Original Article

Health-related Quality of Life of Patients with Type 2 Diabetes Mellitus at A Tertiary Care Hospital in India Using EQ 5D 5L

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Abstract

Objective: To assess the health-related quality of life of Type 2 Diabetes mellitus patients attending outpatient departments of a tertiary hospital using EQ-5D-5L. **Methods:** The study was conducted at a tertiary care hospital in India. The quality of life of patients with type 2 Diabetes mellitus, age 18 years and older, attending outpatient departments of Medicine and Endocrinology was assessed with the help of EQ-5D-5L, a measure of self-reported health related quality of life. Data was analyzed to obtain EQ-5D-5L scores for the five dimensions and EQ VAS score. Correlation of EQ VAS score with different variables was analyzed. **Results:** Out of total 358 participants, 208 had comorbidities, hypertension being the most common. Mean age was 60.71 ± 11.41 years and 216 (58.9%) were female participants. Out of five dimensions, Mobility, Self-care, Usual activities, and Pain/discomfort were most affected in age group 71 years and above while anxiety/depression affected age group 18–30 years the most. Mean EQ VAS score was 78.83 ± 15.02. Female participants had significantly higher EQ VAS score ($P = 0.00$) than male participants. EQ VAS score showed significant negative correlation with uncontrolled state of diabetes ($P = 0.000$). There was significant difference in EQ VAS score between patients with and without comorbidities. ($P = 0.004$) Cronbach alpha for EQ-5D-5L was 0.76. **Conclusion:** The results suggest that EQ-5D-5L is a reliable measure for assessing health related quality of life of patients with Type 2 Diabetes mellitus. Type 2 Diabetes adversely affects the quality of life of patients. Uncontrolled disease and comorbidities can further compromise the quality of life.

Keywords: EQ 5D 5L, quality of life, type 2 diabetes

Introduction

According to the World Health Organization (WHO), quality of life is "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."[1] Researchers have conceptualized quality of life on many levels, and there are multiple views on how it should be defined and measured. The health community has generally chosen to focus on the individual-level aspects of quality of life that can be shown to affect physical and mental health. This narrower concept is referred to as health-related quality of life (HRQoL).[2]

Chronic diseases like diabetes mellitus are known to compromise the HRQoL. Type 2 Diabetes mellitus (DM) is a chronic metabolic disease known to affect HRQoL adversely.[3-7] Prevalence of diabetes in India has been estimated between 7.3% and 9.1% and increasing.[8,9] Comorbidities like hypertension, other cardiovascular diseases can further compromise the quality of life of diabetic patients.[6,10,11]

Two types of tools have been developed to measure HRQoL. Generic tools are general purpose measures used to assess HRQoL of communities and also for comparison between populations. Disease specific tools focus on particular disease and can be useful for assessing treatment effectiveness. WHO BREF[12] and SF 36[13] are among the widely used generic tools. However, these questionnaires have many questions and thus can be time consuming both for respondents and researchers.

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EQ-5D is a standardized measure of health status developed by the EuroQol Group in order to provide a simple, generic measure of health for clinical and economic appraisal.[14] The EQ-5D-5L consists of 2 pages – the EQ-5D-5L descriptive system and the EQ Visual Analogue scale (EQ VAS) The descriptive system comprises the 5 dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/depression). Each dimension has 5 levels: no problems, slight problems, moderate problems, severe problems, and extreme problems. The respondent is asked to indicate his/her health state by ticking (or placing a cross) in the box against the most appropriate statement in each of the 5 dimensions. This decision results in a 1-digit number expressing the level selected for that dimension. The digits for 5 dimensions can be combined in a 5-digit number describing the respondent's health state. The EQ VAS records the respondent's self-rated health on a 20 cm vertical, visual analogue scale with endpoints labeled "the best health you can imagine" and "the worst health you can imagine". This information can be used as a quantitative measure of health as judged by the individual respondents.[15] To our knowledge, only a few studies are reported from India usingEQ-5D-5L to measure quality of life of type 2 diabetes patients.[16] Hence, this study was planned to measure HRQoL of ambulatory Type 2 diabetics using EQ-5D-5L.

Study Objective

To assess the health-related quality of life (HRQoL) of patients suffering from Type 2 diabetes mellitus attending outpatient departments of Dr. Jivraj Mehta Smarak Health Foundation (JMSHF), a tertiary care hospital in Ahmedabad in Gujarat State of India Using EQ-5D-5L.

Study Setting- Outpatient departments of Medicine and Endocrinology at Dr. Jivraj Mehta Smarak Health Foundation Bakeri Medical Research Centre (JMSHF), a tertiary care hospital in Ahmedabad in Gujarat State of India.

