Original Research Article

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An observational study to assess the health-related quality of life of type 2 diabetes mellitus patients attending a tertiary care hospital, Belagavi

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ABSTRACT

Background: 'Quality of life' (QOL) evaluation has emerged as an important outcome measure for chronic disease management. Type 2 diabetes mellitus (T2DM) has a number of chronic effects, including disability, cardiovascular disease, kidney disease, and blindness.

Methods: A cross-sectional study was conducted in Non Communicable Disease (NCD) Clinic of tertiary care hospital Belagavi. The data was collected by interviewing 210 Type 2 DM patients, using a pre designed structured questionnaire. QOL was assessed by using World Health Organization Quality of life questionnaire – short version (WHOQOL-BREF).

Results: Of the 210 study subject's, majority of them were males. The mean and standard deviation scores for physical, psychological, social relationship and environmental domains were 62.36±15.09, 61.84±14.04, 54.92±18.27, 63.61±12.28 respectively. Overall 68.1% of them had good perceived QOL whereas measured QOL was good in only 48.6% of them. Per capita income was positively correlated whereas age and other continuous variables like blood pressure, random blood sugar etc. were negatively correlated with all the four domains of WHOQOL-BREF.

Conclusions: More than half of the study participants (51.4%) had poor QOL. DM had significantly affected Hr-QOL especially the social relationship domain. Participants with older age, obesity, longer duration of DM had poor QOL.

Keywords: Health related Quality of life, WHOQOL-BREF, Type 2 diabetes mellitus, Non-communicable disease

INTRODUCTION

By 2014, there were 422 million adult people living with Diabetes Mellitus (DM) with adult prevalence of 8.5%. By 2016, the prevalence of Diabetes Mellitus in India was 7.8% with 1, 27,600 deaths due to DM.

Type 2 diabetes mellitus (T2DM) accounts for the majority of all diabetes cases. T2DM has a number of chronic effects, including disability, cardiovascular disease, kidney disease, and blindness. It is also accompanied by marked reduction in the quality of life (QOL). Comorbid depression further reduces QOL in

people with T2DM, and is associated with poor treatment outcomes and lowered glycaemic control.

Quality of life has been defined by WHO as "Individual's perceptions 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". It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment. 'Quality of life' evaluation has emerged as an important outcome measure for chronic disease management.²

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QOL is how good or bad a person feels their life to be. This view emphasizes the most essential feature of measuring QOL, which is to capture the individual's subjective evaluation of their QOL and not what others imagine it to be. Efforts to achieve excellent health may damage QOL. If the demands of a treatment regimen do not fit in with how the patients wish to live their lives, they may choose to compromise achieving tight blood glucose control in order to protect their QOL. Therefore, results can be highly misleading if we interpret health status measures as if they are measures of QOL

It is increasingly recognized that in diabetes psychosocial factors have an important impact on self-care, acceptance of therapeutic regimens and treatment success and that, metabolic measures like glycaemic control are poorly correlated with quality of life necessitating separate assessment. In turn, management models for diabetes that include strategies to identify and enhance patient's health-related quality of life issues have the potential to improve compliance and hence their metabolic status. Hence this study was conducted to know the sociodemographic profile and health related quality of life of type 2 DM patients.

METHODS

Study design and area

A hospital based study was conducted among Type 2 diabetes mellitus patients attending Non Communicable Disease (NCD) Clinic of Tertiary care Hospital, Belagavi during September and October 2016.

Sample size and sampling

Sample size was calculated based on the mean and standard deviation values of physical, psychological, social and environmental domains of Quality of life obtained in a study by Somappa et al, at 95% CI by using the formula.³

$$N=(Z^2\times S^2)/d^2$$

Where Z is standard normal deviate; S is sample standard deviation; d is clinically expected variation which is assumed to be 5% in this study.

The highest sample size obtained was 196. However data was collected from a total of 210 eligible patients in a period of 2 months.

Inclusion criteria

Inclusion criteria were confirmed case of type 2 DM on treatment for at least 1 year; age >30 years; stable disease. No hospital admissions in past 3 months.

