

Evaluation of self-care training in adolescents with type 1 Diabetes at the Iranian Diabetes Association

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ABSTRACT

Background and Aim: Diabetes is considered as one of the most common and costly chronic diseases in children and adolescents. Type 1 diabetes is the most common type of diabetes in adolescents. Studies have indicated that controlling diabetes during adolescence is a major challenge in diabetic people. This is due to continued physical and mental growth and development and other changes occurring during adolescence. Thus, continuous evaluation of their treatment needs is crucial and necessary. Nowadays, the standard of care for adolescents with diabetes is used for both caring for their diabetes treatment regimen and identifying their educational needs. This study was conducted with the aim of evaluating the self-care of adolescents with type 1 diabetes at the Iranian Diabetes Association. **Materials and Methods:** In this randomized clinical trial, 90 patients were selected among patients covered by the Diabetes Association in Tehran. Using a randomized block method, they were allocated to three groups of family-centered training, peer-centered training, and control group. Data were collected through demographic information questionnaire and a self-care questionnaire for adolescents with type 1 diabetes. Data were collected at the beginning of the study and three months later. In the family-centered training group, family health and self-care training were provided to the adolescent, and in the peer-centered training group, training was provided by the peers and the control group received only the routine training of the center. Data were analyzed using SPSS 18 software and Tukey, ANOVA, paired-t, Chi-square, and Fisher's exact tests. **Results:** The results of ANOVA test at the Diabetes Association revealed that the mean score of self-care did not differ significantly among three groups before the intervention ($P = 0.971$), but after the intervention, the mean of self-care score showed a significant difference among three groups ($P < 0.001$). Tukey's comparison test revealed no significant difference between the peer-centered training group and the family-centered training group ($P = 0.0844$), but a significant difference was observed between the peer-centered training group and the control group ($P < 0.001$). There was also a significant difference between the family-centered training group and the control group ($P < 0.001$), indicating the effect of peer-centered and family-centered training in this center. **Conclusion:** The results of the present study revealed that teaching self-care behaviors by family and peers can be an effective way to help control diabetes in patients and promoting it can be effective in decreasing the complications of diabetic patients.

Keywords: Training, Family, Peer Group, Diabetes, Self-Care, Type 1 Diabetes.

Introduction

Chronic disease in childhood is a very exhausting and stressful experience, not only for children but for the whole family. The prevalence of diabetes in adolescents has also increased since the last decade ^[1]. The annual incidence of type 1 diabetes in children

is increasing, ranging from 0.8 to 50 percent in children or young adults. Based on the estimations, one in every 400-500 adolescents suffer type 1 diabetes ^[2]. Treatment and care of type 1 diabetes are complex and challenging for adolescents and children who are involved in following the necessary daily treatment measures (blood sugar control, insulin injection) along with changes in their daily lifestyle (nutrition and exercise patterns). Although normal blood sugar control may reduce the risk of long-term complications of diabetes in people with type 1 diabetes, adolescents and children often have a permanent problem with a strict treatment regimen ^[3]. Adolescence is a critical period for treatment management that may persist even into adulthood. Following the treatment and possible behavioral changes during adolescence is crucial. It is necessary to gain knowledge on adhering to principles of treatment and to make

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comparisons between what adolescents and families need and the type of treatment they have received as well as therapeutic diversity and the needs of adolescents and families.

Studies have indicated that family care alone is not enough. Diabetes treatment and management are complex, and diabetes is everywhere with the affected person, such as home and school. As a result, diabetes management should be facilitated optimally with the support of both peers and family members. Studies to find ways that may affect or support adolescents and children with diabetes are still in their early stages^[4]. They have sometimes a negative effect on the process of adherence to the treatment regimen, in which adequate monitoring is required. However, its positive effects are more in the form of emotional support provided by friends, which is very effective as a supporter in regulating meals and exercise. It has been reported that peers who are aware of the process of treatment and management of diabetes make adolescents less involved with their parents with their encouragements. For complete success of goals of supportive programs for the daily improvement and daily care of the treatment regimen of the disease, various supports such as family, peers, etc. should be used^[5]. Peer-centered training is an approach that will improve the health of people in the peer community. Peer-centered training is a factor for transmitting shared information or experiences related to health or diseases, values, and behavior to other peers who have similar social conditions and experiences^[6]. Nowadays, the standard of care for adolescents with diabetes is used for both caring for a diabetic diet and identifying educational needs. However, in many medical centers and clinics, non-formal training may still be offered in a contradictory way. The aim of this type of training is to develop knowledge, attitudes, and create healthy behaviors by those who have not been professionally trained but have shared experiences. It is a kind of humanitarian and altruistic support and can be used as a complementary approach along with other health promotion strategies^[7]. Concerning the importance of training and education, a review of studies also indicated that adolescents with diabetes whose parents are constantly involved in self-care were able to control their blood sugar more effectively. However, due to constant and daily need for diabetes management and control, parents of adolescents with diabetes experience a high level of stress due to care interventions and lower quality of life. Some other studies have revealed that parents' involvement in the care of adolescents with diabetes can result in some problems in the relationship between them^[8]. The key to the success of peer-centered training has been introduced to be sufficient knowledge, observing, providing feedback, emotional support, and cooperation between the peers^[9]. In peer-centered training, a sense of empathy and social identity increases, and it promotes knowledge, since peers and patients are members of one group^[10]. Self-care is a critical factor in controlling diabetes^[3]. Evidence suggests that psychological interventions and coping skills in self-care will improve the control of metabolic status and improve adolescent psychosocial conditions. Thus, the need for

