Research Article

Exploring the Quality of Life of Elderly Population with Type 2 Diabetes Mellitus in Mayo Hospital, Lahore, Pakistan: A Cross-Sectional Study

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Abstract

Background: The number of people suffering from Type-2 diabetes mellitus (T2DM) is continuously rising. Chronic diseases, especially for the elderly population, have an immense impact on quality of life (QoL), which serves as a crucial indicator of overall health and well-being.

Objective: The objective of this study was to evaluate the QoL of elderly T2DM patients and identify the associations between demographic factors and QoL domains.

Methods: A descriptive cross-sectional study was conducted from March 2024 to July 2024 at Mayo Hospital Lahore, involving 94 Out door T2DM patients aged 60 years and above. Using Urdu version of demographic and WHOQOL-BREF questionnaire, data collection involved self-administration or one-on-one interviews. Data analysis was performed using SPSS version 25 by conducting t-test, ANOVA with post-hoc Tukey test, and correlation coefficient.

Results: The findings showed a mixed picture of QoL. While 38% of elderly diabetic patients expressed satisfaction with their health and 40% reported a good QoL, an almost equal number expressed dissatisfaction (39%), with 29% of people denoting their life quality as poor.

Significant positive correlations (p-values <0.001) existed among all QoL domains. Physical (47.32) and environmental (48.38) domains displayed lower average scores compared to psychological (53.24) and social (53.37) domains. Considerable associations were found between QoL domains and demographic factors. Older age, lower income, unemployment, loss of spouse, and duration of diabetes (>10 years) negatively impacted QoL. Hypertension and CVDs had no considerable impact on overall life quality of elderly T2DM patients.

Conclusions: Chronic conditions like DM affect the QoL of elderly patients but the QoL varies across domains and individuals due to factors like age and duration of disease. Lower mean scores of environmental and physical domains with significant correlations among demographic influences and domains were noted

Keywords| Quality of life (QoL), Elderly, Type-2 diabetes mellitus (T2DM).

Introduction

Type-2 diabetes mellitus (T2DM) is a chronic illness characterized by consistently elevated blood sugar levels. It is caused by a combination of two main factors: impaired pancreatic β-cell insulin secretion and a diminished body's reaction to insulin in insulin-sensitive tissues.[1,2] Diabetes is currently a serious global health concern that significantly affects older people's quality of life (QoL).

Globally, the number of persons with diabetes is predicted to rise from 170 million in 2000 to 370 million in 2030.[3] As per the International Diabetes Federation (IDF), 26.7% of Pakistan's adult population suffered from the disease in 2021, a startlingly high percentage that is continually rising.[4] According to World Health Organization (WHO) research, 90% of all diabetics in the senior population have type 2 Diabetes, the most frequent kind of the disease.

Pakistan has been identified as the country with the highest rate of newly diagnosed cases of diabetes, affecting almost one in three citizens, or 37 % of the population.[5] The World Health Organisation (WHO) defined QoL in 1947 as a "state of complete physical, mental, and social well-being, and not merely the absence of disease and infirmity".[6] Being one of the major contributors to a poor QoL in the elderly, T2DM hinders them from living a normal healthy life. WHO has designed different instruments to measure or assess the QoL like WHOQOL-100 and

WHOQOL-BREF. WHOQOL - BREF is considered as a useful alternative to WHOQOL - 100 in assessing quality of life enhancements after significant medical treatments across physical, psychological, and environmental aspects of well-being.[7,8]

Assessing QoL is crucial for gaining insight into how novel treatments, drugs, and healthcare approaches impact patients' daily experiences and overall well-being. By being aware of and having access to the variables linked to older patients' quality of life, such as physical function, psychological factors and knowledge about the disease, we can control the worsening of QoL enabling them to live a healthy life which is the ultimate step in diabetic care.[9] In Pakistan most people have sedentary lifestyles and there is very little awareness about disease control and prevention so patients suffering from T2DM mostly have a poor QoL.

Although a lot of research has been done previously regarding the QoL of T2D patients, the data focusing exclusively on elderly population of Pakistan is not very prevalent as most of the studies had a population of 60 years or below patients. Age is an important factor that introduces bias in QoL. This study serves to eliminate this bias and bridge this gap in literature and also determines the association between QoL domains and demographic variables. Investigating the link between QoL and demographic factors in T2DM patients is essential for providing more personalized, effective healthcare, allocating resources strategically, and adequate policies and plans can be initiated to improve their life quality.

