Original Article

Access this article online

Quick Response Code:

Website: www.jehp.net

DOI: 10.4103/jehp.jehp_72_21

The effect of peer support on quality of life among type 2 diabetic patients in deprived areas in Iran: A randomized clinical trial

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Received: 16-01-2021
Accepted: 21-03-2021
Published: 30-09-2021

Abstract:

BACKGROUND: Quality of life (QOL) is one of the effective factors in promoting the health of diabetic patients. In recent years, the role of peer support in the optimal management of diabetes has gained increasing attention. However, contradictory results have been reported from the effectiveness of this method. This study aimed to investigate the effect of peer support on the QOL among type 2 diabetic patients in deprived areas.

MATERIALS AND METHODS: This study was a randomized clinical trial conducted on 80 patients with T2D referring to the diabetes Clinic in Aligoudarz in Iran. Participants were randomly assigned into two groups of 40 patients. Intervention group received a peer Supportive-educational program for 3 months and the control group received routine clinic care. Diabetes QOL brief clinical inventory was used to collect the data. This questionnaire was completed three times at the beginning of the study, immediately after the 3-day training, and after 3 months of peer supportive intervention. The SPSS software (v. 18.0) was used to analyze the data through the Generalized Estimating Equations.

RESULTS: There was no significant difference in mean QOL between the two groups before the intervention ($P = 0.891$) and immediately after the education ($P = 0.076$). However, after 3 months of intervention, the intervention group showed a significant improvement in mean QOL compared to those in the control group ($P < 0.001$).

CONCLUSION: Peer support program can improve the QOL in type 2 diabetic patients in deprived areas. Therefore, this method can be recommended to improve care and educational programs in these patients.

Keywords:

Nursing care, peer group, peer support, quality of life, type 2 diabetes

Introduction

Nearly half a billion people in the world live with diabetes. With 5.4 million patients with diabetes, Iran is one of the countries in the Middle East and North Africa region having the highest number of adults with diabetes in the age group of 20–79 years.[1] The high prevalence and economic burden of this disease[2] are a serious challenge to public health in this country.[3]

The study revealed that 50%, 33.6%, and 16.4% of patients suffered from one, two, and three complications of type 2 Diabetes (T2D), respectively.[4] Due to microvascular and macrovascular complications, the mortality rate in patients with diabetes is twice as high as that in nondiabetic patients.[5] In addition, the limitations caused by the disease and

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How to cite this article: Shahsavari A, Estebsari F, Atashzadeh-Shoorideh F, Ilkhani M. The effect of peer support on quality of life among type 2 diabetic patients in deprived areas in Iran: A randomized clinical trial. J Edu Health Promot 2021;10:345.

incompatibility with social roles, psychosocial problems, and continuous implementation of self-care behaviors significantly influence the quality of life (QOL) of patients with diabetes.[6,7] QOL refers to a person's perception of his or her physical, emotional, and social status.[8] The present study show that Iranian patients with T2D have a moderate and low QOL.[5]

Due to the complex nature of diabetes, people with diabetes need ongoing support to manage their disease.[9] This support can reduce the complications of the disease and improve the QOL.[10] However, it is difficult for many people with diabetes to receive such support from family and friends.[11] Physicians and health-care providers also often do not have the time and resources to provide adequate support for patients' self-management during routine visits.[12]

Patients with T2D have the potential to be empowered to manage their chronic disease if they are actively informed and educated.[13] One of the strategies approved by the World Health Organization to help patients with diabetes in the self-management of the disease is peer support.[14] Peers are people with diabetes who support similar patients in social and emotional contexts and in addition to improving patients' relationships with clinical caregivers, help them manage the daily activities of a life with diabetes.[15] Some studies have reported the effectiveness of peer support in controlling blood sugar and improving QOL.[10] However, there are contradictory results.[16,17] Furthermore, despite the features proposed for the peer support strategy such as cost-effectiveness,[14] availability,[18] and cultural acceptance,[15] few studies have been conducted following this supportive approach in low-income groups in Iran and more studies seem to be necessary.

