

THE QUALITY OF LIFE IMPROVEMENT IN PATIENTS WITH TYPE 2 DIABETES IN WEST OF IRAN IN 2014, AN EDUCATIONAL INTERVENTION STUDY

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Abstract

Background and aims: Diabetes is considered as the most prevalent disease due to metabolic disorders. This study aimed to determine the effect of an educational on the quality of life (QOL) in patients with type 2 diabetes mellitus (T2DM). **Material and methods:** This quasi-experimental study was conducted in the form of a pre-test/post-test with intervention. The statistical sample of this study included 70 patients with type 2 diabetes living in the rural areas in the city of Ilam (west of Iran). The data were analyzed using the SPSS software version 20 via descriptive statistics, paired t-student test, independent samples t-student test, and ANOVA. **Results:** Except social role functioning, all aspects of QOL significantly increased after intervention ($p < 0.001$). Regardless of age groups, gender, and educational level the QOL scores increased at follow-up ($p < 0.001$). **Conclusions:** Education to patients with type 2 diabetes leads to increased means of all dimensions of QOL that reflect the effects of educational interventions on each domain.

Keywords: Quality of Life, Type 2 Diabetes, rural areas

Background and aims

Diabetes is considered as the most prevalent disease due to metabolic disorders [1] and one of the common health problems across the world whose complications not only have severe effects on quality of life (QOL) but also lead to premature disabilities and increased mortality rate among patients affected with such a disease [2,3].

The World Health Organization (WHO) estimated that the number of patients with diabetes has increased from 171 million in 2000 to 366 million in 2030 [4]. In this respect, the prevalence of type 2 diabetes mellitus (T2DM) among Iranian adults (25 to 64 years old) has been estimated by 7.7% in 2005 and it is predicted that the number of Iranian individuals with diabetes in 2030 will reach more than six million people [5]. Accordingly, the increasing number of patients with T2DM implies a global epidemic [1].

Complications and chronic side-effects of diabetes have great impact on the QOL of patients with diabetes and this could affect patients' economic status, their families and the society they live in [6-8]. Improving QOL in patients with T2DM has been strongly emphasized in the Clinical Guide to Manage T2DM [9]. Over the past two decades, the findings of studies have also shown that the main goal of diabetes treatment is not to deal with the physical symptoms of such a disease but to improve QOL [10]. Therefore, QOL is an important health outcome as well as the ultimate goal of all health-related interventions [11].

Wenger and Furbergde fined QOL as the characteristics which are valuable for a patient and lead to a sense of comfort and good perception. In their views, QOL is to develop physical, emotional, and intellectual

performance in a way that individuals are able to maintain their abilities in life activities [12].

QOL is a multidimensional intrinsic factor which is a combination of cognitive factors of satisfaction and sense of vitality [13].

The WHO has provided the following definition of QOL:

“Individuals' perceptions of their current situations with regard to systematic and cultural values in which they live in and the relationships between these perceptions and goals, expectations, standards, and priorities important to them” [14].

The issue of QOL is important because if it is ignored, it can lead to frustration, lack of motivation for any individual effort, and reduced social activities [15]. Therefore, changing the QOL is not only useful and valuable for patients with diabetes, but also reduces the related costs of health and medical care [16].

It should be noted that the costs of diabetes are not only reduced to financial ones, but also there are intangible costs such as pains, anxiety, discomfort, headaches, weakness, stress, depression, infections, amputations, and nutritional problems which can have effects on social, marital, familial, and work-related relationships and affect various dimensions of QOL in diabetic patients and their families [17,18].

Results of clinical tests have shown that QOL can be used as an indicator of health care quality and a part of a patient's treatment plan. In addition, its measurement in chronic diseases provides researchers with more information about health status and the disease. It can also be a useful guide to improve the quality of care [19,20].

As one of the most basic ways to treat and control chronic diseases, education plays an increasingly significant role in health restoration and recovery in patients. Considering patients

with diabetes, it includes teaching how to live and change their QOL.

The chronic nature of diabetes has also impacts on patients' physical, mental, personal, and social role functioning; therefore, investigations on different dimensions of health and QOL in these patients are of utmost importance [6].

Due to the growing incidence and prevalence of diabetes and the effects of such a disease on all life dimensions in individuals and the various meanings of QOL in different cultures, this study was to investigate the effects of an educational intervention on QOL in patients with T2DM in the city of Ilam which can elaborate on QOL among these patients and the effects of educational intervention on its improvement.

