Health-Related Quality of Life of Type 2 Diabetic Patients in Saudi Arabia

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Received: April 2021; Accepted: May 2021; Published: June 1, 2021.
Citation: Hassan MH Alshehri et al. Health-Related Quality of Life of Type 2 Diabetic Patients in Saudi Arabia. World Family Medicine. 2021; 19(6): 6-13 DOI: 10.5742/MEWFM.2021.94060

Abstract

Aim of Study: To assess health-related quality of life (HRQOL) of type 2 diabetic patients in Aseer Region, Saudi Arabia.

Methods: Following a case-control research design, this study included 100 adult type 2 diabetic patients and 100 healthy, age- and sex-matched subjects who attended outpatient clinics at primary healthcare centers in Aseer Region, Saudi Arabia. Data were collected using an interviewer-administered questionnaire that comprised two parts. The first part covered sociodemographic and clinical data about diabetes, while the second part was the Arabic version of the 12-Item Short Form Survey (SF-12).

Results: Diabetic patients had significantly lower SF-12 mean scores than control subjects, as regards the physical and mental components ($p<0.001$ for both components). Patients' SF-12 physical and mental scores differed significantly according to their age groups, educational status, employment, and monthly income ($p<0.001$ for all). Female patients had significantly lower scores of mental component (17.6±3.8 and 19.2±3.9, respectively, $p=0.041$). Patients' SF-12 physical and mental scores were lowest among those with higher body mass index. However, scores did not differ significantly according to their body mass index. SF-12 physical and mental scores negatively and significantly correlated with duration of diabetes, fasting blood glucose and HbA1c ($p<0.001$ for all correlations).

Conclusions: Several risk factors can affect the HRQOL of diabetic patients including older age, female gender, level of education, employment, monthly income, marital status, and duration of diabetes.

Key words: Diabetes type 2, case control studies, health-related quality of life, Short Form Survey (SF-12).

Introduction

Diabetes mellitus is a chronic disease that occurs as a result of the lack of insulin or its inadequate efficiency levels. Diabetes may result in numerous complications in several parts of the body and significantly increases the risk of disability and premature death (1). Diabetes mellitus is associated with microvascular and macrovascular complications including retinopathy, nephropathy and cardiovascular and cerebrovascular events (2).

Worldwide, the number of diabetics is increasing rapidly. By 2030, it is expected that there will be a 69% increase in the number of adults with diabetes in developing countries and a 20% increase in developed countries (3).

The increasing prevalence of diabetes within progressively aging populations, and the presence of chronic complications significantly and negatively impacts on healthcare costs and patients' quality of life (4). It has been reported that diabetic patients who perceive higher quality of life levels have less difficulty in managing their diabetes (5). Therefore, there is rising attention toward improvement of diabetic patients' quality of life rather than their life longevity (6). Over time, the physical, mental, and social well-being as well as health-related quality of life (HRQOL) of diabetic patients are commonly affected (7).

Despite the presence of several clinical indicators as the criteria for assessing the effectiveness of interventions among diabetics, debates have been raised because clinical indicators are insufficient to capture the overall well-being of diabetics (8-9). Therefore, there has been an increasing interest toward patients' self-reported health outcomes and generic preference-based measures are being utilized to measure the HRQOL of diabetic patients (10).

The assessment of HRQOL can capture the variations in health status of patients with different demographic backgrounds and socioeconomic characteristics at different stages of diabetes. Moreover, quantifying these differences in the health status of diabetic patients is critical for enabling healthcare professionals to understand the relationship between diabetes and individuals' health and well-being (11). Additionally, the generic preference-based measures can provide information on different domains of health and/or well-being for resource allocation by conducting economic evaluation of healthcare polices or clinical interventions and then facilitating decision-making (12).

This study aimed to assess HRQOL of type 2 diabetic patients in Aseer Region, Saudi Arabia.

Methods

This study followed a case-control research design. Data were collected from 100 adult type 2 diabetic patients who attended outpatient clinics at primary healthcare centers in Aseer Region, Saudi Arabia (study group). Moreover, 100 healthy, age- and sex-matched subjects were enrolled (control group). The study was conducted during the period from January 1st, 2021 till March 31st, 2021.

