

The Effect of Self-Care Education through Social Networks on the Patients' Quality of Life with Type 1 Diabetes in Sanandaj City, Iran

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Abstract

Introduction and Objective: The increasing advances in technology and development of the Internet and telecommunications have provided great opportunities for the healthcare and distance education. The present study aimed to examine the impact of distance education (through virtual social networks) on the quality of life in type-1 diabetic patients referring to the diabetes clinic of Tohid Hospital in Sanandaj. **Materials and Methods:** The present study was a clinical trial with a registration number of IRCT2017092336362N1. In the spring of 2017, 80 patients were selected from type-1 diabetic patients, who referred to diabetes clinic of Tohid Hospital in Sanandaj, and they were randomly put into 35-patient experimental group, and the 45-patient control group. The quality of life questionnaire and the subjects' demographic characteristics were collected before the research. In the studied group, training was completed for two months by creating a telegram channel. After two months, the questionnaires were re-completed in both groups. **Results:** Both intervention and control groups were similar in terms of numerical demographic variables such as age and educational status, and also in terms of variables such as the gender, marital status, family history, insurance, weight and height. Before the research, the mean score of quality of life in the intervention group was equal to 40.82, but it was 43.34 after the research. Despite the fact that this value was not statistically significant ($p = 0.0638$), the mean score of their quality of life increased. In the control group, there was not any significant difference between the quality of life scores before and after the intervention ($p = 0.6147$). **Conclusion:** Self-care distance education in

diabetic patients could have a significant effect on the improved patient self-care and ultimately increase the mean score of patients' quality of life. The use of social networks in providing this education could provide free education on a wide scale for a wide range of these patients, and on the other hand, it could reduce the educational inequalities and provide education for remote areas.

Keywords

Quality of Life, Type 1 Diabetes, Self-Care Education, Self-Care, Social Networks

1. Introduction

Diabetes is one of the common problems in most countries, as the World Health Organization (WHO) called it as a silent epidemic (Zaker & Ghavami, 2016). The World Health Organization (WHO) estimated that the prevalence of diabetes would be equal to 171 million people in 2000 and it would reach to 438 million people by 2030 (Sobhani et al., 2014). Most of this increase is taking place in developing countries, and as estimated, about 75% of diabetics will live in these countries by 2025 (Saeidpour et al., 2013). There are currently more than 3 million diabetics in Iran; and according to the World Health Organization, if there are not any effective measures in this field, this value will be increased to about 7 million people by 2030. The prevalence of adult diabetes is estimated to be from 2% to 12% (Grzywacz et al., 2012). Currently, the number of people with type 1 diabetes in Iran is approximately from 5% to 10% of all diabetics. In addition, a child per 400 - 500 children has type-1 diabetes (Abdoli et al., 2016). A person died of diabetes at every 10 seconds (Shahab Jahanlu et al., 2015). Due to the direct association of this disease with increased prevalence of cardiovascular, cerebrovascular, peripheral arteries, retinopathy, neuropathy, nephropathy, diabetic foot, amputation and depression diseases (Sobhani et al., 2014), it has a direct impact on the health care costs, and also increases the mortality in people (Kermansaravi et al., 2011), so that the average age of life expectancy in diabetics reduces to 15 years, and it finally has a negative impact on their quality of life (Lloyd et al., 2011). Quality of life refers to the individuals' satisfaction with some life fields which are important to them (Lloyd & Orchard, 1999).

