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Assessment of Quality of Life among Known Type 2 Diabetics– A Community Based Cross Sectional Study in North Karnataka

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ABSTRACT

Introduction: Type 2 DM is a major public health problem in both developing and developed countries. Diabetes and its complications are leading cause for morbidity and mortality, which negatively affects the quality of life. So we conducted this study to assess the QOL of known type 2 diabetics & to understand the association of BMI, Waist circumference, Blood pressure and HbA1c levels with QOL.

Materials & Methodology: It's a cross-sectional study done in urban slums, using WHOQOL – BREF scale to assess the QOL, semi – structured questionnaire to assess the socio – demographics; and height, weight, abdominal circumference and blood pressure were measured. HbA1C levels was measured using single use HbA1C Now+ kit.

Results: Majority of the study participants were in the age group of 30 – 40 yrs (36.7%). 56% of the study participants were overweight and obese. Hypertension was seen in ≈28%. 12% of them had HbA1c levels >8%. Mean score for QOL in Physical domain was 50.5, Environmental was 50.0, Psychological was 47.0 and Social was 45.8. Factors like depression and HbA1c levels influenced QOL negatively. Perceived QOL was better in males than females, whereas females had better overall QOL domain scores.

Conclusion: Low QOL poses one of the major risks in management of Type 2 Diabetes Mellitus. Our study showed half of the study population with poor QOL scores in all domains, which implicate the need for a better care of diabetics with life style modification.

Key words: quality of life, type 2 diabetes mellitus, HbA1c, urban slum.

INTRODUCTION

Diabetes is a disease of major public health importance both in terms of number of persons who suffer and its significant relation with morbidity and early mortality[1]. Prevalence of type 2 diabetes mellitus (T2DM) has reached an epidemic proportion in many countries. The global prevalence (age-standardized) of diabetes has nearly doubled since 1980, rising from 4.7% to 8.5% in the adult population, this prevalence has risen faster in low- and middle-income countries than in high-income countries with 43% of the deaths occurring due to DM before the age of 70 years[4].

Over the past few decades, various studies have been done in India to estimate the prevalence of diabetes[6]. Among them few multi-centric studies conducted such as, CURES (Chennai Urban Rural Estimation Studies) which gave a crude prevalence of diabetes as 15.5 per cent while that of Impaired Glucose Tolerance was 10.6 per cent[7]. The WHO-ICMR National NCD risk factor surveillance study reported frequency of self-reported diabetes as 4.5%[8]. These studies also reported three-fold higher (18.9/1000 person-years) mortality in diabetes compared to non-diabetics[9]. Apart from causing mortality and significant morbidity, this dis-

ease has a negative impact on quality of life of the sufferers [10]

Unlike other diseases, this needs regular attention and careful monitoring. They have to undergo life-style adjustments such as timing of food intake, type of food, regular exercise, daily medications, blood glucose monitoring and many more. These life style changes place unique demands on individual as well as on the family. Failure to follow may lead to serious consequences. Hence, the primary goal of diabetic treatment is to maintain the glycemic index in normal range, so as to minimize the development of complications related to diabetes mellitus[11].

Quality of life is increasingly recognized as an important health outcome, representing the ultimate goal of health for all interventions. With increase in prevalence of Diabetes in India, it becomes important to assess the quality of life[12].

Very few studies have been undertaken in this regard at community level. Our study was done to know the scenario of QOL among type -2 diabetic population residing in urban slums of the field practice area of a Medical college in North Karnataka.

OBJECTIVES

The study was conducted to assess the Quality of life (QOL) of known type 2 diabetic people and to understand the association of BMI, Waist circumference, Blood pressure and Blood glucose levels (HbA1c) with QOL in the study participants.

METHODOLOGY:

This was a Cross sectional study, conducted in the Urban field practice area (Slum population) of Medical College in North Karnataka. The study population (Known Diabetic people) was identified by house to house survey of the area. The Sample size was obtained by taking prevalence of self-reported type 2 diabetes mellitus as 10.22%[12], in Karnataka at 95% confidence interval and 5% absolute allowable error. The formula used for calculation was $n = 4pq/l^2$, sample size came to be 141, after taking 10% of noncompliance rate, final sample size calculated was around 155. People with known history of type 2 diabetes mellitus aged between 30-65 years were included in the study and Diabetics patients aged < 30 years and > 65 years; people with Gestational DM and Type -1 Diabetes Mellitus patients and those who are not willing to participate in study were excluded from the study.

