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Quality of Life Predictors and Glycemic Control among Type 2 Diabetic Patients Attending Primary Health Care Centers in Qatar

Mohamed Salem Nasralla Saleh[1]*, Zeliakha Alwahedi[2], Muna Taher[2], Ahmed Mostafa[2], Mohamed Hashim[2] and Hisham Almahdi[2]

[1]Department of Family Medicine, Faculty of medicine - Suez canal University – Egypt
[2]Primary Health Care Corporation - Qatar

Abstract

Introduction: Diabetes is one of the most worldwide prevalent chronic diseases that impact the quality of life. The aim of treatment in diabetes must go beyond glycemic control to include quality of life. The aim of this study is to assess quality of life and glycemic control among diabetic patients attending Primary Health Care Centers in Qatar.

Methods: Descriptive cross sectional study was conducted to assess quality of life in 281 adult patients with type 2 diabetes attending non-communicable disease clinics in Primary Health Care Centers in Qatar. patients completed SF-36 checklist and information about socio demographic data and disease characters which include some measurements from patient files (BMI,HBA1C,LDL). Data analysis was applied to identify the significant predictors of quality of life with significant limit of P<0.05.

Results: Total sample include 281 patients adult diabetics of whom mean age 53 ± 10.4, 62.1% were males while 37.9% were females, 28.6% were Qatari patients, diabetics with duration more than 10 years represent 37.2%, the average quality of life score is 64.4 ± 24.6, increasing age is significantly associated with less quality of life scores, males were having significantly higher scores than females. Single patients, higher education, type of medications (tablets), controlled LDL and employed were having significant high scores in different quality of life domains. Prolonged duration of diabetes and complications is significantly associated with less quality of life scores, while obesity and HBA1c were not significantly associated with quality of life domains.

Conclusion: Complications, insulin users and women appear to be the most incremental correlate for poor quality of life so special consideration before shifting to insulin and future research on gender specific attributes to improve quality of care to this vulnerable group.

Keywords: Quality of life; Predictors; Glycemic control; Type 2 diabetic patients; Primary health care; Qatar

Introduction

Diabetes mellitus is one of the most daunting challenges posed today by chronic diseases. Recent data show that approximately 130 million people suffer from diabetes mellitus worldwide and that this number will rise to almost 300 million by the year 2025. This more than two fold rise is projected to occur because of population aging, unhealthy diets, obesity and sedentary lifestyle [1]. In Qatar, the overall prevalence of type 2 DM among the adult population has been estimated to be as high as 17%, and a high proportion of pre-diabetes in Qatari adults predicts an increase the prevalence of DM in the next few years [2]. Diabetes substantially increases the risk of blindness, renal diseases, coronary arterial disease, cerebrovascular disease, and peripheral vascular disease [3]. Diabetes mellitus is becoming a major health problem in Qatar, changes in the lifestyle of the population are accused as an important factor in the increase of its prevalence, and Quality of life (QOL) is an important outcome in clinical trials and health care interventions [4]. Sometimes QOL, health and satisfaction with life are used synonymously [5]. The World Health Organization (WHO) defines QOL as an "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns, it is a broad-ranging concept, affected in a complex way by the person's physical health, psychological state, personal belief and social relationships to salient features of their environment" [6]. Diabetes mellitus is a common and demanding health problem that has a great effect on the everyday life of patients [7]. Diabetes complications have important effects on patient quality of life as well as socioeconomic implications [8]. The two major approaches to measuring health related quality of life are generic and disease specific instruments and the two have been compared in diabetes patients and shown to demonstrate complementarity, with generic ones perhaps providing more information than their specific counterparts [9-11]. Therefore the aim of this study was to assess quality of life and glycemic control among diabetic patients attending Primary Health Care Centers in Qatar and to determine the significant predictors of quality of life and glycemic control.

Materials and Methods

Study design

Descriptive cross sectional study to assess quality of life among diabetic patients attending primary health care centers in Qatar.

Study setting

This study was conducted at Primary Health Care Corporation in Qatar, where diabetic patients seen in primary health care centers by specialists or consultants in family medicine through non communicable disease clinics, these clinics are scheduled to be one to two clinics in each health center arranged in morning or evening duty according to each health center situation, the capacity of each clinic reaches average of 25 patients per clinic time.

