

The effect of FRIENDS education on quality of life of adolescent boys with type 1 diabetes: a quasi-experimental study

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Abstract

Background: People's quality of life is due to emotion control and efficiency, and the FRIENDS program also affects emotion control and empowerment.

Methods: The research method was quasi-experimental with pre-test and post-test with control group. The study population was Adolescent boys with type 1 diabetes in Vali-e-Asr Hospital of Birjand city. Based on the available sampling method, 63 students were first taken in the academic year of 2019 and then 30 students who scored below 50 were selected as the participants. They were randomly assigned to two experimental (n=15) and control (n=15) groups. In experimental group, FRIENDS program was trained in 10 sessions for 2 months (one session per week). To assess the effect of FRIENDS training package on quality of life, the SF-36 Quality of Life Questionnaire was used.

Results: The results showed that there was a significant difference between the mean components of physical function, energy and vitality, pain tolerance, general health in the experimental and control groups ($p < 0.05$). In other words, treatment based on improving quality of life increased the above components. In the post-test stage, it was tested in the experimental group. But there was no significant difference in the components of physical limitation, social functioning and mental health between the two groups ($p > 0.05$).

Conclusion: Teaching the FRIENDS program affects quality of life of adolescent boys with type 1 diabetes.

Keywords: Adolescent; Diabetes Mellitus, Type 1; Quality of Life.

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Introduction

Diabetes is the most common metabolic disease, associated with disorders in carbohydrate, protein and fat metabolism, and because of high blood sugar, a person will suffer from cardiovascular complications, retinopathy, nephropathy and various psychological and behavioral complications (1).

According to the National Document Against Diabetes, the disease in general is increasingly growing throughout of world, so that it is predicted to increase from 4% in 1995 to 43.5% in 2025. During this period, the affected population will increase by 122%, which will be associated with an

increase of 42% and 170% in developed and developing countries, respectively (2).

Type I diabetes becomes more common in childhood with increasing age. Its rate is 9.1 per 1,000 children in childhood and adolescence, which will increase with increasing age (4). Type I diabetes with permanent changes in life also has a negative impact on quality of life (5).

Quality of life is important since poor quality of life leads to hopelessness and lack of motivation to engage in social, economic, cultural and health activities and it affects the socio-economic development of a country at a larger scale (6).

Moreover, the results obtained from its assessment can be used in evaluating the physical, mental, social health, performance state and effectiveness of care and treatment methods (7). However, a change in the level of signs and symptoms of the disease does not necessarily indicate a change in one's recovery (8).

Nowadays, with a shift towards positive psychology and a decline in the pathological attitude, psychologists consider disorders as the result of dysfunctional lifestyle and low quality of life and have considered treatment based on modifying and changing the lifestyle and quality of life (9). Quality of life is a feeling of satisfaction with life, and health is the core of quality of life. Quality of life includes different dimensions of physical, mental and social health and well-being (10).

FRIENDS program has been one of the most widely used methods of preventive and therapeutic intervention in the last one or two decades, so that World Health Organization with sufficient evidence emphasizes on it to improve social behaviors, and reduce anxiety and depression. (11). However, this program has not been investigated much in Iran so far. Hence, due to lack of studies in this

area, the researcher decided to conduct this study to evaluate the effectiveness of FRIENDS program on the quality of life of male adolescents with type I diabetes.

Methods

The present study was a quasi-experimental study with a pre-test and post-test design and with a control group. The statistical population of this study includes adolescent male patients with type I diabetes referred to the Diabetes Center of Valiasr Hospital in Birjand. Using a convenient sampling method, 63 male adolescents with type I diabetes were first examined in terms of quality of life in 2019. Then, 30 male adolescents suffered type I diabetes and obtained quality of life score less than 50 were selected as participants of the study and were randomly assigned to experimental and control groups. Inclusion criteria of the study included the absence of physical disease or disability, having reading and writing skills, no cognitive or mental disorders, and low quality of life (quality of life score less than 50).

