

# Research Paper: The Effectiveness of Training Based on Positive Psychology on the Quality of Life of Patients With Type 2 Diabetes



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## ABSTRACT

**Introduction:** Diabetes is one of the most common chronic diseases, which has a negative effect on the quality of life.

**Objectives:** The aim of this study was to investigate the effectiveness of training based on positive psychology on the quality of life of patients with type 2 diabetes.

**Materials and Methods:** This quasi-experimental study had a Pre-test-Post-test with a control group and a follow-up design. The sample was selected through the convenience sampling method from patients with type 2 diabetes in Hazrat Ali Health center in Isfahan in 2017; then, they were randomly divided into 2 groups (each group contained 15 individuals). The experimental group was trained with positive psychology and the control group did not receive any treatment. Both groups were evaluated before and after the intervention and at the follow-up stage, using the World Health Organization Quality of Life questionnaire. The data were analyzed by the analysis of variance with repeated measurements.

**Results:** The results showed that positive psychological education had a significant influence on the quality of life and mental health area, social relations, and environmental health in patients with type 2 diabetes. Also, there was a significant difference between the experimental and control groups; but in the physical health area, there was no significant difference between the experimental and control groups ( $P < 0.001$ ).

**Conclusion:** Positive psychological education effectively improves the quality of life of patients with type 2 diabetes. Therefore, it is recommended to use this treatment approach to help improve the quality of life of these patients.

## Keywords:

Training, Positive psychology, Quality of life, Type 2 diabetes

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## 1. Introduction

**D**iabetes is one of the chronic and problematic diseases of humans for years. It has happened in different ages and has an alarming prevalence [1]. It is described as a chronic disease caused by an abnormality in the metabolism of carbohydrates, proteins, and fat [2]. Diabetes is defined as a disorder in homeostasis, which includes disorder in fasting glucose and disorder in glucose tolerance. Plasma glucose, which increases the risk of diabetes in this definition, is the level of fasting blood glucose (126 mg/dL) or blood glucose 2 hours after eating (200 mg/dL) [3].

Epidemiological data show that the number of people with diabetes will be double if this increase is particularly about type 2 diabetes [4]. Type 2 diabetes is a chronic multifactorial disorder that is associated with hyperglycemia and damage to organs in the long term [5]. Type 2 diabetes is non-insulin-dependent diabetes or adult diabetes. About 90% to 95% of people get type 2 diabetes. The cause is unknown and it is because of the destruction of stem cells. Overweight or obesity is one of the causes of type 2 diabetes. Overweight causes insulin resistance [6]. The prevalence of diabetes has increased in recent years, and its risk has increased by 40% over the past 26 years [7]. According to the recent World Health Organization, the prevalence of diabetes and its related risk factors in Iran was 9.6% in men, 11.1% in women, and 10.3% in the overall population [8]. According to studies by the International Federation of Diabetes, the number of people with diabetes worldwide has reached 425 million in 2017 and is predicted to reach 629 million in 2045 [9].

The life condition of patients with type 2 diabetes is often reported as having a lower quality of life [10]. The quality of life of patients with type 2 diabetes is affected by disease and its complications, such as retinopathy, neuropathy, and cardiovascular disease because of the chronic condition of illness, disability, and lifetime need for care and it endangers their mental health [11, 12]. In fact, the chronic nature of the disease affects the body, mental, individual, and social function of the patient. Therefore, studying the different dimensions of the quality of life of patients with diabetes is important [13].

Diabetes is a major challenge for healthcare professionals because it affects the patient's psychosocial function and, thus, threatens the quality of life associated with health [14]. There is an interaction between illness and quality of life, especially for those with chronic illnesses, who are involved in many issues throughout life, and physical signs and disorders have a direct effect on all aspects of quality of life [15].

Several studies have shown that the quality of life in patients with diabetes is reduced in comparison to those without diabetes. Moreover, the presence of complications of diabetes has more negative effects on the quality of life of the person [16]. In 2014, Eydi Baygi et al. showed a significant difference between the life quality of patients with and without diabetes [17]. Also, Shokouhi Far and Falahzadeh in 2014 concluded that diabetes is a chronic disease that affects the quality of life [18].

Considering the connection among the quality of life, mental health, and the high prevalence of psychological problems in patients with diabetes, effective interventions to improve the status of mental health and the quality of life of patients are necessary [19]. In fact, improving the quality of life of patients with type 2 diabetes is highly emphasized in the clinical guidelines of diabetes control; one of the primary goals of diabetes control is improving the quality of life [20]. Over the past 2 decades, the results of studies have shown that the main goal of the treatment is not only eliminating the signs and symptoms of the disease but also improving the overall quality of life of patients. In order to achieve this goal, attention must be paid to the psychological and social consequences of the illness. The quality of life is important because if it is neglected, it can lead to disappointment, the lack of motivation, and reduced social, economic, cultural, and health activities [21].