Exclusion criteria

Exclusion criteria were patients with type 1 DM; gestational DM cases.

Method of collection of data

Data was collected using a structured questionnaire consisting of information regarding socio-demographic status (age, sex, religion, marital status, education, occupational status, tobacco and alcohol consumption) and diabetes related information (family history of DM, duration since diagnosis, treatment options and associated co-morbidities). Anthropometric measurements like height, weight, waist and hip circumference were measured, values of blood pressure and glucometric random blood sugar were recorded. World Health Organization Quality of Life Questionnaire – short version (WHOQOL-BREF) was used to assess the quality of life. After obtaining clearance from the Institutional Ethics Committee, data collection was started.

WHOQOL- BREF

Licensed copy of WHOQOL-BREF – English, Kannada and Marathi versions were used. It is a self-report questionnaire. For those who could not read, the questionnaire was filled by interview method. It consists of 26 items, of which the first 2 items measure the perceived QOL and general health satisfaction whereas the remaining 24 items are grouped into four domains of QOL (physical health, psychological health, social relationships and environment). Subjects would rate all items on a 5-point Likert scale.

Data analysis

Data was entered in MS excel, coded appropriately and was analyzed using SPSS software version 22. The four domains of the WHO QOL-BREF-physical health, psychological, social relationships and environment were rated on a 5-point Likert scale. As per the WHO user manual, raw scores for the domains of WHO OOL-BREF were calculated by adding values of single items and were transformed on the scale ranging from 0 to 100, where 100 is the highest and 0 is the lowest QOL. Mean score of each domain and the total mean domain score were calculated.4 Those study participants who scored total mean domain score of >60 were considered to have a good QOL, score between 40-60 was considered fair QOL and those who scored <40 were considered to have poor QOL.5 Mann-Whitney U test, unpaired t test were used to see the association between variables. Spearman correlation was done between quantitative variables and four domains of WHOQOL-BREF scale.

RESULTS

Demographic characteristics of the study participants

As shown in Table 1, the socio-demographic profile of the study participants revealed that out of 210 type 2 DM patients, majority (55.3%) were males with male to female ratio of 1.23:1. The age group of study participants varied from 30-80 years of age, of which majority of them (33.8%) were in 41-50 years and few (5.2%) were of 71-80 years of age. More than 3/4th of the study participants (79.5%) were Hindu by religion

followed by Muslims (18.1%) and Christians (2.4%). More than $1/4^{th}$ of the study subjects (28.1%) were illiterates. Majority of them, 64 (30.5%) had secondary level of education while only 12 (5.7%) of them were graduates. More than $3/4^{th}$ of them (86.2%) were currently married while 13.8% of them had lost their spouse. More than half of them, 126 (60%) belonged to below poverty line based on the availability of type of ration card. Tobacco consumption, either in the form of smoking or chewing was seen in 78 (37.1%) of them. Only 15.2% of them had history of alcohol consumption. The body mass index (BMI) of the study subjects showed that, 151 (72%) of them were either pre-obese or obese.

Table 1: Socio-demographic profile of the study participants.