To measure the quality of life, the short form of quality of life scale (SF-36) was used. It was developed by Wisconsin & Lancashire in 1995 under the supervision of the World Health Organization. It is the most common and comprehensive public standard instrument available for measuring quality of life. SF-36 assesses quality of life in two dimensions of physical health and mental health. Physical health includes physical limitations, physical pain and general health, and mental health includes energy and vitality, social function, emotional limitations, and emotional health. Its lowest score is 0 and the highest score is 100. Montazeri et al., have validated the SF-36 questionnaire in Persian on 4236 people in the age group of 15 years and above. Its reliability using Cronbach's alpha coefficient was reported to be 77% to

Table 1. FRIENDS program content

Sessions	Subject
Session 1	Introducing the FRIENDS program
Session 2	Introducing emotions
Session 3	The relationship between thoughts and emotions
Session 4	Learning to cope with worries - identifying emotions, relaxation and learning to feel good
Session 5	Learning to cope with worries - developing positive self-talk
Session 6	Learning to cope with worries - Challenge with negative and useless thoughts
Session 7	Learning to cope with worries - Developing problem-solving skills
Session 8	Learning to cope with worries - a step-by-step plan and encouraging yourself to succeed
Session 9	Learning to cope with worries - role-playing and using practice in FRIENDS skills
Session 10	Reviewing and party-summarize what has been learned and coping with potential problems

90% for subscales, except for the vitality subscale, which was reported at 65% .In general, the results showed that the Iranian version of this questionnaire has good validity and reliability for measuring quality of life (10).

Before intervention, both groups completed the quality of life questionnaire. Then, the interventions and trainings were explained to the subjects. FRIEND's program activity sessions included familiarizing with emotions, regular de-stressing, thought section (green and red thoughts), problem-solving training, reward for each success, learned skills training section, and joyful program Table 1.

The FRIENDS training package was implemented for the experimental group during ten sessions (one session per week, each session lasted 60 minutes on average), but the control group did not receive any intervention. One week after completing ten sessions, both groups answered the quality of life questionnaires again.

Finally, the data were analyzed using analysis of covariance in SPSS software. To observe the ethical considerations, the participants were explained for the subjects and they were ensured that they have complete freedom to participate in the research and if they wish, the test results will be provided to them. Finally, after

obtaining written informed consent from the subjects and stating that the information of questionnaires would remain confidential, the subjects completed the questionnaires without mentioning their names and using a code, and then training sessions began. After completing the intervention, to observe the ethical considerations in the research, trainings were also provided for the control group.

Results

Demographic information of the participants is presented in Table 2. Most of the participants were in 14-16 years age group.

Table 3 presents pre and post test scores of SF-36 questionnaire in experimental and control groups. Results showed that the mean post-test scores of male adolescents with type I diabetes in the experimental group after FRIENDS program training improved compared to the pre-test, but it did not show much improvement in the control group.

Table 2. Demographic information of participants

Age category	Number (n)	Percent (%)
12-14 years	8	26.66%
14-16 years	19	63.33%
16-18 years	3	10%
total	30	100%

Table 3. Mean pre-test and post-test scores of male adolescents with type I diabetes in experimental and control groups

Variables	Experimental group				Control group			
	Pre-test		Post-test		Pre-test		Post-test	
	M	SD	M	SD	M	SD	M	SD
Physical function	11.33	3.21	21.53	3.54	12.42	3.16	14.46	3.31
Physical limitations	2.00	1.54	2.93	1.32	2.05	1.71	2.09	1.87
Emotional limitations	2.80	1.34	3.40	1.46	2.82	1.23	2.84	1.43
Energy and vitality	5.07	1.08	14.80	2.83	6.60	1.91	7.71	2.01
Mental health	6.11	2.02	14.63	3.01	5.93	1.01	8.04	1.67
Social function	5.27	1.63	6.26	1.87	5.31	1.02	5.36	1.03
Pain tolerance	4.73	1.05	7.71	1.26	4.81	1.23	4.84	1.21
General health	10.33	2.31	17.27	2.83	9.46	1.96	10.52	3.02
Total	47.64	5.23	88.53	4.82	49.4	4.86	55.85	5.54

As shown in Table 4, the mean and standard deviation of the components of the quality of life in the experimental group were 47.64 ± 5.23 in the pre-test stage and 88.53 ± 4.82 in the post-test stage. The mean (standard deviation) of the quality of life components in the control group was $49.3 (\pm 4.83)$ in the pre-test stage and $55.85 (\pm 5.54)$ in the post-test stage.

As can be seen above, the significance level of Levin test is greater than 0.05, so the hypothesis of homogeneity of variances was accepted, so the use of parametric tests was considered unobstructed. Also, Box's M test was used to test the assumption of homogeneity of variances and the results showed that Box's M value is not significant and the assumption of no difference between the variances is confirmed ($P = 0.24$, $F = 1.91$, Box's $M = 14.3$).