Study subject

It includes all diabetic patients who fulfill the inclusion criteria: Male and female type 2 diabetic patients who are registered in the non-communicable disease clinic in the selected health centers and agreed to participate in the research during the study period.

Exclusion criteria includes

Type 1 DM, Gestational DM, previously diagnosed depressed patients, patients with communication problems, severe disabling complication.

Sampling

The sample size was calculated according to expected prevalence of good QOL in a previous study done in Saudi Arabia 2013 of 29.8% and another study in Nigeria estimate 20.7% [12,13]. we used 25.25% as average from both studies Assuming a margin of error of 5%, and 95% confidence level, the calculated sample size is 291, according to Daniel equation it includes all patients attending central health centers chosen for their high registration number of diabetic patients who fulfilled the inclusion criteria, selection is based on systematic random sampling technique every 2nd patient until reaching the required number, this was done in 3 months period from 1st June to the end of August 2015 [14]. However due to incomplete information in 10 checklists, so the total sample size reached 281.

Data collection

During the clinic visit, patients completed the Rand 36-item short form health survey (SF-36), and gave the completed form to the interviewers who also explained to them the used form. This process done after approval from institutional review board and signing consent form by patients. The SF-36 data were scored according to the methods suggested in the SF-36 Health Survey: Manual and Interpretation Guide [15]. The eight domains used to assess patient health status in this analysis were: Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Role- Emotional, Social Functioning, and Mental Health. Raw scale scores were transformed to 0–100 scales, in which higher scores consistently represent better health status in all the dimensions measured.

Another questionnaire for the patients was developed by the research team, which includes questions about their personal characteristics, duration of type 2 diabetes, and other potential determinants of quality of life, for example, smoking status, blood pressure measurement, body mass index metabolic control including HbA1c and LDL and complications (micro albuminuria, fundus changes, foot problems and coronary heart disease), type of treatment and compliance. The definition of outcome variables was as following: control of blood pressure if it is less than 140/90 - control of diabetes if HbA1c less than 7% - LDL less than 100 mg/dl are controlled - BMI more than 25 (overweight) if more than 30 (obesity).

Mean (SD) Age (years)			53.8 (±10.4)	Duration of Diabetes	Less than 5 years	96	34.10%
					5 – 10 Years	81	28.70%
Gender	Male	175	62.10%		More than 10 Years	105	37.20%
	Female	106	37.90%	Presence of DM complications	Present	234	83.30%
					Not present	47	16.70%
Ethnicity	Qatari	80	28.60%	Co-morbidities	None	115	40.90%
	Arab	91	32.40%		Cardiovascular	119	42.40%
	Others	110	39.00%		Others	47	16.70%
				Type of DM medications	Tablets	151	53.70%
Social status	Single	12	4.30%		Insulin and tablets	107	38.10%
	Married	246	87.60%		Others	23	8.20%
	Divorced/Widowed	23	8.10%	Compliance on DM medications	Compliant	218	77.60%
					Non-compliant	63	22.40%
Educational Level	Primary	88	31.40%	LDL Level	Controlled	135	48.00%
	Intermediate	25	8.80%		Uncontrolled	146	52.00%
	Secondary	69	24.70%				
	Graduate or higher	99	35.10%				
				Target Hemoglobin A1c	Achieved	88	31.30%
					Not achieved	193	68.70%
				BMI	Normal	86	30.60%
Job status	Housewife	72	25.60%		Overweight or Obese	195	69.40%
	Manual worker	44	15.80%	Target Blood pressure	Achieved	205	72.90%
	Admin/Business	101	35.80%		Not achieved	76	27.10%
	Others	37	13.00%	Mean (SD) SF- 36 scores	Physical functioning		67.2 (±25.6)
	Not working	28	9.80%		Role functioning/physical		70.3 (±39.9)
Income	Enough	253	90.10%		Role functioning/emotional		72.1 (±38.9)
	Not enough	26	9.20%		Energy/fatigue		56.1 (±17.8)
Smoking status	Smoker	46	16.20%		Emotional well being		68.3 (±16.8)
	Ex- or non-smoker	235	83.80%		Social Functioning		72.7 (±21.0)
					Pain		55.3 (±16.0)
					General Health		53.4 (±20.5)
					Average		64.4 (±24.6)

Table 1: Socio-Demographic & Disease Characteristics of Patients and distribution of SF-36 scales, BMI: Body Mass Index, SF-36: Rand 36-item Short Form Health Survey, DM: Diabetes Mellitus, LDL: Low density Lipoprotein.

