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Original Article

Diabetes mellitus and quality of life: results of Yazd health study

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ABSTRACT

Background & Aim: Today, quality of life has attracted more attention and there is a relationship between disease and quality of life. This study was conducted to evaluate the quality of life in diabetics and non-diabetics and other demographic variables related to the quality of life of individuals.
Methods & Materials: This cross-sectional study was carried out on a random sample of 7533 subjects, using the Health Survey data in Yazd. For assessing the quality of life, SF8 questionnaire was used. Data were analyzed by using, t-test and linear regression model in $SPSS_{19}$.
Results: There were, significantly different between quality of life in diabetics and non-diabetics individual, and this relationship can be generalized to the subscales of quality of life($P<0.001$). It has shown that becoming old, being female and being single were associated with decreasing quality of life, and increasing the level of education and having assurance had a significant role in improving the quality of life($p<0.05$).
Conclusion: Since diabetic patient had lower quality of life than non-diabetics. It is suggested, to promote the quality of life of patients, health authorities should plan the solutions for supporting and promoting patients with diabetes` health.

Introduction:

Diabetes mellitus (DM) is the most common endocrine disease in the world and is responsible for 4 million deaths per year. Overall, 9% of all deaths in the world caused by DM. DM cases will rise from 285 million in 2010 to 439 million in 2030 (54% growth). Globally, 371 million people and more than 4.4 million peoples in Iran are living with diabetes [(1)]. Prevalence of diabetes in Iran is third highest among the countries of the Middle East and North Africa. The prevalence of diabetes is not the same in different parts of the world. In developed countries most diabetics are older than 65 years old, however in developing countries the prevalence is higher among middle aged population[(2)]. Prevalence of diabetes in Yazd province, which is located in central of Iran, is 16.3% ranked first in Iran, also 22% of the Iranian population over 40 years of age have diabetes[(3, 4)]. In a study conducted in 2011 in Iran, 35.1% increase in the prevalence of diabetes was reported[(5)]. Underlying causes of increase in DM, consisted of obesity, due to urbanization and aging population, so that is more dramatic in developing countries, including Iran [(6)].Sedentary lifestyle and poor diet, obesity, low physical

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activity, smoking and blood pressure are modifiable risk factors of DM. In addition to these factors, uncontrollable factors such as age and sex are effective in diabetes [7]. Diabetes in all its forms imposes costs in human, social and economic conditions in all countries and all income levels. Patients with diabetes are more than other people at risk of complications such as ocular disorders, cardiovascular disease, amputation and kidney failure [8]. Quality of life score can be used for general assessment of individuals and community health. Somehow the quality of life indicates status of people living in a country or region and individual understanding of their position in life that are linked to their goals and expectations [9]. Determinants of quality of life are factors including health, political stability and security, family life, community life, climate and geography, job security, political freedom and material[10]. Population health has been affected due to rising living standards, advances in public health and medical care and thus satisfaction, in various aspects of human life. Indicators of quality of life among 194 countries have been assessed on an annual basis. According to the human development index (HDI) 2007-2008 published by the United Nation's Development Program, countries with HDI values in the range of 0.5-0.8 had been categorized in the middle level of human development. Iran with a score of 0.759 had been in the medium human development level[11]. According to the quality of life in Iranian provinces, life index of each province have been studied in three states, these include economic, environmental and social factors. During the rankings, it has been observed that the provinces of East Azerbaijan, Khuzestan and Tehran have had the highest quality of life index and the provinces of Bushehr, Hamedan and Yazd, had the lowest score[12]. Many studies have worked on the quality of life in patients with diabetes and had shown that these patients had low quality of life [13, 14]. Few studies investigate the association between diabetes and quality of life, including in central of Iran, Yazd and compare with general population. This study examined the quality of life in diabetics and non-diabetics and other demographic variables related to the quality of life of individuals. The results of this study can be used by health authorities to plan appropriate interventions, to increase the quality of life of general population and patients and reduce complications of DM in the population.