Material and methods

Study objectives: This quasi-experimental study was conducted in the form of a pre-test/post-test with treatment. The statistical population of this study included 70 patients T2DM in rural areas in the city of Ilam (west of Iran). Using two-mean comparison formula with a confidence level of 95% and a test power of 80% and with a 10% predicted decrease; the study sample was composed of 70 individuals. Sampling in this study was performed through multi-stage random sampling method and the sample size was selected according to the inclusion criteria. Individuals' consents were also obtained for their participation in this research study.

Inclusion criteria were patients with T2DM whom referred to rural centers in the city of Ilam, the age range of over 30, a history of diabetes over 6 months, and no history of acute and chronic mental illnesses and cerebrovascular diseases such as learning disabilities and dementia, as well as willingness to collaborate in

this study. Patients who had missed at least one educational session were excluded.

Study questionnaire: In order to collect the data, a demographic questionnaire and the Persian version of the standard instrument to measure QOL i.e. SF36 (Short-Form 36-Item Health Survey) were used. The questionnaire was designed by Ware and Sherbourne in the U.S. It was a multi-purpose short questionnaire to measure health in the views of patients. This research instrument was localized by Montazeri et al. (2004) for the Iranian population [21].

The validity of this questionnaire was measured through content validity and its reliability was assessed using Cronbach's alpha method. The results of content validity showed that; except for vitality ($\alpha=65\%$), other components of the Persian version of the SF36 had minimum coefficients in the range of 77% to 90% with validity or credibility from 58% to 95%.

The questionnaire contained 36 items in the dimensions of physical functioning (10 items), physical role- functioning (4 items), body pain (2 items), social role functioning (2 items), general health (5 items), vitality (4 items), emotional role- functioning (3 items), and mental health (5 words). Given that this questionnaire was used and validated in multiple studies, there was no need to re-measure its validity and reliability [16].

The total score calculated for each patient was 100 in which zero and 100 were assigned to the worst and the best conditions, respectively. QOL was categorized into three levels including desirable (67-100), relatively desirable or medium (33-66), and undesirable (0-30).

To avoid the likelihood of bias in scoring, the questionnaires were completed through face-to-face interviews by a trained interviewer.

Interventional plan: Considering the objectives of the study, the resources available,

and the results obtained from the pre-tests; an educational needs analysis was conducted and the educational contents were designed. Then, the intervention was administered to the experimental group which included four educational sessions. Each session was held for 50-60 minutes per week. All the sessions lasted for one month.

The duration of each session was variable considering patients and their conditions. At the end of each session, presentations were submitted to the patients in the form of pamphlets and brochures including all the long-term complications of diabetes, mental health, nutrition, and exercise. Prior to the onset of each session, the contents of the previous session were briefly reviewed. The educational methods included lectures, question and answer (Q&A), group discussion, and educational videos. In these sessions, the patients received their food-specific diets by a nutritionist. They also practiced in terms of the types and methods of doing physical activities in group.

Moreover, one of the family members was invited to attend in the educational sessions and an educational pamphlet accompanied by a CD was given to them to increase the level of family support to the patients and to help them to control their diabetes.

Finally; two months after the intervention, the effect of the educational program on patients' QOL was measured.

Statistical analyses: After completing the questionnaires, the data were analyzed. The data were also collected and analyzed in a confidential and anonymous manner. The data were analyzed using the SPSS software (version 20) and through descriptive-analytic statistics such as frequency distribution, independent t-student test, paired t-test, and analysis of variance (ANOVA). Alpha level set at 0.05.

Study ethics: To consider the ethical issues, written consents were obtained from all the patients to participate in this study following they became informed about the objectives and the nature of this study.

Results

68.6% percent were female. The patients with diabetes were in the age range of 30 to 70 years old. In terms of education, 61.4% were illiterate, 31.4% had primary- and secondary-school degrees, and 7.2% had diploma or higher education degrees. 75.6% of these individuals were married and 24.4% had no spouse or they were unmarried. 77.1% of the patients were taking oral medications and 22.9% were using insulin. The average history of diabetes was 8 years.

In total, 71.4% of the patients had a BMI (Body Mass Index) of 25 or higher before the educational intervention. They were also overweight and had obesity rate at grades I, II, and III. Following the educational intervention, 69.6% of overweight and obesity rate in these patients shifted. 69.9% of individuals had a history of diabetes over a 5-year-old period.

31.4% of these individuals had an intense desire to have greasy foods and only 31.6% of them had a strong drive to sugar before their disease. Average fasting blood sugar in patients declined from 257.11 mg/dL before educational intervention to 173.34 mg/dL after educational intervention. Such a difference in mean was statistically significant ($p < 0.001$).