Therefore, because of the importance of psychological constructs in patients with type 2 diabetes, specialists have suggested several psychological interventions [22-24]. Positive psychological interventions are a potential new approach to increase the positive psychological structures in psychology, which seems to have positive psychological structures (such as optimism, the effect of positive affection) with different health outcomes [25]. In fact, positivist interventions can reduce depression, increase happiness and psychological well-being in individuals through increasing positive emotional excitement, positive thoughts, positive behaviors, and satisfaction of the basic needs of individuals such as autonomy, love, and communication [26]. It emphasizes the enhancement of human abilities and virtues, enabling individuals and societies to succeed [27].

Several studies have been conducted to examine the effectiveness of positive psychology; for example, the studies of Masi et al. [28] and Hoffman et al. [29] showed that positive psychological intervention is effective in improving the health outcomes of patients with diabetes and the results of the research by De Bois showed that the positive psychological program would

improve mental health, performance, and health in patients with type 2 diabetes [30]. Therefore, the use of group counseling programs, especially psychotherapy, improves physical, emotional, and social performance, decreases fatigue, and reduces the negative effects of this disease [31].

Positive thinking skills include the teaching of thinking differently both about positive thoughts and events and negative thoughts and events and consider value for having this skill. In positive thinking, individuals are encouraged to recognize their positive experiences and their strong points and recognize their role in enhancing self-esteem and improving their lives [32]. The prevalence of type 2 diabetes and the negative effects of this chronic disease on the quality of life of the patients, considering its future effects, as well as the need to select appropriate interventions to correct it, the lack of research on the effectiveness of education based on positive psychology on the quality of life and its dimensions in patients with type 2 diabetes show the necessity of this research.

Therefore, the aim of this study was to investigate the effectiveness of positive psychological education on the quality of life and its dimensions in patients with type 2 diabetes.

## 2. Materials and Methods

In terms of the aim, this study was applied research and in terms of the data collection, it had a Pre-test-Post-test with a control group and follow-up design. The statistical population of the present study included all the patients with type 2 diabetes from the health centers of Isfahan in 2017. In order to sample the patients with type 2 diabetes referred to Hazrat Ali comprehensive health center, 30 patients were selected according to the availability and the inclusion criteria; they were, then, randomly divided into 2 groups (each group contained 15 individuals). It is worth noting that 2 of the experimental group and 2 of the control group were excluded from the research project because of their unwillingness to continue the study.

The inclusion criteria included the diagnosis of type 2 diabetes with blood tests and physician's diagnosis, age between 30 and 65 years old, competence in reading and writing skills, and satisfaction with participation in the research; the exclusion criteria included unwillingness to continue cooperation, failure to perform the provided assignments at the meetings, absences for

more than 2 sessions, and acute or chronic psychiatric disorders recognized by the psychiatrist.

The world health organization Quality of Life Questionnaire was used to collect the data. It contains 26 questions and measures 4 areas, including physical health, mental health, social relationships, and environmental health with 24 items (each with 3, 6, 7, and 8 questions, respectively). Two questions do not belong to any of the areas and generally assess the general health and quality of life. A score of 4 to 20 will be obtained for each area, in which 4 is the worst sign and 20 is the best condition of that field. These scores can be converted into the amplitude of scores from at least zero to 100 as maximum. According to the results reported by the World Health Organization Quality of Life Questionnaire, in the 15 international centers of the organization, the Cronbach's alpha is between 0.73 and 0.89 for the 4 subscales and the whole scale, respectively. In Iran, Nassiri used 3 kinds of retest with a 3-week interval and the Cronbach's alpha for the reliability of the scale was 0.70, 0.87, and 0.87, respectively.

Thirty people were chosen based on the inclusion criteria and the available sampling method and they were randomly divided into the experimental and control groups. Before applying the intervention, the World Health Organization Quality of Life Questionnaire was delivered to both groups for the Pre-test. There was no intervention for the control group. Then, for the experimental group, 8 sessions (90 minutes for each session) of positive psychological education were performed; then, the test was repeated for both groups. In order to maintain the effect of education, both groups were followed-up 1 month later.

