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# **Research Article**

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# Evaluation of quality of life among type 2 diabetes patients

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#### **ABSTRACT**

Background: Quality of life (QOL) is an essential part of health outcomes for diabetes patients.

**Methods:** This cross-sectional study aimed to evaluate the quality of life among 100 Iranian type 2 diabetes patients aged 37 to 66 years, attending the outpatient diabetes clinic at Golestan Hospital, Ahvaz, Iran, from August to October 2013. Diabetes quality of life (DQoL) questionnaire was used to determine quality of life of diabetes patients. Body weight, height, waist circumference, clinical parameters, including glycated hemoglobin A1c level (HbA1c) were also measured.

**Results:** The mean age of men and women was  $56\pm6.1$  and  $53.4\pm6.7$  years respectively. Sixty one present of patients were female and 39 % were male with  $4.05\pm1.4$  mean years duration of diabetes. The mean total DQOL was  $54.6\pm2.4$ , a moderate quality of life and was associated with diabetes care and treatment adherence. The mean for diabetes-related worry was  $77.5\pm7.05$ .

**Conclusions:** Male diabetic patients in comparison with female diabetic patients, non-insulin-treated patients compared with insulin-treated patients had better quality of life. HbA1c higher than 7%, was associated with higher probabilities of worse quality of life among patients. More studies are needed to include larger study populations among Iranian type 2 diabetes patients in order to help health care providers develop proper health care programs for diabetic patients in Iran.

Keywords: Type 2 diabetes, Quality of life, Iran

## INTRODUCTION

Type 2 diabetes is a chronic illness associated with high rates of comorbidity and mortality. Diabetes is a serious health problem worldwide with increasing number of patients at risk for complications related to diabetes. The prevalence of diabetes is rising due to the changes in lifestyle. The prevalence of diabetes is rising due to the changes in lifestyle.

Type 2 diabetes was the fourth leading cause of death globally based on the report by the International Diabetes Federation.<sup>6</sup> Due to the high prevalence and

complications, diabetes is a serious health problem in the Middle East and Persian Golf regions. The strike in prevalence of type 2 diabetes is even more distressing with increased occurrence among young adults. People in Asia are extremely at risk of diabetes. Compared to western counterparts, due to the changes in the life style pattern and white rice intake. Almost 2 million adults of the Iranian people have diabetes and has been indicated that the incidence to be 7.3% - 7.7% among people over the age of 30 years. 11,12

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Diabetes has a strong influence on the quality of life (QOL) which has a multidimensional perception, such as social, physical and role functioning, worries about the future, emotional and general well-being. <sup>13</sup> Majority of diabetes patients have negative emotional feelings such as frustration and loneliness due to the diabetes. <sup>14</sup>

Several demographic and psychosocial factors which have effects on QOL are age, gender, complications of diabetes, treatment and duration of diabetes. <sup>15</sup> In the concept of psychosocial, several surveys have revealed that social support, self-care activities, knowledge about diabetes, sadness, worry, stress and social support were related to QOL. <sup>16,17</sup>

There is evidence that the effect of disease management, need to be assessed in the concept of patients' QoL. <sup>18</sup> Enhanced QOL in diabetic patients is related to better income, social support, education and exercises without any complications. <sup>18,19</sup> It has been demonstrated that patients' QOL and satisfaction are related to treatment, improved after good glycemic control and better quality of physical activity and diet. <sup>20</sup> It is now believed that a good medical care and self-care practices can suspend complications and improve the QOL among patients. <sup>21</sup>

While the HRQOL of diabetic patients in Iran is one of the most important outcome measures, there are limited studies that evaluated the quality of people with diabetes in southwest of Iran. <sup>22,23</sup> In order to fill the gap in this area, this study was carried out to assess the QOL among type 2 diabetes patients in southwest of Iran and to determine which socio-demographic and clinical characteristics are related with better QOL.