Ethical considerations

Participation in the study was completely voluntary, the investigators explained purpose of research and every patient was able to withdraw at any time, confidentiality was maintained. Approval by Institutional Review Board from research section – Primary Health Care Corporation in Qatar was obtained before conducting the study PHCC/RC/14/07/2014 – RS/RC/FL6/15/05 – Date: 30th April 2015.

Data analysis

Data collected will be analyzed using Epi Info and statistical significant tests suitable for different variables will be used. Categorical data will be tested by X2. Student t test will be used for continuous data. Multivariate analysis will be done to verify the independent factors that could affect the quality of life response.

Results

Table 1 shows the respondent characters: total sample include 281 patients adult diabetics of whom mean age 53 ± 10.4, 62.1% were males while 37.9% were females, 28.6% were Qatari patients, married in 87.6%, less than secondary educated in 40.2% not currently employed in 35.4% and smokers in 16.2% while disease characters of respondent : diabetics with duration more than 10 years represent 37.2%, diabetic complications in 83.3%, diabetics comorbidity in 49.1%, compliance to treatment represent 77.6%, controlled LDL in 48%, achieved HBA1C in 31.3%, obesity in 69.4%, and achieved blood pressure goal in 72.9%. The average quality of life score is moderate 64.4 ± 24.6 in all scale items except (Energy/Fatigue – Pain – General health).

Table 2 shows respondents sociodemographic characters and quality of life domains :increasing age is significantly associated with less quality of life domains (physical functioning, role physical, emotional wellbeing, social functioning and pain), males were having significantly higher scores than females in all quality of life domains except in (emotional wellbeing and social functioning), Qatari patients have higher significant score regarding social wellbeing while Arab patients have higher significant score in two domains (physical function and role functioning physical) but other nationalities have significant higher scores in four domains (role functioning emotional, energy/ fatigue, social functioning and pain). With regard to other parameters such as (single patients, higher education and employed) were having significant high scores in different quality of life domains.

Table 3 shows respondents disease characters and quality of life domains: prolonged duration of diabetes is significantly associated with less quality of life scores specially in (physical functioning, role functioning physical, social functioning, pain and general health). Presence of complications were significantly associated with less quality of life scores (role functioning physical, role functional emotional, energy/fatigue and pain) while no comorbidities were significantly higher scores in quality of life domains (pain and general health). Type of medications (tablets) are significantly associated with high scores in quality of life domains specially (physical functioning, role functioning physical, energy/fatigue, and pain) it was from 60% to 80% range of moderate quality of life. Compliance is significantly associated with higher scores in (role functioning emotional and emotional wellbeing). Controlled LDL is significantly associated with higher scores in quality of life domains (physical function, social functioning and pain) while obesity and HBA1c were not significantly associated with quality of life domains.