Methods:

This study was conducted on a random sample of 7533 men and women using the Health Survey data in Yazd during the years 2014-2015(YaHS). Yazd health study (YaHS) has been the most comprehensive study on the health and disease community in Yazd province. In this study, people were questioned about various aspects of physical and mental health in Yazd. The population of this study is people in age range of 20-70 years old in Yazd city and the sample size of this study is 7533 people. The subjects are from 5 age groups: 20-29, 30-39, 40-49, 50-59 years, and 60-69 years old. The sampling method is based on population and is a two stage clustering. In the first stage, 200 clusters were randomly selected from the regions of Yazd city. At the next stage, according to the list of households in 2014, the clusters were selected. Then, by moving from the right of the cluster computer letters response was completed. The choice of the next household was at the distance of one house from the first house, if there were several households on the same plaque (for example, an apartment), the information was collected from the first unit and was continuously referred to the subsequent units. We took an informed consent before participating in the study. The tool used to collect information was using a Yazd health questionnaire and interviews. The questionnaire includes some question such as quality of life and underlying variables: age, sex, level of education and ...) The questions of this questionnaire were designed with the participation and interaction of all university faculties and research centers. After several consecutive sessions, consultation with the professors, necessary amendments carried out and the validity of the questionnaire was confirmed. To determine the reliability of the questionnaire, a pilot study was done. 200 people from Yazd were randomly selected and 0.8 Cronbach's alpha was obtained. Finally, a final questionnaire was developed. Questions of quality of life section of Yazd people's health survey is based on standard form 8 (SF8questionnaire). SF8 includes 8 scales

(general health, physical functioning, physical pain, vitality, social function, mental health and emotional role); SF8 is a general measure of quality of life that can measure and compare quality of life across a wide range of different groups of patients or healthy people. Validity and reliability of this questionnaire have been confirmed[15]. According to a study conducted by ware j[16] and colleagues in the field of ranking and reviewing the SF8 questionnaire, the score for each question is zero to one hundred and the score for each dimension of quality of life is zero to one hundred. Parametric test, t-test was used in this study. Value less than 0.05 was considered as a significant level. Also, to investigate the relationship between other demographic variables on quality of life and interaction between diabetes and demographic variables regression model was used. P value less than 0.05 was considered as a significant level and data was analyzed using $SPSS_{19}$ software.

Results:

In this study, a total of 7533 subjects, including 49.7% males and 50.3% females, were studied. From them, there was 1146 diabetic patients (15.2%) and 6387 non-diabetic patients (84.8%). The demographic characteristic of two study groups shows in Table 1.

Table 1: *Demographic characteristic of two study groups*

		Diabetics		Non-diabetics	
Characteristic		**frequency**	**Valid percentage%**	**frequency**	**Valid percentage%**
Age	20-29	23	2.19	1441	22.79
	30-39	51	4.87	1416	22.4
	40-49	144	13.76	1402	22.19
	50-59	338	32.31	1122	17.75
	60-69	490	46.87	940	14.87
Sex	Male	452	43.22	3205	50.7
	Female	594	56.78	3116	49.3
Marital status	Single	19	1.81	765	12.1
	Married	929	88.83	5335	84.4
	Widowed	97	9.27	183	2.9
	Divorced	1	0.09	38	0.6
Education	primary school and below	544	52	1515	23.96
	High School	291	27.82	1751	27.73
	Diploma	157	15	1963	31.05
	Masters	48	4.58	902	14.26
	Doctorate	6	0.6	190	3

The mean score of quality of life in the patients with diabetes was 21.3±17.3 and in the group with no diabetes was 31.2±19.7and was significantly different. Mean values on subscales and summary components of the SF8 according to diabetic status shows in table 2.

Table 2: *Mean and standard deviation values of quality of life and it`s subscales of the SF8 according to diabetic status.*

Dimensions of quality of life		M±SD
Physical function*	Diabetics	17.5±23.7
	Non-diabetics	30.8±27.5
Limitation due to physical* problem	Diabetics	16.2±22.7
	Non-diabetics	27.8±27.3
Physical pain*	Diabetics	24.4±25.9
	Non-diabetics	36.8±27.8
general health*	Diabetics	29.3±21.6
	Non-diabetics	39.6±22.9
Vitality*	Diabetics	30.7±23.6
	Non-diabetics	41.1±23
Social Performance*	Diabetics	14.5±21.6
	Non-diabetics	22.3±25.1
Emotional performance*	Diabetics	16.5±21.7
	Non-diabetics	24.9±25.8
Mental health*	Diabetics	21.2±26.6
	Non-diabetics	26.05±27.4
Total quality of life*	Diabetics	21.3±17.3
	Non-diabetics	31.2±19.7

*P<0.05

Also quality of life in diabetics and non-diabetics individual was significantly different, and this relationship can be generalized to the subscales of quality of life(P<0.001).

Relationship between quality of life and demographic variables in subjects under study shows in table 3 and 4.