According to the World Health Organization, the quality of life means the individuals' understanding of their life status in terms of culture, values, goals, expectations, standards and individual concerns (Afshar et al., 2014). The improvement of self-care ability is important in treatment of a chronic disease such as diabetes, and it increases the quality of life in diabetics (Fraser et al., 2004). Self-care in diabetes involves a range of activities such as regular blood glucose

measurement, dietary adjustment, exercise, timely medication, and legs checking which require major changes in the lifestyle. Continuous self-care is associated with lower levels of glycosylated hemoglobin and fewer side effects. This issue should be taken into account because some studies consider the lack of daily self-care as the most important cause of mortality in diabetics (Halipchuk et al., 2017). Therefore, it is important to stimulate the self-care in these patients and use this potential (Afshar & Izadi, 2005). In order to support diabetic patients with self-care problems, it is essential to implement an education programs and a follow-up program with the aim to improve their awareness, performance and attitudes. A treatment follow-up is possible through the presence of clients at the clinic at a specified interval or implementation of a house visit program, but an inexpensive follow-up method, which is applicable to a large number of clients, should be done for diabetes according to its high and growing prevalence and the importance of long-term follow-up (Shayeghian et al., 2014). In this regard, the use of new technologies in healthcare is inevitable due to the unique properties of this science. The issues such as the e-Health and mobile-health, which are now considered by governments, refer to such a point. If every society is able to develop this sector as soon as possible, it will probably have less challenge for its future health issues. It seems that the electronic education of chronic diseases is an effective way of dealing with this group of people and it provides reliable information, empowers the impact on their awareness and self-efficacy and potentially improves their status (Holling et al., 2007).

2. Materials and Methods

The present study was a clinical trial research which was conducted at the diabetes center of Tohid Hospital of Sanandaj by the cooperation of type 1 diabetic patients who referred to this center. This research was registered in the clinical trial system with number of IRCT2017092336362N1. After approving the project by the Ethics Committee of Kurdistan University of Medical Sciences and the consent of Tohid Hospital authorities and director of the diabetes clinic, sampling was done among type 1 diabetic patients referring to this center with the following inclusion criteria: Age range of 10 - 33 years; living in Sanandaj City; more than a year of diagnosed type 1 diabetes; a history of insulin injection; not have an acute illness that affects the patient's quality of life during a month before research, to have a reading or writing literacy by patients or their caregivers; satisfaction to participate in the study; have a mobile phone; using SMS or social networks such as Telegram; the ability to read messages by patients or their caregivers; not have the well-known psychological illnesses; not have developed diseases in vital organs such as the liver and kidneys; and not have severe visual and hearing impairment. The exclusion criteria included hospitalization during the study and a reluctance to participate in the study. In this case, alternative samples were considered. Sample size was equal to 80 according to the results of surveys and statistical estimates and they were randomly selected from the

clients.

Data was collected through the DQOL questionnaire by the attendance interview at the clinic. The main questionnaire of DQOL contained 60 questions and its validity and reliability were first measured by Thomas E. Burroughs et al. and reduced to 15 questions in 2004. This 15-item questionnaire was applied for patients with type 1 and 2 diabetes. The questions of this questionnaire included two aspects of patient care behavior and satisfaction with disease control. Completion of this questionnaire lasted about 10 minutes. This questionnaire contained 15 questions about the quality of life and 11 questions about the demographic characteristics. Each question of quality of life had 5 scores ranging from 1 (totally dissatisfied) to 5 (totally satisfied). The score from 15 and 30 indicated the low quality of life; 30 to 45 indicated the moderate quality of life; and higher than 45 indicated the high quality of life. The internal validity of this questionnaire was done in a research through Cronbach's alpha coefficient of 77% (Burroughs et al., 2004).

Samples were divided into two groups: the experimental group consisted of 35 samples; and the control group had 45 samples. The experimental group subjects first received a briefing and explanation about the research and how it was conducted and creation of channel, and their questions were answered. A telegram channel was then created by the research management and all 35 subjects were added to this channel. Two to four educational texts on the self-care were daily put in this channel. The researcher could check how many people viewed the messages; and also the researcher reviewed the members' presence in the channel according to their profiles, and contacted those who were not online for over 48 hours and asked for reasons. It was also possible for members of channel to directly ask their questions via the researcher's ID. After two months, all participants were asked to complete the questionnaires in the diabetes center of Tohid Hospital.