In the city of Aligoudarz, as the study population of this study, patients with diabetes face restrictions on the use of health facilities due to poverty, and access to free public resources including diabetes records at diabetes centers and monthly visits by health-care providers is also difficult for many of these patients due to the remoteness and mountainous nature of the area. Poverty and lack of access to support resources seem to affect the QOL of patients with T2D in this region and the need for a solution to improve the QOL in these patients is felt. According to the conditions of the study population, this study aimed to investigate the effectiveness of peer support on the QOL of patients with T2D.

Materials and Methods

Study design

This study was a randomized clinical trial conducted on 80 patients referring to the diabetes unit in Hefdah Shahrivar Clinic in Aligoudarz city, Lorestan Province, Iran. The study population included all patients with T2D referring to this clinic from March 05, 2020, to May 09, 2020.

Inclusion and exclusion criteria

The inclusion criteria were being diagnosed with T2D by a specialist physician for at least 6 months[19] and having a diabetes record in the clinic, being over 18 years of age, having a HbA1C higher than 7%,[11,20,21] not participating in diabetes-related education programs in the last 6 months, not suffering from cognitive disorders, having no physical disability, not being educated in medical sciences or related fields of study, and having access to the telephone (mobile or landline). The death of the participants, absence in more than two education sessions, the emergence of new physical problems leading to inability to self-care, and withdrawal from cooperation were among the exclusion criteria.

Sample size

The sample size was determined as 40 patients in each group and a total of 80 patients according to the changes in QOL in a similar study,[22] the probability of Type 1 error (α) of 0.05, test power ($1-\beta$) of 0.80, and based on the sample size formula for comparing the two means. It was also predicted that a replacement participant would be used if the sample drops during the study. Although no samples were excluded from the study [Figure 1].

$$n = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2 (S_1^2 + S_2^2)}{(X_1 - X_2)^2}$$

$$= \frac{(1/96 + 0/84)^2 (17/5^2 + 15/8^2)}{(75/5 - 65/0)^2} = 39/53 \cong 40$$

Randomization

To homogenize the participants' basic information, all of them initially participated in a 3-day diabetes self-care education.[21-24] This education course was conducted by nutritionists and endocrinologists in the clinic. The content of the sessions was prepared according to the 2018 American Diabetes Association Standards of Care and the current instructions of the Ministry of Health of Iran and was implemented after simplifying (Define medical terminology in a language understandable to ordinary people) the concepts. The content included the principles of diabetes self-care (nutrition, physical activity, medication, foot care, and blood sugar control) presented in three 2-h sessions.[21] At the end of the education course, the participants were randomly assigned to intervention (n = 40) and control (n = 40) groups using the computer-based randomization principle using lottery cards. Forty A cards (intervention group) and 40 B cards (control group) were prepared for randomization. Each participant was asked to pick up