continuous training is potentially important^[11]. Studies conducted to control acute and chronic complications have shown that insufficient and irregular training reduces the patients' self-care^[12].

Self-care in diabetes means properly and timely injection of insulin, adhering to the diet, doing proper physical activities, detecting the signs of hypoglycemia and hyperglycemia. Evidence suggests that self-care is crucial for controlling the disease in adolescents living with a diagnosis of diabetes^[13]. Self-care is crucial for controlling the disease of adolescents living with a diagnosis of diabetes^[14]. The goal of self-care is to improve the physical well-being or health of patients through taking measures such as adhering to diet, exercise, blood sugar monitoring, and searching for preventive or medical services and using the prescribed treatments^[15]. Self-care is influenced by attitudes, individual beliefs, and the culture of the society, where the person lives^[3] and it is a function of the individual, social, and psychological factors of patients^[15]. The World Health Organization has reported that the rate of adherence to self-care behaviors is 50% in developed countries and less than 50% in developing countries^[13]. Professional advances in recent years indicate the importance of nursing services. Providing educational services to promote and improve sustainable health and its fundamental role reflects the importance of maintaining good health in all societies. One of the duties of nurses is to support the involvement of family, especially the active member of the family in providing care for the affected child, referred to as family-centered care^[16]. An important duty of the nursing profession is nowadays to train people about health and disease prevention. Proper health training requires identifying the problems and the quality of the various requirements^[17]. Thus, the necessity of continuous training is potentially important. Most importantly, diabetes care in a modern way has been considered by the World Health Organization, so that motto of "Healthy Life and Diabetes for 2014-2016" has been introduced as a warning about diabetes and its prevention and care. It is achieved through continuous training. There is still competition in the process of self-care training in studies to find a more effective solution in health care centers, since increasing access to self-care training services and increasing educational services in medical centers play a key role in reducing the cost of disease complications. Given what was stated above, we aim to answer the question of whether family-centered training and peer-centered training affect the self-care of adolescents with type 1 diabetes.

Materials and Methods

The present study is a randomized clinical trial with pre- and post-test and a control group. In the present study, the effect of the independent variable (family-centered training and peer-centered training) on the dependent variable (self-care of adolescents with type 1 diabetes) was evaluated. In the present study, adolescents with diabetes in the age group of 12 to 16 years

and active parent of the family (based on the statements of the adolescents with diabetes) referred to the Iranian Diabetes Association who were eligible for sampling were sampled within 7 months. After examining the children in the Iranian Diabetes Association, the adolescents who met the inclusion criteria of the study were selected by the randomized block method. A total of 90 adolescents were selected and were divided into three groups of family-centered training ($n=30$) and peer-centered training ($n=30$) and control group ($n=30$) according to the sample size formula. Inclusion criteria of adolescents included being 12 to 16 years old, having an active parent in the family-centered training group, being diagnosed with diabetes in the past year, and not being at risk for ketoacidosis or diabetic coma during the study, having a medical record in the Iranian Diabetes Association and no history of participating in self-care training courses [18].

