Research Paper

The Effect of a Peer Social Support Network Intervention on Self-management of the Elderly With Type 2 Diabetes

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ABSTRACT

Background: Participation in peer social groups could be used in health promotion programs for the elderly. The current study investigates the effectiveness of participation in a peer social support network intervention on the self-management of the elderly with type 2 diabetes.

Methods: This research is a quasi-experimental study with a pre-test-pos-ttest design with a control group conducted in 2019. Two health centers were selected as research settings from a single district in Qom Province, Iran. From each center, 46 subjects were randomly selected. Subjects in the intervention group participated in a peer social support network for 3 months (12 sessions), and the control group received only usual care. The outcome variable was self-management. The components of this variable include the level of hemoglobin A1C (HbA1C), diabetes distress (measured with Diabetes Distress Scale), awareness (measured with Davoodi's knowledge of diabetes questionnaire), attitude (measured with diabetes attitude scale [DAS-3]), self-efficacy (measured with diabetes empowerment scale, [DES-28]), weight and blood pressure. Subjects were evaluated at baseline and at a 6-month follow-up. The obtained data were analyzed using t-test, Chi-Square, and Fisher test in SPSS software, version 22. The significance level was set at less than 0.5.

Results: The change in mean HbA1C of the intervention and control groups at baseline and 6-month follow-up was -0.7 and 0.1, respectively, which was significant ($P \leq 0.0001$). Moreover, the difference in changes in the mean values of diabetes distress ($P=0.008$), self-efficacy ($P \leq 0.0001$), and attitude ($P \leq 0.0001$) were significant. No significant changes were found in knowledge, weight, systolic and diastolic blood pressure ($P>0.05$).

Conclusion: The formation of social support groups may help control blood sugar in the elderly with type 2 diabetes. Seemingly, social groups can mainly impact through psychological factors such as distress control, attitude improvement, and self-efficacy enhancement.

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Highlights

• A peer social support network can provide mutual support for its members.

• Considering the influence of the elderly from peer groups, it seems that developing these groups can help improve the health of the elderly.

• Participation in peer social support groups led to a significant decrease in HbA1C in the elderly with type 2 diabetes.

• Although participation in peer social support groups significantly improved attitude, self-efficacy, and distress, no significant effects were seen on the knowledge, blood pressure, and weight of the elderly.

Plain Language Summary

Successful management of type 2 diabetes requires the right knowledge and attitude. Easily accessible peer groups can help older adults better control type 2 diabetes by sharing their experiences and receiving social support from each other. The results of the present study showed that 12 sessions of participation in peer social groups lead to better management and control of type 2 diabetes in the elderly.

1. Introduction

Successful control of type 2 diabetes (T2D) is impossible through regular medication and a healthy diet alone (American Diabetes Association, 2018). Other factors, such as a healthy lifestyle (Li et al., 2017; Nguyen et al., 2012) and psychosocial considerations (Young et al., 2018), are among the major components of T2D care. Control of T2D requires patients to have the necessary knowledge and skills, which is part of self-management (SM) in this disease (Arda Sürücü and Büyükkaya Besen, 2017). Self-management is the task people need to do to live well with one or more chronic diseases. These tasks include having the confidence to deal with medical management, role management, and emotional management of their condition (Corrigan et al., 2004).

The global prevalence of diabetes was estimated at 10.5% (536.6 million people) in 2021 and is projected to increase to 12.2% (783.2 million people) in 2045 (Sun et al., 2022). Aging is one of the most important risk factors for T2D (Wubishet et al., 2020; Yan et al., 2022). Also, with increasing age, the burden of T2D and its complications increases (Nanayakkara et al., 2021). A global study shows that the prevalence rates of diabetes in people aged 50 to 69 years and over 70 years are 15% and 22%, respectively (Khan et al., 2020). Considering the high prevalence of T2D among the elderly (Taheri Tanjani et al., 2015; Wang et al., 2018), various studies have been conducted on its SM by the elderly (Arda Sürücü & Büyükkaya Besen, 2017; Shearer et al., 2012). Some of these studies have investigated the effect of formal education and educational interventions based on behavioral change models (Hawkins, 2010; Madmoli, 2019). Even though 40% of patients receive a formal education, these interventions have limitations such as unilateral communication, lack of attention to patients' experiences, and lack of consideration of psychosocial aspects (De Coster and George, 2005).

