The Quality of Life in Relationship with Glycemic Control in People with Type2 Diabetes

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ABSTRACT

Introduction: Diabetes is a complex disease that affects the quality of patient's life. Numerous studies have shown that quality of life in the people with diabetes is less than in people without diabetes, but, less research are discussed about the relationship between the quality of life and glycemic control. This study aimed to evaluate the health-related quality of life and its relationship with glycemic control in people with type 2 diabetes.

Methods: Cross-sectional research (descriptive - analysis) is used in this study, which included 250 patients with type 2 diabetes in rural health centers. Demographic variables and data were collected via a standard SF-36 questionnaire. Data were analyzed using the descriptive statistics and independent t-test, ANOVA and Pearson correlation coefficient by SPSS v.21 software.

Results: Average Total score of the quality of life of the participants was 58.32±19.62 and men had higher scores than women in all aspects of quality of life. There was no significant relationship among the dimensions of physical, mental, and the quality of life with HbA1C. However, there was a significant relationship between education level and marital status, quality of life and its dimensions ($p > 0.05$).

Conclusion: According to the results of the study, the patients had undesirable situation in the dimensions of physical, mental, and the quality of life, therefore it is recommended that authorities design special planning due to nursing measures in order to prevent or control the side effects as well as consider the programs providing consulting services, improvement of medical and health services, increased social participation and programs that promote the quality of patients' life.

Keywords: Type 2 Diabetes, Quality of Life, Glycemic Control

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Introduction

Despite the development of science and technology in the modern era, societies and the health of communities are faced with the most prominent and important problem, chronic diseases [1]. Diabetes is a common disease in human societies, which, unfortunately, despite advances in medical science, its outbreak is increasing daily instead of decreasing [2]. The prevalence of diabetes in developing countries in the Middle East is increasing. Diabetes is the most common endocrine disease in the world and is responsible for 4 million deaths a year; as at 1985, 30 million people worldwide have been infected with the disease and statistics shows that there are about 230 million people infected with the disease as at 2008 [3,4]. The prevalence of diabetes in Iran was 7.7% in 2005, an approximate of 2 million people and is projected to reach nearly 5.2 million cases in 2025 with the continuation of the current trend [5,6].

Quality of life in diabetic patients is important. Lack of care, lack of glycemic control and the increase of diabetes complications lead to reduced quality of life [7]. Concept of quality of life is today greatly considered due to development of communities and improvement of life health level [8]. Quality of life is a multidimensional concept defined by the World Health Organization as the individual's perception of their position in life, values, goals, standards and the individual interests [9]. The quality of life generally is one of the main goals in the treatment of chronic patients [10]. The diabetic complications affect various aspects of patients' quality of life, including psychological, physical, social, economic, family life and sexual function [11]. Several studies have shown that the quality of life in diabetic patients is less than in non-diabetic patients [12]. The study of Sanchez et al (2005) showed that the quality of life in insulin-dependent diabetes patients is in low level [13]. The results of Pena et al in Madrid showed that in patients who suffer from diabetes, their mental health and quality of life is significantly lower than the control group [14]. Hull et al. in their study, stated that the quality of life is related to the health of diabetics 1, and concluded that the multiplicity of chronic diabetes duties will lead to the creation of negative effects on the quality of life [15].

The results of Moghaddasian et al research (1386) showed that nearly half of the diabetics did not have a good quality of life in social and physical dimensions [16].

The studies showed that one of the very important concepts in chronic diseases such as diabetes is the concept of quality of life, due to the high incidence of diabetes in the world and Iran and a long - term and short - term effects and the high cost for the treatment of its effects [17]. Over the past two decades, studies have shown that the main goal of treatment is not only addressing the physical signs and symptoms of disease, but it should consider the improving of the overall quality of patient's life [18]. Therefore, studying the quality of life in these patients have special importance to provide proper planning according to the results, in order to improve the quality of life of these patients. Although in Iran, many studies have been conducted to determine and identify the quality of life of diabetic patients, few studies have been conducted in relation to the quality of life of diabetic patients by the glycemic Index.

According to the importance of glycemic control in diabetic patients and its relation to the quality of life, as well as the lack of similar studies in the city of Urmia, this study aimed to evaluate health-related quality of life (physical, psychological, social) and its relationship with glycemic control in people with type 2 diabetes.

Methods

Cross-sectional research (descriptive - analysis) is used in this study. According to previous studies, using the formula for estimating sample size for averages with a 95% confidence level, the alpha value of 0.5, S = 35 d = 4.5, the sample size was estimated as 250 people, which included 250 patients with type 2 diabetes from the rural health centers. Cluster random sampling was used in this study as a sampling method, which is done in rural health centers. The samples were selected

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randomly among the type 2 diabetes patients in 10 identified medical centers, and then patients were invited to interview and complete the questionnaires.

