Original Article

The Effect of Intelligence Self-Control Program on the Quality of Life of the Adolescents with Type I Diabetes

Zinat Mohammadi[1], Tayebeh Mehrabi[2], Soheila Jafari-Mianaei[3]

[1]MSc of Pediatric Nursing, Student Nursing Midwifery Care Research Center, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, [2]Department of Psychologyical Nursing, Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, [3]Department of Pediatric and Neonatal Nursing, Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran

Abstract

Background: Diabetes affects patients' quality of life in almost all physical, mental, and social areas. The aim of the present study was to determine the effect of self-control intelligence program on the dimensions of quality of life in the adolescents with diabetes. **Materials and Methods:** The present study is a randomized controlled trial with pre-test and post-test design in which 56 adolescents with diabetes referring to the Janan charity diabetic association in Najafabad in 2018 (Isfahan, Iran) were selected by convenience sampling method and were randomly divided into two groups of intervention (n = 28) and control (n = 28). Self-control intelligence program was performed for the intervention group. The data were collected using standard Quality of Life Questionnaire for adolescents with diabetes and were analyzed using Chi-square test, independent and dependent t-test, Mann-Whitney. **Results:** Statistical tests showed no significant difference between the groups in terms of their demographic characteristics such as gender, duration of diabetes, and the number of insulin injections. There was, however, a significant difference in the mean scores of all quality of life dimensions except for the dimension of physical symptoms both before and after the intervention in the intervention group (t_{23} = 4.46, $p < 0.001$). By contrast, no significant difference was observed in the mean scores of quality of life before and after the intervention in the control group (t_{24} = 0.08, p = 0.93). **Conclusions:** Based on the results, self-control program can have an effective role in the adoption of coping strategies and, thus, improves the patients' quality of life.

Keywords: *Diabetes mellitus, Iran, nursing, self-control*

Introduction

Type I diabetes is one of the most prevalent chronic diseases in children and adolescents[1] that has affected nearly one out of 400 children and adolescents in developed countries.[2] There is a correlation between diabetes and quality of life, that is, physical impairment and physical symptoms affect all aspects of life directly.[3] Some studies, like that of De Costa and Vieira, studying the quality of life of adolescents with type 1 diabetes in 2015, have shown that the type of insulin, low income of the family, low level of education in parents, inactive lifestyle and female gender can lead to poor quality of life in adolescents with diabetes.[4] Reduced quality of life in diabetic patients results in reduced self-care, inappropriate monitoring blood glucose and increased risk of disease complications.[5] Therefore, improving the quality of life is not only beneficial to the diabetic patient but also reduces the related health and medical costs.[6] On the other hand, diabetic patients, especially adolescents, encounter different and often contradictory choices throughout their lives. Moreover, the tendency to have a normal life, like those around them, causes them not to confine themselves to limiting diet therapies, while the concern about the complications and harmful consequences of the disease may compel them to adhere to the diet therapies.[7,8] Additionally, these patients consider diabetes and its condition beyond their control and believe that any resistance to it will be futile. According to the findings, experiencing this inner contradiction is one of the basic challenges for patients, and it is this experience that makes self-control intelligence a necessity in these patients.[9] The most efficient mechanism for controlling individuals' performance is self-control whose function is far better and more effective than any kind of external monitoring and control. The reason is that control over individuals

Address for correspondence:
Dr. Soheila Jafari-Mianaei, Department of Pediatric and Neonatal Nursing, Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Hezar-Jerib Ave, PO Box: 81746-73461, Isfahan, Iran.
E-mail: m_jafari@nm.mui.ac.ir; jafari.soheila@gmail.com

Access this article online

Website: www.ijnmrjournal.net

DOI: 10.4103/ijnmr.IJNMR_79_19

Quick Response Code:

How to cite this article: Mohammadi Z, Mehrabi T, Jafari-Mianaei S. The effect of intelligence self-control program on the quality of life of the adolescents with type I diabetes. Iranian J Nursing Midwifery Res 2020;25:18-22.