Table 4. Investigation of the assumption of equality of variance of groups

The significance level	Degrees of freedom		Statistic s F degree of freedom
	Intergroup p	Interagroup p	
0.325	28	1	1.45

Pre-test scores showed that there was no significant relationship between the two groups in the quality of life of the subjects before the study ($p > 0.05$). By controlling this non-significant relationship and according to the calculated F coefficient, the difference between the two groups was statistically significant ($p < 0.001$). It can be concluded that intervention increased the total score of quality of life of the experimental group compared to the control group in the post-test stage. Squared-Eta indicates that the study intervention improved the quality of life of the subjects in the experimental group by 48% compared to the control group Table 5. Also, as shown in Table 5, there was a significant difference between the mean components of physical function, energy and vitality, pain tolerance, general health in the experimental and control groups ($p < 0.001$). In other words, treatment based on improving the quality of life increased the above components in the post-test stage in the experimental group, but there was no significant difference between the two groups in the components of physical limitation, social function, and mental health ($p > 0.05$). The results of analysis of

Table 5. Analysis of covariance of the effectiveness of FRIENDS training on quality of life

Dependent variable	SS	Df	MS	F	P	ETA
Physical function	66.15	1	66.15	9.16	0.004	0.136
Physical limitations	0.06	1	0.06	0.02	0.867	0.000
Energy and vitality	60.00	1	60.00	13.84	0.001	0.193
mental health	40.01	1	40.01	1.36	0.247	0.023
Social function	2.40	1	2.40	2.71	0.105	0.045
Pain tolerance	101.40	1	101.40	11.45	0.001	0.164
General health	43.35	1	43.35	15.8	0.001	0.125
Total scale score	944.716	1	944.716	51.842	0.001	0.476

covariance in the quality of life variable showed that there was a significant difference between the mean scores of the experimental and control groups in the post-test score of quality of life. Based on the results, 0.198 changes in the mean of the post-test scores were due to effectiveness of FRIENDS training.

Discussion

Results of the present study showed that the adjusted mean scores of quality of life in the experimental group were significantly higher than that in the control group. Hence, it can be stated that FRIENDS program training significantly increased the quality of life of learners and Pre-test scores showed that there was no significant relationship between the two groups in the quality of life of the subjects before the study. Based on the studies reviewed, no domestic research was found in this area. The results showed that FRIENDS training significantly increased all components of quality of life (physical health and mental health dimensions) in male adolescents with type I diabetes. These results are in line with those of many foreign studies, for example, the studies conducted by Iizuka et al., Barry et al., and Stallard et al., (11-13).

Research related to the present study can be referred to the research of Kendall et al., in other words, FRIENDS program training strengthens new beliefs except for the initial experiences and behavior of parents and new experiences and data are evaluated

based on these beliefs since fundamental beliefs are activated and triggered by important events and lead to creation of assumptions. It results in formation of a set of automatic thoughts that are related to the person, his or her performance and the future. These automatic thoughts lead to emotional, cognitive, and physical changes (14).

According to Barrett and Dadds, FRIENDS program training can provide the conditions for emotional resilience and increased self-esteem as well as cognitive coping with anxious events that result in increased quality of life by correcting dysfunctional beliefs and strengthening useful attitudes and actions and strengthening them and their outcomes (15).

Quality of life is a multifaceted and complex concept, but it can be defined with an interdisciplinary approach and a conceptual model can be developed for it and measured based on that model. Quality of life is relative, and there is no absolute, comprehensive, universal criterion for defining and measuring it that can be applied everywhere. It is a concept that is strongly affected by time and location. Factors affecting the quality of life vary depending on the time, geographical location and cultural conditions (16).

The World Health Organization considers quality of life as focusing on feeling good and life satisfaction, so quality of life has a meaning beyond health. It has proposed 4 dimensions for quality of life: 1- Physical

health dimension, including pain and discomfort, sleep and rest, ability to do daily tasks, 2- Psychological dimension, including appearance, negative and positive feelings, memory, focus and self-confidence, 3- Social communication dimension, including personal relationships, social support and sexual relations and 4- Environmental dimension, including property, home space, access to information about participating in social activities and communication facilities (17).

