

## Health Related Quality of Life And its Associated Factors Among Diabetic Patients Attending Diabetes Clinic in Jimma University Teaching Hospital, Ethiopia, 2014

Mohammed Muze<sup>1</sup>, Endalew Hailu<sup>2</sup>, KifleWoldemichael<sup>3</sup> and Bekana Fekecha<sup>4\*</sup>

<sup>1</sup>Department of Nursing, College of Health Sciences, Mizan Tepi University, Ethiopia

<sup>2</sup>Departments of Nursing, College of Public Health and Medical Sciences, Jimma University, Ethiopia

<sup>3</sup>Department of Epidemiology, College of Public Health and Medical Sciences, Jimma, Ethiopia

<sup>4</sup>Departments of Nursing, College of Public Health and Medical Sciences, Jimma University, Ethiopia

\*Corresponding authors: Bekana Fekecha, Departments of Nursing, College of Public Health and Medical Sciences, Jimma University, Tel: +251910716731; E-mail: bekf@rocketmail.com

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### Abstract

**Background:** Diabetes mellitus is likely to become one of the most prevalent and economically important diseases of the 21st century. Diabetes mellitus, like any chronic medical condition, impacts on quality of life.

**Objective:** The aim of this study was to assess quality of life and associated factors among diabetic patients having follow-up in diabetes clinic in Jimma University Specialized Hospital, Jimma, south west Ethiopia.

**Methods:** Institution based cross sectional study was conducted from February-May, 2014. Consecutive sampling technique was used to select 356 participants. Data collection technique was interview; review of medical records and the mean fasting blood sugar was used as index of glycemic control.

**Results:** A total of 341 respondents participated in the study and the response rate was 96.2%. The sample consisted of 183 males (56%) and 158 females (44%) with mean age  $46.37 \pm 15.9$  years. Mean duration of DM was  $5.7 \pm 5$  years, 229(66.9%) were type II diabetes, mean BMI and FBS were  $23.4 \pm 4.3$  and  $172 \text{ mg/dl} \pm 67$  respectively. Highest percentages (57%) of poor health related quality of life was found in general health followed by role physical (36%) and highest good quality of life found in bodily pain dimensions in which 88% of the respondents had good quality of life.

Additionally, in this study depression symptom, type II diabetes, increased number of drugs, longer duration of illness and number of co morbidity were important predictors of impaired health related quality of life.

**Conclusion:** Depression symptoms, type II diabetes, higher number of drugs, longer duration of illness and number of co morbidity were important predictors of impaired health related quality of life. Additionally, general health and role physical dimensions of respondents' quality of life were severely impaired. As a result programs addressing the physical and mental needs of the population are required.

**Keywords:** Diabetes mellitus; Quality of life; Diabetic patients; Fasting blood sugar; Glycemic control

### Introduction

Diabetes mellitus is likely to become one of the most prevalent and economically important diseases of the 21st century. One in 20 deaths is attributable to diabetes; 8,700 deaths every day and six deaths every minute occur due to it [1,2].

According to the 6th Edition of the IDF Atlas, in 2013 there are approximately 382 million people with diabetes worldwide. About eighty percent (80%) of people with diabetes live in low and middle income countries. In Africa it was estimated that 4.3% of the population are affected by diabetes. Over the next 20 years, the number of people with diabetes in the region will almost double. Urbanization and accompanying changes in life style are the main drivers of the

epidemic. This region has the highest mortality rate due to diabetes [3,4]. Ethiopia, which is one of the developing nations, is at a risk of increased diabetes incidence. About 3.32% of the population is estimated to live with diabetes in Ethiopia and over 23,869 die at age 20-79 due to diabetes. In Jimma Town a community based study done in 2006 shows that about 5.3% of adults 40 years and above live with diabetes [5].