Received: 07 April, 2019. **Revised:** 30 July, 2019. **Accepted:** 22 October, 2019. **Published:** 27 December, 2019.

and their performances can be comprehensive only when they con control themselves internally.[10] Therefore, it is important to support diabetic patients in accepting the responsibility for care and control of their physical and mental status.[11] Although most similar studies have confirmed the significant impact of self-control program[12] on adults with chronic patients, no study has hitherto examined the effect of self-control program on diabetic patients. Medication is not the only way to control chronic diseases and patients must be able to manage their illness and lifestyle. Therefore, it is of particular importance to support diabetic patients in accepting responsibility for care and control of their physical and psychological situation.[9] As such, the researchers aimed to study the effect of self-control program on the quality of life of the adolescents with type I diabetes.

Materials and Methods

This study was a randomized controlled trial (IRCT20181213041951N1) with pre and post-test design. The research samples included 56 adolescents with type I diabetes referring to the Janan charity diabetic association in Najafabad in 2018 (Isfahan, Iran). Inclusion criteria were the passing of at least one year from the diagnosis of diabetes, aged between 12 and 18, and having no acute complication as well as physical and mental disabilities. Exclusion criteria were included the adolescent's reluctance to attend the classes, missing more than two sessions of the class, and having an acute illness.

The confidence coefficient of z_1 was 0.95, i.e., 1.96; power factor of z_2 was 0.80, that is, 0.84; and s was the minimum estimation of standard deviation for each variable that was considered seven based on similar studies, and d = 5.50 was the minimum mean difference for each of the variables between the two groups.

Sampling method was convenient method through with 56 adolescents with type I diabetes were selected. After obtaining informed written consent forms from the adolescents and their parents, they were randomly assigned to the intervention (n = 28) and control (n = 28) groups. The researcher, referring to the adolescents' file, prepared a list of the patients supported by the Clinic and those who were eligible to enter the research, and assigned a number to each patient's file. The number assigned to each file, together with the file number, was written on a piece of paper. All papers were mixed in a container. The first randomly selected number among the numbers was assigned to the intervention group and the next number to the control group. As such the patients were alternately assigned to the intervention and control group.

Eventually, four subjects of the intervention group were excluded from the research owing to the lack of motivation and spirit for attending the sessions. Also, in the control group, one subject because of eye surgery and two other subjects because of the lack of motivation were excluded from the research [Figure 1].

The data collection tool was standard Quality of Life Questionnaire for adolescents with type I diabetes which has been designed by Ingersoll and Marrero in 1991. This questionnaire consists of 52 items, based on Likert scale 51 of which have been classified into six areas, and one item is about the individual's perception of health set in a four-point scale. Validity and reliability of this questionnaire have been confirmed in various studies in Iran.[13,14] Reliability of the questionnaire was determined to be between 78% and 92% by Cronbach's alpha coefficient and its validity was confirmed using content validity method.[15-17]

After completing the questionnaires by the subjects in both groups, the intervention group underwent self-control training program for three weeks, two 90-minute sessions per week (with intervals to rest and eat something). The self-control training program included six sessions [Table 1]. During the intervention period, no training program was conducted for the control group. After one month of training, the two groups were again tested using the quality of life questionnaire. After completing the questionnaires, the control group was given a booklet on emotional self-control. The collected data were analyzed using descriptive and inferential statistic including Chi-square test, independent and dependent *t*-test, Mann-Whitney test, in Statistical Package for the Social Sciences software (version 18 SPSS Inc, Chicago, IL, USA).

Ethical considerations

To observe ethical principles, an approval and introduction letter was obtained from the Research Deputy of the Faculty of Nursing and Midwifery of Isfahan University of Medical Sciences and presented to the related authorities. Moreover, written informed consent forms were obtained from the subjects and they were assured of the confidentiality of their information and statements, their freedom to participate in the self-control sessions and leave the sessions if unwilling to continue, and that the sessions are free of charge.

