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Effects of Group Training on Depression and Anxiety among Patients with Type I Diabetes: a Randomized Clinical Trial

Shahnaz Rostami[1], *Marjan Naseri[1], Bahman Dashtbozorgi[1], Kouorsh Zarea[1], Koroush Riahi Qhahfarrokhi[2], Mohammad Hossein Haghighizadeh[3]

[1]Nursing Care Research Center in Chronic Disease, Nursing and Midwifery School, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[2] Endocrinologist, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[3] Statistics Department, Faculty of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Abstract

Background

Depression and anxiety can have a significant impact on prognosis in diabetic patients. In this study we evaluate how the effect of group learning on anxiety and depression in adolescents with type 1 diabetes at clinics of Ahvaz Jundishapur University of Medical Science.

Materials and Methods

This study was carried out via a pretest- posttest design on the adolescent 11-21 ages with type I diabetes. 74 patients were randomized in education group (n=37) either to the control group (n=37). Data collection tools included demographic and clinical status questionnaires, and the Beck anxiety and depression inventory. Group training intervention was done for intervention group and three months after study two groups filled questionnaires and inventories. Data analyzed using chi-square test and t-test using SPSS- 22 software.

Results

Findings showed that there was a significant difference between patients mean of depression in intervention group before and after intervention ($P < 0.05$). Also there was a significant difference between the patients mean of anxiety in intervention group after group training ($P<0.05$).

Conclusion

Results indicated group training of adolescents with type I diabetes caused reducing in depression and anxiety them. So it would be useful considering training programs in pertinent care plan.

***Key Words*:** Adolescents, Anxiety, Depression, Diabetes, Group training.

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* ***Corresponding Author:***

Marjan Naseri, Nursing Care Research Center in Chronic Disease, Nursing and Midwifery School, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Email: marjannaseri33@gmail.com

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1- INTRODUCTION

Type I diabetes is the most common chronic disease of the endocrine glands in which the beta cells of the islets of Langerhans in Pancreas are degraded for an unknown reason and the insulin levels will be reduced (1). The disease can occur at any age, but the peak incidence is between 10 and 15 years old and 75% of cases are diagnosed before the age 18 years old (2). The number of patients with type I diabetes in Iran is approximately 5%-10% of total people with diabetes and according to the prediction of experts; the number of patients will be tripled within the next 15 years (1).

High prevalence of type I diabetes along with the challenges of adolescence may face controlling the diabetes with obstacles that necessitates the disease self-management by adolescents due to permanent changes in the lives of adolescents, because poor blood glucose control with surge teen challenge will affect teenagers' different dimensions of life such as physical, emotional, psychological, social and economic (4).

Diabetes on the mental – psychological background can cause disorders such as depression, anxiety, anger, aggression, loss of confidence, changes in mental image of their body in adolescence, among which the anxiety and depression are common and the most important psychological disorders (5). In a study conducted by the mean score of anxiety, depression, aggression in adolescents with diabetes is reported more than in non-diabetic adolescents and these people have more problems in connecting with family (6). Also, according to the evidence, more than a quarter of diabetic patients in different age groups, including childhood and adolescence suffer from depression (7). There are several strategies for the prevention of complications, disease management, and coping with the disease, which the most basic and most effective and easiest solution is education. Education is a way to transfer knowledge necessary to change behavior (1). Running educational program for patients to enable them to self-care and optimal control of blood glucose, as well as reinforcing the perception of life goals, improvement of mood disorders such as reducing anxiety and depression, improvement of compatibility and compliance behaviors of patients and ultimately improvement of the quality of life are one of the most important indicators of health and an important part of diabetes care (9). The training interventions include individual training, group training, panel discussions, workshops and group counseling. To teach diabetics, it is necessary to use methods that patients have a greater involvement and understandable education (10). Group makes better training due to engage adolescents to answer to questions in group (11). Group training is a best known and most common organized training method which is used as a way to contribute to the control the problem in peer groups due to their mutual influence used (12). Wilkinson recommends the group teaching as an ideal method for the study of personal feelings and beliefs about health and illness (13). About the adolescents, the group is a good place to identify their emotions, and challenge their controversial and conflicting emotions and values alongside their peers and test their limitations (14). Also, the members will have an opportunity to change and modify it by studying their behavior and values and comparing with others (15). Mufson showed the efficacy of interpersonal psychotherapy on adolescents' depression in the context of teamwork (16). Study by Shirazi found that training self- care behaviors as group discussion is applied as an effective method to improve the knowledge and practice of adolescents with diabetes (17). Therefore, considering the

