Original Research Article

Quality of life among type-2 Diabetes Mellitus Patients: A Cross-Sectional Study from Eastern Indian Medical Institute

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Abstract

Background: Type-2 Diabetes Mellitus is one of the commonest chronic non-communicable diseases occurring worldwide with a high prevalence of diabetes in India.A holistic view in terms of Quality of Life (QoL) is being increasingly recognized as an essential component of diabetes care and management and evaluate the impact of diabetes on physical, social, psychological and environmental components of individual's life,

Aim: To find out the quality of life of type 2 Diabetes Mellitus (DM) patients.

Materials and methods: A cross-sectional study based on response of type-2 DM patients to 26 questions of WHO-QOL BREF and some additional information about their socio-demographic background. Patients were recruited by systematic random sampling into the study sample as they turned out for follow-up at OPD with an informed consent from willing patients, questions were asked in local language from the WHOQOL-BREF in the form of interview. Total 306 number of type-2 DM patients were interviewed following the inclusion criteria of more than 30 years of age and suffering from the disease for at least 2 years or more and under treatment and follow-up.

Results: The maximum domain wise score was in social (68.37 ± 13.54) followed by environmental (61.51 ± 16.24), psychological (58.94 ± 21.27) and physical (52.62 ± 13.54) domain. Males, urban residents, persons aged less than 60 years and overweight individuals reported a better QoL than their counterparts. Gender and residence were found to be significantly associated with QoL, across domains.

Conclusions: QoL assessment is essential for outcome measure in diabetes care. Policy makers ought to consider quality adjusted life years while evaluating health outcomes and National programs should designed for diabetes management must consider the challenges found in their quality of life.

Keywords: Type 2 diabetes, Quality of life, Eastern India, patient compliance.

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Introduction

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disease characterized by elevated levels of blood glucose with major impact on the quality of life (QoL) in terms of various domains such as physical, environmental, social, emotional and mental wellbeing. The prevalence of DM is increasing in the developed and developing countries. WHO reported that the number of diabetic patients in the world has increased from 110million in 1994 to 240 million in 2010 and it is estimated to raise at 300 million in 2025. India is contributing a significant part of the global burden. Diabetes mellitus is associated with many personal, familial, social and financial issues and even people with diabetes and their families suffer substantial economic loss through direct medical costs and loss of work and wages. The burden of diabetes has slowly increased in India and across the globe. About 1.3 billion population of India had diabetes with wide variation across the states of the country and is comparable to large countries in terms of population.

In 2013, WHO developed targets for prevention and control of non-communicable diseases (NCDs) by 2025, which included a 25% reduction in mortality from NCDs, halting the rise in diabetes and obesity, and ensuring that at least 80% of patients have access to affordable basic technologies and essential medicines for NCDs. The Sustainable Development Goals (SDGs) also include a target to reduce the proportion of premature deaths due to NCDs, including diabetes, by one third by 2030.Goals of The National Health Policy 2017 of India is to increase screening and treatment of 80% of people with diabetes and reduce premature deaths from diabetes by 25% by 2025.

Health-related quality of life (HRQoL) is one of the most widely measured treatment outcomes to self-assess the effects of the management of chronic disease on health, and monitors the physical, psychological and social aspects of personal health. It is influenced by individual expectations, beliefs, perceptions and experiences. QoL is defined by World Health Organization (WHO) 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. Again it has been well established that every diabetic patient's life is inimitable and they feel psychologically overwhelmed by the numerous rules and regulations that the disease constrain them to follow. Therefore, assessing the quality of life (QoL) of patients is important due to the fact that each individual has their own individualized perception on their physical, environmental, emotional, and social well-being, which includes a cognitive element satisfaction as well as emotional component happiness.Several studies have demonstrated that diabetes shows a negative effect on QOL. Therefore, assessing the patients' QoL at regular intervals is a necessity for DM as a chronic disease. This evaluation, as a powerful tool, is critical in predicting patients' status for disease management and long-term health care. Regular evaluation for QoL as a routine clinical practice could potentially improve necessary communication among the health care providers and their patients, thereby identify the complications and help them for long care resulting in improving their health status. The World Health Organization QoL-BREF (WHO QoL-BREF) questionnaire, one of the universal instruments, is used to measure QoL in different patients groups. Due to the specific geographical and cultural characteristics of this region, QoL of the patients in this particular area and the factors affecting it may vary with other patients. Soassessing the QoL in Type II diabetes mellitus patients will give a better understanding of the patients' perspective regarding the disease and impact of disease on their day-to-day life.