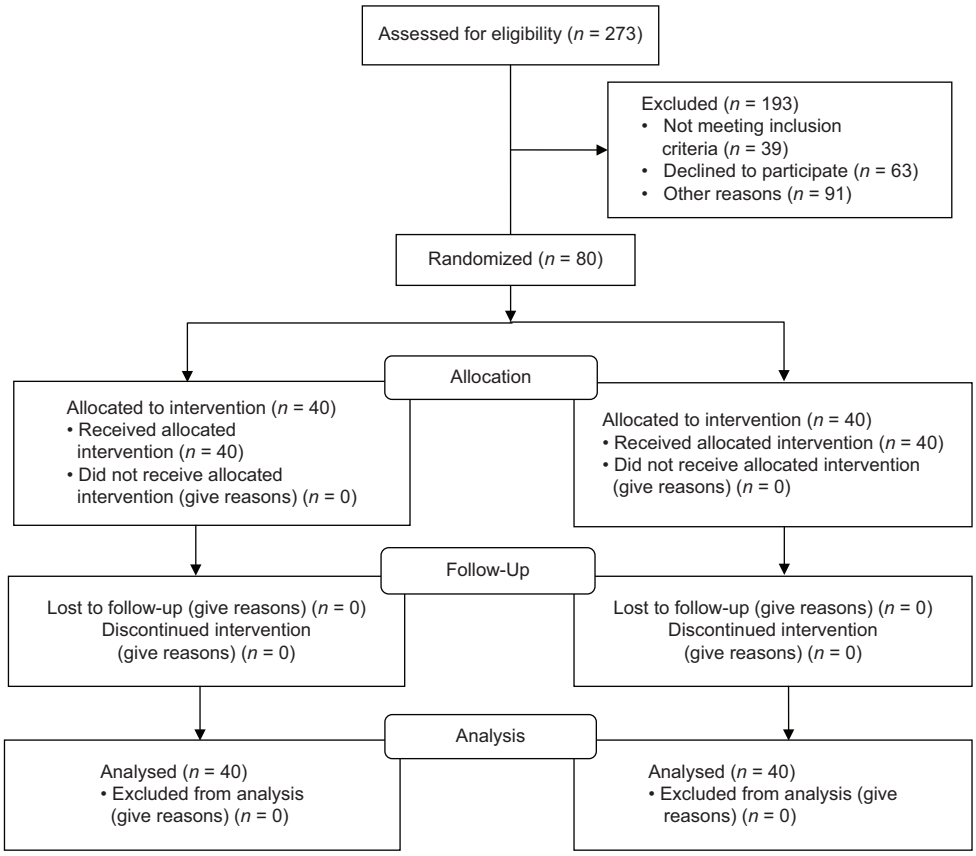

Figure 1: Overview of recruitment and group allocation

a card after the cards had been shuffled. The samples were then divided into one of two groups based on the removed card.

Intervention

Recruiting peers

At the end of the 3-day education course, the research team selected 26 patients with diabetes as potential peers based on the inclusion criteria. These people were not among the 80 participants in the study. The inclusion criteria were being diagnosed with T2D for at least one year,[20] having at least a high school diploma, having basic knowledge about diabetes (participation in the 3-day education), having no chronic complications of diabetes as discerned by a physician, following their treatment plan (based on the documents on their diabetes record and HbA_1C of <8%,[18] having good social, being familiar with the characteristics of the people in the area, attending all peer education sessions, and being approved for their communication and interpersonal skills in the face-to-face interview session by the research team. Finally, as agreed by the research team, the peers with the highest scores were selected from the eligible ones. Informed consent was obtained from the peers to participate in the study. The recruited peers participated in four weekly education sessions for 1 month. Each session consisted of 2 h of theoretical education and 1 h of practical education. Regarding the number of peer training sessions, although the references mentioned holding three 2 hour sessions,[18,20] due to the little information of the selected peers about how to implement the peer support method, the number of sessions increased to 4 sessions. Furthermore, similar studies did not mention how to train peers,[18,20] but in the present study, communication skills and problem-solving through role-playing were held in practice for peers. The content of the sessions included (1) an introduction to the importance of peer support approach and communication skills, (2) problem-solving skills and how to support patients, identify support sources and the barriers to them, and design care goals, (3) diabetes self-care, and (4) how to hold group meetings, answer patients' questions, and communicate with the research team At the end of the education course, which was held by two members of the research team who had worked as a diabetes nurse, the peers received a summary of the educational materials, the schedule and content of the support program prepared for the patients, and a SIM card to communicate with the patients and the research team.

Peer support intervention

After preparing the peers, the participants in the intervention group were randomly assigned to four

groups of 10 members. The patient health-care providers and the person who analyzed the data were unaware of the random assignment of the participants to the intervention and control groups. During the intervention, the control and intervention groups had no contact with each other. Routine visit times were so arranged that the intervention group refers to the clinic on even days and the control group on odd days.

The peer support program was conducted within 3 months. During this period, a 2-h education session was held in public places (mosque, coffee shop, and restaurant) per month. The content of the education included the principles of diabetes self-care. In the education sessions, the members of the group, while examining the barrier to and facilitators of implementing self-care behaviors, shared their experiences, discussed them, and provided solutions. The peers also arranged a 1-h session, group exercise, and a 2-h group food shopping program for the patients per month. In addition, the peers monitored the patients' care and supported them over the telephone. The duration of telephone calls was 15–20 min once a week. In all the sessions, the peers followed the predetermined topics. They also submitted written details of sessions and telephone conversations to the research team. After reviewing peers' reports, the research team provided them with the necessary feedback to improve the quality of the sessions. During the study, the research team was in contact with the peers by phone. In addition to the 3-day self-care education, the patients in both groups received the routine clinic care, including monthly visits by a diabetes nurse and a nutritionist.