characteristics of adolescents, including independence and self-orientation and trust to the peer group, using the participation of young people increase the effect of training, so the importance and necessity of patient education in improving diabetes management led to see the education, as an effective element in diabetes management which provides an opportunity to reduce the financial burden of diabetes on patients, families and sanitation systems along with many positive consequences by preventing the occurrence of intensifying complications and comorbidities (18).

Since most of education programs especially in Iran is related to physical aspects and the patients with type II diabetes, and in form individually performance training as a study that has evaluated the impact of group training on glycemic control, anxiety and depression in adolescents is not found in Iran; thus the researchers tried to understand if the group training interventions will work on glycemic control, anxiety and depression in adolescents with type I diabetes.

2- MATERIALS AND METHODS

2-1. Study design and population

This randomized clinical trial study with intervention and control groups conducted in 2014. Permission to done study was given by Ahvaz Jundishapur University of Medical Sciences Committee after ethical approval by ethical committee with code No. 117.1393. The target population consisted of adolescents with type I diabetes referring to endocrinology clinics of Ahvaz Jundishapur University of Medical Science, South-west of Iran. Before making the decision to participate in the study, patients (n=100) and their parents received information about the study and were asked to sign a written consent. After consent was confirmed, based on a formula for determination of sample volume, eligible participants (n= 74) randomly (simple randomly) assigned to the intervention group (patient education: n=37) and to control (patient without education: n=37) (Figure.1).

Criteria for patients inclusion in the study including: having lived in the city of Ahvaz, confirmation of the diagnosis of diabetes by a physician, a lack of receiving group- support training until the program start, lack of history of uncontrolled underlying disease such as epilepsy, etc., lack of long-term complications of diabetes (retinopathy, nephropathy, neuropathy), desire to participate in the training programs, having no history of severe anxiety and depression and other mental illnesses before suffering diabetes and criteria for patients exclusion from the study including: lack of participation in a group training program more than two sessions, psychiatric treatment or drug abuse during the study, hospitalization during the execution of the study. The randomization was done by using a computer-generated list of the numbers 1 or 2 in random order.

2-2. Intervention

Education and support needs assessment at the beginning and before the intervention was obtained by interviewing. Then the group training sessions were conducted through group discussion for intervention group divided in three groups: (two groups of 12, a group of 13 people) for 8 weeks, a 2-hour session each weak. Topics raised in these sessions included: information about diabetes and related complications, causes, methods of care and self-care, blood sugar control solutions, emotional support including anxiety and depression, enforcing positive thinking and success strategies, how to live better and so that during each session topics and discussions of previous sessions were also examined. In this study, no training intervention was done for control group. Researchers, one pediatric nurse and psychiatric nurse and a graduate student managed teaching group and had

experiences with providing care to adolescents with type 1 diabetes (T1DM) for years. Programs of group training sessions were set based on the most recent literature and books, and consultation with experts which was presented by the researcher and cooperation of supervisor and adviser. After the end of training sessions, the subjects were allowed to use the new skills in their daily life for 3-months from the beginning of the study, and during this period, the researcher was in contact with them by phone, also a phone number was placed at their disposal to call and speak about their problems if needed.

2.3-Ethical consideration

The initial plan of the study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences with code No. 117.1393

2.4-Data collection

After obtaining permission of Ahvaz Jundishapur University of Medical Sciences to doing research, sampling was done based on inclusion criteria. All participants in the research are justified on how to design, confidentiality and lack of misuse of information, as well as the aim of the project and, if desired, they were included to the study by obtaining informed consent. First both groups have filled the questionnaires containing demographic and medical data and anxiety and depression inventories. Also, at baseline tests of fasting blood sugar (FBS) and Hemoglobin A1c (HbA1c) were done for intervention and control groups. After 3 months of beginning of study anxiety and depression questionnaires were completed by two groups after intervention.