Materials and Methods

The present facility-based cross-sectional study was conducted between July to December 2022 among type 2 diabetics' patients above the age of 30 years who were on drug therapy for control of blood sugar and not hospitalized for the last six months, attending Endocrinology OPD of Nil Ratan Sircar Medical College and Hospital and were recruited by systematic random sampling. Inclusion criteria were definitive diagnose case of type 2 diabetes mellitus and those were willing to participation in the study. Patients with cognitive impairment and obvious disability that could affect the functions of then ervous system and affect independent self-care behaviour were excluded from the study and pregnant women

with gestational diabetes were also excluded from the study.

Sample size was calculated by using the standard formula and considering the prevalence of poor (dissatis-fied lifestyle/low scores) QOL in T2DM as27.4%.Minimum sample size required was estimated to be 306 which was calculated based on prior studies with confidence levels set at95%, and margin of error 5%.

The WHOQOL-BREF questionnaire was administered to measure the quality of life of the participants. The questionnaire contains 26 items, of which 24 questions cover 24 facetsrelating to the quality of life (QOL) and clustered into four domains – physical health, psychological, social relationship and environment health. Each of these domains are rated on a 5-point Likert scale. Asper the WHO guidelines, 25 raw scores for each domain were calculated by adding values of single items, and it was then transformed to a score ranging from 0 to 100, where 100 is the highest and 0 is the lowest value. The mean score of each domain, total score, and average score was calculated. Individuals with the total mean score of 50% and above were classified as having good QoL and less than 50% as having poor QoL This questionnaire was translated to Bengali, and then, back to English and Cronbach's Alpha was calculated (the value was found to be 0.794) for assessing reliability of the instrument.

The study participants were interviewed and information like sociodemographic characteristics, that is, age, sex, education, family type, marital status, and income, addiction, co morbidities etc and data on QOL were collecte dusing a structured questionnaire. written consent in Bengali and Hindi was taken after explaining the purpose of the study. Attempt was made to provide utmost privacy during the interview.

Ethical consideration

The study was approved by the Institutional Ethics Committee, Nil Ratan Sircar Medical College, Kolkata. Written informed consents were obtained from the study participants before the study.

Statistical analysis

Data were entered into Statistical Package for the Social Sciences (SPSS Inc, Chicago, IL, USA) version 21.0 and checked for any duplicate or erroneous entry. Summary measures of domain scores (mean ± SD) was compared across different socio-demographic variables. Association of QoL scores across domains with sociodemographic parameters were analysed using independent samples *t*-test.$P < 0.05$ was considered as statistically significant.

Results

The Sociodemographic characteristics of the study population are shown in Table 1. A total of 306 diabetic patients with a mean age of 48.1 ± 9.6 participated in this study (ranged from 31 to 83 years old). 42.5% of the study population consisted of women, only 12.4% of the population had been educated as graduate and 8.5% did not receive any formal education. As shown in Table 1, the majority were married 83%, home maker35.3%, rural residents 62.1% and living in joint family 56.2%. About 44.1% of the population belonged to the lower middle-class according to the modified Kuppuswamy classification of socio-economic status system. About 42.2% of the respondents have co-morbidity like hypertension and 84% study population never smoked.

The WHO QoL BREF instrument responses were analysed andscores obtained by the patients are shown in Table 2. The meantotal score of the QoL scale was(61.11± 19.27).