Diabetes mellitus, like any chronic medical condition, impacts on quality of life. Individuals with diabetes have reduced health related quality of life (HRQOL) compared with those without diabetes. People with diabetes are constantly remind of the disease on a daily basis, they have to eat carefully, exercise, test their blood glucose and based on the result decide when to schedule their next meal or medication [6,7]. In addition diabetes-related changes may cause the disability in physiological, psychological, and social function lead to poor health related quality of life. Changes in physiological function may occur as a

result of diabetes complications and common co morbidities that lead to mobility impairment and decline of activity of daily life [6].

Not only diabetes affects daily functioning and wellbeing of patients but also its treatment regimens influence patients' daily functioning and wellbeing. Poor health related quality of life leads the patients to trouble in participating actively in the social and economic life of the community in which they live. Patients with poor quality of life may have restricted social life, difficulty in accomplishment of roles, school or work absence, poor sleep, increased hospital visits, hospitalizations, and worsening of glycemic control [8,9].

When issues affecting a person's quality of life are not addressed and the incidence of complications increases, an individual's perceived quality of life is further impacted on negatively. Several studies have documented multiple factors contribute to poor health related quality of life like diabetes related medical, psychosocial, demographic and diabetes care factors [10-13].

The investigators didn't come across any study done about HRQOL in the country. As a result, this study was designed to assess health related quality of life and its influencing factors among diabetic patients attending in Jimma University Specialized teaching Hospital.

## Methods and Materials

### Study area and design

This Institution based cross sectional study design was carried out in Jimma University Specialized Hospital (JUSH) which is found in Jimma town. JUSH is the only teaching and referral hospital in the southwestern part of the country. It provides services for approximately 9,000 inpatient and 80,000 outpatient attendants in a year. As one of the outpatient services, the hospital has specialty clinics where patients with specific chronic disease are referred for follow-up. Diabetes clinic is one of those clinics which give service for patients with Diabetes mellitus. The clinic currently gives service for about 2,030 diabetic patients twice a week. On average 90-110 patients are visiting the clinic in a day. The clinic is staffed with internist, residents and nurses who are trained in specific chronic disease patient follow-up. This study was conducted from February-May, 2014.

### Study subjects

All adult diabetic patients who have a follow-up at a clinic in Jimma University specialized hospital. The study population was a sample of adult diabetic patients on follow up at the Hospital. All diabetic patients aged 18 years and older who have been on follow up at least for three months at Jimma University specialized Hospital; and who haven't serious illness were included in the study. All study populations who had not followed up at this hospital and ages less than 18 and others who were not fulfill inclusion criteria were excluded from the study.

### Sample size determination and sampling technique

The sample size was determined considering an estimate of 50% expected proportion of good health related quality of life of population aged above 18 years, giving any particular outcome to be within 5% marginal error and 95% confidence interval of certainty ( $\alpha=0.05$ ).

Based on this assumption, the actual sample size for the study was computed using one- sample population proportion formula.

Correction was also made to adjust for a finite population. Using a contingency of 10% for non-respondent, the final sample size was 356. To identify the participants, a list of diabetic patients was obtained from the clinic and used as a sampling frame. The patients' records were listed in ascending order of the card number. Then, the respondents were selected randomly by lottery method.

### Measurement and data collection

**Operational definitions:** Short-Form 36 item health survey (SF-36) was used to measure patient's quality of life. Short-Form (SF-36) Health Survey is a widely used health related quality-of-life measure that assesses several important dimensions(subscales) of the quality of life, including physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional and mental health. Each subscale scores transferred in to 0-100 scores. Mean score for each subscales used as cut of point and scores below the mean considered as poor quality of life and above the mean as better quality of life.

Patient satisfaction was measured using 19 item satisfaction scale developed after extensive review. Nineteen items measure satisfaction with service accessibility, personality of service providers, physical setting, availability of medical resources, quality of care and medical expenses. Patients were asked to rate their contentment level towards health services. Liker's five points rating scale were applied as 5=very satisfied, 4=satisfied, 3=Neutral, 2=Dissatisfied 1=very dissatisfied. Total satisfaction score was calculated from sum of response to all 19 items. A higher score indicates a greater satisfaction. We calculated Cronbach's coefficient alpha to check reliability of the instrument. The reliability coefficient for the total sample was 0.90.