Patient characteristics / SF-36 subscales		Physical function	Role functioning/ Physical	Role functioning/ Emotional	Energy / Fatigue	Emotional well being	Social functioning	Pain	General Health	
Duration of Diabetes	Less than 5 years	74.1 (26.3)**	80.3 (35.6) **	77.5(37.9)	61.4(18.0)	67.1(16.5)	77.2 (20.6) **	78.6 (21.3) **	59.3(14.4) **	
	5 – 10 Years	65.6 (25.0)	67.3(41.3)	68.4(38.7)	52.9(16.0)	67.1(16.2)	69(20.1)	71(21.6)	51.6(16.5)	
	More than 10 Years	62.0 (26.0)	63.1(43.3)	71.8(40.4)	54.8(19.1)	71.4(17.3)	71.9 (22.8)	67(27.5)	54.4(16.4)	
Presence of DM complications	Present	68.1 (24.9)	54.3 (46.7) **	61.7 (45.6) **	51.2 (20.4) **	68.5 (16.3)	72.9 (20.5)	61 (31.7) **	56 (16.1)	
	Not present	62.2 (28.6)	73.5 (37.7)	74.2 (37.1)	57.1 (17.1)	67.1 (18.8)	71.9 (23.8)	74.5 (21.1)	51.6(15.6)	
Co-morbidities	None	68.6 (24.7)	76.1(35.3)	72.8(36.3)**	57.0(17.6)	71.4(16.9)**	73.4(19.0)	77.6(18.9)	58.6(14.8)**	
	Cardiovascular	66.4 (26.9)	67.4(42.8)	71.4(42.1)	57.2(17.1)	66.6(16.9)	71.6(22.1)	70.5(25.2)	55.1(16.3)	
	Others	65.5 (24.8)	63.3(42.3)	72.3(37.0)	50.9(19.5)	64.8(15.0)	73.9(23.4)	63.4(27.3)	47.6(16.0)	
Type of DM medications	Tablets	72.1 (23.9)**	73.1(38.5) **	73.3(38.9)	59.1(16.7) **	67.0(15.8)	73.9(20.0)	76.3(21.7)**	56.9(15.8)	
	Insulin and tablets	60.0 (27.6)	63.6(44.0)	72.9(39.4)	52.9(18.7)	71.1(17.9)	70.8(23.6)	65.1(26.3)	53.2(16.4)	
	Others	67.8 (18.3)	82.6(20.6)	60.9(35.8)	51.5(17.3)	63.8(15.9)	73.9(14.1)	78.2(13.4)	54.6(15.6)	
Compliance on DM medications	Compliant	68.0 (25.9)	71.2(40.6)	75.4(38.0)**	57.1(18.1)**	69.7(16.6) 71.8(21.0)	72.1(24.0) 55.2(16.3)			
	Non-compliant	64.4 (24.7)	67.1(37.8)	60.1(40.0)	52.6(16.4)	63.4(16.4)	76.0(21.1)	72.7(22.7)	55.6(15.3)	
LDL Level	Controlled	72.0 (24.8)**	74.6(38.9)	71.6(39.8)	56.5(17.4)	67.4(15.3)	77.4(22.2)**	76.3(23.4) **	56.5(16.0)	
	Uncontrolled	62.7 (25.6)	66.3(40.6)	72.6(38.1)	55.7(18.2)	96.2(18.0)	68.4(19.0)	68.5(23.4)	54.1(16.1)	
Target Hemoglobin A1c	Achieved	69.5 (24.9)	73.6(38.7)	75.0(37.6)	55.6(16.3)	66.5(16.6)	75.3(19.6)	74.0(23.3)	54.6(14.6)	
	Not achieved	66.1 (25.9)	68.8(40.5)	70.8(39.5)	56.3(18.5)	69.1(16.8)	71.6(21.6)	71.4(23.9)	55.6(16.7)	
BMI	Normal	70.9 (25.6)	71.2(39.2)	74.4(38.5)	56.7(17.8)	67.7(16.2)	74.7(20.9)	(75.0)23.7	54.6(17.2)	
	Overweight or Obese	65.5 (25.5)	70.0(40.4)	71.1(39.1)	55.8(17.8)	68.6(17.0)	71.9(21.1)	71.0(23.6)	55.6(15.6)	
Target Blood pressure	Achieved	69.1 (25.5)**	69.1(25.5)**	72.7(39.4)	73.5(38.4)	57.0(17.7)	67.8(16.6)	73.1(21.2)	72.5(23.6)	56.1(15.3)
	Not achieved	61.8 (25.2)	61.8(25.2)	63.8(40.9)	68.4(40.0)	53.7(17.9)	69.6(17.2)	71.7(20.7)	71.5(24.1)	53.0(17.8)

Table 2: Socio-Demographic characteristics and SF-36 subscales (Mean scores of the sub-scales and SD), Notes: ** P values < 0.05 - Abbreviations: BMI: Body Mass Index, SF-36: Rand 36-item Short Form Health Survey, DM: Diabetes Mellitus, LDL: Low density Lipoprotein.