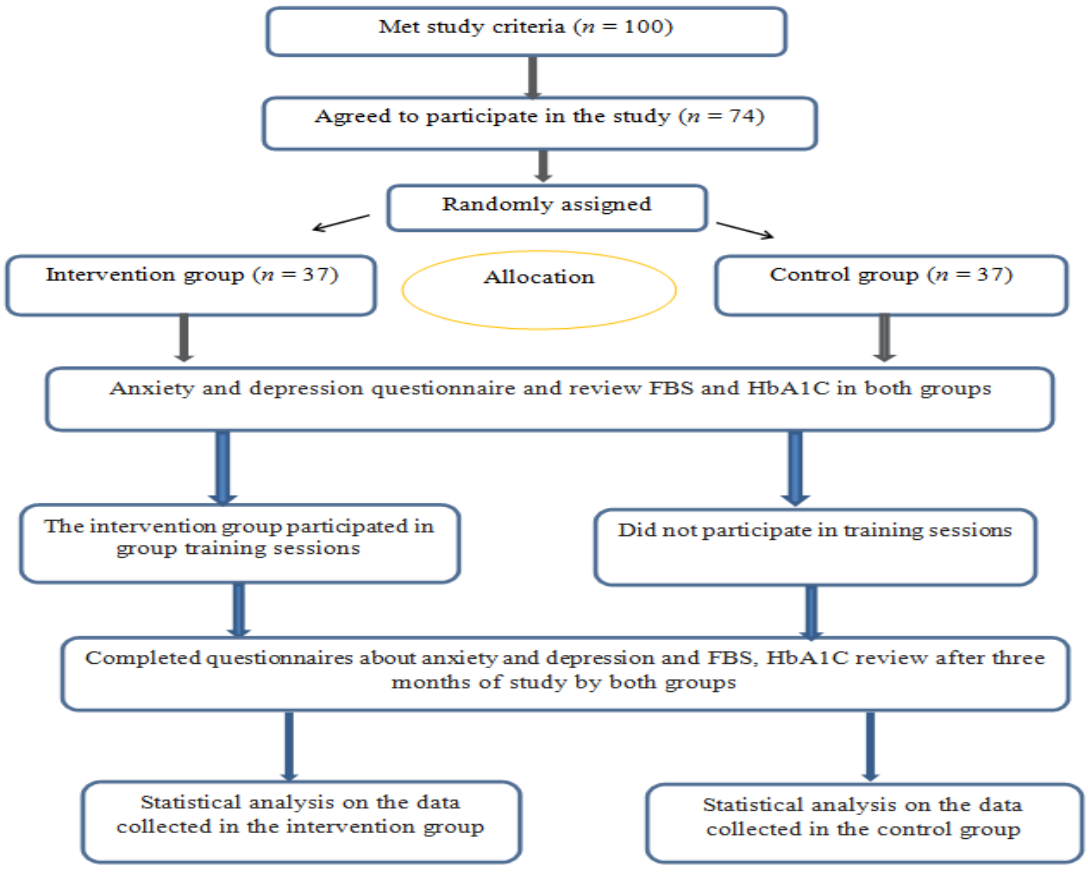

Fig. 1: Sampling strategy and the procedures that were implemented to collect the samples

2.5-Instruments

Three instruments were used to collect data, **first** a researcher made questionnaire that includes demographic features and clinical status of patients, including items such as age, gender, education, ethnicity, family size, family history of diabetes, economic status, age at diagnosis, type of treatment, number of insulin injections, the last fasting blood sugar and HbA1C levels and history of participation in training classes. The others, Beck Depression and Anxiety Inventories, Beck Depression Inventory was designed based on clinical criteria of depression by (19) and consists of 21 items, each item has four options. Two items out of 21 items refer to temper, eleven to the cognitive problems, two to obvious behaviors, and five to physical symptoms and one to interpersonal relationships. The subjects were asked to choose an option that is compatible most with their current mood. The score of each item is 0 to 3 and total score is between 0 and 63. Beck Anxiety Inventory has 21 items and measures the severity of anxiety on the subjects. The questionnaire is scored based on a scale from zero to 3 that option 1 receives score zero, option 2 receives score 1, option 3 receives score 2 and option 4 receives score 3 and the highest score achieved is 63. Glycosylated hemoglobin measurement was performed in a laboratory by colorimetric method. The index is reported as a percentage. FBS measurement was also done by using a glucometer.