Results showed that the mean post-test scores of male adolescents with type I diabetes in the experimental group after FRIENDS program training improved compared to the pre-test, but it did not show much improvement in the control group showed that there was no significant relationship between the two groups in the quality of life of the subjects before the study. It can be concluded that intervention increased the total score of quality of life of the experimental group compared to the control group in the post-test stage. there was a significant difference between the mean components of physical function, energy and vitality, pain tolerance, general health in the experimental and control groups ($p < 0.001$). In other words, treatment based on improving the quality of life increased the above components in the post-test stage in the experimental group, but there was no significant difference between the two groups in the components of physical limitation, social function, and mental health ($p > 0.05$). The results of analysis of covariance in the quality of life variable showed that there was a significant difference between the mean scores of the experimental and control groups in the post-test score of quality of life. Based on the results, 0.198 changes in the mean of the post-test scores were due to effectiveness of FRIENDS training.

It can be concluded that intervention increased the total score of quality of life of

the experimental group compared to the control group in the post-test stage. According to the reviews in domestic and international journals, no research has been done that accurately examines the effectiveness of friends' education on quality of life, so the explanation has been done according to scientific theories. Quality of life components are defined based on individual, social and national values. The realities and objective conditions of society and the material condition of one's life also play a key role in it. However, it should be noted that man is a creature who lives based on his or her mental image of reality - not reality itself - and his or her behavior is influenced by mental perceptions of reality and these perceptions do not necessarily correspond to reality (18).

Using training methods, we can improve the quality of life of people to prevent the occurrence of many mental disorders. In this regard, in studies conducted by Barrett et al., to evaluate the effectiveness of FRIENDS training method on the quality of life of adolescent male patients with type I diabetes. "FRIENDS" program training with an emphasis on positive psychology has been very effective in preventing and treating emotional disorders, managing anxiety, increasing self-esteem and improving well-being. The training of this program is more popular among learners (19, 20).

Generally, Studies suggest that the FRIENDS program reduces anxiety, depression, and behavioral problems, and increases life skills and self-esteem in children, and its effectiveness lasts even after 6 years (21-23).

FRIENDS program has been one of the most widely used methods of preventive and therapeutic intervention in the last one or two decades, so that World Health Organization with sufficient evidence emphasizes on it to improve social

behaviors, and reduce anxiety and depression. It is based on the cognitive behavioral therapy approach developed by Paula Barrett in Australia (24).

FRIENDS program helps children and adolescents learn ways of coping with fear, anxiety and depression. It also provides the conditions for promoting emotional resilience and self-esteem. This program has been effective in helping children manage their psychological stress, including fear, worry, and anxiety, as well as developing skills for their present and future lives (25).

Moreover, the skills taught in the FRIENDS program focus on the physiological, cognitive, and learning processes, resulting in adaptation and management of the environment. Physiological trainings involve increasing awareness of physical symptoms, in such way that allow children and adolescents to perceive the physical symptoms of their worries (e.g., rapid heartbeat). Moreover, children and adolescents learn deep breathing and muscle relaxation. In the cognitive skills section, children and adolescents also learn how thoughts affect emotions and what they need to do about it. Additionally, they learn to recognize negative self-talks and to adapt to disturbing situations by challenging harmful thoughts. Behavioral skills also include problem solving and self-reward, which are considered as positive coping skills. In general, the program teaches self-confidence, problem solving, psychological resilience, self-expression, and building positive relationships with peers and adults (20).

Conclusion

Thus, based on results of the present study and other studies which have been conducted in the area of the effectiveness of the FRIENDS program and confirmed the trustworthiness and credibility of this program in developing cognitive and social

skills, education planners and policy makers are recommended to apply fundamental reforms in the education system from non-formal education courses (kindergarten programs) to higher education courses and include FRIENDS training programs in the formal curriculum. Also, it is recommended for them to provide the conditions so that teachers and physicians can be familiarize with interactive, discussion-based and experiential learning methods by presenting educational programs (in-service) as much as possible.

Author's contribution

Mahmoud Shirazi and Mohammad Hassan Zangouei Dovvom developed the study concept and design. Seyed Hadi Tabatabaeineya acquired the data. Haniyeh Jafari and Mahmoud Shirazi analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual content, manuscript editing and read and approved the final manuscript.

Informed consent

Questionnaires were filled with the participants' satisfaction and written consent was obtained from the participants in this study.

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Conflict of interest

The authors declare that they have no conflict of interests.

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