Table 1: Self-control training programs sessions Objectives and Content

Sessions	Objectives and Content
First session	Introduction and teaching of self-control concepts
Second session	Teaching of self-awareness and empathy skills
Third session	Critical thinking
Fourth session	Problem-solving and decision-making
Fifth session	Effective communication and interpersonal relationships
Six session	Emotion management (anger and stress control)

Method: Compliation of lecture, question and answer, face-to-face and group discussion

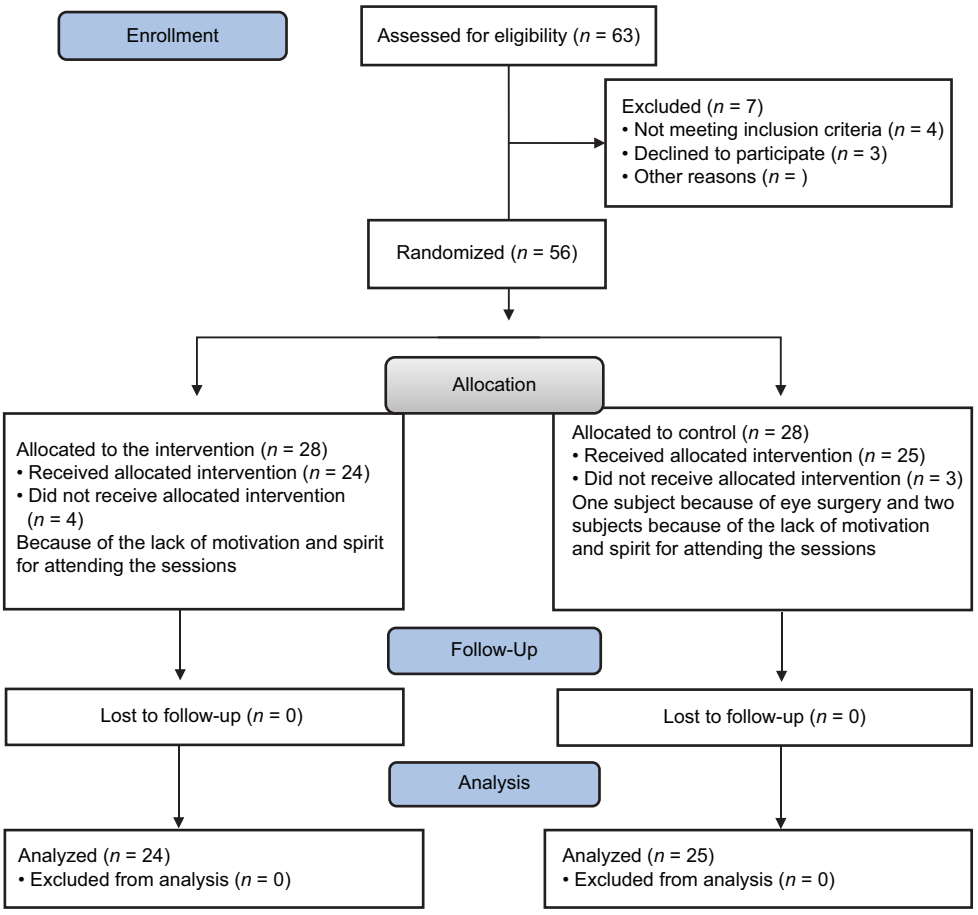

Figure 1: CONSORT flow diagram for the study

Results

The subjects of the research consisted of 56 adolescents 48 of them finished the study. Statistical tests showed no significant difference between the two groups in terms of their demographic characteristics such as gender, duration of diabetes, and the number of insulin injections [Table 2].

Comparing the mean (SD) scores of the six dimensions of quality of life in the intervention group, independent *t*-test showed that the adolescents obtained the highest score in the dimension of life satisfaction 68.20 (13.05) and the lowest score in the dimensions of disease symptoms 9.09 (2.79) and parental control 9.58 (2.80).

Furthermore, the results of the dependent *t*-test showed that the mean of total quality of life score and other dimensions, except for the effects of the disease symptoms, in the intervention group was significantly higher than before the intervention ($t_{23} = 4.46$, $p < 0.001$). However, in the control group, no significant difference was observed in the total score of quality of life and all its dimensions before and after the intervention ($t_{24} = 0.08$, $p = 0.93$) [Table 3].