## **METHODS**

This cross-sectional study was carried out to evaluate the QOL among 100 Iranian type 2 diabetes patients attending the diabetes clinic at Golestan hospital in Ahvaz a city, in southwest of Iran during the study period of August to October 2013. Patients were recruited through non-probability sampling method. The study population comprised of all the patients aged above 30 years, diagnosed with type 2 diabetes mellitus with duration of diabetes more than a year and visiting the hospital for follow-up care. After receiving approval from the Ethics Committee of National University of Malaysia (UKM), data was carried out by a face-to-face interview with patients. Only the patients who met the inclusion criteria and signed consent form were recruited to participate in this study.

The Diabetes quality of life (DQoL) questionnaire was used to evaluate HRQOL for type-2 diabetes. <sup>24,25</sup> This instrument remains the most widely used instrument for the assessment of diabetes-specific HRQoL. It evaluates the relative problems of a severe diabetes treatment procedure. There are 46 core items and four major dimensions: treatment satisfaction and impact worry

about long-term complications and social/vocational issues. The scores of all items were summed to give a total scale score as a grand measure score, which ranged from 15-75. All items are scored on a five-point Likert scale, ranging from 1 (very satisfied) to 5 (very dissatisfied) in satisfaction domain, and from 1 (never) to 5 (all the time) in impact and worry domains.

Domain scores were calculated though summing answers to all items in the domains. The raw score is translated into a 100 point scale where zero represents the lowest possible QOL, and 100 represent the highest possible QOL. The score of the treatment satisfaction component could range from 0 to 75, while the score of the treatment impact component could range from 0 to 100. The total DQoL score, which could range from 9 to 175, was determined by summing the raw scores of the two components. Higher scores suggest a more positive QOL.

It has three diabetes-specific subscales: impact, satisfaction and worry. High scores on the satisfaction scale associate with high levels of satisfaction with social and physical functioning; high scores on the impact scale reveal the low frequency of adverse events related to diabetes; high scores on the worry scale show that the patients worry about the impact of diabetes on their social and physical functioning. An Iranian version of the DQOL questionnaire has been translated and validated among Iranian type 2 diabetic patients.<sup>26</sup>

#### Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS Inc, Chicago, IL, USA) computer software version 20.0. The descriptive data were expressed as mean, standard deviation, frequency and range. One-way analysis of variance (ANOVA), independent t-tests was used in this study. The level for significance was p < 0.05 for all tests.

## **RESULTS**

Socio-demographic and clinical characteristics of the diabetic patients are presented in Table 1. The mean age of the patients (61 female, 39 male) was  $53.4\pm6.7$ and  $56\pm6.1$  years. Most patients were female, married, living with their families, had family history of diabetes mellitus, poor glycemic control and low level of education.

Table 2 shows the key determinants of DQoL in Iranian type 2 diabetic patients. The type 2 diabetes patients were found to be moderately satisfied with their management and current treatment of diabetes and highly worried about diabetes. Male diabetes patients had a significantly higher QOL score compared to female diabetes patients. Table 3 shows that non-insulin treated type 2 diabetes patients and those who have hemoglobin A1c level (HbA1c) less than 7% had reported significantly better overall DQoL. Patients with HbA1c less than 7 had

significantly higher glycemic control satisfaction score. The scores of all DQOL dimensions for all patients are defined in Table 4.

Table 1: Socio-demographic and clinical characteristics of Iranian type 2 diabetes patients (n=100).

Demographic Characteristics	(n=100)
Age (years)	
30-40	5
41-50	23
51-60	46
61-70	26
Gender	
Male	39
Female	61
Marital status	
Married	89
Widowed	11
Education status	
Illiterate	27
Primary school	41
High school	32
Living status	
With family	96
Alone	4
Family history of diabetes	
Yes	68
No	32
Body Mass Index (kg/m2)	
<25	10
≥25	90
Glycated hemoglobin (%)	
≤7	53
>7	47
Treatment of diabetes	
Oral hypoglycemic drugs	61
Insulin	39
Microvascular complications	
Retinopathy	24
Neuropathy	12
Nephropathy	13
No complication	51

## **DISCUSSION**

The prevalence of diabetes is rising steadily in Iran due to population growth, obesity, aging, urbanization and sedentary lifestyle. <sup>27</sup> This cross-sectional study was conducted with the aim of evaluating QOL among Iranian type 2 diabetes patients in Ahvaz, Iran. The results suggest that diabetes mellitus has a strong influence on the subjects QOL.