Some studies have done technology-based interventions such as telephone counseling (Plotnikoff et al., 2010) and online education (Cardoso et al., 2018; Brady et al., 2017). Although these interventions facilitate patients' access at different locations and may act as a motivator to bring about some behavioral change, poorly educated patients and the elderly are unable to effectively use these methods (Zamanzadeh et al., 2017). Moreover, these technologies lack interpersonal relations, social support, and active involvement of patients (De Coster and George, 2005). In the past, the role of patients in the treatment process was limited, but in the new approaches, it is believed that if the patient actively participates in the control and treatment of the disease, more stable results will be obtained (Shin and Park, 2017).

The formation of a peer social support network (PSSN) drew attention as one of the interventions for patient SM (Kohn et al., 2004b). Common challenges and concerns have gathered members of these groups to share their experiences and information (Sahar et al., 2017). Formation and continuation of these groups have low costs and are helpful for both educated (Williams et al., 2018) and

poorly educated (Mok, 2004) patients. The philosophy of forming PSSN is based on the assumption that members offer mutual help to each other while transferring their experiences (Sahar et al., 2017). The main strategies in these groups are educational, emotional, informational, and social support, resulting in social involvement, dynamism, and a sense of self-worth in the elderly (Dibb and Yardley, 2006). Participation in these groups seems highly appealing to the members, too (Williams et al., 2018). Another advantage of self-help groups is that they are formed in their localized communities (Li et al., 2017). This situation mitigates transportation issues and cultural barriers in creating these groups (Williams et al., 2018; De Coster and George, 2005).

There is evidence for the effects of PSSN on empowering older patients (Sahar et al., 2017; Kim et al., 2015; Kim et al., 2014; Kotani and Sakane, 2004; De Coster and George, 2005). Nonetheless, these studies have been mainly based on at least 6-month interventions and lack sufficient evidence for the effectiveness of these groups in shorter periods. Also, current activities in PSSN significantly depend on cultural issues (Williams et al., 2018). In Iran, there is insufficient data on the effectiveness of PSSN on the elderly with T2D.

The present study examines the effectiveness of participating in PSSN on elderly people with T2D over three months. Because over half of the elderly in Iran are uneducated or poorly educated (Shirazi Khah et al., 2012), and the formation of PSSN is inexpensive (Williams et al., 2018), this intervention may be applied to the older population of Iran if it is found to be effective.

2. Materials and Methods

Participants

This research was a quasi-experimental study with a pre-test-post-test design and a control group. Two healthcare centers affiliated with Qom University of Medical Sciences (QUMS) located in one of the districts of Qom Province were selected as research settings. To avoid data contamination, each center was assigned to one of two intervention and control groups. These centers provide primary health care to the community. Potential subjects were informed about the study through phone calls, information messages in health centers, and public announcements in local mosques. Eligible volunteers were referred to a geriatrician for initial evaluation. The process took one month from the beginning until reaching the minimum number of eligible subjects.

The inclusion criteria were as follows: at least 60 years of age, definitive diagnosis of T2D according to the health records, absence of any unpleasant incident in the last 6 months, lack of severe mental disorder according to the health record, normal cognitive status (at least 8 points based on the abbreviated mental test [AMT]), not participating in any other intervention, and normal communication and verbal abilities. The exclusion criterion was the absence of more than 2 sessions of PSSN. Because the current study design has two equal arms and the main variable, HbA1c, is continuous, the appropriate formula was chosen to determine the sample size. The dependent variable in this study is SM, which has several components. According to evidence, the most important predictor of diabetes control is HbA1c. Therefore, this variable was used as the main dependent variable in the sample size formula (Zhou et al., 2017). Type I error (α) and Type II error (β) were considered 5% and 10%, respectively. According to previous studies, the variance of HbA1C was 2.25, and its mean about 8% among patients with T2D (Golmohamadi et al., 2016; Aghamolaei et al., 2005; Tabatabaei-Malazy et al., 2011). Since the American Diabetes Association has recommended that achieving an HbA1C level of less than 7% reduces complications of T2D, a minimum reduction of 1% in the HbA1C mean was considered acceptable. Therefore, 0.66 was obtained as a medium effect size (Fritz et al., 2012). Considering these facts, the final sample size was 38 for each group. Predicting possible attrition of 20% in samples, 46 subjects were eventually considered for each group.