Methods

This descriptive cross-sectional study was conducted at Mayo Hospital, Lahore, from March 2024 to July 2024. The study included 94 participants comprising both males and females. Non-probability convenience sampling technique was used to select participants. The sample size was calculated using Raosoft online sample size calculator. The appropriate formula was used to obtain a sample size of 66 patients and taking 95% confidence interval, 10% absolute precision with expected percentage quality of life as 22%.[7] There were no missing data.

Participants were recruited on the criteria that individuals were aged 60 years or above and had a confirmed diagnosis of T2DM based upon patient history, previous medical records and WHO criteria (Fasting blood glucose > 126, Random Blood Glucose > 200 on one time test with hyperglycemic symptoms, Random Blood Glucose >200 two or more than two times without hyperglycemic symptoms, HbA1c > 6.5%) .participants had the ability to understand and communicate in Urdu. The participants admitted in the wards and those having known psychiatric illness were excluded.

The institutional review board (IRB) of King Edward Medical University approved the research. The study's goal and methodology were explained to the participants, along with their rights and a guarantee of confidentiality.

Two structured questionnaires were utilized to gather data in this study, a Demographic Questionnaire and the Urdu version of WHOQOL-BREF (World Health Organization Quality of Life Brief Version). The demographic questionnaire collected information on age, gender, socioeconomic status, marital status, occupation, duration of diabetes and presence of co-existent chronic diseases (hypertension, CVDs). The WHOQOL-BREF, a shortened version of the WHOQOL-100, is a standardized, generic quality-of-life assessment tool developed by the World Health Organization (WHO). It is designed to be applicable across different cultures and settings. The 26 items of the questionnaire are broken down into four different domains: physical health (7 items), psychological health (6items), environment (8 items),social relationships (3 items), overall health (1 item) and total QoL (1item). Two general health items are also included to measure the quality of life. Before any data was collected, informed consent was acquired from each participant.. Data were collected through a combination of self-administered questionnaires and one-on-one interviews, depending on the participant's literacy level and comfort.

All participant data were input into MS Excel and then imported into SPSS version 25. No missing data were reported. While categorical variables were characterized by frequencies (percent), continuous variables were expressed as the mean ± standard deviation (SD). Using inferential techniques and descriptive tests, the QoL of T2DM patients was ascertained. The assumptions of normalcy were examined which showed skew/SD values for all the domains were <3. 29, hence the data distribution was fairly normal. We used Analysis of variance (ANOVA) with post hoc Tukey test and t-test to determine the relationship between scores of four domains and demographic factors. Pearson's coefficient to determine correlation between different QoL domains was used. P-values less than 0. 05 were deemed statistically significant

in all two-tailed tests. QoL scores were transformed to a 100-point rating system by applying the WHOQOL-BREF manual's algorithms.[11]

Results

A total of 94 patients from Mayo Hospital, Lahore with T2DM participated in the study. Patients with age between 61 to 70 constituted the highest percentage of population (70.2%). Males comprised the majority of study population (78.7%). Around half of the patients were employed and were diagnosed with T2D <10 years ago. The most prevalent co-morbid condition associated with T2D was hypertension (77.7%). The results indicate that around 38% of patients were satisfied with their health and 40% rated their overall quality of life as good (Figure 1).

