

The Effect of Peers Support on Fear of Hypoglycemia in Iranian Patients with Type 1 Diabetes: A Clinical Trial Study

Abstract

Background: Fear of hypoglycemia is a medical emergency which leads to disrupt individuals' normal lives. Peers support is a hopeful approach to improve diabetes self-care behaviors. This study was conducted to assess the effect of peers support on the fear of hypoglycemia in patients with type 1 diabetes. **Materials and Methods:** This randomized clinical trial study was performed among 60 patients with type 1 diabetes in Qazvin city from September 2019 to October 2020. Patients were assigned to control and intervention groups using a random method. The data collection tools included demographic characteristics and a standard questionnaire for Hypoglycemia Fear Survey (HFS). Patients in the intervention group were trained by skilled peers for 2 months, but those of the control group only received routine hospital training. The data were analyzed by SPSS version 16 and paired and independent *t*-test. **Results:** The scores of the fear of hypoglycemia in diabetic patients in the two groups had no significant statistical difference before intervention ($t_{53} = 0.93, p = 0.94$). But after the intervention, the independent *t*-test showed that there was a significant difference between the scores of the fear of hypoglycemia in both groups ($t_{53} = -2.13, p = 0.03$). **Conclusions:** Considering the results of the current study, peer support for diabetic patients is an effective way to reduce the fear of hypoglycemia. Therefore, it is recommended using this training method to train diabetic patients.

Keywords: *Diabetes mellitus, fear, hypoglycemia, Iran, peer group, type 1*

Introduction

Diabetes is a major global problem.^[1] Type 1 diabetes is a chronic autoimmune metabolic disease, resulting in insulin deficiency,^[2,3] that neglecting it leads to great and serious problems for the community.^[4] It is estimated that only in 2013, approximately 380 million adults were living with diabetes (all types), and this number will rise to 590 million by 2035.^[5-7] In Iran, more than 3 million people have diabetes, if effective measures are not taken, by 2030 this number will reach about seven million. The annual incidence of type 1 diabetes in Iran has been estimated at 3.7 per 100,000 people.^[8] The type 1 diabetes management is complex and requires significant changes in the patient's lifestyle and the patient is responsible for a significant part of the care.^[2] One of the prevailing acute complications of type 1 diabetes is hypoglycemia.^[9]

There is no doubt that hypoglycemia is a common and costly complication in the treatment of type 1 diabetes^[10]

and is a medical emergency which can disrupt a person's normal life.^[11] The physical, psychological, and cognitive symptoms of the hypoglycemia could cause embarrassment and concern for type 1 diabetes.^[10] The term fear of hypoglycemia is used to describe severe symptoms such as anxiety in people with diabetes and their families, raising concerns about hypoglycemia and improper behaviors like decreasing insulin consumption, and over-treating hypoglycemia.^[12-14] Erol showed that type 1 diabetic patients experience a more severe degree of hypoglycemia.^[15]

According to the guidelines of the American Diabetes Association, diabetes care is a self-care method.^[16] One teaching method to patients is education by peers, which is effective in creating an environment for learning and promoting changes related to the efficient health.^[17] Various support resources should be used in promoting patients' health, such as family, friends, relatives, colleagues, healthcare providers,

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and same age people, in other words, peers.^[18] Peymani *et al.* (2017) in their study on peer support interventions on blood glucose control in type 2 diabetic patients concluded that after 6 months, among patients in the intervention group there was a significant decrease in HbA1c mean, and a significant increase in diabetes self-management, self-efficacy, and the quality of life.^[19]

Awareness of the importance of the nurses' role in educating diabetic patients for care is increasing worldwide.^[20] Nurses play an important role in empowering patients through providing information also diabetes self-care education is the first essential step in empowering patients and one of the most important duties of nurses.^[20] Although several studies have shown the effect of peers support on reducing HbA1c and blood glucose control and improving the health status of diabetics,^[19,21] there was no evidence of a study on the effect of peers support on the fear of hypoglycemia in patients with type 1 diabetes in Iran and other countries. Therefore, considering the high prevalence of diabetes and the importance of self-care, the researchers conducted this study aimed to assess the effect of peers support on the fear of hypoglycemia in patients with type 1 diabetes.

Materials and Methods

This clinical trial study (IRCT20180623040197N1) was conducted from 10 September 2019 to 7 October 2020. The study population included 60 patients with type 1 diabetes referred to Velayat and Boo Ali Sina Hospitals in Qazvin city. The 4-point random block method was used to allocate patients to 30-person groups of control and intervention.

The inclusion criteria: age (18–45 years), the minimum education degree of diploma, the experience of type 1 diabetes at least for 1 year, and lack of chronic complications of diabetes (diabetic foot ulcers, amputation following disease, renal failure, blindness, severe vision loss). The exclusion criteria: the history of the company in similar research (such as training courses) and the absenteeism over two sessions for patients.