Interview: After obtaining ethical clearance from the Institutional ethical committee, the study was carried out.

The purpose and nature of the study and confidentiality of the data were explained to the participants and their consent was taken. Total 1260 houses were included for house to house survey covering the population of 10000, and enumeration of all the known type 2 diabetics in the age group of 30 – 65 yrs residing in the area was done.

Participants who fulfilled the inclusion criteria were then interviewed using a World health Organization Quality of Life – BREF (WHOQOL – BREF) scale to elicit the quality of life; PHQ-9 to assess the depression; and semi structured questionnaire was used to elicit the socio-demographic and behavioral profile.

Height and Waist circumference was measured by using non stretchable measuring tape to the nearest of 0.1cm. Weight was recorded using a standardized Bathroom weighing scale to the nearest of 0.1kg. Body mass index was then calculated. Two readings of Blood pressure was recorded 5 minutes apart using a mercury sphygmomanometer on right arm in sitting posture. Average of two readings was used for analysis. Blood HbA1c levels were measured by using HbA1c Now+ Single use Kit. This measurement was used in our study as, many studies like Diabetes Complications and Control Trial (DCCT) and the United Kingdom Prospective Diabetes Study measured HbA1c and related this clinical outcome of glycemic control to the complications of diabetes[13, 14]. The American Diabetes Association (ADA) also recommends that HbA1c should be measured at least twice a year in persons with diabetes[15].

RESULTS

158 people with type 2 diabetes mellitus participated in the study. Their socio demographic profile showed that, majority of 36.7% of them belonged to age group of 30 – 40 yrs.; 60.1% were females and 39.9% were males; 90% of them were married; 66.5% belonged to Hindu religion and remaining 33.5% belonged to Muslim religion; majority of 36.7% never had any formal schooling and ≈ 66% of them belonged to Class IV and V of Modified B. G. Prasad Classification. Table 2 shows that 24.7% and 2.5% of the known type 2 diabetics were having grade I and grade II hypertension respectively, while 55.1% had pre – hypertension. After application of PHQ – 9 item scales for diagnosis of depression, we found that 18.4% of them had mild depression, 0.6% had moderate depression. Table 3 showed that 40% of female participants had HbA1C levels in range of 6.5-7.0%, whereas majority of 41.3% of males had their HbA1C levels in

Table 01: Socio - demographic profile of study population

Background variables	Cases (n=158) (%)
Age (yrs)	
30-40	58 (36.7)
41-50	36 (22.8)
51-60	42 (26.6)
>60	22 (13.9)
Sex	
Male	63 (39.9)
Female	95 (60.1)
Marital status	
Married	142 (89.9)
Unmarried	2 (1.3)
Widow/widower/separated	14 (8.9)
Religion	
Hindu	105 (66.5)
Muslim	53 (33.5)
Education	
No formal education	58 (36.7)
Primary school	56 (35.4)
High school	34 (21.5)
Pre university	10 (6.3)
Occupation	
Government	50 (31.6)
Private	51 (32.3)
Self employed	36 (22.8)
Home maker	21 (13.3)
SES	
I (>6528)	2 (1.3)
II (3264 - 6527)	17 (10.8)
III (1959 - 3263)	35 (22.2)
IV (979 - 1958)	56 (35.4)
V (<978)	48 (30.4)
Type of family	
Nuclear	71 (44.9)
Joint	55 (34.8)
Extended	32 (20.3)

range of 7.1-8.0%, which is beyond the target level for diabetic patients (HbA1C at ≤6.5) and this was statistically significant. Around 53.5% of overweight or obese participants had their HbA1C levels ≥7.0% and 38.6% had HbA1c level 6.5 – 7.0% and this was also statistically significant. Table 4 showed the scores of WHOQOL – BREF scale on 0 – 100 scale (i.e., transformed scores). Mean score in physical health domain was around 50.5, similarly for psychological, social and environmental domains it was 47.1, ≈48 and 50.0 respectively. Table 5 shows that, majority of 56.3% had poor physical QOL, 62% had poor psychological QOL, around ≈71% had poor social QOL and 57% had poor environmental QOL. Perceived QOL among male and female participants was not statistically significant, but majority of female participants reported poor perceived QOL then male participants. The results of linear regression depicting poor scores of environmental QOL domain; mild and moderate depression was found to be statistically associated with poor outcome of perceived QOL (Table 6).