To observe the ethical considerations of the study, before distributing the questionnaires, informed consent was obtained from the samples. The method of implementing the intervention and the optionalness of the company in the research were explained to the participants to ensure them about the better cooperation and the confidentiality of the information. They were assured that the data of the research questionnaire would be analyzed and used only in relation to the goals and hypotheses of the research. Positive psychological training sessions were conducted based on the Rashid and Seligman treatment protocol that is described in Table 1.

In order to analyze the research data, SPSS V. 22 software was used. Also, the mean and Standard Deviation (SD) of scores were used at the descriptive level and repeated

**Table 1.** Pandects of formation of positive psychological sessions

Sessions	Training content
First	Familiarizing members with each other, the initial communication, directing the patient to the atmosphere of positive psychology, and self-introduction of patients in a positive way.
Second	Presentation of the summary of the previous session and its review, the expression of the main concepts in positive thinking, the identification of signs and symptoms of positive thinking, the assessment of abilities and helping the patient to develop positive abilities.
Third	Presentation of the summary of the previous session, helping the patient to understand the role of good and bad memories, providing an appreciation notebook, writing 3 good memories, writing 3 bad memories, expression of the negative emotions, and providing assignments about that.
Fourth	Presentation of the summary of the previous session, turning negative to positive emotions, focusing on appreciation and forgiveness, and providing assignments about that.
Fifth	Presentation of the previous session focused on the topic of hope and optimism, reviewing the contents.
Sixth	Presentation of a summary of the previous session, love and attachment, positive relationship with others, review of response styles (active-constructive response), and presentation of assignments in the same direction.
Seventh	Presentation of the summary of the previous session, the art of having and feeling the pleasure, the presentation of assignments about that.
Eighth	Integration of the lessons, creating a positive environment, maintaining health and its impact on positive psychology, and feedback.

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measures Analysis of Variance (ANOVA) was used at the inferential level.

### 3. Results

The Mean±SD age of the experimental and control groups was 44.54±7.52 and 46.85±7.87 years, respectively. In the experimental group, 46.2% of the partici-

pants were male and 53.8% were female; in the control group, 61.5% of the participants were male and 38.5% were female, and 53.8% female and 46.2% male overall.

Descriptive findings were used to examine the mean and SD of the variables in the research. Table 2 presents the mean and SD of the variables.

**Table 2.** Descriptive findings of the studied variables in the experimental and control groups

Variables	Stage	Mean±SD	
		Experimental	Control
Quality of Life	Pre-test	43.4±23.53	69.51±57.4
	Post-test	80.2±76.68	53.50±44.4
	Follow-up	30.3±61.64	46.43±41.5
Physical health field	Pre-test	98.1±53.15	73.1±31.00
	Post-test	16.2±14.00	53.1±23.13
	Follow-up	30.14±25.1	25.2±53.12
Mental health field	Pre-test	97.1±92.13	66.1±61.13
	Post-test	76.16±64.1	84.11±14.1
	Follow-up	73.1±0.17	97.13±30.10
Social relation field	Pre-test	38.5±26.1	60.1±15.5
	Post-test	84.8±0.898	16.6±14.1
	Follow-up	76.8±10.1	84.6±24.1
Environment health field	Pre-test	66.1±53.16	84.15±23.2
	Post-test	30.20±21.2	92.16±36.2
	Follow-up	92.21±18.1	30.2±15.14

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**Table 3.** The results of the Kolmogorov-Smirnov test and Levene's test

Index	Variables	Test	Value	Sig.
Kolmogorov-Smirnov test	Quality of life	Pre-test	151.0	0.013
	Physical health field	Pre-test	212.0	0.104
	Mental health field	Pre-test	141.0	0.691
	Social relation field	Pre-test	208.0	0.725
	Environment health field	Pre-test	153.0	0.911

  

Index	Homogeneity of the Covariance and Scaling Adjoins	F	df 1	df 2	Sig.
Levene's test	Quality of life	001.0	1	24	0.579
	Physical health field	171.0	1	24	0.386
	Mental health field	111.0	1	24	0.247
	Social relation field	627.0	1	24	0.247
	Environment health field	735.0	1	24	0.004

According to Table 2, in the pre-test stage, there was no significant difference between the experimental and control groups; however, in the Post-test stage, the scores of quality of life, the field of physical health, the field of mental health, the field of social relations, and the field of the health of the environment increased in the experimental group. In order to implement a repeated measure of ANOVA, we first need to examine the assumptions of performing ANOVA.

Based on Table 3, the results of the Kolmogorov-Smirnov and Levene's tests show that the data are consistent with the normal distribution and the homogeneous assumption of ANOVA. The results of the Kolmogorov-Smirnov test showed the normal distribution of the scores of dependent variables. Also, the results of the Levene's test showed that the significance level obtained for both groups in the dependent variables was 0.95, indicating that the experimental and control groups are the same in terms of score scattering of the dependent variables.

