Original Article

Exploring the Relationship Between Quality of Life and Clinical Parameters with Diabetes

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ABSTRACT

Elderly people are at substantial risk for this condition since older adults with Type 2 DM are linked to an increase in mortality and complications when compared to young diabetics and non-diabetics in the same age group. Nearly 19 million individuals, or 26.9% of all individuals in this age range, had diabetes in 2010. The most crucial factor in assessing a person's level of health (QOL) is their quality of life. This prospective, cross-sectional, observational study began after receiving ethical approval. There were 182 patients in this study. The chi-square test was employed to compare categorical data, while the unpaired t-test was needed to compare normally distributed continuous data. Physical health domain I of the WHOQOL-BREF domains exhibits a substantial positive connection with SAB, AUT, DAD, INT, and OLD of the WHOQOL-OLD aspects, with correlation coefficients of (r= 708, p= <0.001), (r= 295, p= <0.001), (r= 258, p= <0.001), (r= 240, p= 0.001), and (r= 708, p= <0.001), respectively. The WHOQOL-BREF was shown to have a significantly negative correlation with both the duration of diabetes mellitus and ADS (ρ= -0.194, p= 0.009) and (ρ= -0.339, p< 0.001), respectively). The association between age, BMI, waist-hip ratio, HbA1c, FPG, SBP, and DBP was not shown to be statistically significant. The WHOQOL-BREF score was significantly inversely correlated with the duration of diabetes mellitus and ADS. Age, HbA1c, and WHOQOL-BREF score were all negatively correlated with ADS score in a manner that is significant.

Keywords: Quality of life (QOL), ADS, WHOQOL-BREF, Type 2 DM.

INTRODUCTION

Diabetes mellitus is a diverse range of illnesses that frequently manifest as hyperglycemia and glucose dogmatism related to impaired insulin action, insufficient insulin, or a combination of the two. Globally, 285 million persons between the ages of 20-79 were reported to have diabetes in 2010, with around 70% of those individuals residing in developing nations. The hormone insulin produced by the pancreas controls blood glucose levels.[1] Complications from Type 2 diabetes continue to be one of the leading causes of morbidity and death globally. For those who are above 65, the estimate is certainly more frightening. In 2010, almost 19 million individuals, or 26.9% of the total population in this age range, had diabetes. Because older persons with Type 2 DM are associated with higher rates of death and complications when compared to younger diabetics and non-diabetic individuals in the same age group, elderly people have a significantly greater chance of developing this complaint. Since older adults with Type 2 DM are connected to an increase in mortality and complications when compared to young diabetics and non-diabetic people in the same age group, elderly people are at significant risk for this problem[2]. The elderly population's QOL is negatively impacted by type 2 DM. QOL in patients with kind 2 DM is affected by several variables, including age, gender, insulin use, income, disease complication, education, psychological aspects, kind of healthcare, and disease awareness[3].

The quality of life (QOL) of a person is the most important component in determining that individual's health. The WHOQOL- BREF instrument can be used to assess general QOL[4]. The combined effects of increasing insulin resistance and pancreatic island dysfunction enhance the risk of developing Type 2 DM in the elderly[5]. Type 2 DM has a deleterious effect on the QOL in the elderly population. QOL in similar cases with Type 2 DM is influenced by several factors like age, gender, insulin use, income, a complication of the disease, education, psychological factors, type of health care, and knowledge about the disease. Bettered glycaemic control is associated with better QOL[6].

Health-related quality of life (HRQOL) is a crucial indicator of healthcare needs and health concerns[7]. Because WHOQOL-BREF is so good at assessing HRQOL, it is widely utilized. 26 items make up the WHOQOL-BREF, which is used to evaluate HRQOL in diabetes cases[8].

Giving the elderly population a high quality of life is currently one of the biggest problems we face, particularly when coping with some chronic illnesses like diabetes. One of the most significant risk factors for diabetes is old age, and diabetes is linked to a detrimental effect on quality of life[9]. The WHOQOL-OLD is a unique module designed specifically for the elderly. It comprises six components: autonomy (meaning independence in old age, describing the degree to which one can live independently and make decisions), past, present, and future activities (meaning satisfaction over life's accomplishments and the things one long for), social involvement (meaning participation in

daily activities, especially in the community), death and dying (meaning worries, concerns, and fears related to death and dying), and intimacy (meaning the ability to form personal and close connections)[10].

METHODS

Following getting ethical approval from King George's Medical University, Lucknow (Ref. code: VI-PGTSC-IIA/P10), this prospective, cross-sectional, observational study was launched. Department of Pharmacology & Therapeutics, King George's Medical University, Lucknow collaborated with the Department of Medicine to undertake the current study.

Inclusion and exclusion criteria:

Following their consent, patients who met the following requirements were enrolled in the trial:

1. **Inclusion criteria**

a. Patients ≥60 years of age.

b. Diagnosed with T2DM and on antidiabetic medication for ≥6 months (with and without co-morbidities).

c. Written informed consent.

