ORIGINAL ARTICLE

Assessment of Quality of Life Among Patients with Type 2 Diabetes Mellitus: A Cross-Sectional Study in Rural Area of Jammu District, J&K

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Abstract

Background: Quality of life (QOL) is now becoming an important measure of burden of diseases as it assesses emotional, social and psychological domain besides the physical well being. The present study aimed to asses QOL among diabetic patients in a rural setting.**Methods:** The present cross-sectional study was conducted among diabetic patients attending Medicine OPD in Community Health Centre in rural area. All the eligible diabetic patients were included in the study using consecutive sampling technique and were assessed using WHO-BREF Questionnaire for the QOL.**Results:** A total of 308 respondents constituted the study population. The mean age of the participants was 52.80 ± 10.97 years. Among various domains of QOL, mean scores were found to be maximum for environmental domain (54.08 ± 14.76). Females have lower scores among various QOL domains as compared to their male counterparts. Age was found to be independent predictor for all the domains of QOL. Literacy, monthly family income and duration of the diabetes were all significantly associated with majority of domains of QOL on multivariate analysis (P<0.05).
Conclusion: Advancing age and duration of diabetes were found to be among important predictors of QOL. Influencing factors of QOL in these patients need better planning to improve physical and psychosocial burden of disease and attainment of better QOL.

Introduction

Among the non-communicable diseases (NCDs), Diabetes Mellitus (DM) remains a significant public health challenge, affecting a large number of people in both the developing and developed countries. As per the estimates of International Diabetes Federation (IDF), the counts of people affected from the disease will rise to 642 million in 2040.[1] India with a population of 1.4 billion has been labeled as the diabetes capital of the world with prevalence showing steady rise from 7.1% in 2009 to 8.9% in 2019.[1] Traditional methods like biochemical tests, morbidity and mortality were used to be the measures for burden of disease in diabetes in the recent past but of now, Quality of life (QOL) is being given more attention as it assesses impact of the disease from patient's perspective.[2,3,4] QOL in diabetic patients is impaired not only because of health problems but also due to familial, financial and social issues especially the presence of co-morbidities.[5] Regular assessment of patients for QOL can identify problems that are frequently overlooked and evaluate the effects

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of therapeutic efforts at individual patient level.[6]

Different studies conducted across the globe have clearly revealed that diabetic patients had impaired QOL [7,8] During literature review, it was found that there was paucity of evidence on this problem in our region. So to fill this gap, the authors conducted this study among rural diabetic patients to assess their quality of life.

Material & Methods

Study setting: The present study was carried out in the OPD of Medicine in Community Health Centre RS Pura, district Jammu, J&K.

Study design: Cross-sectional study

Sample size calculation: Assuming the proportion of Diabetic patients having good overall QOL to be 68% based on previous study[9], with 11 % relative precision, confidence level of 99% and non-response rate of 15%, the sample size was calculated as 304 using the formula $4pq/d2$.

Study population: The adults aged $\geq$ 30 years, diagnosed with diabetes mellitus attending Medicine OPD in this centre from 1st Nov 2018 to 31st Oct 2019, fulfilling the eligibility criteria, were enrolled using consecutive sampling technique.

Inclusion Criteria: Diabetes mellitus patients, aged $\geq$30 years, with minimum duration of diabetes one year, who consented to participate in the study.

Exclusion Criteria: Patients with Type 1 Diabetes Mellitus, MODY (maturity onset diabetes of the young), Gestational diabetes, having severe cognitive impairment, suffering from any serious organic illness and with duration of diabetes < 1 year.

Ethical Consideration: The study was approved by the Institutional Ethical Committee GMC, Jammu (IECGJ). (No: IEC/GMC/2019/889)

Data Collection: Before the actual start of the study, permission was obtained from the Block Medical Officer (BMO) of the selected CHC. After taking written informed consent from the willing participants, face to face interviews were held to collect the data by using a self-developed, pre-tested and structured questionnaire. The questionnaire consisted of socio-demographic information and diabetes-related details. To assess quality of life among the respondents "WHO Quality of Life-BREF questionnaire" was used. The reliability score for WHOQOL- BREF among our respondents in terms of Cronbach's alpha coefficient was 0.92.