Nevertheless, almost an equal number of people (39%) were unsatisfied with their health and 29% of patients rated their overall life quality as poor (Figure 2). The baseline characteristics of the patients are represented in (Table 3). The average scores of all four domains of WHOQOL- BREF questionnaire are summarized in Table 1. The mean scores were 47.32, 53.24, 53.37 and 48.38 for physical, psychological, social and environmental domains respectively (Figure 3). The physical and environmental domains had overall lower scores as compared to psychological and social domains. At least 50% of respondents got less than 50 scores for both environmental and physical health domains. As shown in (Table 2), pairwise, the scores in all four domains are strongly correlated with each other (p-values <0.001). The association between QoL domains and demographic characteristics was tested using t-test and one-way ANOVA (Table 3) where applicable, after exploratory analysis which demonstrated normal distribution of variables. A p- value lower than 0.05 was considered statistically significant. Our results show that out of all four domains, age had significant association with physical health scores as people in 61-70 years had highest scores and patients with 80 plus years age had lowest scores. Males had significantly better social scores as compared to females while physical, psychological health and environmental health were not affected by gender. Patients with monthly income >Rs.30,000 had better scores in all four domains. Similarly, patients who were currently employed also had better scores in all domains and thus enjoyed a higher quality of life. Physical and social health scores were better for married patients as compared to patients who had lost their spouses. Moreover, patients with diabetes for more than 10 years had significantly lower physical, psychological and environmental scores as compared to those who had diabetes <10 years. Patients with CVDs and hypertension reported similar levels of QoL with physical and environmental domains having the lowest score.

Data is represented as Mean ± SD. The p value was determined by one-way analysis of variance (ANOVA) and independent samples t-test and where appropriate. Post hoc pairwise comparisons were done using Tukey. For pairwise comparisons, the p value was significant at <0. 05. CVD = cardiovascular diseases. a = pairwise difference.
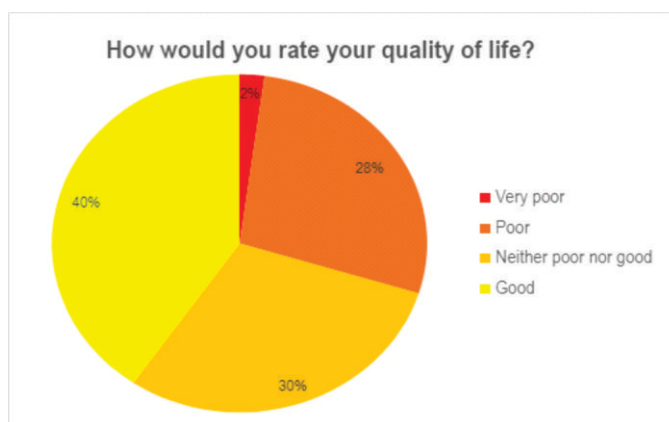

Figure 1: *Rating of the Quality of Life*

Table 1: *Descriptive Summary for domains of QOL*

Domain	Mean ± SD	Median	Minimum	Maximum	Range	Skewness/SE
Physical Health	47.32±19.58	50	3.5	78.5	75	-0.46/0.249
PsychologicalHealth	53.24±20.15	56.2	12.5	91.6	79.1	-0.19/0.249
Social Health	53.37±16.73	58	16.6	75	58.4	-0.43/0.249
EnvironmentalHealth	48.38±17.83	50	15.6	81.25	65.65	-0.12/0.249

Table 2: *Correlation between QOL domains*

Domain	Physical	Psychological	Social	Environmental
Physical	1	0.74(<0.001)	0.62 (<0.001)	0.58 (<0.001)
Psychological	0.74(<0.001)	1	0.69 (<0.001)	0.59 (<0.001)
Social	0.62 (<0.001)	0.69 (<0.001)	1	0.65 (<0.001)
Environmental	0.58 (<0.001)	0.59 (<0.001)	0.65 (<0.001)	1