Data collection was carried out through face-to-face interviews with the participants, whose consent to participate in the study was asked for before they were interviewed.

Data were collected using an interviewer-administered questionnaire that comprised two parts. The first part covered sociodemographic and clinical data about diabetes, while the second part was the Arabic version of the 12-Item Short Form Survey (SF-12), which is a valid tool used in large surveys of general and specific populations. It has good reliability and internal consistency, with Cronbach's alpha coefficient = 0.84 (13).

The SF-12 questionnaire was administered to participants by the researchers. The scoring system of Ware et al. (14) was followed, where a weighted number was assigned to each physical and mental item of the SF-12 questionnaire, then the mean physical and mental component scores were calculated, and were considered as measures of the physical and mental HRQOL among participant patients and controls.

Data were entered into a personal computer and then analyzed using the Statistical Package for Social Sciences (IBM, SPSS, version 25). Descriptive statistics (frequency, percentage, mean, and standard deviation) were calculated. The t-test was applied to differentiate between physical and mental mean scores of HRQOL for both cases and controls. The chi-square (X^2) test was used to measure associations among qualitative variables. Statistical significance was set at $p<0.05$.

Results

Table 1 shows that both study groups were age- and gender-matched. Educational levels and marital status of participants did not differ significantly. However, participants' occupation differed significantly between study groups (p=0.035), with more unemployed and retired among the diabetic participants. Moreover, diabetic patients seemed to have significantly less monthly income but significantly higher body mass index than control subjects (p=0.038, and p=0.029, respectively).

Table 2 shows that duration of disease among diabetics (mean±SD) was 14.68±9.25 years, their fasting blood glucose was 172.15±59.79 mg/dL, while their HbA1c was 8.30±1.69%.

Figure 1 shows that diabetic patients had significantly lower SF-12 mean scores than control subjects, as regards the physical and mental components (p<0.001 for both components).

Table 3 shows that patients' SF-12 physical and mental scores differed significantly according to their age groups (p<0.001), with decreasing scores with older age. Female patients had significantly lower scores of mental component (17.6±3.8 and 19.2±3.9, respectively, p=0.041). Patients' SF-12 physical and mental scores differed significantly according to their educational status (p<0.001), with lower scores among those less educated. Significantly lower physical and mental scores are observed among those who are unemployed or retired. Physical and mental scores differed significantly among diabetic patients according to their marital status (p<0.001), with lowest scorers among divorced/widowed patients, and highest scores being among single patients. Patients' SF-12 physical and mental scores differed significantly according to their monthly income (p<0.001), with decreasing scores with lower income. Patients' SF-12 physical and mental scores were lowest among those with higher body mass index. However, scores did not differ significantly according to their body mass index.

Table 4 shows that SF-12 physical and mental scores negatively and significantly correlated with duration of diabetes, fasting blood glucose and HbA1c (p<0.001 for all correlations).

Table 1: Personal characteristics of participants in diabetic and control groups

Personal characteristics	Diabetic (n=100)		Control (n=100)		P
Age groups	No.	%	No.	%	Value
• <40	20	20.0	18	18.0	
• 40-49	23	23.0	25	25.0	
• 50-59	35	35.0	35	35.0	
• 60+	22	22.0	22	22.0	0.979
Gender					
• Male	54	54.0	54	54.0	
• Female	46	46.0	46	46.0	1.000
Educational level					
• Illiterate	7	7.0	6	6.0	
• Primary	21	21.0	11	11.0	
• Intermediate	16	16.0	18	18.0	
• Secondary	33	33.0	29	29.0	
• University	23	23.0	36	36.0	0.168
Occupation					
• Governmental	21	21.0	35	35.0	
• Private	8	8.0	13	13.0	
• Housewife/Unemployed	40	40.0	34	34.0	
• Retired	31	31.0	18	18.0	0.035
Marital status					
• Single	18	45.0	22	55.0	
• Married	64	51.2	61	48.8	
• Divorced/widow	18	51.4	17	48.6	0.779
Monthly income					
• <5000	67	67.7	51	51.0	
• 5000-10000	15	15.2	28	28.0	
• >10000	17	17.2	21	21.0	0.038
Body mass index (kg/m²)					
• <25	19	19.0	30	30.0	
• 25-29.9	38	38.0	44	44.0	
• 30+	43	43.0	26	26.0	0.029