Eligibility criteria

Male and female patients age 18 years and above, suffering from Type 2 DM for at least one month attending Medicine, Cardiology and Endocrinology Outpatient Departments and agreeing to participate in the study.

Study design

Cross-sectional descriptive study

Methods

Written approval from Institutional Ethics Committee of JMSHF was obtained on 21 March 2015. Data regarding demographic and clinical details were collected from July 2015 to December 2015. Quality of life was assessed using EQ-5D-5L questionnaire self-complete version on paper (Gujarati version for India) obtained from EuroQuol on request.

The EQ-5D-5L consists of 2 parts - the EQ-5D-5L descriptive system and the EQ Visual Analogue scale (EQ VAS). The descriptive system comprises the 5 dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/depression). Each dimension has 5 levels: no problems, slight problems, moderate problems, severe problems, and extreme problems. The investigator first explained the participants how to respond and then asked them to select to indicate his/her health state by ticking in the box against the most appropriate statement in each of the 5 dimensions. This decision resulted in a 1-digit number expressing the level selected for that dimension.

For EQ VAS the respondents were asked to rate their health on that day on a 20 cm vertical, visual analogue scale from 0 to 100, with endpoints labeled "the best health you can imagine" and "the worst health you can imagine". This information provides a quantitative measure of health as judged by the individual respondents. The investigator first explained about the tool to the participants and then asked them to mark an X on the scale to indicate how your health is TODAY and then to write the number he/she marked on the scale in the box below.[14]

EQ-5D-5L Crosswalk Index was calculated with the help of EQ-5D-5L Crosswalk Index Value Calculator' downloaded from the EuroQol website.[17]

Data was analyzed using SPSS v20. EQ-5D-5L scores for 5 dimensions and mean EQ VAS scores were compared for age, gender, presence/absence of comorbidities. Correlation between different demographic variables and EQ 5D 5L scores was obtained. $P < 0.05$ was considered significant.

Results

Total 358 patients participated. Out of these 208 had comorbidities, most frequent being hypertension (180) followed by other cardiovascular diseases (14), musculoskeletal problems (14), and thyroid disease (8). Mean age was 60.71 ± 11.41 years and about 50% participants were elderly. (>60 years) Out of 358, 216 (58.9%) were female participants [Table 1].

Table 1: Characteristics of type 2 diabetes patients (*n*=358)

	***n*=358**
Age (Mean±SD)	60.71±11.41
Gender- Female %	60.3
Monthly Income (INR)	17800±15613
Duration of diabetes (Yr)	8.48±6.97
Diabetes Controlled (%)	238 (66.5)
Diabetes Uncontrolled (%)	120 (33.5)
No comorbidity (%)	149 (41.9)
With comorbidity (%)	209 (58.1)
No. of antidiabetics-	
1	257
2	82
≥3	17
No information	02
EQ VAS Score (Mean±SD)	78.83±15.03

EQ-5D-5L scores

Table 2 shows distribution of percent of DM patients (N = 358) reporting EQ 5D levels 1 to 5 by dimensions. Self-care was reported at level 1 by 86.8% while pain/discomfort scored lowest at 46.6% for level 1.

Table 3 shows distribution of percent of DM patients reporting EQ 5D levels 1 to 5 by dimensions and age group. Mobility, self-care, usual activities, and pain/discomfort were most affected in age group 71 years and above with 61.4%, 80.7%, 61.4%, and 36.9% reporting level 1, respectively. Anxiety/depression affected age group 18–30 years most with 42% reporting at level 1 that is no problem [Figure 1].

EQ VAS score

Figure 2 shows mean EQ VAS Score of all respondents by age and sex (N = 358). Mean EQ VAS score was 78.83 ± 15.02. Mean EQ VAS score for male (N = 142) and female (N = 216) participants was 72.43 ± 15.853 and 83.04 ± 12.85, respectively. There was a statistically significant difference between the two groups (Z = 6.668, P = 0.00). EQ VAS score for uncontrolled and controlled diabetics was 70.33 ± 15.76 and 83.12 ± 12.65 respectively with a statistically significant difference between the two groups (Z = −7.718, P = 0.00). Mean EQ VAS score for DM and DM with comorbidity was, 80.9 ± 13.5 and 76.8 ± 16.2 respectively with significant difference between these groups (Z = 2.615, P = 0.004). EQ VAS score showed negative significant correlation with uncontrolled state of diabetes (P = 0.000). There is negative but nonsignificant correlation with age (P = 0.052), duration of DM (P = 0.175) and presence of co morbidity (P = 0.144). There was no significant correlation with monthly income of participants (P = 0.634) and duration of DM (P = 0.175).

The scores for all the five domains mobility, self-care, usual activities, pain/discomfort, and anxiety/depression showed negative correlation (P < 0.05) with EQ VAS score.

