

# Quality of Life of a Patient with Type 2 Diabetes: A Cross-Sectional Study in Rural South India

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## ABSTRACT

**Background:** With a high prevalence of diabetes in India, there is a need to study the impact of this disease on the quality of life (QoL) of the patients. **Materials and Methods:** This facility-based cross-sectional study assessed the QoL of patients attending the diabetic clinic using the World Health Organization (WHO) QoL BREF instrument in Tamil Nadu. The QoL was analyzed domain-wise and various socio-demographic factors affecting the QoL were studied. **Results:** The mean total score of the QoL scale was 58.05 (95% CI, 22.18–93.88). Domain-wise, 63% had good physical, 69% had good psychological, 27% had good social and 85% had good environmental QoL scores. Males, currently married and those with BMI more than 25 had a statistically significantly better QoL compared to their counterparts. **Conclusions:** Diabetes does impair the QoL of patients but not to a great extent. There is a need to specifically target and improve the QoL of women, widowed and separated, and non-obese diabetics who are at risk of a poor QoL. QoL assessment should be routinely practiced in diabetic clinics.

**Keywords:** Diabetes mellitus, gender, quality of life

## Background

Currently, India is considered the ‘Diabetes Capital’ of the world. This is because the largest number of people with diabetes lives in this country. The International Diabetes Federation estimated that the number of diabetics in India has doubled between 1995 and 2005, and by 2025 it would reach a figure of about 70 million.<sup>[1-4]</sup> India plays a unique role in the diabetes picture of the world. Compared to any other ethnic groups, Asian Indians have a higher propensity to insulin resistance, diabetes mellitus and coronary artery disease.<sup>[5]</sup> In this milieu of high prevalence of diabetes in India, significant research happens to improve the quality of care for the patients. Health care professionals are becoming increasingly aware of the need to assess and monitor the quality of life (QoL) as an important outcome of diabetes care. QoL is how good or bad a person feels their life to be. This view emphasizes the most essential feature of measuring QoL, which is to capture the individual’s subjective evaluation of their QoL and not what others imagine it to be. Efforts to achieve excellent health may damage QoL. If

the demands of a treatment regimen do not fit in with how the patients wish to live their lives, they may choose to compromise achieving tight blood glucose control in order to protect their QoL. Therefore, results can be highly misleading if we interpret health status measures as if they are measures of QoL. Several studies have demonstrated that diabetes has a strong negative impact on the health-related QoL (HRQoL), especially in the presence of complications. Unique scales to measure QoL among diabetic patients in the Indian context have also been developed in the recent years.<sup>[6]</sup> This facility-based cross-sectional study was done to assess the QoL of patients living with diabetes.

## Materials and Methods

This was a cross-sectional study based in the secondary care facility of the Community Health Department of Christian Medical College, Vellore, which serves a rural population of about 1,08,000 living in 85 villages in the Vellore district. This rural area is predominantly agrarian where most of the villagers are agricultural laborers and marginal farmers. The secondary health facility of this program has a weekly diabetic

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clinic attended by approximately 50 patients each week. The patients attending this clinic once in two to three months get their fasting and 2-hour post-meal sugars checked prior to the visit, and the doctors evaluate their glycemic controls. They are also checked for neuropathy, ophthalmic complications, dyslipidemia and renal complications on an annual basis. All the data from the patients registered in the clinic is computerized and updated during each visit. Known diabetic patients aged between 30 and 60 years, diagnosed before July 2006, and attending the diabetic clinic between June and September 2008 were included in the study. Patients with cognitive impairment and obvious disability that could affect the functions of the nervous system and affect independent self-care behavior were excluded from the study. Women with gestational diabetes were also excluded from the study. The first 100 consecutive patients who came for visit to the diabetes clinic during the study period, meeting the above-mentioned eligibility criteria were included in the study.

The questionnaire used to collect data had structured questions related to demographic information, diabetic disease status, duration of illness, most recent blood sugar values, creatinine value and World Health Organization (WHO) QoL-BREF questionnaire, which is a self-report questionnaire comprised of 24 items grouped into four domains of QoL-physical health, psychological health, social relationships and environment, and also two items that measure overall QoL and general health. The questionnaire was translated to Tamil and back translated to English to check for consistency. The translated questionnaire was pilot-tested and modified accordingly. During the pilot study, the time taken to complete one interview was around 10 minutes. Approval was obtained from the Institutional Review Board of Christian Medical College, Vellore. A written consent in Tamil was taken after explaining the purpose of the study. After obtaining consent, the study patients were interviewed by the investigator using the structured questionnaire. Attempt was made to provide utmost privacy during the interview.

Data entry was done using the software Epi-data. Double data entry was done to validate the process of data entry. Statistical analysis software SPSS for Windows 12.0 was used for the analysis of data. The four domains of the WHO QoL-BREF-physical health, psychological, social relationships and environment were rated on a 5-point Likert-type scale.<sup>[3]</sup> As per the WHO user manual, raw scores for the domains of WHO QoL-BREF were calculated by adding values of single items and were transformed on the scale ranging from 0 to 100, where 100 is the highest and 0 is the lowest QoL. Mean score of each domain and the total score were calculated. The first two questions in WHO QoL-BREF were taken together for the analysis of perceived QoL. Individuals with the total mean score of 50% and above were classified as having good QoL and less than 50% as having poor QoL.