Table 02: Distribution of selected Co - morbidities in study population

Co-morbidities	Cases (%)
Depression (using PHQ)	
No	128 (81)
Mild	29 (18.4)
Moderate	1 (0.6)
Hypertension	
Pre –Hypertension	87 (55.1)
Grade I	39 (24.7)
Grade II	4 (2.5)

Table 03: Glycemic control (HbA1C levels) v/s selected risk factors of type 2 DM

Selected risk factors	Excellent (4.5-6.4) (N=13) (%)	Good (6.5-7.0) (N=57)(%)	Acceptable (7.1-8.0) (N=69) (%)	Poor (>8.0) (N=19) (%)	Total (N=158)	p value
Gender						
Male	5 (7.9)	19 (30.1)	26 (41.3)	13 (20.7)	63	0.037
Female	8 (8.4)	38 (40)	43 (45.3)	6 (6.3)	95	
BMI						
Underweight	3 (21.4)	8 (57.1)	2 (14.3)	1 (7.2)	14	0.013
Normal	3 (5.4)	15 (26.7)	30 (35.1)	8 (14.2)	56	
Overweight/ obese	7 (7.9)	34 (38.6)	37 (42.1)	10 (11.4)	88	
Type of work						
Heavy	7 (14.7)	13 (27.1)	22 (45.8)	6 (12.5)	48	0.348
Moderate	4 (4.2)	38 (40)	42 (44.2)	11 (11.6)	95	
Sedentary	2 (13.3)	6 (40)	5 (33.3)	2 (13.4)	15	

Note: *siginificant at 5% level of significance (p<0.05)

Table 04: Distribution of Domains of Quality of life scores (WHOQOL BREF) among the participants

Quality of life Domain	Raw score			Transformed Score (0-100)		
	Min	Max	Mean ± SD	Min	Max	Mean ± SD
Physical health	13	28	21.1 ± 3.2	21.4	75.0	50.5 ± 11.5
Psychological	10	22	17.3 ± 2.6	16.7	66.7	47.1 ± 10.8
Social relationships	3	12	8.2 ± 2.0	0.0	75.0	45.8 ± 16.1
Environment	18	32	24.0 ± 2.8	31.3	75.0	50.0 ± 8.8

Table 05: Distribution of Quality of life scores among the study population- Domain Categories

QOL Domains	Poor N (%)	Good N (%)
Physical QOL	89 (56.3)	69 (43.7)
Psychological QOL	98 (62)	60 (38)
Social QOL	112 (70.9)	46 (29.1)
Environmental QOL	90 (57)	68 (43)

Table 06: Linear Regression Analysis of Predictors of perceived QOL

Variable	B	p value
Predictors		
(Constant)	1.674	0.448
Physical health QOL	0.003	0.713
Psychological health QOL	-0.015	0.07
Social relationships QOL	-0.001	0.925
Environmental QOL	0.027	0.005*
Depression		
No (ref)		
Mild	-1.478	<0.001*
Moderate	-2.147	0.033*
Hypertension		
No (ref)		
Pre	0.036	0.912
GrI	0.153	0.78
GrII	-0.444	0.632
Blood pressure (SBP) (mmHg)	-0.012	0.395
Blood pressure (DBP) (mmHg	0.021	0.073
HbA1c level	-0.014	0.915
Waist circumference (cm)	0.005	0.48
Body Mass Index (Kg/m2)	0.008	0.504
Age (Yrs)	-0.005	0.542
Sex		
Male (ref)		
Female	0.147	0.405
Marital status		
Married (ref)		
Unmarried	-0.583	0.449
Widow/Widower/Separated	-0.078	0.795
Religion		
Muslim (ref)		
Hindu	0.075	0.684

Note: *siginificant at 5% level of significance ($p<0.05$)

DISCUSSION

Few community based studies are done on Quality of Life measurement among known type 2 diabetes patients in Slums in Indian context. Present literature shows lack of uniformity in methodology and sample size in measuring QOL score, resulting in non – comparability both at national and international levels.