Study measurements

Variables of the present study included sociodemographic variables (independent variables) and SM-related variables (outcomes). The variables related to self-management included HbA1C, self-efficacy, attitude toward diabetes, awareness about diabetes, diabetes distress (DD), systolic and diastolic blood pressure, and weight. Measurement of these variables was performed before intervention and repeated after 6 months. The level of HbA1C was the key variable in this study. To measure HbA1C, all participants were referred to a specified reference laboratory.

Diabetes distress scale

This 17-item scale was developed by Polonsky et al. It includes 4 subscales: emotional burden, physician-related distress, regimen-related distress, and diabetes-related interpersonal distress. Each item is scored on a

6-point Likert scale from 1: "not a problem" to 6: "serious problem." The total score is calculated by summing up all the item scores and dividing the result by 17. The lowest and highest possible scores on this scale are 17 and 102, with higher scores indicating more distress. The mean correlation between the total score and the four subscales is high (r=0.82). The internal consistency for the whole scale is 0.93, and its subscales are from 0.88 to 0.90 (Polonsky et al., 2005). The psychometric properties of the Persian version of this scale were evaluated. To determine its validity, the known-groups method was used, and the internal consistency method was used to assess the scale's reliability. The internal consistency for the whole scale is 0.90, and its subscales are from 0.88 to 0.93 (Baradaran et al., 2013).

Knowledge of diabetes questionnaire

To assess participants' knowledge, the Davoodi et al. questionnaire was employed. This questionnaire contains 23 items to measure people's awareness of the symptoms of increased or decreased blood sugar, healthy and harmful foods, symptoms of diabetes, effective factors in controlling diabetes, complications of diabetes, and problems caused by lack of blood sugar control. Each item has three choices: true (1 score), false (0 score), and I don't know (0 score). The minimum and maximum scores are 0 and 23, respectively, and a higher score indicates more knowledge. The content validity index (CVI) and internal consistency of the questionnaire were reported to be more than 0.7 (Davoodi, 2010).

Diabetes Empowerment Scale (DES-28)

This 28-item scale with three subscales (managing the psychosocial aspects of diabetes, assessing dissatisfaction and readiness to change, and setting and achieving diabetes goals) was used to measure psychosocial self-efficacy. The internal consistency of the whole scale is 0.96, and that of its subscales is 0.81-0.93 (Anderson et al., 2000). The items are scored on a 5-point Likert scale from 1: "strongly disagree" to 5: "strongly agree." The total score in this scale is calculated by summing all the items and dividing it by 28. Thus, the minimum and maximum scores are 1 and 5, respectively. A higher score indicates more self-efficacy (Fisher et al., 2010). The Persian version of this scale has good structural validity and reliability. Factor analysis showed that the scale predicts 98% of the total variance. In addition, the Cronbach alpha values for total DES-28 were 0.98 and 0.94 to 0.96 for its subscales (Tol et al., 2013).

Diabetes Attitude Scale (DAS-3)

The third version of this scale, designed by Anderson et al., measures participants' attitudes toward diabetes. This scale with 33 items and five subscales (attitudes toward the need for special training to provide diabetes care, the seriousness of T2D, value of tight glucose control, the psychosocial impact of diabetes, and patient autonomy) is scored on a 5-point Likert scale from 1= "strongly disagree" to 5= "strongly agree." The score in this scale is calculated by summing up all the items and dividing it by 33. The minimum and maximum scores on this scale are 1 and 5, respectively. Twenty-two experts measured the content validity of the scale. The structure validity of the scale was assessed by the Pearson correlation among subscales of DAS-3 (r=0.27 to 0.55). The reliability of the scale was determined by the Cronbach coefficient, and values obtained were more than 0.7 for the total scale and all the subscales (Anderson et al., 1998). Concurrent and criterion validities of the Persian version of the scale were confirmed by assessing the correlation between DAS-3 with Diabetes Empowerment Scale (DES-28) (r=0.42) and HbA1C (r=-0.86), respectively. The internal consistency values of the scale have been reported as 0.78 for the whole scale and 0.58 to 0.78 for its subscales (Mahjouri et al., 2011).