EQ 5D 5L index was 0.803. There was a significant difference between controlled and uncontrolled diabetics - EQ 5D 5L index 0.85 and 0.70, respectively (P = 0.00). Difference between group with and without comorbidity was not significant- EQ 5D 5L index 0.77 and 0.78 respectively (P = 0.695). Cronbach alpha value for EQ-5D-5L was 0.759.

Discussion

For assessing the QOL of Diabetes EQ-5D has been reported to perform at least as well as SF-36 which has larger number of items thanEQ-5D.[18] Sayah *et al.* also have reported EQ-5D-5L as a valid tool for Measuring QOL in type 2 diabetes.[19] The reliability ofEQ-5D-5L for measuring quality of life of Indians has been reported.[20]

Various studies have reported Compromised HRQoL of Type 2 diabetes patients using EQ-5D-5L. In the UKPDS 37 study type 2 diabetics without any complication had a mean EQ-5D index value of 0.83,[4] compared with 0.85 in a Norwegian study.[21] A national study of HRQOL of type 2 DM using EQ 5D 3L in Iran reported mean EQ-5D and VAS score 0.70 and 56.8 respectively which is lower compared to our findings with mean EQ-5D index value 0.8 and EQ VAS score 78.83.[22] The Iran study was a national study including both urban and rural population while our study is limited to outpatients at a

Table 2: Distribution of diabetes mellitus type 2 patients reporting levels 1 to 5 by dimensions (n=358)

Level	Mobility (%)	Self-care (%)	Usual Activity (%) ityactiv	Pain/discomfort (%)	Anxiety/depression (%)
1	240 (67)	311 (86.8)	243 (67.9)	167 (46.6)	231 (64.5)
2	75 (20.9)	36 (10)	78 (21.8)	85 (23.7)	66 (18.4)
3	21 (5.8)	7 (2)	18 (5)	32 (9)	47 (13.1)
4	20 (5.5)	3 (0.8)	17 (4.7)	72 (20.1)	14 (3.9)
5	2 (0.5)	1 (0.3)	2 (0.5)	2 (0.5)	0 (0)

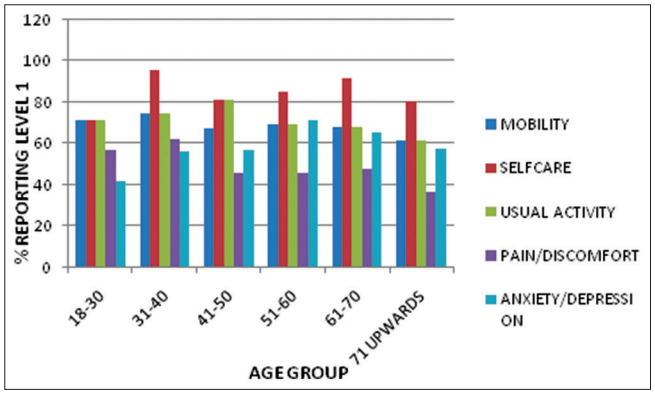

Figure 1: Age group wise distribution of type 2 diabetes patients reporting EQ 5D level 1

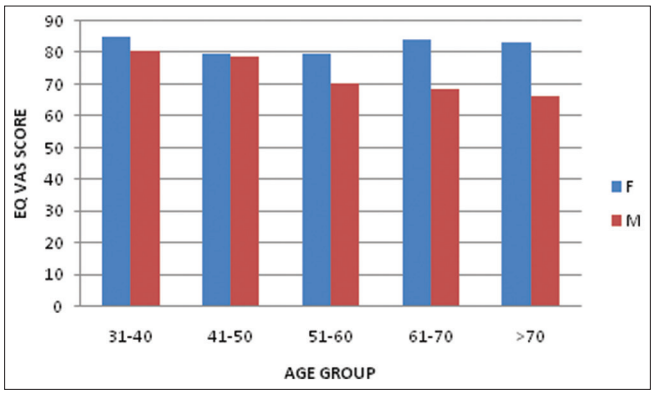

Figure 2: Age and gender wise Mean EQ VAS score of diabetes patients (N = 358)

Table 3: Percentage frequency distributions of EQ-5D-5L dimensions by age group (n=358)