Although type 2 diabetes is known to be a serious burden in Indian scenario, there are still quite scarce studies that assess the impact of diabetes on the patients' QOL. Diabetes needs a lifelong care which should be more comprehensive and quality of life is an important aspect in continuum of care and influences adherence to treatment. So, this study examined the relationship of demographic factors and risk factors and blood glycemic levels with QOL of the study participants.

Diabetes has significant influence on QOL in terms of social and psychological well-being as well as physical health. It is one of the psychologically demanding chronic disease; with social, behavioral & stress factors related to nearly every aspect of the disease and its treatment[18]. The goal of treatment involves a holistic approach planned to improve the QOL at large.

In our study, using transformed scores of mean values of different domains revealed, highest score for physical health and environmental health domain with 50.5±11.5 and 50.0±8.8 respectively which was followed by psychological and social domain with 47.1±10.8 and 45.8±16.1 respectively. This finding is similar to other studies done by Jain V *et al.,* Patel B *et al.,* Manjunath K *et al.* [12,16,17]. This may be due to major impact of diabetes on sex life[18] and sex life is a major component of social domain and also in population based study like ours, it may not be culturally acceptable to people to either report or discuss regarding sexual health in an interview. So, social QOL was affected maximally.

We had categorized the respondents into poor QOL or good 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. Using this we found that, majority of 56.3% had poor physical QOL and remaining 43.7% had good physical QOL. In psychological domain, majority of 62% had poor psychological QOL and only 38% had good psychological QOL. In social domain, around ≈71% of the study participants had poor social QOL compared to 29% who had good social QOL. It was same in environmental domain also, with 57% having poor environmental QOL and only 43% having good environmental QOL. Another study done by Manjunath K *et al.*[17] in CMC, Vellore showed different findings from our study. They reported 63% of good and 37% of poor physical QOL; 69% of good and 31% of poor psychological QOL; 27% of good and 73% of poor social QOL and 85% good and 15% poor environmental QOL. Only social domain findings were comparable to our findings.

Majority of the male participants rated their perceived QOL as neither poor nor good, whereas majority of female participants rated perceived QOL as poor. Hence, males had better perceived QOL than females; on the contrary females scored better in all QOL domain scores. Studies by Manjunath K *et al.*[17], Somappa HK *et al.*[12] and Eljedi A *et al*[19] reported better QOL among male participants than

female participants, which is similar to our finding. Similarly Rubin RR observed that men generally report better quality of life than women and younger people report better quality of life than older people[20] regarding satisfaction with health condition. As majority of female diabetics are housewives, it may be difficult for them to cope up with disease, while male patients being occupied reported better overall general health and perceived QOL.

WHOQOL-BREF domain overall scores were higher in patients with controlled diabetes (i.e., with HbA1c levels either excellent or good) as compared to uncontrolled (i.e., with HbA1c levels either in acceptable or poor range. This collectively depicts poorer QOL in uncontrolled diabetics compared to controlled diabetics. This is an important finding of our study.

As per the studies conducted previously factors that have been identified as predictors of QOL in known type 2 diabetics are age, female gender, depressive symptoms, tobacco consumption, alcohol consumption, presence of co - morbidities like hypertension, overweight / obesity and abdominal obesity and glycemic level (HbA1c)[16,21-23]. We applied linear regression to identify the predictors of perceived QOL in our study population. Poor environmental domain scores was seen probably because the participants were slum dwellers. Mild and moderate depression was found to be predictors of poor perceived QOL in our study population. Study by Somappa HK *et al*.[12], showed that QOL depends on HbA1c levels by logistic regression, which was not found in our study. Another study by, Manjunath K *etal*.[17] showed that QOL depends on gender, marital status, socio-economic status and BMI of the study participants by regression analysis at $p<0.05$ which was not found in our study.

CONCLUSION

In our study majority of the participants were in younger age group (30-40yrs), were females, belonged to lower socioeconomic class and majority were with poor literacy level. This is probably because the study area was Urban Slum. We found that overall Men had poor QOL scores compared to women but perceived QOL was better in males compared to females. The results of this study also showed that the glycemic control based on the HbA1c values and level of depression were associated negatively with the quality of life in people with type 2 diabetes mellitus.

RECOMMENDATIONS: These findings have policy implications and show the need for delivering of Non Communicable Disease health care services to this under privileged groups and to focus mainly on the comprehensive services at primary health care level.

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