WHO Quality of Life-BREF (WHOQOL-BREF) [10]:-
The WHOQOL-BREF instrument consists of 26 items,
which measure the following domains: physical health, psychological health, social relationships, and environment. In addition, it also examines separately overall perception of quality of life of an individual and overall perception of their health.

Statistical Analysis

All the data thus collected was analyzed using Statistical software SPSS version 27.0. ANOVA and independent sample t-test were used to compare continuous variables among different groups. Multiple linear regression analysis was employed to find out the factors independently associated with different domains of QOL. A p-value of <0.05 was taken to be statistically significant.

Results

The study population of current study comprised of 308 individuals. The participant's mean age was 52.80±10.97 years, and almost half (52.6%) of the respondents were in the 50-69 years age group. Female participants were more than males (68.5% vs 31.5%). In the present study, 46.42% of the participants were illiterate and majority (93.50%) of the subjects had family income $\leq$ 50,000 INR per month.

Further analysis of the results revealed that among different domains of QOL studied, mean scores obtained were found to be highest for environmental domain (54.08 ± 14.76). Age had shown linear inverse relationship with quality of life. Mean (SD) scores across different domains of quality of life become better off as the literacy level and monthly family income increases. Statistically significant difference in scores across various domains of QOL were seen for different categories of age, literacy level and monthly family income (p value<0.05) by using ANOVA test. [*Table 1*].

Analysis of results of *Table 2* revealed that the scores of all the domains of QOL show a declining trend with the increase in duration of diabetes and the association between the two was found to be significant (p<0.05) statistically by using ANOVA test. Further, quality of life of the respondents was found to be significantly associated with presence of complications, co-morbidities and type of medication (p<0.05).

Results of multiple linear regression analysis revealed that age was an independent predictor in all the domains of QOL. Literacy was also found to be a significant independent predictor for all domains except psychological domain. Among other variables studied, gender and type of medication were found to be independent predictors

TABLE 1: Scores of Various Domains of Quality of life Among Different Socio-Demographic Variables

Variables	N=308 (%)	Physical Health Domain Mean ± SD	Psychological Health Domain Mean ± SD	Social Relationship Domain Mean± SD	Environment Domain Mean ± SD	Quality of life as rated by respondents Mean ± SD	Health satisfaction as rated by respondents Mean± SD
Age (Years) 30-49	114 (37.01)	54.7 ± 10.39	54.7 ± 13.04	61.08 ± 17.08	61.44 ± 13.79	3.73 ± 0.75	3.52 ± 0.72
50-69	162 (52.58)	49.37 ± 11.11	43.17 ± 12.29	45.38 ± 21.08	52.22 ± 12.56	3.23 ± 0.84	3.06 ± 0.85
≥70	32 (10.38)	37.59 ± 8.56	29.06 ± 8.49	24.06 ± 17.34	37.28 ± 11.66	2.15 ± 0.76	2.12 ± 0.71
p value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gender Male	97 (31.49)	50.23 ± 13.26	52.34 ± 15.40	60.01 ± 22.74	62.59 ± 15.87	3.67 ± 0.78	3.5 ± 0.75
Female	211 (68.50)	50.08 ± 10.91	43.04 ± 13.16	43.91 ± 20.19	50.16 ± 12.43	3.14 ± 0.93	2.96 ± 0.88
p value		0.916	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Literacy level Illiterate	143 (46.42)	46.41 ± 10.08	39.07 ± 12.79	35.97±19.81	46.39 ± 12.15	2.86 ± 0.93	2.70±0.85
Literate	165 (53.6)	54.60 ± 11.26	52.30 ± 14.07	59.01 ± 18.57	59.64 ± 13.86	3.59 ± 0.75	3.38 ± 0.76
p value		0.000	0.000	0.000	0.000	0.000	0.000
Monthly family income ≤ 50,000	288 (93.4)	49.82 ± 11.64	45.32 ± 14.55	47.54 ± 22.22	53.02 ± 14.61	3.25 ± 0.92	3.07 ± 0.87
>50000	20 (6.4)	54.50 ± 11.69	55.25 ± 10.83	69.75 ± 8.89	69.30 ± 5.99	4.15 ± 0.36	4.05 ± 0.51
p value		0.08	0.003	0.000	0.000	0.000	0.000

for psychological and environment domain. Monthly family income was independently associated with all the domains except physical health. Presence of complications and co-morbidities were found to be a significant predictors for psychological and social relationship domain respectively (*Table 3*).