2. **Exclusion criteria**

a. Patient not willing to give informed consent.

b. Newly diagnosed T2DM patients.

c. Patients of Type I Diabetes Mellitus.

d. Patient on steroid medication.

e. Any serious surgical conditions.

f. Patient <60 years of age.

g. Patient having any autoimmune disease, inflammatory conditions, and infections (HIV, TB)

h. Patients with mental and psychiatric disorders.

A study (Patel B, et al 2014) is used for the calculation of sample size, formula below is used to determine the sample size, $n = [Z(1 - \alpha/2) + Z(1 - \beta)]^2 \frac{[SD_1{}^2 + SD_2{}^2]}{(X_1 - X_2)^2}$, n = sample size. The number of patients enrolled in this study was 182.

Statistical analysis

While categorical data was compared using the chi-square test, the normally distributed continuous data were compared using the unpaired t-test. The odd ratios for quality of life (QOL) impairment were calculated using univariate binary logistic regression analysis. The forward conditional technique was utilized in multivariate linear regression to identify the independent predictors of reduced quality of life (QOL), and variables with P values ≤0.10 in the univariate binary logistic regression analysis were included. The SPSS version 21.0 program for Windows (SPSS Inc., Chicago, IL, USA) was used for all statistical analysis. Statistical significance was determined by a two-sided P value of <0.05.

RESULTS

Scores for the WHOQOL-BREF domain and the WHOQOLOLD aspects are correlated. A significant positive association between WHOQOL-BREF overall and sensory abilities (SAB), death and dying (DAD), and WHOQOL-OLD overall has been found (r= 386, p= <0.001), (r= 216, p= 0.003), and (r= 386, p= <0.001), respectively. Physical health domain I of the WHOQOL-BREF domains exhibits a substantial positive connection with SAB, AUT, DAD, INT, and OLD of the WHOQOL-OLD aspects, with correlation coefficients of (r= 708, p= <0.001), (r= 295, p= <0.001), (r= 258, p= <0.001), (r= 240, p= 0.001), and (r= 708, p= <0.001), respectively. The WHOQOL-BREF domain II (Psychological health) exhibits a substantial positive connection with the WHOQOL-OLD components SAB, DAD, and OLD (r= 386, p= <0.001), (r= 216, p= 0.003), and (r= 386, p= <0.001), respectively. The SAB, DAD, and OLD WHOQOL-OLD aspects significantly positively correlate with Domain III (Personal relationship) of the WHOQOL-BREF domains (r= 268, p= <0.001), (r= 267, p= <0.001), and (r= 268, p= <0.001), respectively. The WHOQOL-BREF domain IV (Environment) exhibits a substantial positive connection with the WHOQOL-OLD components SAB, AUT, DAD, and OLD (r= 680, p= <0.001), (r= 285, p= <0.001), (r= 251, p= <0.001), and (r= 680, p= <0.001), respectively **(Table 1).**

Table 1: Pearson correlation between WHOQOL-OLD facets with WHOQOL-BREF domains (n=182)

			WHOQOL-OLD Facets						
			SAB	**AUT**	**PPF**	**SOP**	**DAD**	**INT**	**OLD**
WHOQOL-BREF DOMAINS	WHOQOL-BREF OVERALL	Pearson Correlation	0.386**	0.162*	0.064	0.095	0.216**	0.144	0.386**
		P-value	<0.001	0.029	0.394	0.204	0.003	0.053	<0.001
	Physical Health	Pearson Correlation	0.708**	0.295**	0.126	0.103	0.258**	0.240**	0.708**
		P-value	<0.001	<0.001	0.089	0.168	<0.001	0.001	<0.001
	Psychological Health	Pearson Correlation	0.386**	0.085	0.064	0.095	0.216**	0.144	0.386**
		P-value	<0.001	0.255	0.394	0.204	0.003	0.053	<0.001
	Personal Relationship	Pearson Correlation	0.268**	0.105	0.059	0.144	0.267**	0.059	0.268**
		P-value	<0.001	0.159	0.429	0.053	<0.001	0.426	<0.001
	Environment	Pearson Correlation	0.680**	0.285**	0.094	0.089	0.251**	0.208**	0.680**
		P-value	<0.001	<0.001	0.206	0.233	<0.001	0.005	<0.001

Table 2: Correlation analysis of various parameters with WHOQOL-BREF and ADS scores in the study population

Parameters	WHOQOL-BREF		ADS	
	Pearson's ρ	P-value	Pearson's ρ	P-value
Age	-0.055	0.462	-0.147	0.048
Duration of DM	-0.194	0.009	0.071	0.338
BMI	-0.036	0.627	0.072	0.334
Waist hip ratio	0.118	0.114	-0.130	0.080
HbA1c	-0.010	0.893	-0.189	0.011
FPG	-0.039	0.604	-0.005	0.950
SBP	-0.069	0.358	-0.071	0.342
DBP	-0.039	0.601	0.002	0.981
WHOQOL-BREF	1.000	-	-0.339	<0.001
ADS	-0.339	<0.001	1.000	-