Dimension	Age group					
	18-30	31-40	41-50	51-60	61-70	71 upwards
Mobility						
Level 1	71.4	75	67.6	69.4	68	61.4
Level 2	14	20.8	24.3	19.4	21.6	24.6
Level 3	14	4.2	5.4	5.6	6.4	5.3
Level 4	0	0	2.7	4.6	4.0	8.7
Level 5	0	0	0	0.9	0	0
Self-care						
Level 1	71.4	95.8	81.0	85.3	92.0	80.7
Level 2	28.5	4.2	16.2	10.1	6.4	14.0
Level 3	0	0	0	2.8	1.6	3.5
Level 4	0	0	2.7	0.9	0	1.8
Level 5	0	0	0	0.9	0	0
Usual activity						
Level 1	71.4	75	81.0	69.4	68.0	61.4
Level 2	28.5	20.8	16.2	19.4	21.6	26.3
Level 3	0	4.2	0	9.3	6.4	3.5
Level 4	0	0	2.7	0.9	4.0	8.7
Level 5	0	0	0	0.9	0	0
Pain/Discomfort						
Level 1	57	62.5	46	46.2	48.0	36.9
Level 2	0	20.8	16.2	23.1	25.6	29.8
Level 3	14	8.3	5.4	12.0	6.4	10.5
Level 4	28.5	8.3	32.4	16.7	20.0	22.8
Level 5	0	0	0	1.9	0	0
Anxiety/depression						
Level 1	42.0	56.6	56.8	71.3	65.6	57.9
Level 2	28.5	26.7	27.0	14.8	18.4	17.5
Level 3	28.5	16.7	8.1	9.3	15.2	15.8
Level 4	0	0	0	4.6	0.8	8.8
Level 5	0	0	8.1	0	0	0

hospital. Moreover, both EQ VAS and EQ-5D index are lower than that reported for health professionals (90.2 ± 8.0 and 0.958 respectively) at our study site.[20] Thus, the EQ -5D -5L can differentiate between a younger, healthier group and patients with type 2 diabetes.

In our study women scored significantly higher for EQ VAS than men. This is in contrast to most previous studies reporting lower EQ VAS score in women.[21,22] However, D'Souza *et al.* reported mean quality of life scores of women slightly higher for age, schooling, prevention of activities of daily living, ability to manage positively, and knowledge of diabetes and its management as compared to men.[23] Women are by nature more resilient to the problems like illness and may be able to cope up better than men. Moreover, women are more likely to accept the adverse situations and hence may report higher level for different dimensions of the QoL measure. Charmaz argues that although traditional assumptions of male identities, such as an active problem-solving stance, can encourage men to recover from illness. However, illness can relegate a man to a position of marginalized masculinity in the gender order. In comparison, women with diabetes showed a greater adaptability to illness, and were far less likely to attempt to recapture their past selves once they had defined physical changes as permanent.[24]

There was a significant correlation between EQ-5D dimensions and EQ VAS score. Mobility, self-care, usual activities, and pain/discomfort were most affected in age group 71 years and above. Anxiety and depression showed a different pattern with youngest group being the most affected. Cost of Diabetes Type 2 in Europe (CODE-2) study, a Dutch population of 1371 type 2 diabetics, also noted that anxiety and depression first increased and then decreased with age. Possible explanation is that in younger populations the fear of future complications is greater. The study also reported that the duration of diabetes did not correlate with HRQoL.[25] Our findings are comparable with this study.

In our study pain/discomfort was the most affected dimension with 53% reporting some problem while anxiety/depression was reported by 35%. Our finding is similar to previous studies. In a study from China involving type 2 diabetics, more patients reported problems with pain/discomfort (24.8%) and anxiety/depression (20.3%) than other dimensions of mobility (7.1%), self-care (2.2%) and usual activities (4.3%).[26] Pain/discomfort was the most common among the five Euroqol 5-D domains in several other studies also.[27-29]

Both EQ VAS score and EQ 5D 5L index were significantly lower in uncontrolled diabetes than in controlled group and had negative correlation with uncontrolled state of diabetes (P = 0.000). A negative correlation has been reported between health-related quality of life and HbA1c levels.[28,30] About 58% of study population reporting comorbidities had significantly lower EQ VAS score than the group without any comorbidity. The comorbidities reported include hypertension, coronary artery disease, and musculoskeletal disorders like osteoarthritis. Several studies have reported adverse influence of comorbidities on HRQoL of diabetic patients.[10,11,21,28,31,32]

Our study is limited to ambulatory patients at a tertiary care hospital and hence the findings cannot be generalized to Indian population. Moreover, self-reported health state by participants cannot be completely relied upon. However, this study shows that EQ 5D 5L is a reliable tool in measuring HRQoL of type 2 diabetes patients. The tool can be explored further to assess the quality of life of Indian population and to compare with patients suffering from chronic diseases.

Conclusion

The findings of this study suggest that patients with type 2 diabetes have a poor quality of life as measured by EQ 5D 5L. Age, male gender, uncontrolled disease, and presence of comorbidities can worsen it further.

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Conflicts of interest

There are no conflicts of interest.

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