Among our study population, 44.5% of the respondents perceived that they had an overall good QOL. Almost One-quarter (26.9%) of patients rate their overall QOL as neither poor nor good.

Discussion

Diabetes impairs majority of components of quality of life although differences with respect to ethnicity, gender, profession, environmental changes, socio-economic status, cultural practices, dietary habits are in existence. In the current study, it was found that age independently influence the quality of life scores and with progressing age the overall scores of quality of life decreases. These findings of our study are in agreement with those reported by Alshayban *et al*.[11]

In the present study, females had lesser score across various domains of quality of life than their male counterparts and these findings are similar to the results reported by Kumar *et al* [12] but in contrast to those reported

TABLE 2: Scores of Various Domains of Quality of Life Among Different Variables Related to Clinical History

Variables	N=308 (%)	Physical Health Domain Mean ± SD	Psychological Health Domain Mean ± SD	Social Relationship Domain Mean± SD	Environment Domain Mean ± SD	Quality of life as rated by respondents Mean ± SD	Health satisfaction as rated by respondents Mean± SD
Duration of diabetes < 5 Years	187 (60.71)	52.33 ± 10.37	48.49 ± 13.46	53.47 ± 22.10	56.83 ± 13.85	3.44 ± 0.86	3.25 ± 0.78
≥ 5 Years	121 (39.3)	47.12 ± 12.74	43.55 ± 16.48	42.23 ± 19.33	50.30 ± 16.19	3.11 ± 0.98	2.90 ± 0.99
p value		<0.0001	<0.0001	<0.0001	<0.0001	0.003	0.009
Presence of complications Nil	139 (45.12)	53.90 ± 10.85	52.58 ± 12.68	58.70 ± 18.86	58.82 ± 14.92	3.69 ± 0.75	3.47 ± 0.72
Neuropathy	24 (7.79)	51.79 ± 12.05	52.83 ± 11.99	47.41 ± 24.80	58.50 ± 11.29	3.58 ± 0.88	3.37 ± 0.64
Retinopathy	88 (28.57)	48.45 ± 10.60	41.07 ± 12.60	41.25 ± 20.54	51.63 ± 11.81	3.09 ± 0.78	2.97 ± 0.85
Both Neuropathy and Retinopathy	57(18.5)	44.68 ± 11.70	36.41 ± 13.70	37.97 ± 22.93	46.90 ± 15.78	2.68 ± 1.10	2.53 ± 1.07
p value		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Co-morbidities Present	151 (49.02)	47.90 ± 12.59	41.79 ± 14.03	42.0 ± 22.18	50.30 ± 14.47	2.98 ± 0.93	2.88 ± 0.89
Absent	157 (50.97)	52.27 ± 10.32	49.99 ± 13.91	55.70 ± 20.29	57.71 ± 14.15	3.61 ± 0.80	3.38 ± 0.80
p value		<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Type of medications Oral Hypoglycemic Agents (OHA)	282 (91.55)	50.88 ± 11.45	46.88 ± 14.56	49.46 ± 21.80	55.12 ± 14.46	3.34 ± 0.92	3.18 ± 0.88
Insulin alone or both Insulin & OHA	26 (8.44)	38.00 ± .00	31.00 ± .000	39.52 ± 22.99	38.00 ± 0.0	2.0 ± 0	2.66 ± 0.57
p value		<0.001	<0.001	<0.001	<0.0001	0.100	0.026

by Srinivas *et al*.[13] Respondents with higher education, and those with higher monthly income had overall better score across various domains of quality of life in current study. This may be due to positive impact of higher education on knowledge, physical well-being, social relationship and healthy environment. These findings are in agreement with Saleh *et al*[14] and Chisalunda *et al*.[15]

In our study, duration of diabetes had a negative effect on overall quality of life. It was found that those who had duration of diabetes of more than 10 years had poor scores across various domains of quality of life than their counterparts. These results are consistent with study conducted by Hussein *et al*.[16] In the current study, the association between the presence of complications of diabetes with various domains of quality of life was found to be significant statistically. Respondents with diabetes associated complications like tripathy (neuropathy, nephropathy and retinopathy) had overall lower scores across various domains of quality of life. Lesser the complications, better the quality of life. These results are in consensus with Hayek *et al*.[17]