3. Findings

Table 1 shows the underlying variables of research units and the comparison of both groups. Independent T-test was used to compare the control and intervention groups in terms of demographic variables. The mean age of control group was 20.40 with a standard deviation of 6.29. The maximum age of control group was 13 years, but the minimum was 32 years. According to the p-value of test, there was not any significant difference between control and intervention groups in terms of height and weight. For comparison of control and intervention groups in terms of gender and marital status, Chi-square test (according to the qualitative two variables) was used and indicated that 33 samples (42.3%) were male and 45 samples (57.7%) were female. P-value of Chi-square test indicated that there was not any significant difference between control and intervention groups in terms of educational level, and thus both groups were similar in terms of educational level.

Table 1. Underlying variables of studied units and comparison of two groups.

Underlying variables		Intervention group	Control group	Test result
Age		23.08	20.4	$\Pr(T > t) = 0.0480$
Weight (kg)		60.6	62.34	$\Pr(T > t) = 0.5340$
Height (m)		165.31	166.37	
Gender	Male	14	20	Pearson $\chi^2(1) = 0.1385$ $\Pr = 0.710$
	Female	21	25	
Marital status	Single	28	33	Fisher's exact = 0.600
	Married	7	12	
	Illiterate	1	1	
Education	Elementary school	2	4	Fisher's exact = 0.624
	Secondary school	6	11	
	High school	10	16	
	University	16	13	
Insurance	Yes	35	44	Fisher's exact = 1.000

Suitable parametric samplers were used to test the hypotheses according to the nature and type of data. Wilcoxon test was used to test the first hypothesis test as the mean score of quality of life variable was presented (**Table 2**). Given the obtained results of Wilcoxon test, there was not any significant difference between the patients' quality of life before and after the intervention in the intervention group. In this group, the mean score of life quality before intervention was equal to 40.82, and it reached 43.34 after the intervention (p -value = 0.0638) indicating an improvement in the quality of life in the intervention group. According to the obtained results of Wilcoxon test for the second hypothesis, there was not any significant difference between the patients' quality of life before and after the intervention in the control group. The mean score of quality of life in the control group was equal to 44.22 before the intervention; and it reached 43.64 (p -value = 0.6147) which was not statistically significant, but it qualitatively indicated that the mean score of quality of life in the control group was decreased.

Results of the Wilcoxon test for the third hypothesis indicated that the mean scores of quality of life before intervention was 40.82 in the intervention group and 44.22 in control group (p -value = 0.0424), and this indicated that there was a significant difference between the quality of life scores of both groups (**Table 3**).

Results of Wilcoxon test for the fourth hypothesis indicated that the mean score of quality of life was equal to 43.34 in the intervention group and 43.64 in the control group after the intervention (p -value = 0.7050) indicating that there was not any significant difference between scores of both groups after the intervention, but the mean score of quality of life increased in the experimental group and decreased in the control group (**Table 4**).

Table 2. Comparison of patients' quality of life before and after the intervention in intervention and control groups (Wilcoxon signed-rank test).

	Result of Wilcoxon test	Expected	Sum ranks	Obs	Sign
Intervention group	p -value = 0.0638	312	199	10	Positive
		312	425	22	Negative
		6	6	3	Zero
		630	630	35	Total
Control group	p -value = 0.6147	478.5	522.5	17	Positive
		478.5	434.5	16	Negative
		78	78	12	Zero
		1035	1035	45	Total

Table 3. Comparison of patients' quality of life before intervention in the control and intervention groups.

Result of Wilcoxon test	Expected	Sum ranks	Obs	Group
p -value = 0.0424	1417.5	1208.5	35	Case
	1822.5	2031.5	45	Control
	3240	3240	80	Total
	N	SD	Mean	Group
	35	7.698303	40.82857	Case
	45	6.367135	44.22222	Control
	80	7.138315	42.7375	Total

Table 4. Comparison of patients' quality of life after the intervention in control and intervention groups.