According to Table 4 and the significance of factors within the groups, there was a significant difference between the measurements of Pre-test, Post-test, and follow-up for the quality of life; the areas of patient's physical health, mental health, social relationships, health of the environment Type 2 diabetes were confirmed at  $P < 0.001$ . Also, with the significance of the source of the group among the groups, it can be said that there is a

significant difference between the experimental group and the control group for the of quality of life, mental health, social relations, and health of the environment of patients with type 2 diabetes at the level of  $P < 0.001$ ; it means that positive psychological education was effective in the quality of life, mental health, social relations, and the health of the environment in patients with type 2 diabetes, but this intervention had no effect on the physical health of this group.

In order to investigate the difference between the mean of the studied scale among Pre-test, Post-test, and follow-up measurements, the Bonferroni post hoc test was used as a paired test. The results of this test are presented in Table 5.

According to Table 5, the Pre-test scores with Post-test and follow-up of the quality of life, the mental health field, the field of social relations, and the health of the environment field have a significant difference. The Post-test scores in the follow-up scale are relatively constant and the effect of the training positive psychology for the quality of life on mental health, the field of social relations, and the field of health of the environment are also persistent. These results indicate that positive psychological education was effective in the quality of life, mental health, social relations, and the field of health of the environment. Moreover, in reducing the effectiveness of this treatment, the time was not effective through the Post-test to followed-up. According to the

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**Table 4.** ANOVA among subjects and inside subjects with 3 measurements: Pre-test, Post-test, and follow-up for quality of life, physical health, mental health, social relationships, and healthy environment of patients with type 2 diabetes

Source	Sum of Squares	Freedom Degree	Mean of Squares	F	Sig.	Eta	Statistical Power
Error interactive factor	154.779	2	577.389	219.19	0.00	0.544	0.01
	872.2685	2	936.1342	251.66	0.00	0.437	0.01
	974.972	48	270.20				
Error group	013.5400	1	013.5400	229.453	0.00	0.059	0.01
	949.285	24	915.11				
Error interactive factor	564.1919	2	782.959	641.360	0.00	0.839	0.01
	026.92	2	013.46	289.17	0.00	0.914	0.01
	744.127	48	661.2				
Error group	821.160	1	821.160	752.77	0.404	0.460	0.132
	641.49	24	068.2				
ERROR interactive factor	333.6	2	167.3	928.19	0.200	0.735	0.658
	256.141	2	628.70	704.20	0.00	0.364	0.01
	744.163	48	411.3				
Error group	013.308	1	013.308	197.157	0.00	0.868	0.01
	026.47	24	959.1				
Error interactive factor	792.50	2	397.25	880.32	0.00	0.875	0.01
	795.50	2	397.25	880.32	0.00	0.875	0.01
	07.37	48	772.0				
Error group	128.123	1	128.123	771.62	0.00	0.327	0.01
	077.47	24	962.1				
Error interactive factor	641.78	2	321.39	688.9	0.00	0.882	0.679
	538.282	2	269.141	806.34	0.00	0.295	0.01
	821.194	48	059.4				
Error group	385.415	1	385.415	267.110	0.100	0.128	0.01
	460.90	24	767.3				

**Table 5.** Bonferroni post hoc test for comparing the quality of life, mental health, social relations, and environmental health as a pair in the time series

Scale	Stage A	Stage B	Mean difference (A-B)	Standard error	Sig.
Quality of life	Pre-test	Follow-up Post-test	019.7-	850.0	00.0
			077.6	443.1	00.0
	Post-test	Follow-up	115.1	379.1	915.0
Mental health area	Pre-test	Follow-up Post-test	538.0-	460.0	00.0
			115.0	625.0	00.0
	Post-test	Follow-up	154.0-	430.0	425.0
Social relation area	Pre-test	Follow-up Post-test	731.1-	193.0	00.0
			962.1-	297.0	00.0
	Post-test	Follow-up	038.0	230.0	918.0
The health of the environment area	Pre-test	Follow-up Post-test	423.2-	441.0	00.0
			846.0-	566.0	00.0
	Post-test	Follow-up	577.1	650.0	069.0

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results, the education based on positive psychology is effective in the quality of life, mental health, the field of social relationships, and health of the environment of patients with type 2 diabetes and remains stable for 1 month.