Table 2: QOL of type 2 diabetes patients based on demographic characteristics (n=100).

Socio- demographics characteristics	Satisfaction Mean± SD		Total DQOL ie Mean± SD	P- value	
Age					
≤50	55.3±2.1	0.327	54.4±1.9	0.993	
>50	54.5±4.05	0.327	54.4±3.2		
Gender					
Males	55.2±2.4	0.258	55.5±2.2	0.002*	
Females	$54.4 \pm 4.2$	0.236	53.7±3.05	0.002**	
Marital status					
Married	54.6±3.8		54.5±3		
Spouse passed away	55.6±1.5	0.428	53.9±2.09	0.512	
Education					
Illiterate	54.6±1.9		54.8±1.6		
Primary school	55.4±2.3	0.313	54.2±2.1	0.713	
High school	54.1±5.5		54.3±4.3		
Living status					
With family	55.8±2.1	0.555	55.09±2.8	0.656	
Alone	54.7±3.6	0.557	54.4±2.9	0.656	
Family history of diabetes					
Yes	54.5±4.07	0.270	54.1±3.2	0.199	
No	55.2±2.3	0.370	54.9±2.05	0.199	

\*P<0.05 shows the significant mean differences in QoL score between groups. Values are resulted from independent t-test and One-way analysis of variance (ANOVA).

Table 3: QOL of type 2 diabetes patients based on clinical characteristics (n=100).

Socio- demographics characteristics	Satisfaction Mean± SD	P- value	Total DQOL Mean± SD	P- value	
Duration					
<5 years	54.7±3.9	0.939	54.5±3.0	0.556	
≥5 years	54.8±2.0	0.939	54.1±2.0	0.556	
Body mass index					
<25	55.5±1.7	0.513	54.1±1.4	0.692	
≥25	54.7±3.7	0.313	54.4±3.0		
Complications					
None	54.9±2.0	0.250	54.3±1.7	0.245	
Neuropathy	55.6±2.2		55.9±1.6		
Retinopathy	54.9±2.1	0.350	54.3±2.3		
Nephropathy	53.2±8.6		53.6±6.4		
Treatment					
Oral hypoglycemic agents	55.5±2.2	0.010*	55.4±1.8	0.000*	
Insulin	53.6±4.9		52.8±3.5		
Glycated hemoglobin					
≤7	54.8±4.6	0.025	55.3±3.4	0.001*	
>7	54.7±1.9	0.935	53.3±1.7	0.001	

\*P<0.05 shows the significant mean differences in QoL score between groups. Values are resulted from independent t-test and One-way analysis of variance (ANOVA).

Table 4: QOL of Iranian type 2 diabetic patients measured by DQOL (n=100).

DQol (Diabetes QOL)	Optimal range	Actual Range	Mean ±SD
Impact of treatment	0-100	36.25 - 66.25	57.7±3.9
Worry in Total	0-100	38.39- 59.82	50.8±4.2
Diabetes- related worry	0-100	56.25- 87.50	77.5 ±7.05
Social/ vocational worry	0-100	14.2- 35.7	24.07± 5.3
Satisfaction	0-75	51.6- 73.3	55.2 ±2.7
Total DQOL	9-175	49.3- 60.08	54.6± 2.04

For evaluation of diabetes care, it is necessary to determine the impact of diabetes on QOL. It gives us not only information about patients' experience of living with diabetes, but also shows us ways in which we can improve diabetes care. The mean total QOL score was 54.6±2.04 which represent moderate level. This result is similar with study conducted in Saudi Arabia, which reported an overall QOL of mild to moderate range. 1.28

The population of female diabetes patients (61%) was more than male (39%) in this study. This is perhaps due to the higher population of female patients in the hospital in comparison with males. The statement by the World Health Organization (WHO) in 2008 established that the lifetime risk of developing diabetes is expected to be 33% for males and 39% for females. This may describe the higher prevalence of Type 2 diabetes among the female patients.<sup>29</sup>

Numerous demographic and psychosocial determinants affect QOL of diabetics. Some demographic variables associated with QOL in diabetes patients parallel with those in the general population. Specifically, men seem to report better QOL than women; It was stated that women with diabetes appeared to have more depression and anxiety, worse HRQOL and lower scores for general and mental well-being than men and their anxiety scores correlated with more overweight. Similar results have been found in this study.