Discussion

This study aimed to determine the effect of self-control intelligence program on quality of life in the adolescents with type I diabetes. Based on the results of the data analysis, no statistically significant difference was observed between the two groups in terms of demographic and disease characteristics. In fact, the results of the statistical tests confirm the random allocation of samples in two groups**.** Also, the results showed that self-control training had a significant effect on improving the quality of life in adolescents with diabetes. In evaluating the components of quality of life, the results indicated that self-control training can significantly improve the life satisfaction, treatment effect, the effect of diabetes on activities, lack of concern for future, and parental control. However, the effect of the disease symptoms on quality of life was not significant. The results of this study confirm the effectiveness of self-control program in the area of psychological treatment and quality of life in adolescents with diabetes. The results of the study by Kermansaravi *et al*. (2011), comparing the scores of the six dimensions of quality of life, showed that adolescents obtained the highest score in the dimension of the treatment effect on quality of life and the lowest score was related to the symptoms of the disease. The results of their study are in line with the results of the present study is in line with that study Kermansaravi *et al*. (2011).[13] The present study also showed that self-control intelligence

program has no effect on the symptoms of the disease. One of the reasons for this ineffectiveness is probably the specific clinical profile of the disease that, more than any other dimension, has been affected by the physical and physiological changes. Similarly, in line with these results, the results of the study by Saeidpour *et al*. (2012), conducted to assess the effect of self-care training, showed that self-care training has a positive effect on the quality of life dimensions and the total score of quality of life. The results of this study also emphasized that self-care and quality of life are directly correlated with each other, that is similar to the results of the present study.[6] Similarly, a research was conducted by Heidari *et al*. (2007) to investigate the effect of the empowerment model on the quality of life of the adolescents with diabetes. The results of this study showed empowerment model effect on the all dimensions of the quality of life. It thus can be inferred that in some types of empowerment, the individual is able to achieve self-control and, as this study showed, increased self-control can improve quality of life.[3] The results of the study conducted by Polanska *et al*. (2015) also indicated that changing the lifestyle of patients with diabetes can improve their quality of life.[18] Similar to the results of our study, the results of these studies also showed that increasing the level of the knowledge of chronic patients can improve their general health, physical functioning, mental health and overall quality of life.[19-20] Lansing *et al*. (2016) also concluded that diabetic patients with higher self-control had a better quality of life than those with low self-control.[21] Likewise, the results of the study by Beh-Pajooh *et al*. (2012), with the aim of investigating the effect of self-control program on increasing social skills of Attention Deficit Hyperactivity Disorder (ADHD) of students in Tehran, showed that self-control program has a positive effect on the development of social skills in students. The same results were obtained in the present study for diabetic adolescents.[22] Studies have shown that in addition to physical complications, diabetes can affect mental, social and emotional states of adolescents and lead to emotional reactions such as depression, feelings of guilt, aggression, anxiety, and decreased self-confidence all of which in turn may decrease quality of life in patients. Self-control, however, can lessen these complications.[23] Accordingly, this study showed that self-control program is one of the important needs of mental health education in diabetic patients that leads to better adaptation to the disease and treatment regimens and improves these patients' responsibility for self-care.[9,24] Self-control intelligence program moderates the relationship between pressures of life and psychological stress, and strengthens capabilities such as emotional self-awareness, emotional control, impulse control, decision-making and problem-solving.[25]

Table 2: Comparsion of the results of the demographic characteristics in the two groups of intervention and control

Intervention group		Control group		
Variables		**N (%)**	**N (%)**	***p***
Age	12-18	24 (100)	25 (100)	0.13*
Gender	Girl	14 (58.30)	12 (48)	0.47**
	Boy	10 (41.70)	13 (52)	
Insulin type	NPH	2 (8.30)	2 (8)	0.57**
	Nph, Regular	8 (33.30)	7 (28)	
	Lantus	12 (50)	12 (48)	
	Others	2 (8.40)	4 (16)	
Birth rate	First	11 (45.80)	8 (32)	0.20**
	Scond	8 (33.30)	7 (28)	
	Third	4 (16.70)	9 (36)	
	Others	1 (4.20)	1 (4)	
Education level of adolescents	Primary	2 (8.40)	4 (16)	0.38***
	Middle school	11 (45.80)	12 (48)	
	High school	11 (45.80)	9 (36)	
Fathers level of education	Literate	24 (100)	23 (92)	0.66***
	Unlearned	0 (0)	1 (4)	
Mothers level of education	Literate	24 (100)	24 (96)	0.83***
	Unlearned	0 (0)	1 (4)	
Duration of diabetes	<6 months	1 (4.20)	0 (0)	0.35***
	>6 months	23 (95)	25 (100)	
Number of insulin ingections	Once	1 (4.20)	2 (8)	0.51***
	Twice	3 (12.50)	4 (16)	
	>2 times	20 (83.30)	19 (76)	