Weight and blood pressure variables were extracted from electronic health records. In health centers, these two variables are measured and recorded by calibrated digital balance and sphygmomanometers. The client's weight was measured with minimal clothing. The blood pressure of the elderly was measured in two stages with an interval of 5 minutes, and the average of the two values was recorded. In the national routine program, these measurements are done monthly continuously for the elderly with T2D. If the health record information was incomplete, these measurements were performed by the research team.

Study procedure

First, baseline measurements were evaluated in both groups. The experimental group received planned interventions, and the control group only received routine primary health care. Both groups were monitored for 6 months (three months of intervention and three months of follow-up). During this period, the intervention group was monitored for attention to the instructions and the control group members to ensure they did not participate in other interventions.

Study intervention

The intervention included creating a network of elderly people with TD2 and their participation in PSSN sessions. The intervention was held in 12 weekly sessions of 60-90 minutes in a classroom located in the health center. For more effectiveness and observation of the principles of PSSN, the members of the intervention group were divided into 4 groups, forming 3 groups of women (with 10, 11, and 12 members) and 1 group of men (13 members). The same procedure based on a common protocol was performed for all groups. Accordingly, the approach by De Coster and George (2005) and the guideline of the Centers for Diseases Control and Prevention (CDC) (Cherrington et al., 2012) were used. Based on this approach, an individual manages meetings as a facilitator that may be selected from the group members. However, due to the low education level of the members, a local health education specialist familiar with the culture of the research environment was selected as the facilitator. The facilitator had a master's degree in health education and was constantly present in all groups.

The first session of the intervention included the introduction, clarification of the framework, and ethical principles. In the second session, communication skills and effective communication were discussed. The third, fourth, and fifth sessions were dedicated to sharing the challenges and concerns of members regarding T2D. In session 6, a diabetes specialist and a mental health specialist were invited. Due to the potential risk of members sharing misinformation, a diabetes expert was invited to explain some misconceptions about T2D in 45 minutes. A mental health professional was also invited to briefly teach the group a simple problem-solving method. During the seventh to tenth sessions, the facilitator brought up worries and challenges reported earlier by the members and asked them to provide their experiences and solutions. In the 11th session, members described their experiences with the new measures taken in recent weeks and shared any obstacles with other group members to find a solution. The 12th session was devoted to summarizing and reviewing the previous sessions.

Data analysis

The t-test, Chi-square test, and Fisher exact-test were used to compare the baseline data of the intervention and control groups. The effect of the intervention on SM variables was measured by comparing the mean difference of each variable in the intervention group and the changes of the same variables in the control group. The independent t-test was used to analyze this impact. All the analyses were carried out using the SPSS software version 22. The significance level was set at 0.05.

3. Results

At the beginning of the study, 46 elderly attended in each group. However, during the intervention process and 6 months of follow-up measurements, 3 and 6 subjects were excluded from the control and intervention groups, respectively. Finally, 40 and 43 subjects attended the intervention and control groups, respectively. The CONSORT flowchart of the study process is shown in Figure 1.

The Mean±SD age of the subjects (n=92) was 64.9±3.7 years. Most subjects were female (66.3%), married (90.2%), illiterate (79.3%), without diabetes complications (72.8%), housewives (68.5%), without polypharmacy (63%), and without comorbidities (63%). There was no significant difference between the two groups in terms of the main sociodemographic factors (Table 1).

A comparison of differences between the baseline mean of the dependent variables and that of a 6-month follow-up showed that the mean changes in HbA1C of the intervention and control groups at baseline and 6 months follow-up were -0.7 and 0.1, respectively, and this difference was significant (t=4.37, P≤0.0001 A1). Also, the results of comparing the mean difference of other variables in the intervention and control groups showed the significance of the difference between the two groups: self-efficacy (t=-6.17, P≤0.0001), attitude toward diabetes (t=-6.96, P≤0.0001), and DD (t=2.74, P=0.008). On the other hand, the difference of changes in the following variables was not significant: knowledge (t=-0.54, P=0.591), weight (t=1.05, P=0.298), systolic blood pressure (t=1.18, P=0.241), and diastolic blood pressure (t=0.87, P=0.385) (Table 2).