Result of Wilcoxon test	Expected	Sum ranks	Obs	Group
p -value = 0.7050	1417.5	1378.5	35	Case
	1822.5	1861.5	45	Control
	3240	3240	80	Total
	N	SD	Mean	Group
	35	9.110249	43.34286	Case
	45	6.512769	43.64444	Control
	80	7.704994	43.5125	Total

4. Discussion

According to the determined frequency of demographic characteristics in both intervention and control groups, most samples were female (57.69) and single (76.25), and the mean age of participants in the study was 21.57 years. Results of statistical Fisher and Exact Fisher tests indicated that two groups were homogeneous in terms of height, weight, and type of treatment, insurance and history of diabetes; and were similar in terms of the age and educational level variables. According to the research by Hassanali et al. who studied the effect of participa-

tory care model on the metabolic control in adolescents with type-1 diabetes, the subjects' mean age was equal to 20 years (Hassanali et al., 2014). However, according to the Heidari et al.'s research entitled "The effect of educational program based on the Glycated hemoglobin empowerment model in adolescents with type 1 diabetes", the mean age of intervention group was 16.5 years (Heidari et al., 2012). In Rezaei et al.'s study entitled "The study on the effect of nutrition education on the knowledge, attitude and performance of patients with type-1 diabetes", the mean age was equal to 30.8 years (Rezaei et al., 2014).

The results also indicated that both the intervention and control groups were not homogeneous in terms of age. The mean age of control group was 20.40 with a standard deviation of 29.26. The minimum age of control group was 10 and the maximum age was 31. The mean age of intervention group was 23.09 with a standard deviation of 5.44. Results of independent t-test also indicated that there was a significant difference between control and intervention groups in terms of mean age. In other words, both groups were different in terms of age. One of its reasons may be the random sampling and random division of samples into the experimental and control groups. According to the research by Khaledi et al., who investigated eight dimensions of quality of life in type 2 diabetic patients, the age was only related to the patients' physical performance and their physical pain (Khaledi et al., 2011).

The results also indicated that most participants in the study were females. According to a research by Vosoghi Karkazloo et al. on the self-care ability in diabetic patients, 65.2% of participants were female (Vosoghi Karkazloo et al., 2012). In a research by Zaker and Ghavami, 62% of participants in the study were females (Zaker & Ghavami, 2016). Furthermore, in a study by Davis et al. (2010) on diabetics' self-care assessment with distance education, 72.9% of the intervention group and 76.3% of the control group were female (Davis et al., 2010).

According to the analysis of results of pre-intervention experimental group, the mean score of quality of life was equal to 42.52 and at the moderate level in both groups before the intervention. Different studies on the quality of life in diabetics in Iran indicated the moderate quality of life in them. For instance, Zeynali conducted a research entitled "The influence of cognitive-behavioral therapy group on depression and increased quality of life in patients with type I diabetes, and they found the quality of life equal to 41.61 and moderate in the intervention group" (Beigi & Zeinali, 2017). In Baghianimoghadam and Afkhami Ardekani's research entitled "The effect of educational intervention on the quality of life in type II diabetics, 32.46% of patients had low quality of life, 32.46% had moderate quality of life and 35.08% had good quality of life" (Baghianimoghadam & Afkhami Ardekani, 2008). In Sepahvand et al.'s study entitled "The study on the effect of educational intervention on the quality of life in type II diabetics, 31.92% of participants had low quality of life, 29.78% had moderate quality of life, and 38.30% had high quality of life" (Izadi et al., 2013). All of

these results were consistent with research by Glasgow et al. because they also found that the quality of life in diabetic patients was moderate or low (Glasgow et al., 1997). The above-mentioned results were consistent with results of the present study in which the quality of life in the participated research samples was moderate.