Variables		Males	Females	Total
	21.40	N=116 (%)	N=94 (%)	N=210 (%)
Age group	31-40 years	14 (12.1)	8 (8.5)	22 (10.5)
	41-50 years	35 (30.2)	36 (38.3)	71 (33.8)
	51-60 years	30 (25.9)	33 (35.1)	63 (30.0)
	61-70 years	33 (28.4)	10 (10.6)	43 (20.5)
	71-80 years	4 (3.4)	7 (7.4)	11 (5.2)
	Hindu	94 (81.0)	73 (77.7)	167 (79.5)
Religion	Muslim	19 (16.4)	19 (20.2)	38 (18.1)
	Christian	3 (2.6)	2 (2.1)	5 (2.4)
Area of Residence	Rural	55 (47.4)	32 (34.0)	87 (41.4)
Tirea or Residence	Urban	61 (52.6)	62 (66.0)	123 (58.6)
	Illiterate	26 (22.4)	33 (35.1)	59 (28.1)
Educational	Primary	31 (26.7)	30 (31.9)	61 (29.0)
Status	Secondary	38 (32.8)	26 (27.7)	64 (30.5)
Status	PUC	11 (9.5)	3 (3.2)	14 (6.7)
	Graduate & above	10 (8.6)	2 (2.1)	12 (5.7)
Marital Status	Married	104 (89.7)	77 (81.9)	181 (86.2)
Marital Status	Widow/ Widower	12 (10.3)	17 (18.1)	29 (13.8)
	Class II	6 (5.2)	3 (3.2)	9 (4.3)
Socio-Economic	Class III	25 (21.6)	21 (22.3)	46 (21.9)
Status	Class IV	50 (43.1)	46 (48.9)	96 (45.7)
	Class V	35 (30.2)	24 (25.5)	59 (28.1)
	No use	50 (43.1)	82 (87.2)	132 (62.9)
Tobacco	Current use	45 (38.8)	10 (10.6)	55 (26.2)
Consumption	Past use	21 (18.1)	2 (2.1)	23 (11.0)
A111	No use	85 (73.3)	93 (98.9)	178 (84.8)
Alcohol	Current Alcoholic	23 (19.8)	1 (1.1)	24 (11.4)
Consumption	Past Alcoholic	8 (6.9)	0.00	8 (3.8)
BMI Grading (Asians Criteria)	Underweight (<18.5)	5 (4.3)	2 (2.1)	7 (3.4)
	Normal (18.5-22.9)	34 (29.3)	18 (18.2)	52 (24.8)
	Pre-obese (23-27.5)	48 (41.4)	38 (40.4)	86 (40.9)
	Obese (>27.5)	29 (25.0)	36 (38.3)	65 (30.9)
Waist	Normal	38 (32.8)	2 (2.1)	40 (19.0)
Circumference	Obese	78 (67.2)	92 (97.9)	170 (81.0)
***	Normal	21 (18.1)	1 (1.1)	22 (10.5)
Waist Hip Ratio	Obese	95 (81.9)	93 (98.9)	188 (89.5)
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Table 2: Diabetes related parameters of the study participants.

Variables		Males N=116 (%)	Females	Total N=210 (%)
	No h/o DM	86 (74.2)	N=94 (%) 70 (74.4)	156 (74.2)
Family history of DM	Only Father	5 (4.3)	3 (3.2)	8 (3.8)
	Only Mother	20 (17.2)	20 (21.3)	40 (19.1)
	Both Parents	5 (4.3)	1 (1.1)	6 (2.9)
D: 11114	1-5years	68 (58.6)	58 (61.7)	126 (60.0)
Diagnosed diabetic	6-10years	38 (32.8)	28 (29.8)	66 (31.4)
since	11-15years	10 (8.6)	8 (8.5)	18 (8.6)
O	Yes	88 (75.9)	72 (76.6)	160 (76.2)
On regular treatment	No	28 (24.1)	22 (23.4)	50 (23.8)
Also on alternate	Yes	13 (11.2)	8 (8.5)	21 (10.0)
medicines	No	103 (88.8)	86 (91.5)	189 (90.0)
	OHA	100 (86.2)	76 (80.9)	176 (83.8)
Treatment options	Insulin	8 (6.9)	7 (7.4)	15 (7.1)
	Both	8 (6.9)	11 (11.7)	19 (9.0)
	Nil	67 (57.8)	64 (68.1)	131 (62.4)
Co-morbidities	Hypertension*	47 (40.5)	27 (28.7)	74 (35.2)
	Others*	9 (7.8)	10 (10.6)	19 (9.1)
	Nil	46 (39.6)	34 (36.2)	80 (38.1)
	Eye problems*	70 (60.3)	60 (63.8)	130 (61.8)
Complications	Neuropathy*	46 (36.4)	45 (47.9)	91 (43.3)
Compucations	Renal problems*	1 (0.9)	2 (2.2)	3 (1.5)
	IHD [*]	9 (7.1)	6 (6.5)	15 (7.1)
N.f14:1	Stroke	2 (1.7)	1 (1.1)	3 (1.3)

^{*}Multiple answers

Table 3: Self rating of Hr-QOL and health satisfaction of the study participants.