Patient characteristics / SF-36 subscales		Physical function	Role functioning/ Physical	Role functioning/ Emotional	Energy / Fatigue	Emotional well being	Social functioning	Pain	General Health
Age groups	< 55 years	74.8 (23.7)**	80.5 (34.6) **	71.7 (38.8)	57.4 (16.5)	65.0 (15.5)**	77.2 (19.5) **	76.1 (21.7) **	56.4 (14.7)
	55 – 69 years	61.6 (24.5)	62.5 (42.5)	71.6 (40.0)	55.2 (19.0)	70.8 (17.5)	69.5 (21.5)	68.1 (24.0)	53.1 (16.4)
	> 69 years	48.8 (33.0)	51.5 (48.0)	82.4 (35.6)	52.6 (22.0)	74.8 (18.3)	60.3 (24.3)	61.4 (34.2)	55.0 (22.4)
Gender	Male	70.8 (24.8)**	74.4 (37.0) **	75.8 (35.9) **	58.1 (18.9)**	67.4 (17.0)	73.7 (21.5)	74.8 (22.5) **	56.2 (16.4)**
	Female	61.5 (26.6)	64.0 (44.7)	65.3 (43.4)	53.2 (15.3)	69.0 (16.2)	71.0 (20.6)	65.9 (25.1)	52.2 (14.9)
Ethnicity	Qatari	55.3 (27.9)**	52.0 (45.3) **	69.8 (39.5)	51.5 (16.9)**	71.8 (17.6)**	66.0 (22.3) **	63.3 (25.4) **	52.0 (15.2)
	Arab	74.7 (21.1)	78.9 (34.8)	69.0 (40.3)	54.5 (16.1)	63.5 (17.4)	73.8 (20.6)	74.6 (21.6)	54.8 (15.9)
	Others	70.6 (25.9)	77.2 (37.6)	78.6 (37.3)	61.5 (19.3)	70.6 (14.6))	77.4 (20.4)	76.1 (24.2)	57.8 (16.1)
Social status	Single	85.9 (16.3)**	95.5 (10.1) **	75.8 (36.8)	65.0 (12.0)**	71.3 (9.1)	76.1 (18.1) **	75.9 (17.9) **	61.4 (10.7)**
	Married	68.9 (25.2)	72.7 (39.2)	74.3 (38.3)	57.1 (17.8)	67.8 (16.8)	74.4 (20.6)	73.3 (23.9)	55.7 (15.8)
	Divorced/ Widowed	46.0 (28.1)	34.5 (47.7)	58.7 (47.0)	46.9 (18.3)	76.6 (17.3)	54.8 (24.2)	56.9 (26.9)	45.2 (15.8)
Educational Level	Primary	61.5 (28.9)**	52.0 (47.5) **	62.2 (44.0) **	52.5 (18.4)**	72.3 (18.0)	72.0 (23.7)	66.2 (27.0) **	51.2 (14.6)**
	Intermediate	71.7 (22.7)	92.9 (22.6)	93.7 (22.7)	63.1 (17.1)	73.1 (15.4)	75.0 (20.1)	72.9 (23.5)	56.0 (13.4)
	Secondary	67.2 (27.2)	69.1 (39.2)	71.8 (38.6)	55.1 (17.9)	65.8 (15.3)	70.1 (23.0)	69.4 (23.4)	52.2 (17.0)
	Graduate or higher	75.7 (22.4)	81.0 (33.7)	77.8 (36.7)	59.6 (17.4)	67.6 (16.2)	76.5 (19.3)	77.6 (22.5)	59.0 (16.1)
Job status	Housewife	55.2 (27.5)**	46.4 (47.3) **	58.2 (46.3) **	48.7 (14.7)**	69.7 (18.0)	67.4 (22.5) **	57.6 (25.3) **	49.6 (15.0)**
	Manual worker	82.6 (21.4)	84.0 (33.2)	75.2 (38.8)	64.9 (17.7)	72.9 (16.9)	84.0 (19.5)	84.0 (20.5)	54.2 (13.8)
	Admin/Business	72.0 (21.7)	76.7 (34.1)	76.9 (36.6)	57.6 (17.8)	66.5 (15.9)	74.7 (20.1)	73.8 (20.4)	56.9 (15.7)
	Others	76.6 (25.4)	89.8 (25.3)	81.3 (32.7)	65.9 (18.1)	71.1 (17.9)	72.7 (20.4)	82.3 (21.1)	62.5 (17.0)
	Not working	55.8 (25.3)	61.5 (44.2)	80.6 (29.4)	49.2 (15.7)	67.0 (15.3)	66.1 (22.3)	63.4 (28.5)	50.8 (18.0)
Income	Enough	67.6 (26.2)	70.5 (40.9)	73.9 (38.7)	56.5 (18.0)	68.8 (16.4)	73.6 (21.5)	71.7 (24.4)	55.0 (15.4)
	Not enough	68.0 (27.5)	71.0 (41.3)	65.3 (43.5)	58.8 (17.8)	65.0 (20.1)	70.5 (22.5)	72.2 (23.8)	55.8 (20.4)
Smoker		76.4 (21.0)**	76.7 (33.4)	73.6 (38.2)	57.3 (17.1)	64.3 (15.6)**	75.9 (20.1)	74.7 (21.0)	54.8 (14.3)
Ex- or non-smoker		65.5 (26.6)	69.1 (41.4)	72.9 (39.1)	56.3 (18.3)	69.8 (16.6)	72.4 (21.7)	71.8 (24.8)	55.6 (16.4)