Results of this study indicated that despite the statistical insignificant difference between quality of life scores in two groups, the quality of life score in the intervention group reached from 40.82 to 43.34 ($p = 0.638$) at the end of research. In the control group, there was a decrease in the mean score of their quality of life. Several studies have investigated the effect of distance education on the improvement of diabetic patients. In a research by Saeidpour et al. with the aim to investigate the effect of self-care education on the quality of life in diabetic patients, the appropriate education in preventing, improving and treating diabetes through increasing the level of knowledge could increase the diabetics' general health and improve their quality of life (Pour et al., 2013). In other chronic diseases, the self-care education had a significant impact on the improvement of their quality of life. Yekeh-Fallah et al. conducted a research entitled "The impact of tele-nursing on the quality of life in patients with atrial fibrillation" and found that the distance education improved the quality of life in patients with the atrial fibrillation (Yekefallah et al., 2016).

Yousef Behzad et al. studied the impact of tele-nursing on the self-efficacy in the self-care behavior in elderly people with type 1 diabetes. Their results indicated that the self-efficacy education was effective in improving the self-efficacy and improving the quality of life in the elderly people with hypertension through tele-nursing (Behzad et al., 2016). According to a research entitled "The study on the effect of educational packages on the quality of life in diabetics", Zaker and Ghavami found that the mean quality of life in these patients was divided into two dimensions of mental and physical health, and it was not changed in the mental dimension after the intervention; and the education did not affect it, but affected the physical health. The total results of this study indicated that the self-care education improved the quality of life in diabetics, but it only affected their physical dimension in the quality of life, and it did not affect the mental health (Zaker & Ghavami, 2016). These results were consistent with results of the present study; and the distance education improved the patient parameters in all of them.

Results of Wilcoxon test also indicated that there was not any significant difference between the quality of life in patients before and after the intervention in the control group. Mean scores of quality of life in the control group was equal to 44.22 before the intervention and it reached 43.64 (p -value = 0.6147). Despite the statistical insignificance of this value, the qualitative mean score of quality of life was decreased in the control group. Behzad et al. conducted a research entitled "The study on the impact of educational packages on the quality of life in diabetics". Results of their study indicated that the mean score of quality of life

was equal to 49 in the physical health before study and 55.6 after study in the control group. It was also equal to 57.7 which reached 64.7 in the mental dimension (Behzad et al., 2016). According to Beigi and Zeinali's research entitled, "The impact of cognitive behavior therapy on reduction of depression and increase in the quality of life in patients with type I diabetes", the results of the present study indicated that there was not a significant difference between score of quality of life and depression in the control group before and after the intervention, so that the score of quality of life reached from 42.70 to 43.35, and the depression score reached from 9.45 to 8.87 in the research group (Beigi & Zeinali, 2017). Baghianimoghadam and Afkhami Ardekani conducted a research entitled "The impact of educational intervention on the quality of life in diabetics", and found that the score of quality of life reached from 52.36 to 51.72 after intervention in the control group (Baghianimoghadam & Afkhami Ardekani, 2008). Saeidpour et al. conducted a research entitled "The study on the impact of self-care education on the quality of life in diabetics", and found that the score of quality of life reached from 41 to 65 after research in the experimental group (Pour et al., 2013). According to Izadi et al.'s entitled "The study on the effect of educational intervention on the quality of life in patients with type II diabetes", the mean score of quality of life was not increased after the intervention in the control group (Izadi et al., 2013). All of these results are consistent with our results.

5. Conclusion

In the present study, the distance education was performed through Telegram virtual social network to improve the self-care in patients with type 1 diabetes. Given the high and increasing prevalence of diabetes in Iran and since the education and follow-up are the best ways to prevent the complications of diabetes, the continuous education and follow-up through tele-technologies can prevent the imposed heavy financial burden due to the development of diabetes complications among the society, patients and their families, and thus we can make the maximum use of features of virtual social networks such as cost-effectiveness, availability, and lack of temporal and spatial limitations because the lack of personnel is one of the problems of health service providers. On the other hand, this method is easy and inexpensive for most patients who do not access to care service centers in rural and remote regions and many patients who cannot attend the educational classes due to their works and also the clients who have type-1 diabetes and are often at the active and productive ages, and thus a large number of clients can be covered by spending the low cost and time and small number of personnel, and then the effective steps can be taken in improving and promoting the healthcare for these patients.

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