How would you rate your quality of life?	Total N=210 (%)	How satisfied are you with your health	Total N=210 (%)
Very poor	1 (0.5)	Very dissatisfied	3 (1.4)
Poor	6 (2.9)	Dissatisfied	17 (8.1)
Neither poor nor good	60 (28.6)	Neither dissatisfied nor satisfied	92 (43.8)
Good	117 (55.7)	Satisfied	75 (35.7)
Very good	26 (12.4)	Very Satisfied	23 (11.0)

Table 4: Hr-QOL domain scores and their association with sex of the study participants.

Domains	Variables	Males	Females	P value
Damain 1.	Mean±SD	62.65±15.84	62.00±14.17	
Domain 1: physical health	Median	64.28	62.50	0.671*
physical health	IQR	25.00	21.43	
Domain 2: psychological	Mean±SD	62.53±14.60	60.99±13.34	0.430**
Damain 2.	Mean±SD	57.54±19.53	51.68±16.10	
Domain 3: social relationships	Median	58.33	50.00	0.023^{*}
sociai relationships	IQR	33.33	25.00	
	Mean±SD	64.14±11.96	62.96±12.71	0.531*
Domain 4: environmental	Median	62.50	60.93	
	IQR	15.63	15.63	
	Mean±SD	60.49 ± 12.48	60.92±13.34	
Overall QOL	Median	59.15	60.80	0.783^{*}
	IQR	20.70	20.54	

^{*}Mann-Whitney U test, **Unpaired t test.

Table 5: Distribution of study participants according to measured and perceived QOL.

		Measured QOL			
		Poor (<40) (%)	Fair (40-60) (%)	Good (>60) (%)	Total (%)
Perceived QOL	Poor (<40)	2 (1.0)	4 (1.9)	1 (0.5)	7 (3.3)
	Fair (40-60)	2 (1.0)	26 (12.4)	32 (15.2)	60 (28.6)
	Good (>60)	8 (3.8)	66 (31.4)	69 (32.9)	143 (68.1)
	Total	12 (5.7)	96 (45.7)	102 (48.6)	210 (100.0)

Table 6: Spearman's correlation between QOL domains and continuous variables.

Parameters	Physical	Psychological	Social	Environmental
Age	-0.511**	-0.453**	-0.577**	-0.384**
Percapita income	0.230^{**}	0.271**	0.207**	0.223**
RBS	-0.007	-0.070	-0.042	0.016
SBP	-0.326**	-0.313**	-0.323**	-0.288**
DBP	-0.116	-0.082	-0.083	-0.130
BMI	-0.140 [*]	-0.168 [*]	-0.195**	-0.196**
Waist circumference	-0.204**	-0.205**	-0.261**	-0.215**
Waist hip ratio	-0.205**	-0.161 [*]	-0.283**	-0.251**
Duration since diagnosis of DM	-0.401**	-0.390**	-0.421**	-0.335***

^{**}p value significant at 0.01 level, *p value significant at 0.05 level; RBS-Random blood sugar, SBP-Systolic blood pressure, DBP-Diastolic blood pressure, BMI-Body mass index.

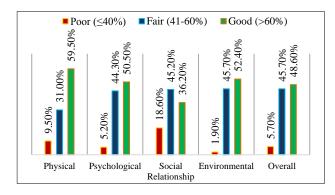


Figure 1: Distribution of study participants according to categories of QOL domains.

As shown in Table 2, family history of DM was present in nearly 26% of the study subjects. Majority (60%) of them were diagnosed to have DM since 1-5years. Nearly 76% of them were on regular treatment and 10% of them were also on other alternate therapy like ayurvedic/homeopathic etc. More than 3/4th of them (83.8%) were on oral hypoglycemic drugs followed by Insulin (7.1%) and both (9%). Most common comorbidity (35%) seen was Hypertension and 9% of them had other comorbidities like rheumatoid arthritis, HIV, Asthma, Hypothyroidism etc. Based on history, most common complication seen was eye/vision problems (61.8%). Nearly 7% of them had history of ischemic heart disease and 1.3% of them had history of stroke in the past.