Variances in means for QOL and all of its dimensions (8 groups) before and after intervention are presented in [Table 1](#). The mean and the standard deviation of the total score for QOL increased from 43.7 ± 13.70 before intervention to 57.46 ± 8.97 after educational intervention ($p < 0.001$).

Given the results of Table 1 and according to the paired t-test, there was a significant difference in the variances of means for QOL before and after intervention ($p < 0.001$).

According to [Table 1](#), the means for all dimensions of QOL were relatively desirable before intervention and they increased after it.

Thus, the results revealed a significant difference in all the dimensions of QOL (except for social role functioning) for patients with diabetes compared to their status before intervention.

Table 1. Descriptive indicators of scores for the dimensions of QOL before and after intervention in patients with T2DM in the city of Ilam

Group	Before Intervention	After Intervention	P-Value
QOL Dimensions	Mean \pm Standard deviation	Mean \pm Standard deviation	
Physical functioning	20.91 \pm 48.28	20.38 \pm 61.64	0.001**
Physical role functioning	26.68 \pm 40.35	23.92 \pm 45.01	0.027*
Emotional role functioning	34.66 \pm 35.71	27.32 \pm 59.06	0.001**
Vitality	17.48 \pm 47.42	11.21 \pm 62.21	0.001**
Mental health	15.62 \pm 53.54	13.50 \pm 66.74	0.001**
Social role functioning	11.25 \pm 47.85	9.85 \pm 49.64	0.095
Body pain	20.12 \pm 34.32	16.33 \pm 63.17	0.001**
General health	14.75 \pm 42.25	10.62 \pm 52.38	0.001**
Total	13.70 \pm 43.72	8.97 \pm 57.46	0.001**

* $P < 0.05$; ** $P < 0.01$

Table 2. Determining the relationship between QOL and demographic variables in patients with T2DM

Demographic variables		QOL before intervention		QOL after intervention		p-value
		Mean	Standard deviation	Mean	Standard Deviation	
Age (year)	30-39	47.47	6.16	66.22	4.01	0.001**
	40-49	48.53	11.53	61.68	5.69	0.001**
	50-59	47.77	15.52	60.68	8.82	0.001**
	60-69	37.45	13.47	54.19	8.32	0.001**
	70-79	41.04	12.50	48.84	8.21	0.001**
Gender	Male	45.88	18.24	60.93	9.45	0.019*
	Female	43.13	12.33	56.51	8.68	0.020*
Education	Illiterate	42.81	13.69	55.77	8.92	0.001**
	Primary school	42.13	14.24	57.64	8.50	0.001**
	Secondary school	56.34	14.36	65.07	7.36	0.048*
	Diploma	45.87	7.03	66.78	7.75	0.001**
	University degree	49.03	11.21	69.34	5.99	0.001**
Occupation	Governmental	42.20	4.27	63.61	9.59	0.001**
	Private	63.85	11.48	66.35	5.20	0.055
	Housewife	43.13	12.33	56.51	8.68	0.087
	Unemployed	35.56	15.21	56.87	10.41	0.068
Type of treatment	Insulin	38.76	11.31	57.23	6.51	0.126
	Oral	45.18	14.09	57.52	9.63	0.080
Marital status	Married	44.27	14.12	58.15	8.52	0.198
	Separated or late spouse	43.23	11.85	56.05	10.05	0.198
Total		43.72	13.70	57.46	8.97	0.001**

* $P < 0.05$; ** $P < 0.01$

[Table 2](#) represents the means for intervention and their statistical correlation with demographic variables and QOL before and after paired t-test results. As can be observed, there is

a significant relationship between age, education, gender, and QOL after intervention at the level of $p < 0.05$.

Discussion

In terms of BMI, the results showed that the highest percentage of patients (71.4%) were overweight and obese. Although that the percentage of overweight and obese decreased to 69.6% after intervention, it was not dramatic. The results of this study were consistent with those of Khaledi (70.7%) where in patients had BMIs in the overweight or obese range [22].

There was a significant relationship between BMI and QOL in this study ($p < 0.001$) in a way that as BMI increased, QOL reduced. These findings were in agreement with the results of Lloyd's investigation [23].

The results of this study before educational intervention showed that QOL of diabetic patients was relatively high in all dimensions, while QOL of patients with diabetes in the studies by Glasgow et al [24] and Saeed pour et al. [25] was poor and at a low level.

In this study, QOL in patients with diabetes increased after educational intervention which is statistically significant and could be due to their participation in educational sessions. These findings were in line with previous research studies [26-33] in which education had an effect on QOL.

Moreover; in a study by Fooladvandi (2013), educational intervention improved the mean score of QOL for patients with diabetes from 54.32 ± 14.79 before education to 63.52 ± 14.79 after it ($p < 0.001$) [34].