Majority of respondents in the current study were treated with oral hypoglycemic agents (OHA) followed

Table 3: Multiple Linear Regression Analysis Showing Variables Independently Associated with Domains of Quality of life Among Diabetic Patients

Variables	Physical Health Domain		Psychological Health Domain		Social Relationship Domain		Environment Domain	
	Adjusted (95% C I)	P value	Adjusted (95% C I)	P value	Adjusted (95% C I)	P value	Adjusted (95% C I)	P value
Constant	(38.384 to 70.0220	0.000	(40.504 to 73.267)	0.000	(29.125 to 77.798)	0.000	(57.228 to 88.707)	0.000
Age	-0.296 (-4.304 to -1.507)	0.000	-0.190 (-3.773 to -0.876)	0.002	-0.266 (-7.128 to -2.825)	0.000	-0.328 (-5.467 to -2.683	0.000
Gender	0.135 (-0.385 to 7.187)	0.078	-0.140 (-8.306 to -0.465)	0.028	-0.110 (-11.093 to 0.556)	0.076	-0.280 (-12.664 to -5.131)	0.000
Literacy	0.237 (0.545 to 2.909)	0.004	0.112 (-0.210 to 2.238)	0.104	0.241 (1.529 to 5.166)	0.000	0.170 (0.387 to 2.739)	0.009
Monthly Family income	0.015 (-2.537 to 3.093)	0.846	0.186 (1.463 to 7.293)	0.003	0.221 (3.665 to 12.326)	0.000	0.193 (1.814 to 7.416)	0.001
Duration of Diabetes	-0.142 (-4.291 to -0.336)	0.022	-0.096 (-4.005 to 0.092)	0.051	-0.185 (-8.811 to -2.725)	0.000	-0.206 (-6.224 to -2.288)	0.000
Complications	-0.045 (-1.334 to 0.74)	0.574	-0.264 (-3.255 to -1.108)	0.000	-0.002 (-1.617 to 1.573)	0.978	0.037 (-0.719 to 1.344)	0.551
Co-morbidity	-0.068 (-4.433 to 1.27)	0.276	0.013 (-2.563 to 3.343)	0.795	0.115 (0.724 to 9.498)	0.023	0.066 (-0.878 to 4.797)	0.175
Type of Medication	-0.075 (-4.083 to 0.788)	0.184	-0.166 (-7.056 to -2.012)	0.000	0.006 (-3.493 to 4.00)	0.894	-0.276 (-10.063 to -5.217)	0.000

CI (Confidence Intervals), p<0.05 considered as statistically significant

by insulin or in combination therapy. Diabetic patients who received more intensive therapy with insulin or in combination with OHA'S were associated with more impaired quality of life in most of the domains. These results are in agreement with the results reported by Huang *et al.*[18]

Multivariate regression analysis in the present study revealed age as an independent predictor for all domains of QOL which is in agreement with the results reported by Gebremedhin *et al* [19] but in contrast to the results of Amin *et al.*[20] Similar to findings of Amin e*t al*[20], monthly income was found to be significant predictor for all domains of QOL except physical health domain in the present

study. Literacy was found to be a significant independent predictor for all domains except psychological domain of QOL. In a similar vein, Amin *et al*[20] and Pandey *et al*[21] also reported a significant positive impact of higher education on all domain scores. Duration of diabetes was a significant independent predictor for social relationship and environmental domain in the present study but Amin *et al*[20] reported that after adjustment for other factors, impact of duration of diabetes on QOL becomes weaker.

Abualhamael *et al*[22] reported that age, education and regular medicine intake were distinct factors associated with QOL.

Limitations

The current study being cross-sectional in nature, could not establish the causality. Another limitation is lack of data on glycemic index of patients. And lastly, the results lack generalization as the respondents were limited to a particular geographical area. So the authors advise caution while interpreting the results.

Conclusion

Variables likeage, literacy, monthly family income, and disease duration affect Quality of Life in diabetic patients. So authors recommend to tailor healthcare interventions taking individual variations into consideration to improve QOL in these patients. The integration of screening programs and diabetic education at community level is likely to limit complications and improve QOL.

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