Data collection method

In the present study, a questionnaire was used to obtain data. The data collection tools of the present study include 2 questionnaires, including individual-social information questionnaire and Schilling et al self-care questionnaire [19]. The Schilling et al self-care questionnaire assesses type 1 diabetes in adolescents. It includes 52 questions with four options in 5 areas. Two questions of this questionnaire were eliminated during assessing its validity and reliability in the study conducted by Reza Sefat et al in Rasht School of Nursing and Midwifery [20]. It includes five areas of the first area of collaboration with parents, diabetes care activities, diabetes problem solving, diabetes communication, and diabetes care goals. Questions related to the areas of collaboration with parents and diabetes care activities are scored reversely. The total score range of adolescents in diabetes self-care questionnaire varies between 5 and 200. Also, to measure the level of effectiveness of the intervention, the mean self-care questionnaire was considered as a cut-off point in this study, so that scores higher than mean were classified as desirable self-care and scores lower than the mean were classified as undesirable self-care. In other words, the higher the score, the better self-care. It should be noted that the Individual-Social Information Questionnaire and the Self-Care Questionnaire were completed at the beginning of the sampling and 3 months after the end of the training course (Session 6) by the active parent and adolescent.

Assessment of reliability and validity of data collection tool

The validity and reliability of the tools used in this study have previously been confirmed in several domestic and foreign studies. The research conducted by Reza Sefat [13] regarding self-care questionnaire has confirmed the validity and reliability of this scale. Determining the internal reliability of self-care questionnaire in adolescent diabetes by conducting a preliminary study on 15 subjects of the study, Cronbach's alpha coefficient in different areas of self-care questionnaire was obtained as follows:

First area: 0.7; Second area: 0.7; Third area: 0.75; Fourth area: 0.9 and Fifth area: 0.8, and the Cronbach's alpha coefficient for the whole questionnaire was obtained at 0.77. Also, to determine the reliability of the self-care questionnaire, the translation and re-translation method was used and the two-stage internal consistency coefficient for five areas was obtained at 0.74, 1, 0.90, 1, and 0.81, respectively, and it was obtained at 0.96 for the whole questionnaire. The used tools used have been translated into Persian and used in domestic studies.

Method of implementing the intervention

After obtaining a letter of introduction from the Research and Technology Deputy and obtaining permission from the University's Ethics Committee and receiving a letter of introduction from the Research Deputy of the School of Nursing and Midwifery and submitting to Iranian Diabetes Association, the researcher obtained the consent of these centers to conduct a study by providing explanations on the research objectives. The present study was a randomized, block stratified study with pre-test and post-test design and a control group. A total of 180 samples were selected among the adolescents aged 12 to 16 years with a history of 1 year of diabetes and the ability of reading and writing and having glucometer device and a medical record by using a convenience sampling method. Then, using a block randomization method, 30 blocks (3 in each block). Among these 6 states, one of the states was selected for all 3 groups randomly and they were assigned to the studied groups. The number of individuals was determined based on the block randomization list and the researcher intervened in the groups based on the predetermined list of the number of individuals. As this type of intervention has an educational aspect, it was not possible to perform the study as a single-blind and a double-blind. However, the list of individuals was determined based on the time of entry by block randomization method in each class and provided to the researcher. Adolescents were divided into three groups of family-centered training, peer-centered training, and control (each included 30 people).

In the active parent group, the objectives of the research were explained for the active parent who had the ability of reading and writing selected to obtain his or her written consent and participation in the study. In the peer training group, a successful peer, first a girl and a boy between the ages of 14 and 16 with a history of 1 year of diabetes with a first-grade or second-grade high school level of education, with at least 175 scores in self-care questionnaire and successful in glycosylated hemoglobin in a good control range of less than 7.5 percent and not having more than 120 fasting blood sugar repeats, with no history of hypoglycemia and low hemoglobin levels and no ketoacidosis in the past six months, were selected as a successful peer to train the peer adolescents. The research was carried out in three stages. In the first stage, successful peers and active parents were trained for two weeks after the end of the visit of physicians in the clinic of the studied centers during six two-hour sessions (to be empowered and aware of the principles and methods of

teaching diabetes care) in groups of 12-16^[21] by the researcher according to their own opinions in the classroom and the Diabetes Association. In the second stage, the successfully trained peers trained the adolescents during two two-hour sessions at the Diabetes Association^[13, 22]. Active parents active in the family-centered training group who were trained in the first stage, trained their adolescents at home. Diabetic adolescents in the control group also received routine training. There was no possibility of group parents' visit to create a bias in the study because the schedule did not allow for their visit. In the third stage, three months after the training of diabetic adolescents, the intervention and the control groups completed self-care questionnaires. Finally, the collected data were analyzed using statistical software and ANOVA tests, χ^2 test, and Tukey's test in each group. The educational materials were presented to diabetic adolescents (74 and 34) by the researcher and peer during six sessions of two hours as follows:

Educational sessions:

- **Session 1:** Familiarity with diabetes: Familiarity with type 1 diabetes, etiology, pathophysiology, symptoms and diagnostic methods of type 1 diabetes, along with questions and answers
- **Session 2:** Familiarity with hypoglycemia and hyperglycemia, its symptoms and cares
- **Session 3:** Familiarity with the treatment methods of type 1 diabetes, especially insulin injection: vial and insulin syringe specifications, the way of sucking and mixing insulin, insulin injection site, and way of injecting insulin
- **Session 4:** Familiarity with complications of insulin injections and diabetes, exercise-related care, maturity
- **Session 5:** Diet in adolescents with type 1 diabetes and ways to adapt to diabetes
- **Session 6:** reviewing of the course and questions and answers

It should be noted that the educational content was completely the same for teaching all groups.

Data analysis method

The research data were entered into SPSS software for analysis. The data of intervention and control groups were compared using the Chi-square and Fisher's exact, the analysis of variance and Tukey's tests. Statistical analysis was performed at a significance level of 95% ($\alpha < 0.05$).

Results

Table 1 = Frequency distribution and frequency percentage of status and education of active caregivers of diabetic adolescents in family-centered training and peer-centered training and control groups in the Diabetes Association of Iran.

active caregiver	f	group			Fisher's exact test
		peer	family	control	
	%	3.6	0	0	
mother	n	26	23	22	
	%	86.7	82.1	73.3	
father	n	4	5	6	
	%	13.3	17.9	20	
family member	n	0	0	1	
	%	0	0	3/3	
others	n	0	0	1	P=0.734
	%	0	0	3.3	
education of active caregiver	%				
employee	n	8	4	6	
	%	26.7	14.3	20	
worker	n	3	2	0	
	%	10	7.1	0	
self-employed	n	2	5	3	
	%	6.7	17.9	10	
housewife	n	17	17	21	P=0.432
	%	56.7	60.7	70	

According to Table 1, the most active caregivers (80.7%) were mothers. Due to the qualitative nature of the studied variable (active care), Fisher's exact test was used to investigate the homogeneity of the distribution of individuals among the 3 groups. Investigation of the active caregivers in three groups at the Diabetes Association center with Fisher's exact test showed that peer and family and control groups were not statistically significant in this regard and most caregivers (62.5%) were

housewives. Given the qualitative nature of the studied variable (caregivers' job), Fisher's exact test was used to investigate the homogeneity of the distribution of individuals among the 3 groups. Investigation of caregivers' jobs in three groups at the Diabetes Association Center with Fisher's exact test showed that peer and family and control groups did not differ significantly in terms of caregivers' jobs and had significant value was ($P = 0.432$).

Table 2: Frequency distribution and frequency percentage of self-care status in diabetic adolescents in family-centered training and peer-centered training and control groups at Iranian Diabetes Association

group	self-care status	group		family		peer		total		Chi-square test
		f	%	f	%	f	%	f	%	
Iranian Diabetes Association	undesirable	10	33.3	12	42.9	12	40	34	38/6	P=0.745
	desirable	20	66.7	16	57.1	18	60	54	61.4	
	total	30	100	28	100	30	100	88	100	
group	self-care status after intervention	group		family		peer		total		Chi-square test
		f	%	f	%	f	%	f	%	
Iranian Diabetes Association	undesirable	11	36/7	0	0	0	0	11	12/5	P<0/001
	desirable	19	63/3	28	100	30	100	77	87/5	
	total	30	100	28	100	30	100	88	100	

According to the results of Table 2 in the Iranian Diabetes Association, there is no statistically significant difference among three groups in terms of self-care status ($P = 0.745$) before the intervention, but there is a statistically significant difference after

the intervention ($P < 0.001$). In the family group, the undesirable status of self-care has declined from 40% to 0%, and in the peer group, it has been declined from 42.9% to 0%, and in the control group, it has been declined from 33.3% to 7.36%.