Data were collected through interviews and recorded information of the patient's files. So the quality of life questions were completed after explaining the purpose of the research, and satisfaction of diabetics population and tip's of the questioner as a self report questionnaire, and the questionnaires of illiterate patients were completed by health workers of the centers by interviewing. Questions about demographics, glycemic and body mass index will be recorded by health workers from the patient files in the questionnaire.

Inclusion criteria for the study:

1. The quality of life of patients can be affected by affliction with type 2 diabetes at least after 2 years.
2. They shouldn't have any other diseases except diabetes.
3. The samples should be in the age group of35-65 years. Because according to research, the most common age of onset of type 2 diabetes is 40-65 years old.
4. There should be no change in diet or medication intake and have not received specific training on diabetes 3 months prior to the research.
5. It should not exceed a month after the HbA1c test.

Demographic variables data were collected through a standard SF-36 questionnaire, which is a questionnaire to determine the quality of life while the various aspects and factors of the quality of life were taken into consideration and are scored in different ways. It consists of two parts: the first part consists of demographic information including age, gender, occupation and education,. while the second part consists of questions related to quality of life. The questionnaire have 36 words in 8 categories including: physical functioning (10 items), mental health (5 items), social functioning (4 words), physical role (4 items), bodily pain (2 items), emotional role (3 phrase), vitality (4 items), general health (4 words). Due to the validation and translation of the questionnaire by Montazeri et al, in the past studies, there is no need to re-assess the reliability and validity [19]. Cronbach's alpha correlation values (0.86) were obtained.

Data were analyzed using SPSS software version 19. Chi-square test was used to measure the relationship between demographic variables with quality of life and Pearson correlation test was used to evaluate the relationship between quality of life and its dimension with blood glucose. The level of statistical significance was considered as p.value=0.05.

Results

According to the results, demographic characteristics of the population of study are shown in Table 1. A total of 70 and 30% of patients are male and female, respectively. Almost 62% of patients were illiterate, 66.5% were housewife and 76.5% were married. Total score of the quality of life of the participants is 58.3±19.6. In terms of quality of life, physical function (69.7±25.3) and public health (44.6± 13.06) had the highest and the lowest score, respectively (Table 2).

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Table 1. Social and demographic characteristics of subjects

Characteristics	Levels	Number (Percentage)
Gender	Male	78(30)
	Female	182(70)
Education	Illiterate	161(61.9)
	Elementary	55(21.2)
	Guidance school	30(11.5)
	Diploma	11(4.2)
	Academic	3(1.2)
Job	Poulterer	42(16.2)
	Self-employment	24(9.2)
	Employee	2(0.8)
	Housewife	173(66.5)
	Other	19(7.3)
Marital status	Single	12(4.6)
	Married	199(76.5)
	Divorcee	6(2.3)
	Widow	43(16.5)
The term of the identification of diabetes	Less than 2	47(18.1)
	2-5	75(28.8)
	6-9	72(27.7)
	More than 10	66(25.4)
Ethnicity	Azeri	146(56.2)
	Kurd	112(43.1)
	Fars	1(0.4)
	Other	1(0.4)
Type of treatments	Insulin	37(14.2)
	Pill	191(73.5)
	Diet	32(12.3)
Smoking	Yes	23(8.8)
	No	237(91.2)

Table 2. The Mean (SD) of Quality of Life in Resolution of Dimensions and Whole in Type 2 Diabetic Patients

Indexes of quality of life	Mean and Standard deviation (SD)
General Health	44.63±13.06
Physical function	69.71±25.28
Physical role	53.27+-39.47
Emotional role	61.66+-41.99
Social function	65.14±24.79
Pain	56.53±25.39
Vitality	55.03±17.69
Mental health	60.55±17.64
Total	58.32±19.62

According to the results in Table 3, there was a significant relationship between level of education and quality of life and its dimensions (p = 0.000), such that by increasing the level of education, the quality of life will increase.