Values in parenthesis are p-values

Table 3: *Association between QOL domains and demographic characteristics*

Variable	N (%)	Physical Health	p	Psychological Health	p	Social Health	p	Environmental Health	p
Age									
61-70	66 (70.2)	52.12±17.43a		55.08±18.72		54.63±15.11		50.25±16.95	
71-80	25 (26.6)	38.05±19.84	<0.001*	49.78±22.90	0.32	52.50±20.12	0.09	45.67±19.66	0.11
81 and Above	3 (3.2)	18.97±14.40 a		41.63±27.34		33.10±8.00		30.20±10.96	
Gender									
Male	74 (78.7)	48.09±18.76	0.47	54.46±19.75	0.26	55.46±15.62	0.02*	49.33±17.85	0.330
Female	20 (21.3)	44.46±22.68		48.7150±21.5		45.66±18.80		44.92±17.82	
Monthly Income									
<Rs.30,000/ month	59 (62.7)	43.49±19.87	0.02*	47.96±19.18	<0.001*	48.13±16.29	<0.001*	40.03±14.99	<0.001*
>Rs.30,000/month	35 (37.2)	53.40±17.94		62.45±18.77		62.42±13.61		62.28±13.27	
Marital Status									
Unmarried	0	0		0		0		0	
Married	85 (90.4))	48.64±19.20	0.04*	54.32±19.83	0.11	55.31±15.38	<0.001*	49.30±17.52	0.129
Widow	9 (9.6)	34.86±19.96		43.02±21.52		35.13±18.8		39.79±19.58	
Divorced	0	0		0		90		0	
Profession									
Unemployed	39 (41.5)	41.64±22.48	0.03*	46.42±22.12	0.01*	46.88±19.30	<0.001*	43.27±18.49	0.02*
Employed	55 (58.5)	51.35±16.29		58.07±17.27		57.98±12.96		52.02±16.59	
Duration of diabetes									
1-10 years	62 (66)	53.07±18.17	<0.001*	57.49±18.84	<0.001*	55.22±15.73	0.13	51.15±17.87	0.04*
>10 years	32 (34)	36.18±17.53		45.00±20.35		49.80±18.25		43.05±16.79	
Other Chronic Diseases									
Hypertension	73 (77.7)	47.72±19.09	0.71	54.52±20.10	0.25	54.41±17.22	0.27	49.12±17.81	0.47
CVDs	21 (22.3)0	45.95±21.67		48.80±20.20		49.79±14.74		45.84±18.16	

Baseline characteristics of patients (N=94)
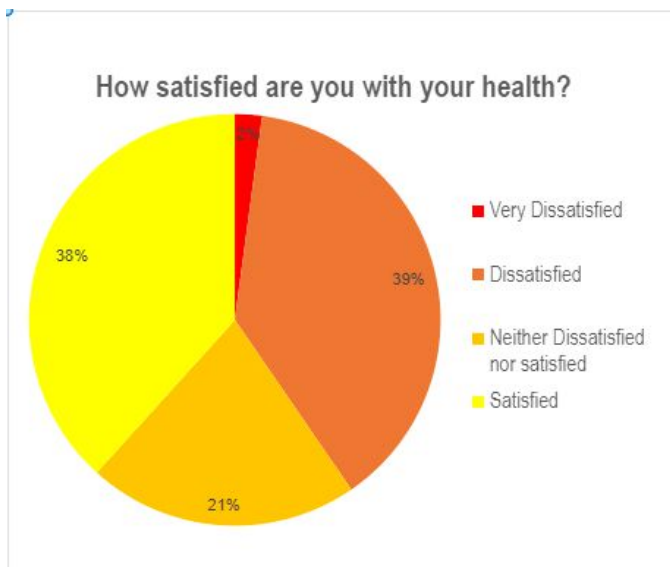
Figure 2: *Health Satisfaction Rate*
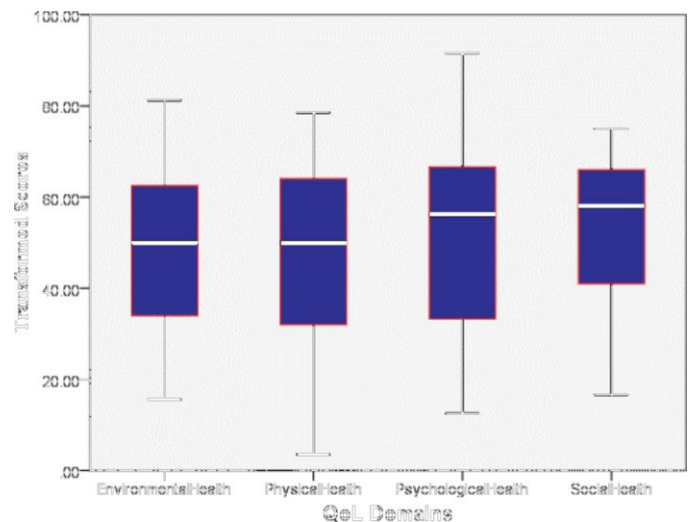
Figure 3: *A box plot representing the participants' altered quality of life domain scores. SE and Mean represented by the box and lines respectively*