Table 3 - Mean frequency of self-care scores in diabetic adolescents in family-centered training and peer-centered training and control groups at Iranian Diabetes Association

Iranian Diabetes Association	Mean \pm SD			results of ANOVA test	results of Tukey's test
	peer	family	control		
before intervention	130.90 \pm 15.48	130.07 \pm 14.54	131.16 \pm 22.21	P=0.971 F=0.3 df=2	----- peer and control) (P<0.001
after intervention	154.43 \pm 16.37	156.96 \pm 14.23	136.80 \pm 20.68	P<0.001 F=11.78 df=2	control and family) (P= 0.001 peer and family) (P= 0.844)
mean difference before and after intervention	23.53 \pm 16.45	-26.89 \pm 19.78	-5.63 \pm 9.78		
intra-group paired-t test results	P<0.001 t=-7.832 df=29	P<0.001 t=-7.191 df=27	P<0.001 t=-3.154 df=29		

In Table 3, a one-way ANOVA test was used to compare the mean scores of self-care before and after the intervention among the three peer, family, and control groups, as the score was quantitative and normal. The results of this test showed that in the Diabetes Association of Iran, there was no significant difference among mean scores of self-care in three groups of peer, family, and control before the intervention ($P = 0.971$).

However, after the intervention, the mean difference in this score among the 3 groups is strongly significant ($P < 0.001$). Thus, the result shows that after the intervention, the self-care scores of the three groups changed significantly. To examine the source of this change, Tukey's test was used. The results indicated that after the intervention, there was a significant difference between mean scores of self-care in peer group

(154.43) and the control group (136.80) and self-care score of the peer group was significantly higher than that of the control group. The results of this test also showed that after the intervention, there was a significant difference between the mean scores of self-care in the family group (156.96) and control group ($P < 0.001$) and patients' self-care score after intervention in the family group was significantly more than that of the control group. The test also showed that there was not any significant difference between the self-care scores of patients in the family and peer groups after the intervention.

Paired t-test was used to evaluate the difference in self-care scores before and after the intervention because this score was quantitative, normal, and continuous (were selected before and after the intervention of the same people). The results of this test showed that the mean score of self-care in the peer group decreased from 130.90 to 154.43 and this change was strongly significant ($P < 0.001$). Also, the mean score of self-care in the family group increased from 130.07 to 156.96 and this increase was statistically significant ($P < 0.001$). In the control group, the self-care score decreased from 131.16 to 136.80 ($P < 0.001$). Although this difference was statistically significant, according to Tukey's test, the changes between the family of peer groups and the control group were significant. Also, after the intervention, the changes between peer and control groups ($P < 0.001$) and between family and control groups ($p < 0.001$) were significant, but the changes between the peer and family changes were not statistically significant ($P = 0.844$).

Discussion and Conclusion

The aim of the present study investigated the effect of family-centered training and peer-centered training on the self-care of adolescents with type 1 diabetes. At the Diabetes Association, 88 people were included in three groups (30 people in the peer-centered training group and 28 people in the family-centered training group and 30 people in the control group). As these tables show, most of the active parents who participated in the study were mothers, housewives, with a bachelor's degree and no family history of diabetes. In a study conducted by Gery *et al*, parents of people with type 1 diabetes also found that 64.6% of the participants in the training group were mothers^[23]. In the present study, at the Iranian Diabetes Association, 80.7 active caregivers who participated in the research were mothers. In Iranian culture, the majority of mothers are housewives and are mostly responsible for caring for their children. Vasli *et al* (2009) examined the relationship between parental education and children's self-care and reported that with increasing the education of parents, the ability of children to self-care increases^[24]. In the present study, most mothers had a diploma. The participation of mothers in the control and test groups was higher in the present study and measures should be taken to increase fathers' participation in caring for their children.

Also, in a study conducted by Vasli *et al* on the self-care status of diabetic adolescents, the results showed that 75% of adolescents

had poor to moderate self-care^[24], which in this present study at the Iranian Diabetes Association, 38.6% had undesirable self-care. Data analysis to investigate and compare mean scores of self-care of adolescents with type 1 diabetes among family-centered training, peer-centered training, and control groups before training showed that based on ANOVA test, before intervention, there was no significant difference among three groups of family-centered training, peer-centered training, and control groups ($p = 0.971$). Therefore, Tukey's test was not performed to compare three groups, but after the intervention, there was a significant difference between peer-centered training and the family-centered training and the control groups (at the Iranian Diabetes Association, $P < 0.001$). Thus, the Tukey's test was performed to show in which groups the differences were significant, and the results showed that the peer group did not have a significant difference with the family-centered training group ($P = 0.293$), but there was a significant difference between the peer group and the control group ($P < 0.001$) and also the family-centered training group had a significant difference with the control group ($P < 0.001$), indicating the positive effect of peer-centered training and family-centered training.