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Table 3. The correlation between demographic characteristics of patients and quality of life and its dimensions

Variable	Levels	General health	Physical function	Physical role	Emotional role	Social function	Pain	Vitality	Mental health	Total
	Illiterate	42.1±12.9	62.7±26.3	43.6±39.6	54.4±43.2	59.6±24.5	49.6±25.1	50.8±16.1	57.4±16.5	52.56±19.3
	Elementary	48±12.4	78.2±18.8	60.4±36.8	69.1±41.5	71.4±24.2	65.4±20.2	61.4±18.1	67.2±17.5	65.15±17.40
	Guidance school45±15	51.5±11.1	83.3±19.4	80.8±25.1	83.3±27.3	79.5±16.3	67.1±21.8	64.5±13.9	64±16.8	71.77±11.72
Education	Diploma51.6±5.7		85.9±16.4	75±33.5	69.6±37.8	76.1±30.3	73.8±27.1	57.7±29.2	62.5±27.1	68.23±21.46
	Academic		91.6±5.7	83.3±14.4	66.6±33.3	62.5±0	91.6±7.2	58.3±2.8	61.3±11.5	70.892±4.64
	P value P=.001		P=.000	P=.000	P=.004	P=.000	P=.000	P=.000	P=.007	P=.000
	Male	46.6±13.1	78.1±23.8	57.3±39.3	64.9±42.9	72.2±24.5	64.5±24.6	57.5±16.1	62.4±16.4	62.98±18.29
Gender	Female	43.7±12.9	66.1±25.1	51.5±39.5	60.25±41	62.1±24.3	53.1±24.9	53.9±18.3	59.7±18.1	56.32±19.87
	P value	P=.112	P=.000	P=.272	P=.409	P=.002	P=.001	P=.142	P=.268	P=.012
	Poulterer	44.8±13.2	72.1±29.6	56.5±39.4	61.6±41.9	69.9±25.1	63.1±26.9	56.2±11.4	63.6±13.8	61.22±19.23
	Self-employment	44.3±12.4	86.4±11.5	62.5±38.3	63.4±45.8	70.8±23.2	68.7±21.1	54.3±20.5	57.3±20.1	64.25±17.85
	Employee	55±0	95±0	75±0	69.4±41	62.5±0	87.5±0	60±0	68±0	73.29±2.94
job	Housewife	43.9±13.1	66.1±24.2	50.1±39.7	60.5±41.4	62.1±24.1	52.9±24.3	53.8±17.9	59.6±17.7	56.14±19.35
	Other	49.7±12.7	73.6±28.4	60.5±39.3	56.1±41.6	75.6±29	55.9±29.8	63.4±22.5	65.6±21	62.59±23.55
	P value	P=.322	P=.002	P=.416	P=.757	P=.061	P=.005	P=.251	P=.341	P=.120
	Single	36.6±12.8	72.5±19.9	47.9±43.2	36.1±36.1	62.5±27.6	61.4±22.8	44.5±21.5	44±15.1	50.71±14.39
	Married	46.6±12.7	73.3±23.4	57.2±39.2	66.6±41.3	67.7±24.1	59.7±24.5	57.1±16.3	61.9±17.3	61.32±18.79
Marital status	Divorcee	45.8±10.6	79.1±19.1	70.8±24.5	77.7±27.2	75±28.5	68.7±28.2	58.3±25.8	63.3±25.8	67.37±20.43
	Widow	37.3±11.4	50.6±27.2	33.7±35.7	43.4±41.4	52.3±23.1	38.3±21.8	48.1±19.2	58.3±16.4	45.28±18.97
	P value	P=.000	P=.000	P=.003	P=.0001	P=.002	P=.000	P=.003	P=.005	P=.000

Despite the lack of a significant relationship between gender and the total score of the quality of life of patients (p = 0.012), there is a significant relationship between the sexuality and some aspects of quality of life (physical function (p = 0.000), social functioning (p = 0.002) and pain (p = 0.001)). Also, there were significant relationships between jobs and aspects of physical function of patients (p = 0.002) and their pain (p = 0.005). There was a significant relationship in terms of marital status between total score of the quality of life of patients (p = 0.000) and all aspects by marital status, while there was no significant correlation between the type of treatment and quality of life.

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The relationship between quality of life and its dimensions was investigated using Pearson test. The results showed that there was no significant correlation between quality of life and its subscales based on the SF-36 questionnaire with blood sugar control which indicated that with increase of the quality of life, blood sugar control in diabetic patients did not increase.