4. Discussion

The present study aimed to investigate the effectiveness of PSSN sessions on the Self-management (SM) of older patients with T2D. The concept of SM is a broad one and not easy to measure. However, in many studies, HbA1C level control, increasing awareness and self-efficacy, reducing anxiety, and controlling weight and blood pressure have been recommended as measures to evaluate these patients' SM (Shearer et al., 2012; De Coster and George, 2005; Adolfsson et al., 2007). In this study, the attitude of patients towards diabetes was also used as another measure of SM because, in recent approaches, it is considered an important factor in diabetes care (Skovlund and Peyrot, 2005). Overall, participation in 12 sessions of PSSN yields a decrease in HbA1C and DD and an improvement in self-efficacy and attitude toward T2D. On the other hand, the current intervention did not show a meaningful increase in knowledge or decrease in weight or blood pressure.

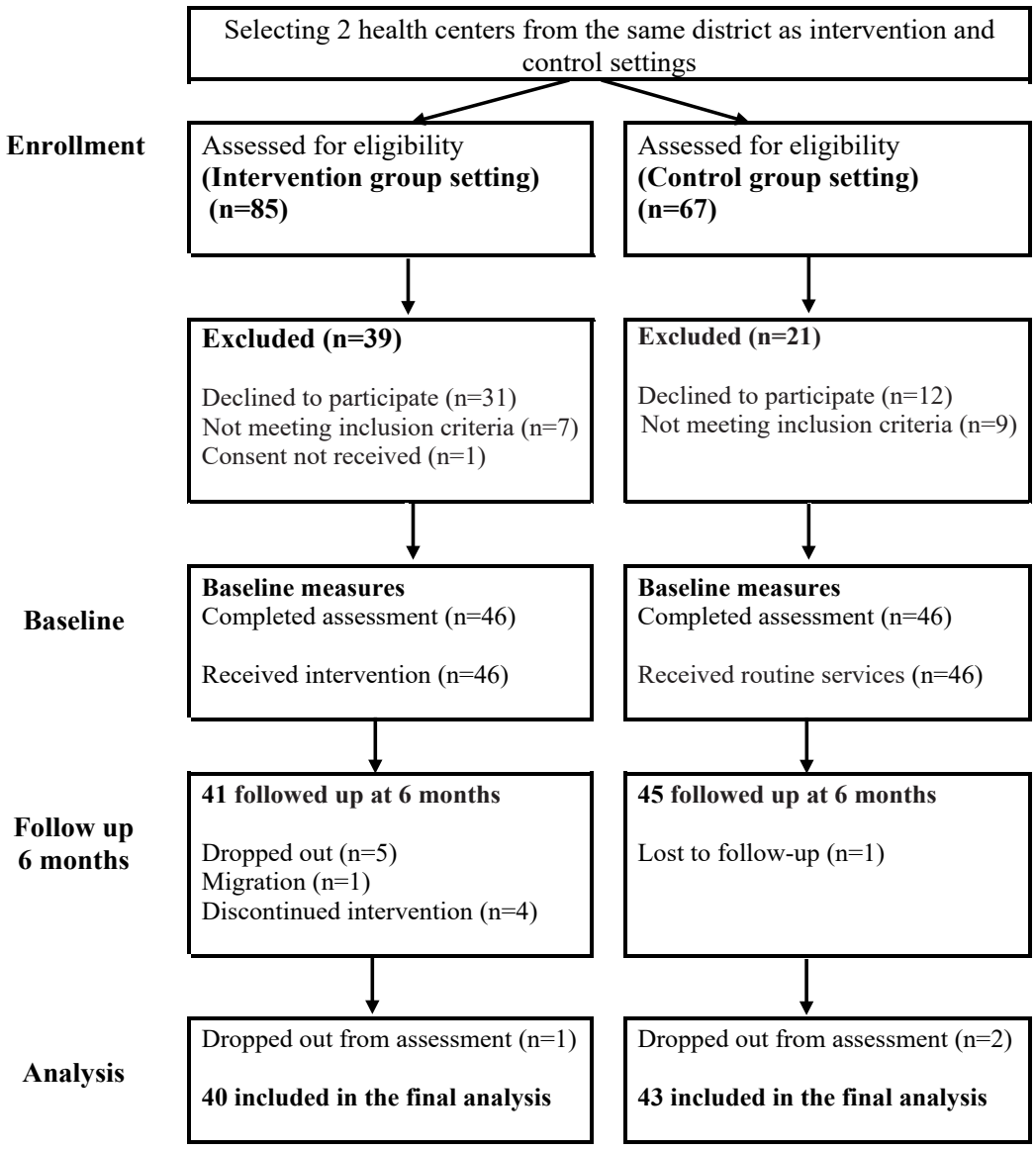

Figure 1. CONSORT flowchart of the study participants

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The main dependent variable in the current research was HbA1C, which significantly decreased in a 6-month follow-up. Considering the lack of significant change in the knowledge level of the subjects, it seems that the decrease in HbA1C occurred for psychological reasons, including the reduction of DD, improvement of attitude, and increase in self-efficacy. Much blood sugar control is linked to psychological factors (Gonzalez et al., 2007; Perrin et al., 2017), such as reduced DD as one of the most important ones. Diabetes distress imposes a negative psychological burden on patients, caused by concern about the inability to control the disease and fear of subsequent complications. It could be manifested through anger, anxiety, dissatisfaction, and negative feelings (Young-Hyman et al., 2016). The most important consequence of DD is increased HbA1C levels (Kawada, 2018). Therefore, it seems that the reduction of DD in the intervention group effectively helped to reduce their HbA1C (Fisher et al., 2010). Members in a PSSN provide social and emotional support for each other, enhancing mental health (Sahar et al., 2017). In addition, members receive others' experiences in managing DD. If these experiences are of practical value, they can help empower patients in managing DD. Around half of the people who face mental problems seek others' help (Kohn et al., 2004a). Peer social support networks allow patients to share their concerns with others and improve their mental health (Sahar et al., 2017).