#### 4. Discussion

The aim of this study was to provide a positive psychological education on the quality of life in patients with type 2 diabetes. Based on the results, positive psychological education had an impact on the quality of life and led to improvements in the quality of life; the effect of this treatment was stable after 1 month and the results of this study were in line with the results of many studies based on the effect of treatment and education on positive psychology. In a study, Jalali et al. evaluated the effectiveness of positive psychotherapy on the quality of life of spouses of neurology and psychiatry veterans; it was concluded that positive psychotherapy education increased the psychological well-being and the quality of life in the experimental group in comparison with the control group in the Post-test stage [33-35]. The results of Shahid Golami's research indicate the effectiveness of positive psychological therapy on improving the quality of life of multiple sclerosis patients [36]. Soheilzadeh et al. found that improving self-esteem and resilience

and providing appropriate strategies could improve the quality of life of patients with type 2 diabetes [37]. The results of studies by Diener and Chan [38] and Sin et al. [39] showed that positive thinking is effective in improving the quality of life. In the theoretical explanation of these findings, it can be said that positive psychological education can help improve the quality of life in order to strengthen and improve the positive relationship with oneself, others, and life and increase self-esteem. Also, the training of optimism and positive thinking skills encourages patients with diabetes to notice positive and good experiences and their role in increasing respect for themselves and others rather than reminding negative thoughts about their illnesses and their constraints [40]. Generally, positive psychosocial education by creating positive thinking leads to a happy life, a better way of looking at life rather than focusing on illness and its symptoms and limitations. Attention to positive emotions, positive sources of energy, positive energy transfer to others, the reduction of psychological stress and self-confidence may have contributed to the improvement of quality of life in patients with type 2 diabetes [41]. Also, Tabataba'i and Manafi, in line with the present study, stated that the treatment affects the emotions of quality of life [42]. Also, according to Shoshani et al., this intervention has a positive effect on cognitive interactions and social relationships [43]. Yazdi Ravandi



et al. also concluded that social support and self-efficacy play an important role in predicting the level of compatibility in patients with diabetes. [44]. Fraser et al. reported that positive psychological education is effective in the environmental characteristics of diabetes control and management [45]. In explaining this part of the findings, positive psychological education teaches patients to take an active position in the world and shape their lives personally and to express a clear picture of good life and see the best in every situation and reconstruct themselves; thus, a patient with type 2 diabetes accepts the constraints of his illness and acts by knowing more about his abilities in every situation [46]. By considering the success that has been achieved, they feel more fluent in their own environment.

In explaining the disapproval of the effectiveness of positive psychological education on the physical dimension, it can be stated that the symptoms of diabetes, including frequent urination, excessive thirst, excessive hunger, weight loss, tingling, itching, peripheral neuropathy, acute vagina infections, and fatigue are affected by the individual's compliance with the treatment. It can also be argued that patients with chronic disease, long-term disease, long-term persistent and debilitating treatment, and physical and emotional consequences are among the factors [47]; they are corresponsive with the results of Yazdi Ravandi's research, which concluded that the severity and duration of pain play an important role in predicting the quality of life of patients for chronic pain, especially in the physical domain [48]. Patients with type 2 diabetes appear to have no difference in physical and general health even after the treatment because of the daily feelings of their symptoms, necessity of using drugs on time, and the duration and severity of the disease.

The present study was confronted with the generalization of the results because of the self-reporting of the counseling tool and the lack of neutral counseling sessions for the control group in order to eliminate the effect of group therapy expectations. Other limitations such as the impossibility of random selection of the sample group in the present study were suggested and it would be advisable to conduct random sampling in future studies with larger sample size. Also, conducting longer studies with long-term follow-up and multi-stage is suggested to investigate the continuity of the effectiveness and sustainability of the course of positive psychological education.

## 5. Conclusion

The results of this study showed that the implementation of a health plan and positive psychological education effectively improve the quality of life of patients with diabetes. Also, the use of positive thinking techniques and skills to strengthen and improve positive self-affiliation, positive relationship with others and life, and increased self-esteem can help improve the quality of life. Therefore, it can be expected that providing appropriate strategies such as conducting educational programs with positive thinking, looking at life from its good aspects rather than focusing on disease, and increasing adaptability in patients with diabetes would improve the quality of life of these patients to reduce the complications, problems, and costs of the treatment of this disease.

## Ethical Considerations

### Compliance with ethical guidelines

All ethical principles were considered in this article. The participants were informed about the purpose of the research and its implementation stages; they were also assured about the confidentiality of their information; Moreover, They were allowed to leave the study whenever they wish, and if desired, the results of the research would be available to them.

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### Authors' contributions

All authors contributed equally in preparing all parts of the research.

### Conflict of interest

The authors declared no conflict of interest.

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