Diabetes self-care practice was assessed using the 11-item Summary of Diabetes Self-Care Activities (SDSCA) scale. The SDSCA is a self-reporting measure of the frequency of performing diabetes self-care tasks, such as: - diet, exercise, blood glucose testing, and foot care over the preceding 7 days. The average score across items for each of subscale represents frequency of performing self-care activities in the past seven days. A high score indicated high levels of self-care.

A structured interviewer administered questionnaire was used to collect the data which was adapted from previous studies [9,10,13]. The questionnaire was initially prepared in English and then translated in to Amharic. The Amharic version was again translated back to English to check for any inconsistencies or distortions in the meaning of words and concepts. The questionnaire was tested to be reliable with Cronbach's alpha coefficient of 0.909 for Sf-36 items showed. The questionnaire was pre tested prior to the actual data collection on 18 (5%) respondents that were not included in the main survey. The result of the pretest was discussed, and some corrections and changes were made on the questionnaire.

### Data processing and analysis

Data were entered by using Epidata3.1 for cleaning and coding and was exported to SPSS version 20 for analysis. Univariate analyses were done and Frequency distributions were used to organize and present the data. Measures of central tendency were calculated and utilized for appropriate variables to describe the data. For bivariate analysis simple logistic regression was used. Multiple logistic regression analysis was used to predict factors which affect health related quality of life (dependent variable). And those variables with a p value  $\leq 0.05$  were considered as statistically significant. Voluntary informed consent was

obtained from Oromia region research and ethical review committee, Jimma University Specialized Hospital and responsible bodies of the respected wards. Participants' confidentiality was maintained and the informed consent process respected the language and socio-cultural norms of participants.

## Results

### Characteristics of study patients

Variables		Frequency	Percent
Marital status	Single	55	16.8
	Married	277	81.2
	Widowed	8	2.3
	Divorced	1	0.3
Religion	Orthodox	133	39
	Islam	192	56.3
	Protestant	15	4.4
	Others	1	0.3
Ethnicity	Oromo	224	65.7
	Amhara	67	19.6
	Dawro	16	4.7
	Yem	14	4.1
	Others	20	5.9
Educational status	Illiterates	106	30.1
	Can write and read	23	6.4
	Grade 1-6th	102	28.8
	Grade 7-12th	58	16.9
	Grade 12th and above	49	16.7
Occupation	Government worker	43	12.6
	Housewife	81	23.8
	Farmer	124	36.4
	Merchant	28	8.2
	Daily laborer	19	5.6
	Others	46	13.5

**Table 1:** Socio demographic characteristics of respondents in JUSH, Jimma, South West Ethiopia, 2014.

A total of 341 respondents participated in the study, giving a response rate of 96.2%. The sample consisted of 183 males (56%) and 158 females (44%) with mean age  $46.37 \pm 15.9$  years. Of the study participants, 81% were married, majority (65.7%) was Oromo ethnic

group and 37.1% had low education. Mean duration of DM was  $5.7 \pm 5$  years, 229(66.9%) were type II diabetes, mean BMI and FBS were  $23.4 \pm 4.3$  and  $172 \text{ mg/dl} \pm 67$  respectively. Of the study participants, 200(58.7%) had co morbid conditions, 233(68.3%) were insulin users. Of the respondents 28.3% had depression symptoms and 15.8% had hypertension (Table 1).

### Respondent's quality of life (QoL) profile

Mean and proportions of poor quality of life were analyzed for each eight domains and found highest in general health and lowest in bodily pain. For further information, see in Table 2.

Variables	% of poor HRQOL	Mean	Std. D
Physical functioning	34.6	65.9384	28.5
Role physical	39.9	63.673	40.9
Bodily pain	12.9	78.1305	23.4
General health	57.5	51.6751	12.5
Mental health	24	58.1818	13.8
Role emotional	34.3	65.9365	43
Vitality	21.4	62.1896	16.7
Social functioning	36.7	71.0117	26

**Table 2:** Respondent's Quality of Life (QoL) profile in Jimma University specialized Hospital (JUSH), Jimma, South West Ethiopia, May 2014.