Outcome measures

The primary outcome of the study was QOL. At the beginning of the study, demographic characteristics were extracted and recorded from the patients' diabetes records. The Diabetes QOL Brief Clinical Inventory (DQOL-BCI) was also used to measure the participants' QOL. This 15-item questionnaire was developed by Burroughs (2004), and its Cronbach's alpha was reported to be 0.85.[25] The answers to the questions are based on a 5-point Likert scale. There are two categories of questions in terms of Likert form. One category is rated as very satisfied, satisfied, almost satisfied, dissatisfied, and very dissatisfied (score 5-1) and the other category is rated as never, rarely, sometimes, often, and always (score 5-1). The total score of the questionnaire is between 15 and 75. A higher score indicates a better QOL. The content validity of the questionnaire in patients with T2D in Iran was reported to be good following its qualitative assessment by expert panel and quantitative assessment by content validity index and content validity ratio (CVR > 0.99, CVI > 0.75). Also, internal consistency of the questionnaire was reported to be adequate as indicated by $\alpha = 0.75$ and ICC = 0.81 in test-retest method.[8] In the present study, the reliability of the questionnaire was evaluated by the test-retest method. Cronbach's alpha showed the internal consistency of the questionnaire as $\alpha = 0.89$.

During face-to-face interviews with each participant, the DQOL-BCI was first completed at the beginning of the study and repeated both immediately after the 3-day education and after 3 months of peer support intervention.

Statistical analysis

The data analysis was performed with IBM SPSS Statistics for Windows (version 18, IBM Corporation, Armonk, NY, USA). Descriptive statistics included frequency, mean, and standard deviation was used to categorize the demographic findings. The difference between the two groups in terms of these variables was measured at the beginning of the study by the Chi-square and Fisher's exact test. To achieve the main objectives of the research, first the normality of the data was performed by the Shapiro–Wilk test. This test showed that the QOL variable was abnormal at different assessment times. Therefore, nonparametric Chi-square test was used to compare the frequency distribution of this variable according to the groups under the study. The Generalized Estimating Equations (GEE) model was used to investigate the mean intergroup and intragroup effects of the changes made in the QOL variable. Thus, the effect of two independent factors of group (intervention and control groups) and time (before the intervention, immediately after the 3-day education, and after 3 months of peer intervention) on the QOL variable was investigated through exchangeable structure in the GEE model. To investigate the statistical differences between the groups, Benfroni *post hoc* test in the same model was used. Significance level was considered to be <0.05.

Ethical considerations

This study is the result of a research proposal approved by the School of Nursing and Midwifery of Shahid Beheshti University of Medical Sciences in Tehran with ethics code IR. SBMU. PHARMACY. REC.1398.348 on 02/03/2020 and registered in the Iranian Registry of Clinical Trials (code: IRCT20150525022406N2). At the beginning of the study, the objectives of the research were explained to the participants, and written informed consents were obtained from them to participate in the research. They could leave the study whenever they wanted.

Results

The present study was conducted on 80 patients with T2D. The mean age of the participants was 53.65 ± 14.26 years

in the intervention group and 54.47 ± 12.89 years in the control group. The results showed no significant difference between the participants of the two groups in demographic characteristics [Table 1].

The study of intragroup effects in the intervention group showed that the mean of QOL significantly decreased by 0.93 immediately after the 3-day education and increased by 14.17 3 months after the intervention ($P < 0.050$). The study of intragroup effects in the control group showed that the mean of QOL, immediately after the intervention compared to before the intervention had a significant decrease of 1.17 ($P < 0.05$). However, 3 months after the intervention, these changes were not significant ($P > 0.05$).

The study of intergroup changes showed that there was no significant difference between the intervention and control groups in the mean of QOL before the intervention and immediately after the 3-day intervention ($P > 0.050$). However, after 3 months of intervention, mean of this variable in the intervention group was significantly greater than the control group ($P < 0.05$) [Table 2].