Using the study of Khavasi *et al.*,^[1] the mean and standard deviation of the life quality scores of patients in both groups after the intervention were reported 94 (14.70) and 111 (8.7), respectively. Given the first type error of 0.01 and the second type error of 0.05, the sample size was estimated. Taking into account 30% sample drop, samples of each group were considered 23 people, and finally, for the validity of the results 30 people were considered for each group. The study population included 60 patients with type 1 diabetes, in the first stage, 60 eligible patients were selected using the convenience method. The steps of the research study can be seen in Figure 1.

The intervention in this study was done by peers in the form of group training for the patients. The researchers (first author and corresponding author) chose the peers by referring to the clinics and wards of the Velayat and

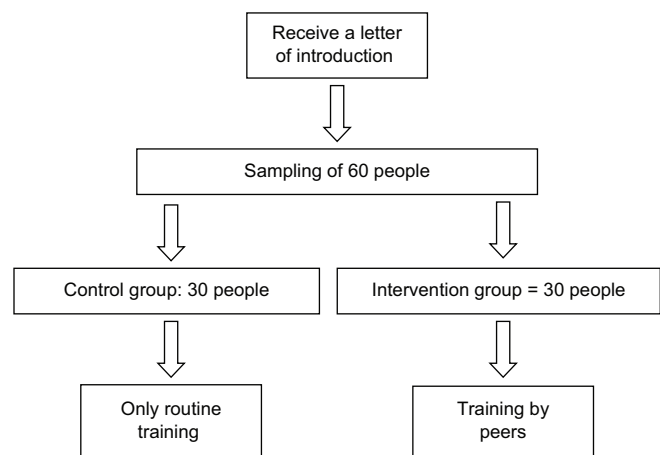


Figure 1: Study Steps

Boo Ali Sina hospitals and reviewing the list of patients who had type 1 diabetes during the past years. The inclusion criteria for peers included the minimum degree of diploma; the experience of type 1 diabetes at least for 1 year; having cultural, social, and economic interested in training through interviews; interested in leading in a group according to their own statement; the ability to express and manage training sessions; appropriate adaptability to control the disease; no chronic complication of diabetes (such as diabetic foot ulcers, amputation following illness, kidney failure, blindness, and severe vision loss). Also, four male and female peers were selected for training diabetic patients, that two of them were considered reserves. Before starting the intervention, in order to check the level of awareness and unify peers education, a checklist of the level of awareness of the peers, performed in the study of Khavasi, was used that its reliability was obtained 0.86 and a Cronbach alpha 0.85.^[1] Then, three 2 h training sessions were held for peers.

The training contents of the sessions for patient included as follows: the definition of diabetes, types of diabetes, symptoms, and risk factors, complications, healthy lifestyle, how to inject insulin, symptoms of hypoglycemia, and care during it, the place of injection of insulin, and tips about the types of insulin and cares and how to take care of the feet in the treatment and control of the disease. At the end of each session, the training pamphlets and booklets of the same session were given to individuals. Each session, in addition to training, included questions and answers, and sharing experiences. The researchers (first author and corresponding author) attended the sessions to monitor the proper implementation of the training sessions.

The data collection tools included demographic information [age, gender, marital status, education, occupational health insurance, head of household, income, residence, tobacco use, height, Body Mass Index (BMI), history of diabetes, history of hospitalization, years of illness, chronic disease]; and the Hypoglycemia Fear Survey (HFS) questionnaire, that its original version was developed by

Cox *et al.*,^[22] consisted of 18 questions that were scored from 0 (no fear) to 4 (most fear). The scores ranged from 0 to 72, that higher scores indicated a greater fear of hypoglycemia. This questionnaire was used in the study of Momeni *et al.* with a Cronbach's alpha of 0.87 and a retest method reliability of 0.76 (by test-re-test).^[11,23]

At the beginning of the research, researcher before the intervention completed the fear of hypoglycemia questionnaire, then, patients in the intervention group, received intervention from their peers in the form of training sessions (8 sessions, each session 2 h a week, total 16 hours during 2 months). Table 1: Training sessions

There was no intervention in the control group. The intervention group consisted of 30 patients who were divided into four groups using a randomized triple block method and for every 3 groups, one peer was assigned randomly. Two months after the intervention, the questionnaires were completed again by both groups.^[1]

The data were entered into SPSS (version 16.Chicago, SPSS Inc) and the independent *t*-test was used in both groups to assess the fear of hypoglycemia and the effect of peer support on it. The paired *t*-test was used in both groups to assess the fear of hypoglycemia before and after the intervention. The Kolmogorov–Smirnov test was used to evaluate the normality of the variables. The significance level for all tests in the study was considered 0.05.