In a study by Aghamolaei, a significant growth was found in the means for knowledge, physical functioning, mental health, personal control of blood sugar, and weight control; however, there was no significant difference in the social dimension of QOL which was in

agreement with the results of the present study [5].

The results of an investigation by Borhani et al. also demonstrated that participation in educational programs and nutrition counseling as well as increased family supports to patients led to a rise in the social dimension of QOL and patients' assessment of their health status and QOL [27].

QOL is composed of two general domains of physical health and mental health in which the physical health consists of four dimensions of physical functioning, physical role functioning, body pains, and general health perceptions; and mental health includes four dimensions of emotional role functioning, vitality, mental health and social role functioning

In this study, the scores for patients' QOL in the physical functioning domain increased from 165.2 before intervention to 222.2 after it. These scores in the domain of mental health improved from 184.5 before intervention to 238.4 after intervention. According to these findings, the mean scores of physical functioning domain were lower than those of mental health which seemed to be due to the emphasis of this study on the dimension of mental health in patients and educational intervention to change their wrong beliefs and attitudes as well as patients' age and their bodily problems and limitations which had effects on their physical functioning. However, these findings did not match with the results of a study by Zareand Ahmad Abadi [35] in which the scores for mental health domain were reported to be lower than those of physical functioning.

In this study (Table 2), the mean scores of QOL in women before and after the intervention were lower than those obtained by men which was consistent with previous studies [22,31,32] due to the biological and psychological differences between both genders and the high

number of female samples in this study. These findings were not in line with the results obtained by Monjamed, Paymani, and Lloyd in which women obtained higher scores for QOL compared with men [23,31,32].

Furthermore, married participants gained higher scores for QOL compared with Separated or late spouse participants which was consistent with the results of a study by Paymani and Dehghan [31,33] in which married people's lifestyle was at a desirable level.

After the intervention, a significant relationship was also found between QOL in patients with diabetes and their education in a way that QOL in all levels of education improved. It was concluded that as the levels of education increased, patients' knowledge and awareness in terms of prevention from disease complications and self-care as well as proper use of medications also increased and this could improve QOL of patients. These findings were consistent with the results of studies by Glasgow et al. [24], Saeedpour [25], and Borhani [27]; however, no significant relationship between QOL and education was reported in a study by Bagheri [29].

Although there was a significant relationship between occupation and QOL before intervention ($p < 0.02$) in this study, the scores of QOL in employed individuals were higher than those of housewives and unemployed people with an insignificant difference. Borhani [27] in a study reported a significant relationship between occupation and QOL ($p < 0.04$).

In this study, there was no significant relationship between the type of treatment and medical history and QOL.

Moreover, there was a significant inverse relationship between age and QOL according to the findings of this study, so that the scores of QOL decreased as age increased. Tang et al. in 2006 in a research study found that QOL of

elderly patients was at lower levels compared with younger patients [36] but Saeed pour et al. [25] and Jacobson [30] revealed that as age increased, the QOL improved.

Also, the findings of this study showed a significant inverse relationship ($p < 0.001$) between demographic variables and dimensions of QOL, between age and physical functioning (before and after intervention) ($p < 0.001$), and physical role functioning (after intervention) in a way that the scores of these dimensions reduced with age.

There was also a significant relationship between levels of education and physical functioning before the intervention ($p < 0.001$) and after intervention ($p < 0.001$) and physical role- functioning after intervention ($p < 0.001$).

In this study, there was a significant relationship between occupation and vitality before intervention ($p < 0.01$), general health perceptions before intervention ($p < 0.001$), physical role functioning before and after intervention ($p < 0.001$), and emotional role functioning before the intervention ($p < 0.001$). A significant relationship was also found between gender and physical functioning after intervention ($p < 0.001$) and emotional role functioning before intervention ($p < 0.001$).

There was also a significant relationship between physical functioning and age as well as education and the domain of physical role-functioning and occupation and emotional role functioning in Khaledi's study which was consistent with the results of the present study [22].

According to the findings of this study, it was recommended to use given theories and models in health education in a right manner to increase the effectiveness of educational programs in the personal and social dimensions in investigations on QOL. It was also obvious that the more appropriate the theoretical supports

along with basic health needs, the greater the effectiveness of health education programs.

Conclusion

According to the findings of this study, education to patients with T2DM leads to increased means of all dimensions of QOL that reflect the effects of educational interventions on each domain. Furthermore, demographic variables such as age, gender, and education can affect QOL of patients; thus, officials of health education programs and plans are required to pay more attention to these factors.

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