Table 2: Characteristics of diabetic patients (n=100)

Patients' Characteristics	Range	Mean	SD
Duration of diabetes (years)	1-39	14.68	9.25
Fasting blood glucose (mg/dL)	76-340	172.15	59.79
HbA1c (%)	5.8-12.0	8.30	1.69

Figure 1: Comparison between diabetic and control groups' SF-12 mean scores for Physical and Mental components

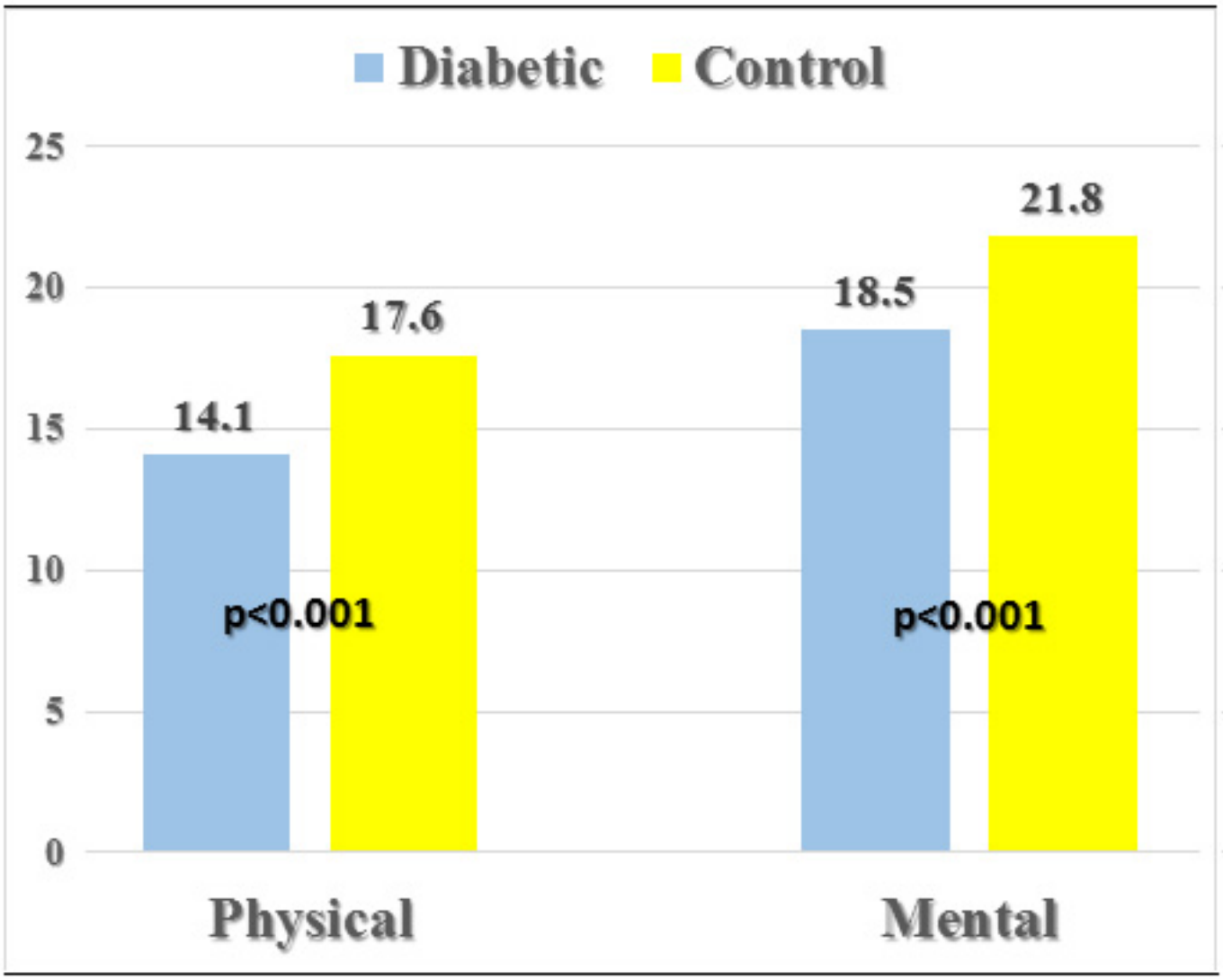

Table 3: Diabetic patients' physical and mental components scores (Mean±SD) according to their personal characteristics

Personal characteristics	Physical Component		Mental Component	
	Mean	SD	Mean	SD
Age groups				
• <40	17.55	3.43	21.05	3.80
• 40-49	15.22	3.85	19.22	3.92
• 50-59	13.06	3.40	17.94	3.60
• 60+	11.50	3.70	16.18	2.99
• p-value	<0.001		<0.001	
Gender				
• Male	14.7	4.1	19.2	3.9
• Female	13.5	4.1	17.6	3.8
• p-value	0.144		0.041	
Educational level				
• Illiterate	10.00	2.77	14.57	2.15
• Primary	12.19	4.18	17.14	3.98
• Intermediate	12.94	4.30	17.81	3.97
• Secondary	14.91	3.50	18.76	3.43
• University	16.78	3.12	20.91	3.46
• p-value	<0.001		<0.001	
Occupation				
• Governmental	17.33	2.50	21.57	2.73
• Private	18.13	2.64	22.25	3.20
• Housewife/Unemployed	13.00	4.03	17.03	3.58
• Retired	12.32	3.56	17.26	3.40
• p-value	<0.001		<0.001	
Marital status				
• Single	17.61	3.05	20.44	4.23
• Married	14.09	3.75	18.70	3.68
• Divorced/widow	10.67	3.46	15.67	2.87
• p-value	<0.001		<0.001	
Monthly income (SR)				
• <5000	12.97	4.02	17.43	3.73
• 5000-10000	15.73	3.45	20.53	3.07
• >10000	16.82	3.17	21.00	3.50
• p-value	<0.001		<0.001	
Body mass index (kg/m^2)				
• <25	14.47	4.54	18.16	4.02
• 25-29.9	15.00	4.24	19.47	4.05
• 30+	13.16	3.70	17.72	3.62
• p-value	0.123		0.121	

Table 4: Correlation between SF-12 physical and mental scores and characteristics of diabetic patients