Table 3: *Relationship between quality of life and demographic variables in non-diabetics*

Variables	Unstandardized Coefficients		Sig.	95.0% Confidence Interval for B	
	B	Std. Error		Lower Bound	Upper Bound
Age	2.484	.608	.000	1.292	3.677
Sex	7.317	1.251	.000	4.861	9.773
Level of education	-2.080	.707	.003	-3.468	-.692
Family number	.562	.427	.189	-.276	1.400
Marriage status	8.495	3.515	.016	1.598	15.392
BMI	-.106	.470	.822	-1.028	.817
job	.967	.610	.113	-.230	2.164
Assurance	-1.020	.384	.008	-1.773	-.266

*P<0.05

Table 4. *Relationship between quality of life and demographic variables in diabetics*

Variables	Unstandardized Coefficients		Sig.	95.0% Confidence Interval for B	
	B	Std. Error		Lower Bound	Upper Bound
Age	2.542	.208	.000	2.135	2.950
Sex	5.175	.466	.000	4.261	6.089
Level of education	-1.765	.250	.000	-2.254	-1.275
Family number	-.458	.168	.063	-.787	-.129
Marriage status	2.962	.744	.000	1.504	4.419
BMI	-.178	.212	.400	-.594	.237
job	.109	.250	.664	-.382	.599
Assurance	.117	.126	.035	-.129	.363

*P<0.05

It has shown that becoming old, being female and being single were associated with decreasing quality of life and increasing the level of education and having assurance had a significant role in improving the quality of life. In this study in two groups studie diabetic and non-diabetic patient who had assurance had better quality of life

Discussion:

This study showed that the quality of life in diabetics and non-diabetics was significantly different, and this relationship can be generalized to the subscales of quality of life. So that people with diabetes had lower scores in terms of quality of life than non-diabetics. In general, people with diabetes had lower scores in both general physical and mental aspects of quality of life than non-diabetics. Such studies also confirm our findings[17, 18]. People with diabetes face many physical, psychological and social problems that can lead to a decline in their quality of life. Diabetes mellitus complications can also reduce the quality of life of affected people. Diabetes mellitus treatments, such as insulin use, nutritional limitations in the daily lives of patients can reduce their quality of life. Contrary to our study, such studies have also shown that there is no significant relationship between quality of life scores in different subscales in the two study groups[19]. Also this research revealed more quality of life scores in men. Overall, women have a lower quality of life than men in this study; that may be related to lifestyle of women in Yazd. Most studies have showed as well; Even, such studies explain differences among anti-diabetes treatments between men and women[19, 20]; so that men had lower QOL score than women which was contradict with this study [21]. People whom married, had better quality of life, it was found that single people with diabetes also had lower quality of life which was statistically significant. Probably, better inhibition of the disease and its complications by patient due to emotional support from their family, can be substantial reason for this. Mohammadi Also confirms these findings[22]. However, other studies in different cultures reported higher quality of life for single people[21]. Individuals with higher education had better quality of life. It was found that people with higher education, although having diabetes, have a better quality of life and diabetes, have a negative effect on the quality of life of people with low levels of education. This result of our study was consistent with other studies[19, 23, 24] Probably it may be because of their jobs, social condition and awareness about the disease and its preventive way, but other studies have indicate an inverse significant relationship between level of education and quality of life[25]. Increasing age had lower the quality of life in our study similar to other studies[26][26]. The quality of life starts to reduce with aging from age 40 years which may be due to physical, emotional and self-care limitations or chronic complications of Non-Communicable Diseases (NCDs) [23] [23]. Also in this study in two groups studies diabetic and non-diabetic patient who had assurance had better quality of life, it can be related to high treatment cost that impose to individuals.

There were some limitations in this study. The definition of diabetes in our study was based on the self-declaration of individuals. The main

limitation of our study was its cross sectional design, it was impossible to show the cause-effect relationship; which just measure association not causation; Nevertheless, our study also had some advantages. This study was one of a large population-based study using appropriate sampling methods. Therefore, the least bias was expected.

Conclusion:

Present study displayed the lower quality of life in patients with diabetes than non-diabetics. It is suggested, for promote the quality of life of this patient, health authorities should plan the solutions for supporting and promoting patients with diabetes` health. This planning could be including: appropriate diabetic care such as self-care and health education, family education, blood glucose management, mental and social support etc. Also for conducting more subsequent studies, it was suggested the research about the impact of suitable methods in promotion of all aspects of health in patients with diabetes.

Conflicts of interest:

The authors declare that they have no conflicts of interest.

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