## Discussion

This study found substantial impairments in general health and role limitation due to physical functioning domains of sf-36. This is congruent with other study done in turkey found substantial impairments in general health. Additionally, another study done in South Africa found in bodily pain and general health domains. All these findings were laid in physical health dimensions. As a result possible explanation for this is diabetes has more impact on physical health than mental health [13,14].

This study also reveals determinants of poor HRQOL. Having type II diabetes, number of drugs, duration of illness and number of co morbidity were most important predictors of impaired HRQOL (Table 3).

Individuals with higher co morbid condition had impaired HRQOL in physical functioning and vitality dimensions. It is consistent with studies conducted in Indonesia and Canada found higher number of co morbidities was significantly associated with impaired HRQOL [15,16].

Regarding impacts of diabetes kind, this study found that individuals with type II diabetes had impaired quality of life than type I diabetes, particularly in terms of role limitation due to physical functioning, mental health and social functioning. This finding is congruent to study done in Turkey found type II diabetes were associated with decreased health related quality of life than type I diabetes, particularly in terms of physical and social functioning [14].

	PH	RP	BP	GH	MH	RE	VT	SF
Variables	OR 95% C.I.	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR 95% C.I.
Sex(female)	1.05 (0.42,2.63)	1.07 (0.47,2.4)	0.69 (0.20,2.4)	1.04 (0.5,2.2)	<b>4.21 (1.4,12)*</b>	0.68 (0.3,1.5)	1.23 (0.5,3.3)	0.57 (0.3,1.3)
Age	<b>1.05 (1.01,1.097)*</b>	1.00 (0.97,1.04)	1.03 (0.97,1.09)	1.00 (0.9,1.04)	1.04 (0.99,1)	1.02 (0.9,1.0)	0.98 (0.9,1.0)	1.02 (0.9,1.1)
Grade 7-11th	<b>0.18 (0.04,0.90)*</b>	2.34 (0.63,8.73)	0.87 (0.08,9.20)	1.60 (0.53,4.9) 1.60 (0.53,4.9)	2.52 (0.5,13)	1.35 (0.4,5.1)	0.50 (0.1,2.1)	1.08 (0.3,3)
Grade 12	<b>0.09 (0.01,0.669)*</b>	0.79 (0.17,3.80)	0.25 (0.01,12.03)	0.39 (0.10,1.54)	0.85 (0.1,8.8)	0.84 (0.2,4.1)	0.32 (0.0,2.6)	1.02 (0.2,4)
Duration of illness	<b>1.11 (1.01,1.225)*</b>	1.02 (0.94,1.10)	0.92 (0.81,1.06)	1.01 (0.9,1.08)	0.94 (0.9,1.0)	1.04 (0.9,1.1)	0.95 (0.9,1.0)	<b>1.09 (1.0,1)*</b>
Type II diabetes	0.74 (0.19,2.82)	<b>5.64 (1.8,17.3)**</b>	0.81 (0.18,3.8)	1.16 (0.42,3.15)	<b>0.20 (0.1,0.8)*</b>	2.01 (0.7,5.9)	0.69 (0.2,2.3)	<b>4.49 (1.5,13)*</b>
Depression symptoms	<b>5.32 (2.15,13.17)***</b>	<b>5.97 (3,13)***</b>	<b>8.06 (3,24)***</b>	1.74 (0.87,3.48)	<b>3.46 (1.4,8.4)*</b>	<b>3.08 (1.5,7)**</b>	1.24 (0.6,2.8)	0.97 (0.5,2)
Number of comorbidity	<b>1.74 (1.1,2.759)*</b>	1.15 (0.8,1.71)	0.88 (0.5,1.55)	1.22 (0.84,1.77)	1.20 (0.7,1.9)	1.20 (0.8,1.7)	<b>1.67 (1.1,3)*</b>	0.77 (0.5,1.2)
Number of drugs	0.93 (0.53,1.61)	1.16 (0.7,1.81)	<b>2.27 (1.1,4.9)*</b>	0.96 (0.63,1.46)	<b>1.80 (1.1,3.1)*</b>	1.21 (0.7,1.9)	<b>1.73 (1.1,3)*</b>	<b>0.39 (0.2,0.7)**</b>
Good diabetes self-care	0.997 (0.3,3.01)	1.377 (0.5,3.6)	0.829 (0.2,3.8)	<b>1.024 (0.4,2.3)*</b>	<b>0.04 (0.0,0.4)*</b>	0.693 (0.3,1.8)	0.298 (0.1,1.2)	0.479 (0.2,1.2)
Fasting blood sugar	1 (0.9,1.0)	<b>0.991 (0.9,0.99)*</b>	1.003 (0.99,1.01)	0.992 (0.98,0.9)*	0.999 (0.9,1.0)	0.995 (0.9,1.0)	1.006 (0.9,1.0)	1.002 (0.99,1.0)