Patients' characteristics	Physical		Mental	
	r	P	r	P
Duration of diabetes	-0.641	<0.001	-0.501	<0.001
Fasting blood glucose	-0.681	<0.001	-0.637	<0.001
HbA1c	-0.681	<0.001	-0.685	<0.001

Discussion

Health related quality of life is one of the most widely measured treatment outcomes to self-assess the effects of the management of chronic diseases, e.g., diabetes, on health, and monitors the physical and mental aspects of personal health (15).

The present study aimed to assess HRQOL of type 2 diabetic patients in Aseer Region, Saudi Arabia.

Although our study included diabetes and control groups, whose participants were age- and gender-matched, some other personal characteristics differed significantly between participants in both groups. Participants' occupation and monthly income differed significantly, with more unemployment, and consequently significantly less monthly income, among diabetic patients. Moreover, participants in the diabetes group had significantly higher body mass index than those in the control group. These findings possibly reflect the negative economic impact of diabetes and the significant association between obesity and diabetes.

In accordance with our findings, Lee et al. (16) reported that prevalence of diabetes in Canada increased by 56% in the lowest income group, 93% in the lower middle income group, 59% in the upper middle income group and 0% in the highest income group. Bird et al. (17) added that lower income can be the result of diabetes since its chronic nature and severe complications may limit employment opportunities for those affected. Obesity is a potent risk factor for diabetes, where obesity is observed to be more prevalent in socioeconomically deprived neighborhoods.