Table 1: Demographic characteristics of two study groups

Variables	Frequency, *n* (%)		*P*
	Peer-support group (*n*=40)	Control group (*n*=40)	
Gender			
Male	17 (42.5)	16 (40)	0.820*
Female	23 (57.5)	24 (60)	
Occupation			
House worker	12 (30)	16 (40)	0.744**
Unemployed	8 (20)	10 (25)	
Employee	9 (22.5)	5 (12.5)	
Retired	3 (7.5)	4 (10)	
Student	2 (5)	1 (2.5)	
Farmer	6 (15)	4 (10)	
Income (Million Rial)			
Between 3 and 4	3 (7.5)	1 (2.5)	0.622**
Between 2 and 3	21 (52.5)	21 (52.5)	
Lower 2	16 (40)	18 (45)	
Housing situation			
Private housing	30 (75)	26 (65)	0.329*
Rental housing	10 (25)	14 (35)	
Place of living			
City	26 (65)	21 (52.5)	0.256*
Village	14 (35)	19 (47.5)	
Age			
<50	19 (47.5)	16 (40)	0.499*
>51	21 (52.2)	24 (60)	
Number of family members			
<5	25 (62.5)	25 (62.5)	1.000*
>6	15 (37.5)	25 (37.5)	

*Chi-square test, **Fisher's exact test

Discussion

The findings showed that after 3 months of intervention, the intervention group's QOL improved significantly compared to that in the control group. This finding is consistent with the results of the studies by Peimani and Johansson *et al*.[16,18] These studies were similar to our study in terms of intervention design steps and the use of trained peers.

In their study on patients with diabetes, Ghasemi *et al*. showed that the participants' QOL improved immediately after peer intervention, but no significant difference was seen between the two groups after 1 month of follow-up.[26] Contrary to these results, the results of the present study showed that immediately after the 3-day educational intervention, the QOL in the intervention and control groups had significant decrease. This could be the result of contrasting patients' experiences with diabetes services (what is provided) with the standards of care (what should be provided) that they learn about in a short-term training course. This rise in initial understanding and lack of access to what should be can have an effect on patients' QOL. Compared to our study, it seems that the decrease in QOL 1 month after the end of peer intervention in the study by Ghasemi *et al*. could be related to the age difference of the participants, the time-intensive mode of the peer intervention, and its focus on self-care education. Their study was conducted on patients over 65 years of age, who often find it difficult to memorize educational materials and need more practice and repetition. They also have less self-care power than younger adults, which can affect their QOL. While we tried to use the peers'

Table 2: Comparison of between and within groups quality of life before, immediately after and after 3 months intervention in study groups

Variables	Time	Group	Mean±SD	Difference mean	*P**	Difference in mean	*P***
QOL	T1	Peer-support group	27.13±2.45	0.08	0.891	-	-
		Control group	27.05±2.50			-	-
	T2	Peer-support group	26.20±1.77	0.32	0.076	−0.93	<0.001
		Control group	25.88±2.00			−1.17	<0.001
	T3	Peer-support group	41.30±2.72	14.37	<0.001	14.17	<0.001
		Control group	26.93±2.55			−0.12	0.187

*Between-subject, **Within-subject. SD=Standard deviation, T1=Baseline measurement, T2=Immediately after the three-day training, T3=After 3 months peer support intervention, QOL=Quality of life

capacities for social and emotional support of patients individually and in groups, in addition to education, group discussion, and exchange of experiences.

Contrary to our results, Simmons *et al*. showed that peer support intervention has no effect on the QOL of patients with diabetes.[27] This discrepancy in results may be related to differences in the QOL questionnaires and the duration of peer support intervention used in these studies. Furthermore, QOL is a multidimensional concept directly related to lifestyle and cultural, economic and social characteristics, and various factors, in addition to disease, can affect it. Therefore, it seems that the design of peer support intervention according to the study population and its degree of coordination with different dimensions of QOL can influence its effectiveness.

Kong *et al*. showed that peer interventions did not lead to improvement in self-efficacy and QOL in adults with T2D. However, they reported that peer interventions performed <6 months ago had a positive effect on improving patients' self-efficacy and QOL.[28] It can be said that the success of peer support program is closely related to patients' need for support resources, how they accept this support, and how they interact with peers. This support strategy may even work differently for people who do not have financial constraints on accessing healthcare facilities. Therefore, it is recommended that future studies examine the effectiveness of peer support in different communities and provide valid evidence. The use of native questionnaires, taking into account the cultural considerations of the patients, can help achieving accurate estimation of changes in QOL.