In addition, it is revealed that diabetes patients face different challenges in the management of diabetes. Increasing age seems to be associated with decrements in some domains of functioning and well-being; and those with more education or income generally report better QOL. 33 Similar results were stated in a review of HRQoL studies among diabetic patients in Nordic countries in which diabetes had a negative impact on HRQoL and being in older age, having diabetes—related complications, lower socio-economic status and being female were related with lower HRQoL. 15

It has also been reported in a Systematic review that diabetic patients had a lower HRQoL than healthy people and those with better socio-economic status and better control of cardiovascular risk factors had better health related QOL.<sup>34</sup>

In the present study, female diabetes patients had lower levels of QOL and mental well-being compared with male patients. Meanwhile, poor glycemic control (PGC) was more prevalent in men than in women. This finding was in agreement with the results of a previous study. 33,3 There were significant differences between OOL of type 2 diabetes patients with HbA1c > 7% and those with HbA1c lower than 7 %. This is consistent with previous reported results among diabetes patients in Turkey, where higher HbA1c levels were negatively related to DQoL and patients with higher HbA1c levels were less satisfied with the treatment. <sup>36-37</sup> In addition, male diabetes patients had better QOL in comparison with women and noninsulin treated patients had better QOL compare to insulin treated patients. Similarly, this result was revealed in a study among diabetes patients in Oman.<sup>38</sup> Patient education improves self-management of diabetes and diabetic care. A randomized controlled study reported that better education of type 2 diabetes patients leads to better knowledge, problem solving ability and better QoL.3

Association between treatment regimen and QOL in people with diabetes are mixed. It has been reported that patients taking oral medications had more QOL-assessed diabetes-related worries than those controlling their diabetes with only diet and exercise. Patients who are treated with insulin had less satisfaction with treatment and more burden of illness than those taking oral blood-glucose-lowering medication or none at all. 40-41

Diabetes is a main contributing factor in overall health status, morbidity, mortality and QOL.<sup>42</sup> Uncontrolled diabetes increases health problems which lead to reduced QOL.<sup>43,44</sup> In the present study, diabetic complications were prevalent in almost one-half (49%) of diabetics. Retinopathy ranked first (24%), followed by nephropathy (13%) neuropathy (12%), and diabetic foot (10%). Those with two or more complications constituted 22% of all diabetics with complications.

Subjects' QoL, self-care activity have been viewed as critical outcomes of disease treatment and control. Self-management or changing lifestyle in diabetes, which has direct application for metabolic control has better efficient prognosis as measured by DQoL.<sup>34</sup> It has to be mentioned that feeling well was lower than fear of complications in the diabetes-related questionnaire. To date, diabetic patients' QOL has received low consideration. With the increasing rate of lifestyle diseases such as diabetes mellitus in many developing countries, healthcare policy makers should develop policy to educate diabetes patients to have a good glycemic control.

#### **CONCLUSION**

In conclusion, Iranian type 2 diabetes patients reported moderate DQoL in Ahvaz (southwest of Iran), which appeared to be associated with lifestyle factors and level of education. Patients with HbA1c less than 7% showed significantly better overall DQoL. Male diabetic patients in comparison with female diabetic patients, non-insulintreated patients compared with insulin-treated patients had better QOL. HbA1c higher than 7% was associated with higher probabilities of worse QOL among type 2 diabetes patients.

#### **Recommendations**

More studies are needed to include larger study populations among Iranian type 2 diabetes patients in order to help health care providers develop proper health care programs for these patients in Iran.

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