Ethical considerations

This study has been approved by the Ethics Committee of Qazvin University of Medical Sciences (IR.QUMS.REC.1397.032). In order to enter the research environment, a letter of introduction was obtained from the related authorities, then the oral and written consent was obtained from the patients.

Results

This study was performed on 60 patients with type 1 diabetes in two 30-people groups. The results of the present study showed that the patients were similar in demographic

characteristics in both the intervention and control groups. There was no significant difference, in both groups, between the variables [Table 2].

The mean (SD) score of the fear of hypoglycemia in patients with type 1 diabetes before the intervention was obtained 25.40 (9.51) in the intervention group and 23.33 (8.43) in the control group. Also, after the intervention, the mean (SD) score was obtained 18.23 (9.33) in the intervention group and 22.63 (6.33) in the control group. As you can see, the scores of the fear of hypoglycemia in diabetic patients in the two groups had no significant statistical difference before intervention [$t_{53} = 0.93, p = 0.94$]. But as we expected, after the intervention, a significant statistical difference was observed in the two groups of test and control [$t_{53} = -2.13, p = 0.03$]. Also, according to the results obtained, and the paired *t*-test, in the test group, the mean scores of the fear decreased after the intervention, that this difference was statistically significant [$t_{29} = 4.16, P = 0.000$]. But in the control group, the mean scores of the fear did not decrease [$t_{29} = 0.50, p = 0.61$] [Table 3].

Discussion

The results showed that peer support through group training for diabetic patients reduced the fear of hypoglycemia, so that the mean score of the fear of hypoglycemia in the intervention group, after training by the peers, dropped dramatically. No study was found on the reduction of the fear of hypoglycemia using peer support method, but some studies used different interventions to reduce the fear of hypoglycemia and assess the impact of peer support on the other variables of the type 1 diabetes.

Johansson *et al.* (2016) showed that peer support has helped to improve the life quality of diabetic patients and their blood glucose control.^[24] Vorderstrasse *et al.* (2015) in their study showed that peer support and teaching aids improved metabolic control, weight control, and physical activity of diabetic patients in the intervention group, in New York.^[25] Rashidi *et al.* in their study reported that 3 months of diabetes self-care training by peers did not

Table 1: Training sessions

Number sessions	Educational content	Time sessions
Session 1	Introducing the researcher and colleagues and expressing the educational goals, starting the training about the definition of diabetes, different types of diabetes, the symptoms of the disease, and the expressing patients' experiences	110 min
Session 2	Risk factors, side effects, diet, and expression of patients' experiences	120 min
Session 3	Blood glucose control by the disease itself and its interpretation, regular physical activity, and expression of patients' experiences.	120 min
Session 4	How to inject insulin, the symptoms of the hypoglycemia and care during it, and the expressing patients' experiences	110 min
Session 5	The insulin injection site, tips related to different types of insulin, and expressing patients' experiences	120 min
Session 6	Types of insulin and its uses, the effects of insulin, and expressing patients' experiences	120 min
Session 7	Fit care in the treatment and control of the disease	100 min
Session 8	Summarizing all the training materials and review them and answering patients' questions	120 min

Table 2: Demographic characteristic of patients in intervention and control groups