The WHOQOL-BREF was shown to have a significantly negative correlation with both the duration of diabetes mellitus and ADS (ρ= -0.194, p= 0.009) and (ρ= -0.339, p< 0.001), respectively). The association between age, BMI, waist-hip ratio, HbA1c, FPG, SBP, and DBP was not shown to be statistically significant. Age (r = -0.147, p = 0.048), HbA1c (r = -0.189, p = 0.011), and WHOQOL-BREF (ρ= -0.339, p< 0.001) were all significantly inversely linked with the ADS. However, there was no apparent link between the duration of diabetes mellitus and the BMI, waist-hip ratio, FPG, SBP, or DBP **(Table 2)**.

DISCUSSION

WHOQOL-BREF overall shows a significant medium to high positive correlation with sensory abilities (SAB), death and dying (DAD), and WHOQOL-OLD overall (r= 386, p= <0.001), (r= 216, p= 0.003), and (r= 386, p= <0.001) of WHOQOL-OLD facets respectively. Domain I (Physical health) of WHOQOL-BREF domains shows a significant medium to high positive correlation with SAB, AUT, DAD, INT, and OLD (r= 708, p= <0.001), (r= 295, p= <0.001), (r= 258, p= <0.001), (r= 240, p= 0.001), and (r= 708, p= <0.001) of the WHOQOL-OLD facets respectively. Domain II (Psychological health) of WHOQOL-BREF domains shows a significant medium to high positive correlation with SAB, DAD, and OLD (r= 386, p= <0.001), (r= 216, p= 0.003), and (r= 386, p= <0.001) of the WHOQOL-OLD facets respectively. Domain III (Personal relationship) of WHOQOL-BREF domains shows a significant medium to high positive correlation with SAB, DAD, and OLD (r= 268, p= <0.001), (r= 267, p= <0.001), and (r= 268, p= <0.001) of the WHOQOL-OLD facets respectively. Domain IV (Environment) of WHOQOL-BREF domains shows a significant medium to high positive correlation with SAB, AUT, DAD, and OLD (r= 680, p= <0.001), (r= 285, p= <0.001), (r= 251, p= <0.001), and (r= 680, p= <0.001) of the WHOQOL-OLD facets respectively. A similar correlation study was conducted by Conrad et al[6] which shows a medium to high positive correlation between the WHOQOL-OLD facets and WHOQOL-BREF domains.

Pearson correlation was also done to measure the degree of association between WHOQOL-BREF and ADS on various parameters and it was seen that duration of diabetes mellitus and ADS were found to be significantly inversely correlated for WHOQOL-BREF. Whereas, age and WHOQOL-BREF are significantly inversely correlated for ADS.

We observed that there was a highly significant association between HbA1c (p= 0.24), duration of diabetes mellitus [p= 0.009], and marital status [p= 0.048]. We observed that there was a highly significant association between age (p= 0.05), and marital status [p= 0.025]. Ganesh Kumar et al[7] their study also observed that after applying the binary logistic regression model, age, education, marital status, and family type differed significantly between the type 2 diabetes mellitus patients with impaired quality of life (QOL), thus all those above-mentioned parameters are identified as independent risk factors for impaired quality of life (QOL) in type 2 diabetes mellitus patients of the elderly population. Similarly, in the study of Singh A et al[11] on binary logistic regression analysis there was a highly significant relationship between age, gender, marital status, education, and socio-economic status. Soren SK et al[12] also observed significant association after binary logistic regression, education, socio-economic status, family type, and physical activity emerged as a significant risk factor associated with impaired quality of life (QOL). Debnath A et al[13] in their study show that age, gender, education, marital status, socio-economic status, and types of family were the independent predictors of impaired quality of life (QOL). Ababio et al[14] in their study FPG, HbA1c, BMI, and SBP were predictors for impaired quality of life (QOL).

CONCLUSION

Overall, there was a strong positive correlation between WHOQOL-BREF and the WHOQOL-OLD components of sensory abilities (SAB), dead & dying (DAD), and OLD. Sensory abilities (SAB), autonomy (AUT), dead & dying (DAD), and OLD of WHOQOL-OLD facets were significantly positively associated with Domain I (Physical health) of

WHOQOL-BREF domains. SAB, DAD, and OLD of the WHOQOL-OLD aspects showed a significantly favorable association with Domain II (Psychological health) of the WHOQOL-BREF domains. SAB, DAD, and OLD of the WHOQOL-OLD aspects had a significantly positive association with Domain III (Personal relationship) of the WHOQOL-BREF domains. SAB, AUT, DAD, and OLD of the WHOQOL-OLD aspects had a significantly positive association with Domain IV (Environment) of the WHOQOL-BREF domains. The duration of diabetes mellitus and ADS were significantly inversely linked with the WHOQOL-BREF score. Age, HbA1c, and WHOQOL-BREF score were all significantly adversely linked with the ADS score.

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