## Results

The characteristics of the study population are shown in Table 1. Sixty-four percent of the study population consisted of women, and the mean age of the patients was 56 years. Only 9% of the population had been educated greater than 12<sup>th</sup> standard and 30% did not receive any formal education. About 63% of the population belonged to the lower middle class socio-economic status according to the modified Kuppaswamy classification system. The percentage of the study population that belonged to the lower class was 24%. About 69% of the respondents were unemployed. On analysis of the body mass index (BMI), about 59% were either overweight or obese. Of the study population, 89% never smoked and 6% were past smokers.

The WHO QoL-BREF instrument responses were analyzed. The scores obtained by the patients are shown in Table 2. The mean total score of the QoL scale was 58.05 (95% CI, 22.18–93.88). The QoL scores in the other domains of the scale are shown in Table 2.

**Table 1: Characteristics of the study population**

Demographic characteristics	Categories	% (n=100)
Gender	Male	36
	Female	64
Education	Nil	30
	Up to 5 <sup>th</sup> grade	7
	Up to 10 <sup>th</sup> grade	54
	Up to 12 <sup>th</sup> grade	3
	Graduate	6
SES (Modified Kuppaswamy scale)	Lower	24
	Lower middle	63
	Middle	9
	Upper middle	4
Marital status	Currently married	71
	Widowed	29
Occupation	Unemployed	69
	Unskilled worker	3
	Semi-skilled and skilled	16
	Clerical, shop owner, farmer	9
BMI	Semi-professional	3
	Underweight	15
	Normal	26
	Overweight	30
	Obese	29

BMI: Body mass index, SES: Socio economic status

**Table 2: Quality of life scores of diabetic patients**

Domains (max. 100)	No.	Minimum	Maximum	Mean	SD
Physical QoL score	100	14.29	96.43	58.64	18.541
Psychological QoL score	100	12.50	100.00	62.21	21.313
Social QoL score	100	0.00	100.00	45.25	22.698
Environmental QoL score	100	28.13	100.00	66.03	15.390
Total score QoL score	100	16.29	98.21	58.03	18.293

QoL: Quality of life, SD: Standard deviation

The QoL scores were further converted into categorical variable by obtaining the mean score and dividing the group into those who got a score above the mean and those below the mean. They were labeled as good and poor QoL as shown in Table 3. It was seen that 68% of the patients had an overall good QoL score, whereas 72% had a good perceived QoL score. The agreement between measured QoL score and perceived QoL score for this study population was analyzed. This is depicted in Table 4. The observed agreement between the measured QoL and perceived QoL was 80% and the  $\kappa$  value was 52.5%. Factors influencing the QoL of patients with diabetes mellitus are shown in Table 5. It was seen that males, currently married patients and those with BMI more than 25 had a statistically significantly better QoL compared to their counterparts.

### Discussion

The mean QoL BREF instrument score, indicating the QoL of the patients, was 58.03. Keeping the mean as the cut-off, the QoL

scores were converted into categorical variables. Domain-wise 63% had good physical QoL, 69% had good psychological QoL, 27% had good social QoL and 85% had good environmental QoL. Sixty-eight percent of the patients had an overall good QoL. On analysis of the perceived QoL questions, 72% had good perceived QoL. The scores are as expected for any person in a community with low education, low standards of living and poor socioeconomic status. But the unexpected result was the high percentage of the study population (85%) that scored well in environmental QoL. The facets measured in the WHO QoL BREF instrument pertaining to environmental QoL are availability of money, condition of living place, access to health care and transport facilities. The fact that the patients were from Vellore district where good roads and transport facilities and good public health infrastructure and access are available could influence this result. An 80% agreement between the total QoL score and the perceived QoL score was observed. The  $\kappa$  value was 52.5%. This indicates good agreement.

Overall, 68% of the diabetics have reported a good QoL. This is comparable to the study from Thiruvananthapuram, which showed that 62% of the diabetics reported good QoL.<sup>[4]</sup> Nevertheless it is important to mention that the instruments used in these two studies were different. Before drawing major conclusions from this prevalence of good QoL, comparisons need to be made between QoL among non-diabetics and among patients with other chronic illnesses.