Table 1. Comparing demographic characteristics of the subjects in the intervention and control groups

Variables		Mean±SD[a]/No. (%)			Test Statistics	P
		Overall (n=92)	Intervention (n=46)	Control (n=46)		
Age (y)		64.9±3.7	64.2±3.3	65.6±3.7	1.88	0.063
Duration of disease (y)		5.0±2.3	5.1±2.3	5.0±2.4	-0.09	0.929
Gender[b]	Female	61(66.3)	34(73.9)	27(58.7)	2.38	0.123
	Male	31(33.7)	12(26.1)	19(41.3)		
Marital status[c]	Married	83(90.2)	41(89.1)	42(91.3)	<0.0001	1.000
	Single/ Widow/ Other	9(9.8)	5(10.9)	4(8.7)		
Education[b]	Illiterate	73(79.3)	33(71.7)	40(87.0)	3.25	0.071
	Literate	19(20.7)	13(28.3)	6(13.0)		
Complications	Yes	25(27.2)	14(30.4)	11(23.9)	0.49	0.482
	No	67(72.8)	32(69.6)	35(76.1)		
Occupation	Retired	29(31.5)	12(26.1)	17(37.0)	1.26	0.262
	Housewife	63(68.5)	34(73.9)	29(63.0)		
Polypharmacy[b]	Yes	30(32.6)	17(37.0)	13(28.3)	0.79	0.374
	No	62(63.0)	29(67.4)	33(71.7)		
Comorbidity[b]	Yes	34(37.0)	21(45.7)	13(28.3)	2.98	0.084
	No	58(63.0)	25(54.3)	33(71.7)		

[a] The independent t-test was used to compare the means of the two groups for normally distributed data.
[b] The Chi-square test was used to compare the proportion of the two groups for categorical data.
[c] The Fisher exact (2-sided) test was used to compare the proportion of the two groups for categorical data (if the expected value of each cell was less than five).

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Table 2. Differences between mean scores of the components of diabetes self-management (bassline and 6 months follow-up)

Variables	Mean±SD						t (P)
	Bassline		6 months		Difference		
	IG (n=46)	CG (n=46)	IG (n=40)	CG (n=43)	IG	CG	
Hb1Ac	8.44±0.8	8.33±0.8	7.64±0.8	8.19±0.8	-0.80±0.5	-0.15±0.5	5.608 (≤0.0001)
DD	2.95±0.7	3.06±0.5	2.67±0.7	3.08±0.5	-0.29±0.6	0.04±0.3	3.130 (0.004)
SE	2.05±0.3	2.03±0.2	2.46±0.4	2.09±0.2	0.40±0.5	0.05±0.1	-4.239 (≤0.0001)
Knowledge	15.13±1.7	14.89±1.6	15.40±1.2	14.93±1.1	0.28±1.3	0.05±0.1	-0.834 (0.407)
Attitude	2.25±0.5	2.29±0.6	2.65±0.5	2.25±0.4	0.42±0.6	-0.05±0.6	-3.673 (≤0.0001)
Weight	73.25±5.6	73.60±6.5	73.21±5.4	73.05±5.7	-0.15±1.0	0.07±1.1	0.983 (0.329)
SBP	131.96±6.4	132.28±6.0	131.25±5.3	133.14±5.6	-0.88±4.9	0.70±2.6	1.842 (0.069)
DBP	91.09±6.7	90.76±7.4	88.63±6.8	90.35±5.5	-2.38±4.7	-0.47±4.6	1.876 (0.064)