Concerning the objectives of "Determining and comparing the mean scores of self-care in adolescents with type 1 diabetes in the family-centered training group and control group before training and determining and comparing the mean scores of self-care in adolescents with type 1 diabetes in the family-centered training group and control group 3 months after training, the results of the present study showed that there was not any significant difference between family-centered training group and control group before training, but after training, the difference between the two groups was significant. Also, according to Tukey's test at the Iranian Diabetes Association, the family group had a significant difference with the control group ($P < 0.001$), indicating the effect of training in this regard. Asgari reported that training facilitates achieving the maximum level of health and quality of life and reduces health care costs^[25]. Concerning the objectives of determining and comparing the mean scores of self-care in adolescents with type 1 diabetes in the family group and peer group and the control group before training and determining and comparing the mean scores of self-care in adolescents with type 1 diabetes in the family education group, peer group and the control group 3 months after training", the results of the study showed that there was not any significant difference between peer group and control group before training, but after training, the difference between the two groups was significant and according to the Tukey's test at the Iranian Diabetes Association, the peer group had a significant difference with the control group ($P < 0.001$), indicating the effect of training in this regard.

Some studies have also referred to the benefits of peer-centered training. In the study conducted by Sargzi Shad *et al.* (2017) to investigate the effect of family-centered empowerment model on the quality of life and self-efficacy of adolescents with type 1 diabetes, referred to Hazrat Ali Asghar Clinic in Zahedan showed

that the family-centered intervention increased the self-efficacy and quality of life scores in the intervention group, and this difference was statistically significant [26], indicating the positive effect of this method on improving the patient's self-care behaviors, which is consistent with results of the present study. In a study conducted by Me-fang Chen *et al.* (2015) to examine the effect of family empowerment program on 72 patients with type 2 diabetes on self-care behaviors and glycosylated hemoglobin in the three stages of before intervention, immediately after intervention, and three months after the intervention, the results showed the positive effect of this method on the improvement of these indicators was in the third stage [27], which is in line with the results of the present study. Thus, in accordance with the results of this study, it can be concluded that both family-centered training and peer-centered training methods are effective on the self-care behaviors of adolescents with diabetes and can be used as an intervention by nurses and other health workers in these centers and other diabetes centers and clinics. Based on the results of this study, managers and nurses of clinics and diabetes centers can ask for help from diabetic people who have been able to control their disease in the best possible way with proper self-care methods and the experiences of families of diabetic adolescents to provide comprehensive and effective care to promote self-care of the patients.

Analysis of data of evaluating and comparing the mean scores of self-care score in adolescents with type 1 diabetes in the family-centered training group and peer-centered training, and control group before training and evaluating and comparing the mean scores of self-care in adolescents with type 1 diabetes in family-centered training group and peer-centered training group and control group 3 months after training showed that there was no significant difference between peer-centered training group and family-centered training group but there is a significant difference between peer-centered training group and control group, and between family-centered training group and control group, indicating the effect of these two training methods. Data analysis to evaluate and compare the mean scores of self-care in adolescents with type 1 diabetes in the family-centered training group and control group before training and to evaluate and compare mean scores of self-care in adolescents with type 1 diabetes in the family-centered training group and control group 3 months after training showed that there was no significant difference between family-centered training group and control group before training, but after training, the difference between family-centered training group and control group was significant. Data analysis to evaluate and compare the mean scores of self-care in adolescents with type 1 diabetes in peer-centered training and control groups before training and to evaluate and compare the mean scores of self-care in adolescents with type 1 diabetes in peer-centered training and control group 3 months after training showed that there was no significant difference peer-centered training group and control group before training, but after training, the difference between peer-centered training

group and control group was significant. Based on the research results, educating families with children with diabetes is one of the main tasks of health workers, especially nurses. The results of the present study showed no educational interventions on self-care are provided for diabetic people by nurses, especially professional nurses who have the necessary knowledge in child care, not only in diabetic adolescents but also in other groups and researchers. The researchers also found a shortage of nurses, along with other socially active units. Thus, it is recommended that continuous and sustainable studies be conducted to investigate the causes of this problem to eliminate the shortcomings in this area. It can be stated that the family is the first place where health behaviors are taught and most health care is provided to family members. Family support is the most important factor influencing the outcome of providing care to chronic patients. Also, peers develop autonomy and sense of identity in adolescents, and adolescents at this age show more tendency towards peers. Hence, in designing an educational program for nursing students, the role of family and peers in the care of patients must be emphasized.

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