One of the strengths of the research is the implementation of a peer support in one of the deprived areas of Iran in terms of access to health facilities and low-income levels. The selection of peers from the sociocultural context similar to that of the participants was another feature of this study, that may have been one of the reasons for the active participation of participants in the study and the lack of sample loss during the study. We also tried to use a variety of peer-centered individual and group support programs. One of the limitations of the research was the difficulty in recruiting peers of both sexes, which was due to cultural barriers, low education levels of the female participants and their husbands' disapproval to allow them play the role of peers. To solve this problem, the research team interviewed 26 potential peers of both sexes, but none of the female patients, despite meeting the inclusion criteria, accepted to cooperate as a peer. Also in the initial research design, HbA1c was determined as one of the research variables. However, due to the high cost of doing it and the lack of regular visits of patients to perform this test, even for routine visits, it was not possible to collect data on this variable at the time desired by the research team.

Conclusion

The results of study showed that peer support intervention after 3 months can lead to improved QOL in patients with T2D in in deprived areas. Peer support can be used as a source of social support to address challenges such as shortage and lack of access to healthcare providers, lack of timely referral of patients to health centers, lack of access to educational care resources, and high costs of care.

Acknowledgments

Hereby, we thank all those who cooperated with us in this study, especially the Vice Chancellor for Research and Technology of Lorestan University of Medical Sciences, the staff of Clinic in Aligoudarz and the patients with diabetes participating in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. International Diabetes Federation.IDF Diabetes Atlas, 9th edn. Brussels,Belgium: 2019. Online version Available from: https://www.diabetesatlas.org. [Last accessed on 2020 Feb 10].
2. Javanbakht M, Mashayekhi A, Baradaran HR, Haghdoost A, Afshin A. Projection of diabetes population size and associated economic burden through 2030 in Iran: Evidence from micro-simulation Markov model and Bayesian meta-analysis. PLoS One 2015;10:e0132505.
3. Jafarian-Amirkhizi A, Sarayani A, Gholami K, Taghizadeh-Ghehi M, Heidari K, Jafarzadeh-Kohneloo A, *et al*. Adherence to medications, self-care activity, and HbA1c status among patients with type 2 diabetes living in an urban area of Iran. J Diabetes Metab Disord 2018;17:165-72.
4. Tol A, Pourreza A, Shojaeezadeh D, Mahmoodi M, Mohebbi B. The assessment of relations between socioeconomic status and number of complications among type 2 diabetic patients. Iran J Public Health 2012;41:66-72.
5. Mokhtari Z, Gheshlagh RG, Kurdi A. Health-related quality of life in Iranian patients with type 2 diabetes: An updated meta-analysis. Diabetes Metab Syndr 2019;13:402-7.
6. Jing X, Chen J, Dong Y, Han D, Zhao H, Wang X, *et al*. Related factors of quality of life of type 2 diabetes patients: A systematic review and meta-analysis. Health Qual Life Outcomes 2018;16:189.
7. Chung JO, Cho DH, Chung DJ, Chung MY. Assessment of factors associated with the quality of life in Korean type 2 diabetic patients. Intern Med 2013;52:179-85.
8. Mirfeizi M, Jafarabadi MA, Toorzani ZM, Mohammadi SM, Azad MD, Mohammadi AV, *et al*. Feasibility, reliability and validity of the Iranian version of the diabetes quality of life brief clinical inventory (IDQOL-BCI). Diabetes Res Clin Pract 2012;96:237-47.
9. Mohebi S, Parham M, Sharifirad G, Gharlipour Z, Mohammadbeigi A, Rajati F. Relationship between perceived social support and self-care behavior in type 2 diabetics: A cross-sectional study. J Educ Health Promot 2018;7:48.