*Independent *t*-test; **Chi-square test; ***Mann-Whitney test

Table 3: Mean and standard deviation of quality of life dimensions and total score of quality of life before and after the intervention in the two groups

Dimensions of quality of life	Intervention group					Control group				
	Mean (SD)		df	*t*	*p*	Mean (SD)		df	*t*	*p*
	Pre-test	Post-test				Pre-test	Post-test			
Life satisfaction	58.41 (9.59)	68.20 (13.05)	23	3.69	0.001	58.42 (13.52)	59.35 (15.96)	24	0.26	0.80
Treatment effect	7.73 (4.55)	12.64 (3.03)	23	4.07	0.001	8.46 (4.59)	9.43 (3.41)	24	0.70	0.48
The effect of disease symptoms	7.91 (3.55)	9.09 (2.79)	23	1.17	0.25	7.75 (4.17)	7.76 (2.68)	24	0.01	0.99
The effect of diabetes on activities	7.60 (6.63)	14.43 (5.18)	23	3.42	0.002	9.74 (6.06)	10.86 (4.10)	24	0.68	0.50
Lack of concern for future	23.01 (11.45)	30.58 (9.86)	23	2.11	0.049	24.13 (14.74)	24.50 (8.32)	24	0.09	0.92
Parental control	7.54 (3.36)	9.58 (2.80)	23	2.31	0.03	7.30 (3.04)	7.15 (3.12)	24	0.19	0.85
Total score	110.98 (24.25)	143.24 (24.40)	23	4.46	0.001	111.33 (25.46)	112.05 (32.77)	24	0.08	0.93

This program also can be effective in adopting appropriate coping strategies and, thus, improves the quality of life in these patients.

The small size of the sample and the short duration of the follow-up are among the limitations of this research. Therefore, it is recommended that future researchers conduct research on a larger number of samples and do follow-up from 6 months to 1 year after the intervention.

Conclusion

The results of this study showed that self-control intelligence program can help adolescents with diabetes in adjusting their emotions. Adjustment of emotions allows patients to control their level of excitation and prevent malicious reactions to stimulation. It can be concluded from the results of this study and other similar studies on the effect of self-control intelligence program on quality of life of the patients with chronic disease that self-control education can be included in a health care program as a convenient, affordable, and low-cost method to improve the quality of life of the adolescents with diabetes. As such, this method can be used as a useful non-therapeutic treatment over time.

Acknowledgements

The present study is a part of the master thesis with the ethical code of (397433) approved by Isfahan University of Medical Sciences in 2018. It is incumbent upon us to express our gratitude for the genuine cooperation of the adolescents participating in this research and the staff members of Janan Diabetes center.

Financial support and sponsorship

Isfahan University of Medical Sciences

Conflicts of interest

Nothing to declare.

