20), and enhancement of nutritional indices and attitudes in diabetic women, compared to education by the health care personnel (24). The reduced levels of depression in diabetic patients might be due to the provision of an opportunity to share empirical knowledge in peer support groups which helps the group members find effective strategies to adapt to the stress of the disease. Given the direct sharing of valuable individual experiences with other members, individual evolution of group support attendees could be obtained in these groups (25).

Various studies have reported that social support leads to the improvement of mental health (26). Uccelli et al. (2004) marked that attending peer group sessions resulted in the enhanced mental health of MS patients (27). In addition, Kumakech et al. (2009) conducted a study to evaluate the effect of peer group support intervention on the improvement of the mental health of children with AIDS in the

control and intervention groups. They showed that support intervention of peer group decreased psychosocial distress, especially depression signs, anxiety, and aggression in the intervention groups after the intervention. Furthermore, this study suggested using the peer group on the psychological and physical symptoms of other patients (28).

In the present study, peer support was used as a form of social support. Generally, social support is the strongest and most powerful coping force for successfully dealing with a stressful situation while struggling with problems (29). Zare Shahabadi et al. (2010) confirmed in their study that the more a patient with diabetes was socially supported, the more he would be determined to acquire information and improve self-efficacy in adhering to self-care activities (30). On the other hand, similar people of a community have a common understanding of each other's needs and issues that push them toward each other. Therefore, they are more capable of providing relevant and meaningful information, understanding empathy, and assisting each other (12). The effect of peer group on depression in diabetic patients was confirmed in the current study.

In a study performed by Dehghani et al., the group sessions significantly decreased the level of depression in patients with MS after the intervention (22). These results confirmed that in peer-group training, patients shared their experiences and information with other group members, each having a different experience regarding adapting to the disease, which led to more favorable results (23). In the present study, patients with type 2 diabetic shared their concerns and feelings with those who had similar conditions. They were also able to properly adapt to their disease and control its symptoms and had valuable and useful experiences in a friendly environment under the supervision of the researcher. It is worth mentioning that they benefited from the solutions proposed by peers to deal with depression.

Khoshraftar Roudi et al. (2016) investigated the effect of a peer group and community health nurses' educational program on the quality of life of the elderly. They found that peer education affected the quality of life similar to community health nurses (31). Since mental health is one of the dimensions of quality of life, it can be concluded that in the present study, a peer group may have increased mental health of type 2 diabetic patients and consequently reduced depression.

Some of the major limitations of the current study included characteristics and personality traits of individuals in interaction with their peers, participation in discussions, and accountability of individuals in relation to their mental health. Moreover, the mental states of the participants during the sessions might have affected their participation.

### **Implications for Practice**

According to the results of the study, the formation of a peer group can be effective in the improvement of the level of depression in type 2 diabetic patients. Given the fact that chronic diseases adversely affect the health and quality of life of a person and considering the time limitation of physicians and nurses to educate patients, peer groups can be used to reduce the level of depression in diabetic patients. In most cases, depression in diabetic patients occurred due to physical problems and chronicity of the disease. Therefore, it is recommended that peer education be considered as a part of patients' therapeutic program with the aim of reducing mental symptoms and improving the living conditions of these individuals. This study did not compare the effect of education by peer group with that by nurses at the diabetes clinics on the level of depression in diabetic patients; consequently, it is recommended to conduct a study in this regard. The presence of peers with the help of healthcare providers play an important role in identifying health hazards and helping clients choose a healthy lifestyle in the community. Therefore, the empowerment of this group can affect their efficiency and ultimately improve public health. According to the obtained results, it seems that the continuation of this program can stabilize the positive changes. Although this study conducted on elderly females and males in an informal training center, it is distinctive since it compared the effectiveness of the two methods of peer education and training by community health nurses.

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### Conflicts of Interest

The authors state that they have no conflict of interest.

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