Discussion

This cross-sectional study aimed at evaluating the QoL of

elderly T2DM patients concluded that QoL is greatly impacted by demographic characteristics among all the QoL domains. Regarding satisfaction with health, 38% were satisfied, 39% were dissatisfied, and 21% expressed neutrality regarding their health. Our findings were similar to a study conducted in Kerala, India, where around the same percentage of people (38%) expression dissatisfaction with their health and denoted poor life quality.[12] These results, however, contradict the results of study done in Bangladesh where the highest percentage (51%) showed neutrality, 22% were satisfied and the rest had general dissatisfaction about their health.[10] This huge difference indicates that their study population which included young adults and adults >15 years had a widely different perception regarding their health and life quality. The study demonstrated significant associations between age and physical health scores, highlighting a decline in physical well-being with advancing age.[10,13] While most of the studies in previously published literature demonstrated higher scores associated with male gender across all domains, our results only showed significant difference in social domain with no significant differences in other domains. Since percentage of males in our study was far more than females hence results might not be certain. Higher income and employment status was associated with better QoL across all domains, in relevance to previously published data thus emphasizing the role of education, literacy and better skills in effective management of disease.[10,13,14] Marital status was also associated with increased QoL scores with married patients having the highest scores for all domains. This is backed by studies done in UAE and China where marital status positively influenced the QoL of subjects with diabetes.[14,15] Patients with longer durations of diabetes (>10 years) showed lower QoL scores across physical, psychological, and environmental domains, underscoring the impact of disease progression as shown in previous studies.[14,16] The physical health domain emerged as the most challenging aspect of quality of life for Pakistani elderly patients with type 2 diabetes mellitus aligning with the studies conducted in Kuwait and Ethiopia.[17,18] This is likely due to the physiological effects of diabetes, which often result in physical symptoms and complications that can impair daily activities and overall quality of life. Our study showed no impact of chronic conditions like cardiovascular diseases and hypertension with QoL scores. This contradicts some research findings where people with hypertension and CVDs had lower scores compared to those without hypertension and CVDs.[16,19]

Further research on larger sample size is needed to determine the relations. Keeping in view considerably elevated scores in both psychological and social aspects, our study's findings imply that Pakistani elderly patients with T2DM exhibit robust psychological well-being and are satisfied with their familial and social connections as opposed to a study done in india.[20] Cultural influences, including the norms and religious beliefs contribute to the strong social support and sense of belonging observed in this population. Our comprehensive literature search suggests that this study is one of the initial investigations in Pakistan focusing exclusively on the elderly T2DM population in order to pinpoint the target areas for better policies and to reduce confounding variables which could impact the overall QoL scores.[21] Despite its valuable contributions, this study is subject to limitations including its cross-sectional design, single-site study, small-scale study and communication barrier, which may limit generalizability. Future research should incorporate longitudinal studies and broader demographic representations to validate these findings.

Conclusion

Our study reveals that Type 2 Diabetes Mellitus (T2DM) has a profound influence on the quality of life (QoL) of the elderly, particularly in Pakistan's unique cultural and socioeconomic context. The findings highlight both satisfaction and dissatisfaction with health among elderly patients and role of demographic factors in shaping different dimensions of QoL, underscoring the need for tailored interventions and policies. Integrating comprehensive diabetes care that addresses both medical and psychosocial needs is essential.[22] Policies aimed at enhancing socioeconomic support, healthcare accessibility, and community engagement can mitigate QOL disparities observed among elderly patients. To cater to the physical well-being, provision of facilities such as gyms, walking tracks or even physical therapy by professional experts to admitted patients and recommendation of regular exercise to all patients can be an effective step ahead. Moreover, the administration is advised to keep the environment clean, provide greener lawns, good and nutritious food and maintain hygiene of the hospitals to improve the environmental aspect of QoL. By highlighting the gaps in care and obstacles encountered by older patients living with diabetes in Pakistan, the research can guide the creation of personalized care plans, inform healthcare policy, and spur future research focused on improving diabetes management and patient well-being in this growing demographic.

Authors Contribution:
NU: Involved in conceptualization of study

TI, UA, SAQ: Involved in data collection
WR, SS, SE: Involved in manuscript writing

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