Our study revealed that diabetic patients had significantly lower physical, mental and total SF-12 scores than those for control subjects, indicating that diabetic patients perceive less HRQOL than non-diabetic subjects.

Golicki et al. (18) noted that diabetes causes significant morbidity and mortality and has been reported to result in a lower QOL compared with non-diabetic patients.

Riaz et al. (19) reported that diabetes is associated with decreased levels of both physical and emotional wellbeing, with more evident deterioration in HRQOL in the physical than in the emotional wellbeing.

Several studies found that the SF-12 mean scores were significantly lower in female than male diabetics (20-21). Moreover, duration of diabetes was positively associated with decreased HRQOL. Patients having longer duration of diabetes had lower scores in all SF-12 domains (21-23).

Clarke et al. (24) emphasized that diabetes is a lifelong disease requiring patients to continuously self-manage their disease to maintain HRQOL. Strategies which address those factors which directly or indirectly affect the QOL like level of level of education and economic status may increase compliance leading to improved metabolic control which ultimately will result in decrease in complications. Therefore, diabetes health education plays an important role, providing patients with information and skills to self-manage their diabetes. Thus, diabetes education should be part of the management of diabetes as improvement in HRQOL is the ultimate goal in the treatment of diabetes.

Residents living in low-income neighborhoods had higher rates of overall physician visits for diabetes and diabetes medications in comparison to those living in the high income neighborhoods (25). Lipscombe et al. (26) added that income also impacts mortality rates among those with diabetes.

Bird et al. (17) argued that, it is ironic that people in poor neighborhoods with the lowest levels of security in income are most likely to develop diabetes, and once they do, they lack access to important resources to help them properly manage their disease. This mismatch between stress, and reduced capacity to deal effectively with distress, may help explain the higher rates of chronic disease in general and diabetes specifically observed among poor and vulnerable populations.

Our study showed that diabetic patients' HRQOL differed significantly according to their personal characteristics. Worse HRQOL was significantly associated with older age, female gender, lower educational status unemployment, lower monthly income, and divorced/widowed marital status. Worse HRQOL was also positively and significantly correlated with duration of diabetes, fasting blood glucose and HbA1c.

These findings are in accordance with those reported by several other studies, which have demonstrated that socioeconomic status is positively associated with HRQOL among adults with a chronic disease (27). Alshayban and Joseph (28) in Saudi Arabia and Bani-Issa (29) in United Arab Emirates found that less educated diabetics had worse HRQOL compared to those having higher education. Moreover, a higher proportion of diabetics with low monthly income reported worse HRQOL compared to patients having moderate/high monthly income (28).

Several studies in Saudi Arabia reported that diabetic females had lower HRQOL than males (13; 28; 30) and also in other populations (31). Siddiqui et al. (32) explained these gender differences in diabetic patients by that male patients are less depressed and anxious and can generally live more effectively with the disease than females.

In Saudi Arabia, Almasri et al. (4) demonstrated a significant association between diabetics' marital status and their HRQOL, where divorced and widowed patients had lower HRQOL than married patients. Kiadaliri et al. (33) reported similar findings where a better HRQOL was reported for married compared to widowed diabetics. This finding was explained by that uncontrolled diabetes affected patients' everyday relationships and social experiences, with many patients expressing negative impacts on their social well-being (34).

Regarding the level of education, Alshayban and Joseph (28) in Saudi Arabia, has shown that low educational levels adversely affect patients' HRQOL. Illiterate patients have worse HRQOL compared to those with higher educational levels. This is also in agreement with numerous studies worldwide that demonstrated that increased patient education level among diabetic patients improves overall health outcomes including HRQOL (31;35).

In Saudi Arabia, Alshayban and Joseph (28) found that longer duration of diabetes was associated with worse HRQOL for diabetic patients. Patients who had diabetes for more than five years tend to have lower health related HRQOL (36). This association can be explained by that increased disease severity negatively impacts HRQOL of diabetic patients (37).

Conclusions

Several risk factors can affect the HRQOL of diabetic patients including older age, female gender, level of education, employment, monthly income, marital status, and duration of diabetes.

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