Quality of life assessment

More than half of the study participants 117 (55.7%) rated their Quality of Life as good. 92 (43.8%) of them

were neither dissatisfied nor satisfied with their health. However, 3 (1.4%) were very dissatisfied with their life (Table 3).

Table 4 shows the mean, median and standard deviation values for all four domains and for overall QOL. Highest mean score was seen in environmental domain and lowest was with social relationship domain. Males had better social relationship domain than females which was statistically significant.

Figure 1 shows the categorization of the QOL. Nearly 60% of the study subjects had good physical domain, 50.5% of them had good psychological domain, 36.2% of them had good social relationship domain and 52.4% of them had good environmental domain. Overall 48.6% of them had good QOL, 45.7% had fair and 5.75 of them had poor QOL

Table 5 shows about measured and perceived QOL. In the present study, 68.1% of them had good perceived QOL whereas measured QOL was good in only 48.6% of them

Table 6 tells about the correlation between various domains of QOL and continuous variables. Age was negatively correlated with all the four domains. With advancing age the QOL decreased. Percapita income was positively correlated i.e., with increasing percapita income, the QOL also increased. All other continuous variables like random blood sugar, systolic blood pressure, diastolic blood pressure, body mass index, waist circumference, waist hip ratio and duration since diagnosis of DM were negatively correlated with QOL domains.

DISCUSSION

The aspect of quality of life of persons living with diabetes is an essential component to assess, both for the patients as well as the healthcare providers. In the present study, majority of the study participants were males (55.3%) which was similar to study done in Maharashtra whereas in many other studies majority of the study participants were females.⁵⁻⁹ The mean age of study participants in this study was 53.95±10.84, similar results were seen in studies done in Nepal and Nairobi. 5,6 Whereas it was low compared to study done by Somappa et al.³ Nearly 28% of the study participants were illiterates which was same as seen in several other studies and it was high compared to other studies by Genga et al and Jain et al.⁵⁻⁹ Majority of the study participants (86.2%) were currently married as was seen in several other studies.⁵⁻⁹ More than half of the study subjects (57%) were consuming any of the form of tobacco whereas this was very high compared to study done in Nepal and Maharashtra. 6,7 In this study only 26.7% of them gave history of alcohol consumption which was less compared to study done by Jain et al, which showed it to be 98.6%. Family history of DM was present in 26% of the study participants. Whereas study done by Mishra showed it to be 40%. Based on BMI, 72% of them were either pre-obese or obese, which was similar to study done in Nairobi, Malaysia, and Iran. 5,10-12 Whereas this was 47% in Nepal study and 59% in CMC Vellore study.6,8

Majority of the study subjects were diagnosed to have DM since last 5years, which was similar to several studies. Several studies. Majority of them (93%) were on oral hypoglycemic agents as seen in several studies. Nearly 38% of them had comorbidities which was less compared to a study done in Iran which showed 81%. Nearly 38% of them had comorbidities which was less compared to a study done in Iran which showed 81%. In the present study, 62% of them had history of complications. Similar result was seen in Nairobi and Maharashtra studies. Majority (61.8%) of them had eye problems followed by neuropathy and Ischemic heart disease. Similar results were seen in studies done by Ashraf et al and Renata et al. Nhereas neuropathy was the major complication seen in several other studies.

The highest mean score was seen with the environmental domain (63.61) and lowest was with social relationship domain (54.92). Similar results were seen in studies conducted in Kolar, Maharashtra and CMC Vellore. Nhereas several other studies showed highest mean score in social relationship domain. Overall QOL was good in 48.6% of the study subjects. This was low compared to studies done by Genga et al (84%) and Manjunath et al (68%). Age, BMI, waist circumference, waist hip ratio were negatively correlated with all the four domains of WHO-BREF, QOL. Whereas Kolar study showed that age was positively correlated and others were negatively correlated with the domains.

To conclude, nearly half of the study participants (48.6%) had good QOL. DM had significantly affected Hr-QOL especially the social relationship domain. Participants with older age, obesity, longer duration of DM had poor QOL. Continued educational and counselling interventions are required to improve the overall quality of life of diabetic individuals.

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