Qualitative Variables		Intervention (60) n (%)	Control (60) n (%)	Statistical Test	df	p
Gender	Female	19 (63.33)	24 (80.00)	$\chi^2=2.05$	1	0.25
	Male	11 (36.66)	6 (20.00)			
Marital status	Married	19 (63.33)	23 (76.67)	$F\text{-exact}=1.97$	2	0.47
	Divorced	4 (13.33)	4 (13.33)			
	Widow	7 (23.4)	3 (10.00)			
Job	Self-employment	8 (26.66)	2 (6.66)	$F\text{-exact}=6.08$	3	0.09
	Retired	3 (10.00)	3 (10.00)			
	Housewife	16 (53.34)	24 (80.00)			
	Other	3 (10.00)	1 (3.34)			
Education	Elementary	5 (16.66)	13 (43.34)	$F\text{-exact}=5.121$	2	0.08
	Middle school	19 (63.34)	14 (46.66)			
	Diploma	6 (20.00)	3 (10.00)			
Residence	Qazvin	12 (40.00)	11 (36.67)	$F\text{-exact}=0.33$	2	1.72
	County around	18 (60.00)	17 (56.66)			
	Village	0 (0.00)	2 (6.67)			
Living with others	Alone	2 (6.67)	9 (30.00)	$F\text{-exact}=6.9$	4	0.10
	With spouse	20 (66.66)	14 (46.66)			
	With spouse and children	6 (20.00)	5 (16.66)			
	With children	0 (0.00)	1 (3.34)			
	With parents	2 (6.67)	1 (3.4)			
History of high blood cholesterol	Yes	22 (73.33)	21 (70.00)	$F\text{-exact}=0.33$	1	0.99
	No	8 (26.67)	9 (30.00)			
History of high blood pressure	Yes	20 (66.66)	22 (73.33)	$F\text{-exact}=0.42$	1	0.85
	No	10 (33.34)	8 (26.67)			
Get information about the diabetes	Yes	25 (83.33)	20 (66.67)	$\chi^2=2.22$	1	0.23
	No	5 (16.67)	10 (33.33)			
The way information sources received about diabetes	Doctor	11 (36.67)	12 (40.00)	$F\text{-exact}=3.24$	5	0.80
	Nurse	9 (30.00)	8 (26.67)			
	Family	8 (26.67)	6 (20.00)			
	Television	1 (3.33)	3 (10.00)			
	Book	0 (0.00)	1 (3.33)			
History of hospitalization	Yes	25 (83.33)	26 (86.67)	$\chi^2=0.9$	1	0.13
	No	5 (16.67)	4 (13.33)			
Type of long-term complications of diabetes	Nephropathy	2 (6.66)	4 (13.33)	$F\text{-exact}=1.46$	4	0.93
	Retinopathy	3 (10.00)	2 (6.67)			
	Cardiac	2 (6.67)	1 (3.33)			
	Neurological	2 (6.67)	2 (6.67)			
	Combination of some	21 (70.00)	21 (70.00)			
Smoking	Yes	6 (20.00)	5 (16.67)	$\chi^2=0.99$	1	0.11
	No	24 (80.00)	25 (83.33)			
Having chronic disease	Yes	15 (50.00)	16 (53.33)	$\chi^2=0.99$	1	0.067
	No	15 (50.00)	14 (46.67)			
Amount of daily intake of insulin	1-10 Units	12 (40.00)	9 (30.00)	$\chi^2=1.09$	2	0.62
	10-20 Units	6 (20.00)	5 (16.67)			
	20-30 Units	12 (40.00)	16 (53.33)			
Quantitative Variables		Mean (SD)	Mean (SD)	t-test	df	p
Year of getting ill		69.86 (48.44)	77.70 (23.08)	-0.79	58	0.42
Age		38.63 (1.42)	37.40 (3.63)	1.73	58	0.89
The number of hospitalization days		3.26 (1.61)	2.80 (2.20)	0.93	58	0.35
The hospitalization Duration		9.40 (9.35)	6.93 (3.99)	1.32	58	0.18

* χ^2 , t-test, F-exact

Table 3: Comparison of the mean and standard deviation of the score of fear of hypoglycemia in both groups before and after the intervention

	Mean (SD)		t-test	df	p
	Intervention (60)	Control (60)			
Before intervention	25.40 (9.51)	23.33 (8.43)	0.93	58	0.94
After intervention	18.23 (9.33)	22.63 (6.33)	-2.13	58	0.03
Paired t-test	$t=4.16, df=29, p<0.001$		$t=0.50, df=29, p=0.61$		

show any change in blood glucose and the use of diabetes drugs.^[26] The results showed that education through peer support was effective in controlling diabetic patients. In the present study, group training was used by peers who were able to share well their experiences and knowledge of the disease and what they have experienced during the disease course in a friendly environment, under the supervision of the researcher, with patients in the intervention group and their peers. It caused the mean score of the fear of hypoglycemia was significantly reduced in the test group compared to before the intervention. Also in this study, it was found that the mean scores of the fear of hypoglycemia before and after the intervention in the control group were not significantly different.

The limitations of this study included few educational sessions that because of the lack of cooperation of patients, the number of sessions was reduced to a minimum, but with the full supervision of researchers on the educational content in the training sessions by peers, this limitation was controlled as much as possible. Another limitation of the study was the non-generalizability of the study results because the sample size was small and the study was conducted only on type 1 diabetic patients in public hospitals. Therefore, it is suggested more researches be done in other cities of the country and also on type 2 diabetes because different geographical conditions, cultural differences, social conditions, etc., can be effective.

Conclusion

Considering the results of the study, it can be concluded that peers support through training to type 1 diabetic patients is an effective method to reduce the fear of hypoglycemia. Although this research for the first time in Iran has assessed the peers support on the fear of hypoglycemia in type 1 diabetic patients, it could properly investigate the fear of hypoglycemia in these patients. The peers can be useful in training workshops to train diabetic patients to promote their health, improve their quality of life, and reduce their fear of hypoglycemia.

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Conflicts of interest

Nothing to declare.

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