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IG: intervention group; CG: control group; DD: diabetes distress; SE: self-efficacy; SBP: systolic blood pressure; DBP: diastolic blood pressure.

An important finding of this study was that despite the lack of knowledge, the subjects' self-efficacy increased. It is believed that reducing DD in the subjects, independent of their knowledge, can increase their self-efficacy (Devarajooh & Chinna, 2017). Various studies indicate that an increase in self-efficacy of patients with T2D is accompanied by a reduction in their HbA1C (Indelicato et al., 2018; O'Hea et al., 2009).

As an individual's feeling of ability to do a particular activity, the concept of self-efficacy was first proposed by Bandura (Devarajooh and Chinna, 2017). Self-efficacy is directly related to health behaviors since it stimulates people to adopt healthy behaviors (Mankan et al., 2017). Patients with T2D confront many challenges in their daily life while trying to better control their blood sugar (Young-Hyman et al., 2016). In other words, effective blood sugar control needs regular monitoring, healthy diets, sufficient physical activity, interpersonal relationship management, and periodic examinations. Self-efficacy plays an important role in implementing all these behaviors (Devarajooh and Chinna, 2017). Peer social support networks allow collective learning through social integration (De Coster and George, 2005). Collective learning is one of the major elements of PSSN, empowering members to discover new solutions and opportunities in an informal and homogeneous social context (Mok, 2004).

In the present study, there was a significant difference between the mean attitude score in the intervention and control groups. Attitude is a key factor in determining health behaviors (Livneh and Antonak, 2005). It is associated with patients' vulnerability, so the level of desirable attitude is considered a protective factor against the vulnerability of the elderly (Gale and Cooper, 2018). A positive attitude helps patients adapt and cope with the disease, reducing DD (Chin et al., 2000). Participation in PSSN sessions could create a suitable platform for moderating the attitude of older patients with T2D.

The present research was subject to different limitations. First, a 6-month period for evaluating the SM of the subjects is the shortest acceptable duration. However, it would have been more desirable to evaluate the SM-related variables in 9-months and even 1-year intervals so that better judgments regarding the durability of the resulting changes could be made. The second limitation of the study was the illiteracy of a significant number of the subjects, which can directly affect the understanding of the content presented in the PSSN by the elderly and indirectly on other variables presented in this study.

5. Conclusion

The present study showed that participation of the elderly with T2D in PSSN sessions is associated with a significant decrease in their HbA1C. A reduction in the subjects' HbA1C levels occurred even though their knowledge remained unchanged. In the present study, psychosocial parameters such as attitude, DD, and self-efficacy in the intervention group improved. It seems that these parameters play an important role in reducing HbA1C. It is recommended that centers providing services to elderly people, especially care centers, pay attention to forming peer support groups to increase SM of diabetes. It is suggested to use the elderly as facilitators in future research and study its effectiveness.

Ethical Considerations

Compliance with ethical guidelines

This research was approved by the University of Social Welfare and Rehabilitation Sciences in Tehran (Code: IR.USWR.REC.1397.122). The necessary permissions were also obtained from Qom University of Medical Sciences (QUMS) before sampling. During the research, the principles of the Declaration of Helsinki were observed. Informed written consent was obtained from all subjects, and they were assured of the confidentiality of their information. After the study was done, a self-help group workshop with the support of the Center for Health was held for the control group.

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Authors' contributions

Study design and data analysis: Mojtaba Azadbakht, Reza Fadayevatan, and Nasibeh Zanjari; Initial draft: Mojtaba Azadbakht; Figures and tables: Reza Fadayevatan, Parisa Taheri Tanjani, and Mahshid Foroughan; Final approval: Reza Fadayevatan, Parisa Taheri Tanjani, Mahshid Foroughan, and Nasibeh Zanjari.

Conflict of interest

The authors declare no conflict of interest.

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