2.6-Statistical analysis

Data were analyzed using chi-square test for qualitative variables, the independent t-test to compare both groups before and after the intervention. Significant level for alpha was 0.05. Statistical analyses were performed using statistical package for social sciences (SPSS) version 22, (20). for windows. Data was reported using mean ± standard deviation (SD), number and percentage.

3-RESULTS

In this study, the majority of subjects in the intervention group (48.7%) and control group (46%) were aged 15-18 years old and chi-square test showed no significant difference between the two groups in terms of age (P = 0.96). Also the majority of subjects in the intervention group (64.8%) and control group (54%) were female and chi-square test showed no significant difference between the two groups in terms of gender (P =0.34). In terms of education level, results showed that in the intervention group (37.9%) and control group (46%), most subjects had a secondary degree and chi-square test showed no significant difference between the two groups (P= 0.77). Most subjects in the intervention group (51.3%) and control group (46%) were Arab and chi-square test showed no significant difference between the two groups in terms of ethnicity (P = 0.65). In terms of the diabetes history it can be said that most of the patients participating in this study in the intervention group (35.2%) and control group (32.4%) had a history of diabetes for 6-7 years and chi-square test showed no significant difference between the two groups in the duration of diabetes (P=0.83). In terms of family history, most subjects in the intervention group (54%) and control group (64.8%) had a positive family history of diabetes and chi-square test showed no significant differences between the two groups in term of a family history of diabetes (P = 0.89). In terms of income, the majority of participants in the intervention group (75.7%) and control group (70.3%) had an income more than 7,000,000 Rials and chi-square test showed no significant difference between the two groups in terms of monthly income (P = 0.27) **(Table 1).**

Table 1: Demographic characteristics of subjects in intervention and control group

Demographic features		Group Name				P-value
		Intervention		Control		
		Number	Percent	Number	Percent	
Age (year)	11-14	10	0.27	10	0.27	0.96
	15-18	18	48.7	17	0.46	
	19-21	9	24.3	10	0.27	
Gender	Boy	13	35.2	17	0.46	0.34
	Girl	24	64.8	20	0.54	
Education	Primary	3	1.8	4	8.10	0.77
	Secondary	14	37.9	17	46	
	High School	11	29.7	9	3.24	
	Diploma	6	16.2	3	1.8	
	Collegiate	3	8.1	4	8.10	
Ethnicity	Lor	13	35.2	12	32.4	0.65
	Arab	19	51.3	17	46.0	
	Persian	5	13.5	8	21.6	
Duration of Diabetes(year)	1-2	6	16.2	4	10.8	0.83
	3-4	9	24.3	12	32.4	
	5-6	9	24.3	9	24.3	
	6-7	13	35.2	12	32.4	
Family history of diabetes	Yes	20	54.0	24	64.8	0.89
	No	17	46.0	13	35.2	
Family income (Rials)	Between 4.000.000-7.000.000	9	24.3	11	29.7	0.27
	More than 7.000.000	28	75.7	26	70.3	

3-1. Change of depression

About the depression, it can be said that the mean depression score of patients in both groups before the intervention had no statistically significant difference (P = 0.24), while the difference in average score of depression between the two groups after the intervention was statistically significant. (P<0.002) and it means that the depression score was reduced in the training group and was increased in the control group **(Table 2)**.

Table 2: Comparison of the depression rate of study samples before and after the intervention

Depression rate	Before intervention				After intervention			
	Intervention		Control		Intervention		Control	
	N	%	N	%	N	%	N	%
No depression	5	13.5	8	21.6	19	51.3	6	16.2
Mild depression	15	40.5	8	21.6	8	21.6	7	19.0
Moderate depression	10	27.0	13	35.2	7	19.0	15	40.5
Severe depression	7	19.0	8	21.6	3	8.1	9	24.3
Total	37	100	37	0.100	37	100	37	100
Mean ± SD	16.10±10.76		20.00 ±10.73		13.02 ± 8.50		21.27 ±9.92	
P- value	0.24				0.002			

3-2. Change of anxiety

The results of current study showed that average anxiety score of patients in two groups before the intervention had no statistically significant difference (P = 0.46). While, the difference in mean of anxiety score of subjects after intervention was statistically significant (P = 0.003).