\*P<0.05; \*\*p<0.005; \*\*\*p<0.005, PH- Physical Functioning, RP -Role Limitation Due To Physical Functioning, BP- Bodily Pain, GH -General Health ,MH- Mental Health, RE- Role Limitation Due To Emotional Problems, VT -Vitality, SF -Social Functioning.

**Table 3:** Predictors of respondent's HRQOL domains, JUSH, Jimma South West Ethiopia, 2014.

We also observed significant relationship between depression symptoms and HRQOL. Those individuals with depression symptoms experienced significantly impaired health related quality of life than diabetics without symptoms. Other studies done in Australia and in Korea found consistent results that those with diabetes and depression experienced significantly impaired in health related quality of life than diabetic group without depression. Same study in Korea specifically found that more depressive symptom was associated with decreased HRQOL [15,16].

Significant association also observed between treatment regimen and quality of life. Individuals with higher number of drugs had significantly impaired HRQOL than individuals with lower number of drugs particularly in bodily pain, mental health, vitality, and social functioning.

A study done in Malaysia showed that those taking 3 or more drugs had impaired HRQOL in sub scales (role-physical and bodily pain) [17].

In relation to duration of diabetes, higher duration of diabetes was significantly associated with impaired quality of life. It is consistent with studies conducted in Singapore found increased duration of diabetes significantly associated with poor HRQOL. This may be due

to associated factors of illness duration like complications and treatment side effects [18].

Our study also found significant relationship between diabetes self-care practice, age, level of education and health related quality of life. Specifically individuals with good diabetes self-care had significantly better HRQOL, particularly in mental health. Better self-care practice has better glycemic control leads reduced hyper glycemic symptoms. Increasing age was significantly associated with poor HRQOL particularly physical health functioning.

A study done in Indonesia found that increasing age was significantly associated with reduced HRQOL. Ageing is clearly associated with a decline in most physiological systems that limited physical capacity.

The cardiovascular and musculoskeletal systems have involved with the most basic functions of everyday life. Lower level of education significantly associated with poor health related quality of life in physical functioning. Other study done in Malaysia found lower level of education was associated with impaired HRQOL [15,19]. However, other socio demographic variables, body mass index, patient satisfaction and diabetes control were not significantly associated with quality of life in this study.

## Conclusion

This study found substantial impairments in respondent's general health and role physical domains of HRQOL (sf-36). Additionally found having depression symptoms, type II diabetes, number of drugs, longer duration of illness and higher co morbid conditions were important predictors of impaired health related quality of life. Health intervention programs should focus on addressing the physical and emotional needs of patients which are essential to improve their quality of life.

## Authors' Contributions

Mohammed Muze, Prof. KifleWoldemichael, Endalew Hailu and Bekana Fekecha designed the study, analyzed the data, drafted the manuscript and critically reviewed the article. All authors read and approved the final manuscript.

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