Table 1: Distribution of the participants according tosociodemographic characteristics (*n*=306)

Variables	Subcategory	Frequency, n (%)
Age in years	30 – 40	64 (20.9)
	41 – 50	88 (28.8)
	51- 60	95 (31)
	61 -70	52 (17)
	> 70	7 (2.3)
Gender	Male	176 (57.5)
	Female	130 (42.5)
Residence	Rural	190 (62.1)
	Urban	116 (37.9)
Religion	Hindu	186 (60.8)
	Muslim	98 (32)
	Others	22 (7.2)
Education	Illiterate	26 (8.5)

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	Primary	142 (46.9)
	Secondary	100 (32.7)
	Graduate and above	38 (12.4)
Occupation	Employed	28 (9.2)
	Home maker	108 (35.3)
	Retired	40 (13.1)
	Self employed	59 (19.2)
	Unemployed	71 (23.2)
Marital status	Married	254 (83)
	Single	52 (17)
Type of family	Joint Family	172 (56.2)
	Nuclear Family	134 (43.8)
SES	Upper	16 (5.2)
	Upper Middle	34 (11.1)
	Middle	48 (15.7)
	Lower Middle	135 (44.1)
	Lower	73 (23.9)
Hypertension	Yes	129 (42.2)
	No	177 (57.8)
Addiction	Yes	49 (16)
	No	257 (84)

Quality of life was analysed in four domains namely physical, psychological, social, and environmental domains as, per the WHOQOL questionnaire. The mean total score of the QoL scale was 61.11 (95% CI, 22.18–93.88). The maximum domain wise mean score was in social (66.37 ± 21.13) followed by environmental (61.51 ± 16.24) domain. Least mean score was obtained in the physical domain (57.62 ± 17.54). (Table 2).

Table 2: Domains wise Quality of life (QOL) scores of diabetic patients(*n*=306)

Domains (max. 100)	Minimum score	Maximum score	Score Mean ± SD
Physical QoL score	24.29	88.23	52.62 ± 13.54
Psychological QoL score	27.83	92.43	58.94 ± 21.27
Social QoL score	35.31	100	68.37 ± 21.13
Environmental QoL score	29.17	98.65	61.51 ± 16.24
Total score QoL score			61.11± 19.27

The QoL scores were further converted into categorical variableby obtaining the mean score and dividing the group into those who got a score above the mean and those below the mean, labelled as good and poor QoL respectively as shown in Table 3. We categorised the individual scores into good and bad scores where Majority of the participants scored good in social domain (67.65%) followed by environmental domain (55.55%) and scored poor in physical QoL (62.75%)

Table 3: Categories of study participant based on quality-of-life scores (n = 306)

Domains	Good score [n (%)]	Poor score [n (%)]
Physical QoL score	114 (37.25)	192 (62.75)
Psychological QoL score	142 (46.40)	164 (53.60)
Social QoL score	207 (67.65)	99 (32.35)
Environmental QoL score	170 (55.55)	136 (44.45)

Factors influencing the QoL of patients with diabetes mellitus are shown in Table 4 which has shown the comparison of scores in all four domains of QOL. Comparing the scores obtained in the physical health domains, individuals aged <50 years were having better score ($P < 0.05$). On bivariate analysis, gender of the study participants was significantly associated with QOL in physical, social and environmental domains. Gender, nuclear family status, and higher socioeconomic class were the factors found having significantly better score in psychological health domain ($P < 0.05$). Comparing

the scores obtained in the social relationship domains and socio-demographics variables, male participants had better score ($P < 0.05$) in physical and social domain. In the environmental domain, the factors found to have statistically significant associated with gender, residence, education and addiction.

Table 4: Comparison of the World Health Organization quality of life-BREF domain score with factors influencing the quality of life of diabetic patients(n=306)