Table 3: Disease-related characteristics and SF-36 subscales (Mean scores of the sub-scales and SD), ** P values < 0.05 Abbreviations: BMI: Body Mass Index, SF-36: Rand 36-item Short Form Health Survey, DM: Diabetes Mellitus, LDL: Low density Lipoprotein.

Discussion

In this study of the quality of life and its determinants in diabetic patients in Qatar, we found that regarding sociodemographic factors and its relation to quality of life that increasing age, prolonged diabetes duration, female patients, less educated patients, and no employment have significant less scores in different quality of life domains. These findings are in agreement with who reported that some demographic factors are associated with quality of life in general population as well as diabetic patients such as: men seem to report better quality of life than women, increasing age seems to be associated with decrements in some domains of quality of life also more education is associated with better quality of life [16].

This study found that smoking is significantly associated with higher score in physical function domain of quality of life while it is significantly with lower scores in emotional wellbeing domain; this in agreement of a study found that current smoking is associated with decrease mental health [17]. Giving higher score in physical function domain is self-reported and may not reflect the truth and this finding may be due to high prevalence of smoking in the studied population which is 16.2%. With regard to disease character and its relation to quality of life domains it is found that duration of diabetes, presence of complications or comorbidities and insulin use are significantly associated with less scores in different quality of life domains which is matched with which stated that the strongest correlates of health related quality of life are diabetic complications and its comorbidities, the prolonged duration of diabetes is usually associated with complications which may explain its relation to poor quality of life, also same finding in review of health related quality of life by who found that macro vascular disease reported to be the strongest predictor of poor quality of life, in our study the cardiovascular comorbidity represent 42.4% which could explain previous results also controlled LDL in our study is associated with higher score in quality of life, at the same time another important finding in our study which is use of treatments other than drugs is significantly associated with less quality scores which is in concordance with study done by which reported that less quality of life satisfaction with insulin use. In regard to BMI, HBA1C, and targeted blood pressure all these factors show no significant relation with quality of life, this is in contradictory to which reported less quality of life among diabetic obese patients [18-21].

Limitations

This study is based on self-reported measure specially may affect complication and comorbidity reporting, it is cross sectional study which may not establish temporal relationship between exposure and outcome measures, there are other factors that may affect quality of life not well assessed in this study such as lifestyle, psychosocial aspects, and health education.

Conclusions

Complications appears to be the most incremental correlate for poor quality of life, so interventions to prevent it may improve quality of life, poor quality of life among insulin users makes special consideration before shifting patients to insulin, and finally women with diabetes appeared to have less score in quality of life domains which mandates future research on gender specific attributes to improve quality of care to this vulnerable group

Conflict of interest

There are no organizations with conflict of interests related to the study.

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