This means that anxiety scores in the intervention group was decreased, and not only it is not decreased in control group but also it is increased **(Table.3).**

Table 3: Comparison of anxiety of study samples before and after the intervention

Anxiety	Before intervention				After intervention			
	Intervention		Control		Intervention		Control	
	N	%	N	%	N	%	N	%
No anxiety	9	24.3	6	16.2	13	35.2	2	5.4
Mild anxiety	11	29.7	12	32.4	15	40.5	6	16.2
Moderate anxiety	8	21.6	8	21.6	6	16.2	18	48.7
Severe anxiety	9	24.3	11	29.7	3	8.1	11	29.7
Total	37	0.100	37	0.100	37	0.100	37	0.100
Average ± SD	16.75 ± 10.54		18.32 ± 10.39		12.54 ± 8018		19.00 ± 10.18	
P-value	0.46				0.003			

3.3-Change of HgA1C and FBS

The study showed that average FBS of patients in both groups before the intervention had no significant differences (P =0.31). In connection with HbA1C, the results showed that the mean HbA1C of patients in both groups before the intervention had no statistically significant differences (P= 0.30)**(Table 4).**

Table 4: Comparison of mean of FBS, HBA1C of study subjects before and after the intervention in both intervention and control groups

Variables	Group name	Review time			
		Before intervention		After intervention	
		Mean	SD	Mean	SD
FBS	Intervention	181.59	94.14	135.75	65.50
	Control	203.43	91.12	212.70	87.67
	P-value	0.31		0001	
HbA1C	Intervention	10.68	2.15	7.87	2.01
	Control	10.17	2.09	11.04	2.30
	P-value	0.30		0.001	

4-DISCUSSION

A study found that depression increases the severity and variety of complications in individuals with diabetes (21). Depression might cause functional deficits that increase medical costs. Past studies have found that depression in patients with diabetes might increase medical costs by four to five times (22). It is apparent that dealing with depression might lower medical and social costs. According to the results of Watson (23) the lifetime comorbidity of general anxiety disorder and major depression disorders was 66.3–80%. Psychosocial factors play an integral

role in diabetes management. Their impact is a stronger predictor of mortality in patients with diabetes than many physiological variables (24).

Finding in one study revealed that depression and anxiety are closely related to high blood glucose levels in both type 1 diabetes and type 2 diabetes individuals. High blood glucose can complicate vascular diseases, and moreover, poor blood glucose regulation is one of the main contributors of depression in individuals with diabetes (25). However, psychosocial issues are important for people with diabetes, and psychosocial therapy can help patients improve their disease management (26).

In this randomized, controlled trial, we hypothesized that adolescents with diabetes receiving group training intervention would have a lesser anxiety and depression scores that control group patients. The hypothesis was confirmed: we found that after intervention of group training, the mean anxiety and depression scores in diabetic adolescents have decreased. So, performing the group training program has a key role in reducing these parameters. These results were consistent with the results of Ayman who showed that a significant improvement was detected at the level of anxiety and depression after training intervention (P= 0.03) (27). Also, study of Aghakhani showed the role of training intervention in reducing anxiety and depression in patients with myocardial infarction (28). In addition, the results of this study were consistent with the results of Ooi et al. who showed that group training has increased the information and knowledge of diabetics' patients about the diabetes and prevention its complications including mental and psychological problems significantly (29). Thus, according to the findings of this research, it can be said that performing an effective training program for adolescents with type I diabetes leads to improved mental -psychological indicators in them by promoting the leadership behaviors (30).

5-CONCLUSION

The results of this study indicated that training increases the ability to control emotional psychological problems.
Because of the importance of training, especially group training in the prevention and control of psychological symptoms in diabetic adolescents, it is recommended to conduct similar studies for people with diabetes and other chronic illnesses. It is also suggested to consider nurses in group training of the diabetic patients with in relation with the psychological disorders and provide permanent training for diabetes centers especially for vulnerable segments of the society including adolescents.

6-CONFLICT OF INTEREST: None.

7-ACKNOWLEDGMENTS

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8- AUTHORS CONTRIBUTIONS

- *Study design*: R S, NM, DB B, KZ
- *Data Collection and Analysis*: R S, NM, DB B, R KG, H MH,
- *Manuscript Writ*ing: R S, NM, DB B, KZ.

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