Factor	Category (n)	Physical	Psychological	Social	Environmental
Age	<50 year (152)	55.02±8.45	55.48±10.01	66.95±17.60	61.34±10.83
	≥ 50 year (154)	52.48±8.91	52.45±12.33	68.36±15.31	62.93±10.39
	P value	0.0128*	0.122	0.513	0.221
Gender	Male (176)	57.79 ±12.54	58.52 ± 14.89	68.39 ±14.27	64.60 ± 16.47
	Female (130)	52.34 ±12.71	54.54 ± 12.69	62.34 ±12.60	57.39 ± 15.16
	P value	0.035*	0.150	0.026*	0.025*
Residence	Rural (190)	52.25 ±12.35	54.02 ± 15.02	62.52 ±13.92	56.21 ± 15.30
	Urban (116)	57.84 ±12.63	59.48 ± 12.38	69.28 ±13.09	66.94 ± 15.28
	P value	0.0001*	0.048*	0.013*	0.001*
Education	<Secondary (168)	55.95 ±11.89	54.80 ± 13.21	64.19 ±13.56	60.69 ± 15.06
	≥Secondary (138)	57.79 ±12.54	58.52 ± 14.89	68.39 ±14.27	65.60 ± 16.47
	P value	0.1753	0.0215*	0.0091*	0.0012*
Marital status	Married (254)	48.46± 14.89	49.82±12.62	61.77±13.11	56.43±11.22
	Single (52)	53.19±11.70	51.12±13.34	60.22±12.77	59.34±11.82
	P value	0.0368	0.5024	0.4212	0.0929
Hypertension	Yes (129)	47.21±13.63	54.33±13.41	62.52±12.27	61.11±12.58
	No (177)	51.41±13.82	52.46±12.22	62.88±13.81	59.26±13.86
	P value	0.0086*	0.2124	0.3538	0.2471
Addiction	Yes (54)	49.66±13.36	56.72±11.78	62.12±12.58	65.77±12.56
	No (252)	50.71±12.43	59.11±12.35	65.75±13.62	60.72±11.71
	P value	0.0423*	0.1911	0.0829	0.004*

Discussion

Diabetes can have a profound effect on QOL in terms of social and psychological well-being as well as physical ill health. It is one of the most psychologically demanding of the chronic diseases; with psychosocial factors pertinent to nearly every aspect of the disease and its treatment. Diabetes continues to grow at a fast pace assuming proportions of a modern-day epidemic, particularly in Low- and Middle-Income countries like India. Diabetes is known to adversely affect subjective perception of quality of life. Here, 61% of the respondent reported a good perceived QoL. This is comparable to studies from Thiruvananthapuram and Vellore, which showed that 62% and 68% of the diabetics reported good QoL, respectively.

Domain-wise37.3% had good physical QoL, 46.4% had good psychological QoL, 67.7% had good social QoL and 55.6% had good environmental QoL, Mean QoL scores were higher in males than females as reported by other studies in India and elsewhere. This result is also comparable with present study.

Several factors have been identified as predictors of T2DM-related QOL. Age, duration of diabetes, associated comorbidities, treatment significantly affected the QOL as patients aged ≥60 with 6-10 years of diabetes, multiple comorbidities had verypoor QOL. In the present study, most of the participant were from Rural background. Furthermore, most of the male patients were middle-aged while the majority of the female patients were housewives and had reached old age, demonstrating that the chances of getting T2DM in females increased on reaching old age. This result agreed with Anumol *et al*., who found

that more than half of the females with T2DM had a low education level and were house wives. Better awareness and health seeking behaviour among males. under reporting, lack of women empowerment in rural areas and less compliance to routine testing and follow ups, might be the contributing factors.

The current study has clearly shown that diabetes does impair the QoL, particularly in the domain of physical health. 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.

Conclusion

A very large proportion of rural population have poor quality of life due to lack of healthcare facilities in the rural areas. People of low socio-economic status have poor quality of life.

Almost one third of the study population belongs to the age group 51-60. A very small percentage belongs above 71 years of age.Special emphasis should be given to the most vulnerable groups (i.e. elderly age groups, rural residentials, less educated). We have observed that most respondents have poor physical quality of life. To improve physical quality of life, regular exercise, physical activity and diet are recommended.

Limitation:

Our study has its limitations. It was a single-centered study in India and included T2DM patients from a teaching hospital. Again, only ambulatory subjects were taken, so the results cannot be generalized to indoor patients and those with long standing complications and critically ill. Therefore, findings may not be generalized for all Indian patients and both types of diabetes.

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Conflict of interest: None

Ethical Clearance: The study was approved by the Institutional Ethics Committee, Nil Ratan Sircar Medical College, Kolkata. Written informed consents were obtained from the study participants before the study. Date- 07/06/2022 Ref no: NRSMC/IEC/340/2022

FROM - IEC, NRS Medical College, Kolkata

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