Factors influencing the QoL among diabetics were studied. Being males, being currently married, belonging to higher socioeconomic status, and having a BMI in the overweight or obese range led to better QoL compared to their counterparts. These results are comparable with the Swedish study where middle-aged women had worse QoL compared to men.<sup>[5]</sup> The results also correspond with the findings of the Thiruvananthapuram study.<sup>[4]</sup> But careful consideration of the association between BMI and QoL is important. Previous studies independently looking at the

**Table 3: Categories based on quality of life scores**

Domain	Good score ( $\geq 50\%$ )	Poor score ( $< 50\%$ )
Physical QoL score	63	37
Psychological QoL score	69	31
Social QoL score	27	73
Environmental QoL score	85	15
Total QoL score	68	32
Perceived Qo	72	28

**Table 4: Agreement between measured quality of life score and perceived quality of life score among diabetics**

Perceived quality of life category	Measured quality of life category		
	Good	Poor	Total
Good	60	12	72
Poor	8	20	28
Total	68	32	100

**Table 5: Factors influencing the quality of life of diabetic patients - univariate analysis**

Factor	Category	No. (%)		$\chi^2$ P	95% CI	
		Good QoL (n=68)	Poor QoL (n=32)		OR	Adjusted OR
Age	<55 years	36 (72)	14 (28)	0.521	1.54 (0.62-3.37)	0.78 (0.24-2.51)
	>55 years	32 (64)	18 (36)			
Gender	Male	32 (88.9)	4 (11.1)	0.001*	6.22** (1.97-19.67)	3.85*** (1.10-13.51)
	Female	36 (5.3)	28 (43.8)			
Education	<10 <sup>th</sup> std	60 (65.9)	31 (34.1)	0.265	0.24 (0.03-2.02)	0.14 (0.01-2.31)
	>10 <sup>th</sup> std	8 (88.9)	1 (11.1)			
Marital status	Currently	57 (80.3)	14 (19.7)	<0.001*	6.66** (2.57-17.24)	2.35*** (1.31-4.22)
	Widowed	11 (37.9)	18 (62.1)			
SES	Low	55 (63.2)	32 (36.8)	0.008*		
	Middle	13 (100)	0 (0)			
BMI	<25	14 (46.7)	16 (53.3)	0.049*	0.39** (0.69-0.94)	0.25*** (0.09-0.75)
	>25	54 (76.3)	16 (23.7)			
Duration of diabetes	<5 years	42 (72.4)	16 (27.6)	0.285	1.62 (0.69-3.77)	1.77 (0.50-5.23)
	>5 years	26 (61.9)	16 (38.1)			

\*Statistically significant  $\chi^2$  P value, \*\*Significant odds ratio from univariate analysis, \*\*\*Significant odds ratio from multivariate analysis. QoL: Quality of life, BMI: Body mass index, OR: Odds ratio, CI: Confidence interval, SES: Socio economic status

association between obesity and QoL have clearly indicated that obesity impairs the QoL.<sup>[7]</sup> A study from Stanford also showed that among diabetics, presence of obesity significantly impaired the QoL.<sup>[8]</sup> In this context, it is important to discuss the disparity between the findings of this study and previous studies. On looking at the distribution of the overweight and obese among the patients, it can be seen that 30% are overweight and 29% are obese. On further analysis of the obese group, it can be seen that only 16 individuals have BMI of greater than or equal to 30. The others fall between 27 and 30 with the modified cut-off of BMI for Asian Indians. For analysis of obesity versus QoL, if we consider obese to have a cut-off of 30, then the actual numbers are very small (16%). This could be the reason for the distorted result in the association. While this small subgroup of morbidly obese people could have a poor QoL, the other larger group of overweight and obese could still have a good QoL as overweight/obesity is not severe enough to cause physical or psychological problems in them.

Previous studies, including the Thiruvananthapuram study on diabetes-related QoL have shown that good attitudes and awareness were associated with better QoL.<sup>[4]</sup> Similar association was also seen between good self-care behaviors and QoL.

The WHO QoL BREF instrument is useful for measuring general QoL. There are other diabetes-specific instruments to measure QoL, such as Audit of Diabetes-Dependent Quality of Life (ADDQoL), Diabetes Quality of Life (DQoL), Diabetes Health-Related Quality of Life (DHRQoL), etc.<sup>[9,10]</sup> These could not be used in this study for want of a locally validated translation of these tools. But the WHO QoL BREF instrument still gives a very good estimate of QoL.

Previous studies have shown that patient reported outcomes such as QoL and general health status are associated significantly with clinical outcomes such as HbA1c. This association may be mediated by better self-management behaviors among patients with better reported outcomes.<sup>[11]</sup> Better health-related QoL among diabetes patients was significantly associated with better sleep quality and therefore better activity and productivity.<sup>[12]</sup> There are also studies that have shown that good diabetes control leads to better QoL.<sup>[13]</sup> On the other hand overtreatment and episodes of hypoglycemia and other side effects can also impact the QoL.<sup>[14]</sup> These studies show that patient-reported outcomes such as QoL need to be significantly studied and incorporated into assessment of diabetes and its follow-up.

The current study has clearly shown that diabetes does impair the QoL, but to a lesser extent. Again women, with lesser education and belonging to lower socioeconomic status have a higher risk of poor QoL. This has to be kept in mind while treating patients with diabetes in the clinic. While it might not be easy to modify clinical outcomes with good services and support, it might be much more effective in bringing a change in QoL. Thus,

QoL measurements should become a routine part of clinical management of diabetic patients.

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