Table 4. The correlation between the dimensions of life and HbA1C in studied diabetic patients

Indexes of quality of life	HbA1C	
	Correlation coefficient (r)	P value
General Health	-0.024	0.84
Physical function	-0.021	0.81
Physical role	-0.018	0.80
Emotional role	-0.014	0.55
Social function	-0.017	0.59
Pain	-0.028	0.73
Vitality	-0.019	0.64
Mental health	-0.011	0.51
Total	-0.027	0.66

Discussion

Diabetes is one of the most common and important metabolic disease in the world and is one of the major causes of death in most societies. The results of the study indicate that an overall score of the quality of life of the participants is 58.3 ± 19.6. Also, in terms of quality of life dimensions, the physical function (69.7 ± 25.3) and public health (44.6± 13.06) have the highest and lowest score, respectively. This is in line with the study of Aryan et al [20], in which the lowest and highest score was the score of general health and physical functioning, respectively. However, in the research of Montazeri et al[19], the lowest score was related to the scale of emotional role, and the highest scores on physical performance. It seems that public health of patients has been more negatively affected. In terms of education and occupation, most of the patients were illiterate and housewives which is consistent with the study of Bagust et al [21]. The results showed that between sex and quality of life in all eight dimensions, the women obtained lower scores in comparison with men, considering the fundamental role of education in the treatment of diabetes and its effect on the quality of life. With regard to the study of Ghasemi et al., it can be concluded that low level of education among women compared to men, is the reason of low social support about diabetes, healthy diet and appropriate treatment [22]. Also, low levels of quality of life in women compared to men may be due to more attention of women to health symptoms and deficits. In addition, limited physical activity of women and their response in the face of adverse events and the arrival of menopause are also factors contributing to the differences in the quality of life between men and women [23]. The results of this study showed that there is a significant relationship between marital status and all aspects of quality of life. Zareipour et al. in their research showed that successful marriage may improve compatibility with the disease conditions. The support from the patient's spouse is the most important source of support of the individuals during the disease phases [24]. The results show that there is a significant relationship between educational attainment and all aspects of quality of life. It seems that, the quality of life will improve by increasing levels of education.

This can be due to the increased awareness on the importance of diet and exercise as well as proper metabolic control, proper use of drugs and control of other factors affecting the risk of chronic diabetes. In fact, higher education levels cause increase economic, social and political participation, and subsequently quality of life, too. Education is one of the important factors affecting the quality of life which directly or indirectly affect

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the quality of life through social class and income. In the scrutinizing of jobs and all eight dimensions of quality of life except the social function, employees had a higher score rather than other business groups. Considering the fact that people with specific occupation are involved in a string of job activities and are associated with participation in different social environments with various people more than those who have no job, occupation can affect their health [23].

The results showed that there is a significant correlation between identifying the disease and physical function, emotional disorders, social function, pain and quality of life. If the identification of diabetes is less, diabetic patients will have higher quality of life. Madigan et al's results are consistent with the findings of this research [25]. Ahmadi et al's research results in the province of Chahar Mahal Bakhtiari showed that diabetes imposition and duration of the disease have greatest impact on quality of life. If a long time from the diagnosis and disposition to of diabetes has passed, it would have more effect on the quality of life [26]. The findings of this study show that there is no significant correlation between quality of life (based on SF-36 questionnaire) and HbA1c. Pitale et al. indicated that there was no significant relationship between quality of life scales (SF-36) with HbA1c levels in patients with type 2 diabetes [27]. However, the study of Santhanam et al., showed the inconsistent results, such that blood glucose levels were associated with quality of life and increase in the HbA1c reduced the quality of life, i.e. the quality of life among patients with type 2 diabetes increased with the control and reduction of HbA1c [10]. Finally, there were no significant changes in health status on standard treatment groups, and on the other hand, there was no significant difference between two groups. Therefore, intensive glycemic controls in type 2 diabetes have no impact on people's health and also the reducing the glycemic control does not improve health-related quality of life [26]. The study of Li et al (2009) showed that, there was no significant correlation between the scales of quality of life SF-36 by indicators of diabetes control (HbA1c) in patients with type 2 diabetes [28]. We can say that diabetes like any other disease or chronic condition reduces quality of life by affecting different aspects of life. Obtained differences in the present study compared to the results of other studies in other countries suggest that, it is necessary to take into consideration some factors in the medical recommendations - and planning health care for diabetic patients, such as the type of diabetes, type of treatment etc., in order to improve the self-care behaviors, monitor and better control of diabetes and improve the quality of life of the patients.

Medical staff who are dealing with diabetics should pay attention to the fact that laboratory indices such as a HbA1c and blood sugar don't necessarily have direct relationship with the quality of life and these criteria cannot represent the physical and mental tangible feeling among patients, except that they only represent the criteria to guess the quality of treatment.Sometimes, excessive stress causes extreme physical and mental burden on the patient which will reduce their quality of life.

Conclusion

The results showed that there was no significant relationship among the dimensions of physical, mental, and quality of life with HbA1C, but some of the health-related scales of quality of life had a significant relationship with blood sugar, so it is proposed that in order to improve the quality of life among diabetic patients, some factors should be kept under observation such as social and economic support, lifestyle, attitudes, self-care program, improve medical and health services, and providing consulting services.

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Conflict of Interest

None declared by authors.

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