10. Zhao X, Yu X, Zhang X. The role of peer support education model in management of glucose and lipid levels in patients with type 2 diabetes mellitus in Chinese adults. J Diabetes Res 2019;2019:8.
11. Assah FK, Atanga EN, Enoru S, Sobngwi E, Mbanya JC. Community-based peer support significantly improves metabolic control in people with Type 2 diabetes in Yaoundé, Cameroon. Diabet Med 2015;32:886-9.
12. Karimian S, Atashzadeh-Shoorideh F, Moosavi S, Ilkhani M, Naderiravesh N, Salmany F. Survey of comparing discharge time nursing education with the education standards of diabetes type 2 patients in hospitals affiliated in Yazd University of Medical Sciences in 2015. Iran J Endocrinol Metab 2017;19:84-90.
13. Tol A, Baghbanian A, Mohebbi B, Shojaeizadeh D, Azam K, Shahmirzadi SE, *et al*. Empowerment assessment and influential factors among patients with type 2 diabetes. J Diabetes Metab Disord 2013;12:6.
14. Wingate L, Graffy J, Holman D, Simmons D. Can peer support be cost saving? An economic evaluation of RAPSID: A randomized controlled trial of peer support in diabetes compared to usual care alone in East of England communities. BMJ Open Diabetes Res Care 2017;5:e000328.
15. Fisher EB, Earp JA, Maman S, Zolotor A. Cross-cultural and international adaptation of peer support for diabetes management. Fam Pract 2010;27 Suppl 1:i6-16.
16. Johansson T, Keller S, Winkler H, Ostermann T, Weitgasser R, Sönnichsen AC. Effectiveness of a peer support programme versus usual care in disease management of diabetes mellitus type 2 regarding improvement of metabolic control: A cluster-randomised controlled trial. J Diabetes Res 2016;2016:10.
17. Smith SM, Paul G, Kelly A, Whitford DL, O'Shea E, O'Dowd T. Peer support for patients with type 2 diabetes: Cluster randomised controlled trial. BMJ 2011;342:d715.
18. Peimani M, Monjazebi F, Ghodssi-Ghassemabadi R, Nasli-Esfahani E. A peer support intervention in improving glycemic control in patients with type 2 diabetes. Patient Educ Couns 2018;101:460-6.
19. Ahmadi Z, Sadeghi T, Loripoor M, Khademi Z. Comparative assessment the effect of self-care behavior education by health care provider and peer on HbA1c level in diabetic patients. IJEM 2017;19:144-50.
20. Rashidi K, Safavi M, Yahyavi H, Farahani H. The impact of peers' support on the hemoglobin A1C and fasting blood sugar level of patients with type 2 diabetes. Indian J Med Special 2017;8:7-12.
21. Nesari M, Zakerimoghadam M, Rajab A, Bassampour S, Faghihzadeh S. Effect of telephone follow-up on adherence to a diabetes therapeutic regimen. Japan J Nurs Sci 2010;7:121-8.
22. Saeid Pour J, Jafari M, Ghazi Asgar M, Dayani Dardashti H, Eymoorzadeh E. The impact of self-care education on life quality of diabetic patients. J Health Adm 2013;16:26-36.
23. Shahsavari A, Bakhshandeh Bavarsad M. Is telenursing an effective method to control BMI and HbA1c in illiterate patients aged 50 years and older with type 2 diabetes? A randomized controlled clinical trial. J Caring Sci 2020;9:73-9.
24. Shahsavari A, Foroghi S. The effectiveness of telenursing on adherence to treatment in patients with type 2 diabetes. Iran J Endocrinol Metab 2015;17:138-45.
25. Burroughs TE, Desikan R, Waterman BM, Gilin D, McGill J. Development and validation of the diabetes quality of life brief clinical inventory. Diabetes Spectr 2004;17:41-9.
26. Ghasemi M, Hosseini H, Sabouhi F. Effect of peer group education on the quality of life of elderly individuals with diabetes: A randomized clinical trial. Iran J Nurs Midwifery Res 2019;24:44-9.
27. Simmons D, Prevost AT, Bunn C, Holman D, Parker RA, Cohn S, *et al*. Impact of community based peer support in type 2 diabetes: A cluster randomised controlled trial of individual and/or group approaches. PLoS One 2015;10:e0120277.
28. Kong LN, Hu P, Yang L, Cui D. The effectiveness of peer support on self-efficacy and quality of life in adults with type 2 diabetes: A systematic review and meta-analysis. JAN 2019;75:711-22.