References

1. Clarke WL. Behavioral challenges in the management of childhood diabetes. Diabetes Sci Technol 2011;5:225-8.
2. Gadallah MA, Ismail TA, Aty NS. Health related quality of life among children with Type I diabetes, Assiut city, Egypt. J Nurs Educ Pract 2017;7:73-82.
3. Heidari M, Alhani F, Kazemnejad A, Moezzi F. The effect of empowerment model on quality of life of diabetic adolescents. Iran J Pediatr 2007;17:87-94.
4. Da Costa LM, Vieira SE. Quality of life of adolescents with type 1 diabetes. Clinics 2015;70:173-9.
5. Alvarado-Martel D, Velasco R, Sánchez-Hernández RM, Carrillo A, Nóvoa FJ, Wägner AM. Quality of life and type 1 diabetes: A study assessing patients' perceptions and management needs. Patient Prefer Adherence 2015;9:1315-23. self-.
6. Pour JS, Jafari M, Asgar MG, Dardashti HD, Teymoorzadeh E. The impact of self-care education on life quality of diabetic patients. J Health Adm 2013;16:Pe26-36.
7. Streisand R, Monaghan M. Young children with type 1 diabetes: Challenges, research, and future directions. Curr Diab Rep 2014;14:520.
8. Afshar M, Memarian R, Mohammadi E. A qualitative study of teenagers'experiences about diabetes. Diabetes Nurs 2014;2:7-19.
9. Mahmoudi A, Alavi M. Self-control: An important educational need in diabetic patients'mental health. IJNR 2011;5:68-75.
10. Abbasi Sphajir AS, Rostamian Z, Bajan AS, Bachshandeh A. Investigating the relationship between self-control dimensions and Youth's deviant behaviors in general theory of crime. J Mazandaran Forensic Sci 2016;7:21-40.
11. Cobuz M, Cobuz C. Life quality of the child with diabetes mellitus. Rom J Diabetes Nutr Metab Dis 2016;23:289-98.
12. Alquist J, Baumeister RF. Self-control: Limited resources and extensive benefits. Wiley Interdiscip Rev Cogn Sci 2012;3:419-23.
13. Saravi FK, Navidian A, Tabas EE, Shad TS. Prediction of the quality of life in the adolescents with diabetes based on self-efficacy. Endocrinol Metab 2016;5:43-9.
14. Ingersoll GM, Marrero DG. A modified quality of life measure for youths: Psychometric properties. Diabetes Educ 1991;17:114-8.
15. Safarabadi-Farahani T, Ali-Akbar M, Safarabadi-Farahani A, Haghani H. Quality of life in young people with type 1 diabetes in relation to age and gender. Iran J Nurs 2011;23:73-9.
16. Novato TD, Grossi SA, Kimura M. Cultural adaptation and validation of the "Diabetes Quality of Life for Youths" measure of Ingersoll and Marrero in to Brazilian culture. Rev Lat Am Enfermagem 2008;16:224-30.
17. Nasihatkon A, Pishva A, Habibzadeh F, Tabatabaei M, Ghashghaeizadeh M, Hojat F, *et al*. Validity and reliability of clinical questionnaire summary of quality of life in ptients with diabetes in Persian. Iran J Diabetes Mellit 2011;11:483-7.
18. Jankowska-Polańska B, Fal AM, Uchmanowicz I, Seń M, Polański J, Kurpas D. Influence of organized diabetic education on self-control and quality of life of patients with type 2 diabetes. Int J Diabetes Dev Countries 2015;35:79-87.
19. Soleimani E, Habibi M, Basharpuor S. Effectiveness of self-control training on dimensions of quality of life in multiple sclerosis patients. J Res Behav Sci 2013;10:746-56.
20. Elfatah WA. The effectiveness of self-control and anxiety management training to reduce anxiety and improve health-related quality of life in children with asthma. J Psychol Psychother 2015;5:61-8.
21. Lansing AH, Berg CA, Butner J, Wiebe DJ. Self-control, daily negative affect, and blood glucose control in adolescents with Type 1 diabetes. Health Psychol 2017. p. 25:1-19.
22. Beh-Pajooh A, Fatemi SM, Bonab BG, Alizadeh H, Hemmati G. The impact of a self-control training program on enhancement of social skills in students with ADHD. Psychology 2012;3:616-20.
23. Hemmati Maslakpak M. Quality of life in adolescent girls with diabetes. J Urmia Nurs Midwifery Fac 2012;10:713-20.
24. Hughes AE, Berg CA, Wiebe DJ. Emotional processing and self-control in adolescents with type 1 diabetes. J Pediatr Psychol 2012;37:925-34.
25. Jamshidi MS. Self-control in children and Adolescents. 2nd International Conference on Behavioral science and social studies; Istabul- Turkey, 2016 {Pertion}.