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Original Research Article

Does glycaemic status influence quality of life of type II diabetes patients: an exploratory study in Mysuru, Karnataka, India

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ABSTRACT

Background: Type II diabetes is a major public health problem in India. The epidemiological shift of the disease towards younger and middle aged individuals has resulted in longer duration of life with diabetes among the patients. Diabetes being a lifestyle disease, requiring robust behavioural and social adjustments influences the quality of life of an individual to a largest extent.
Methods: A cross-sectional study conducted among 200 type II diabetic patients attending JSS Hospital, Mysuru for a period of one year. Information regarding socio-demographic characteristics like gender, education, occupation was collected in a pretested proforma by interview technique. Assessment of Quality of life was done using the WHO BREF questionnaire. Glycemic status of subjects was assessed using glycosylated haemoglobin (HbA1C) levels. The Data entry and Statistical analysis were done using Microsoft Excel and SPSS 22version. Descriptive statistics like mean and standard deviation of QOL calculated and analysed with Sociodemographic variables, inferential statistics like Chi-square and Man-Whitney U test was done.
Results: Among 200 study participants majority, 53.5% belonged to age group of 41-60 years, 57.5% were males, 67.5% belonged to lower socio economic class according to BG Prasad classification, 85% were married, 51% were Obese, 44.5% were having family history of diabetes, 48% were having Hypertension, 68.5% were on oral hypoglycemic, 10.5% were on Insulin, 20.5% were on both oral hypoglycaemic and Insulin. Overall Quality of Life was poor in 114 (57%), 114 (57%) had Poor Physical QoL score, 109 (54.5%) had poor psychological QoL score, 108 (54%) had poor social QoL score and 113 (56.5%) had poor environmental QoL score and 87 (43.5%). Median score of overall score of QoL was less in uncontrolled diabetes when compared to controlled diabetes status, this difference was statistically significance (P value- 0.04).
Conclusions: Patients with type 2 diabetes have a substantially lower quality of life. QOL was poorer in subjects with uncontrolled glycemic status compared those with good diabetic control.

Keywords: Diabetes mellitus, Glycemic status, QOL, WHO-BREFF

INTRODUCTION

Diabetes is a Major public health problem, it is a serious chronic condition affecting millions of people worldwide and is the fourth leading cause of death in India. Diabetes is a silent disease-many sufferers became aware that they have diabetes only when they develop one of its life threatening complications. Once diabetes develops, it is a costly disease to manage because of its chronic nature and severity of complications. In 2014, it was estimated that 387 million people worldwide had DM, corresponding to a global prevalence of 8.3%.[1] In this context, type II diabetes mellitus accounts for the

majority of these cases. The disease is reported to be growing at an alarming rate in most developing countries. For example, it is estimated that by the year 2025 about 80% of all new cases of diabetes will occur in developing countries (International Diabetes Federation, Diabetes Atlas, 2006).Seventy percent of current cases of diabetes occur in low and middle income countries, with India being top on the list, India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world".[2] The increased prevalence is associated with deleterious changes in lifestyle, unhealthy eating patterns and reduced physical activity.[3]

Diabetes Mellitus requires a lifetime personal care, as it is a disease with serious short- and long-term consequences for the afflicted.[4] Both micro- and macro- vascular complications are associated with diabetes mellitus and the risk of death from a cardio or cerebrovascular event is significantly elevated when compared with people without diabetes mellitus.[5]

The problem of diabetes management in developing country is characterized by late and poor clinic attendance, delayed diagnosis and poor quality care. Diabetes is often accompanied by complications, stemming from various reasons including non-adherence to treatment and delayed adjustment of treatment regimen leading to progressive loss of b-cell function. These complications have a negative impact on patients' satisfaction with treatment as well as patients' quality of life.[6,7]

Yet, relatively little is known about the effects of these disorders on patient's quality of life. There is increasing recognition that the impact of chronic illnesses and their treatments must be assessed in terms of their influences on quality of life in addition to more traditional measures of medical outcome, such as morbidity and mortality.[8]

The present study aims at assessing Quality of Life of type II diabetic patients with controlled and uncontrolled glycaemic status and the factors influencing it.

METHODS

This was a cross-sectional study conducted in Department of Medicine and Community Medicine, JSS Medicine Mysuru during the period January to December 2015. In the diabetic clinic of JSS hospital Mysore there are 2000 diabetic patients registered, who come for regular check-up and follow up.

Study was done including duration of diabetes more than 1 year and registered type II diabetes mellitus patients. Excluding gestational diabetes and those who was not able to communicate due to physical or mental disability.

Taking the prevalence of diabetes, which was 12.1% in urban area of India with 5% allowable error. It was calculated to interview 200 subjects of type II diabetic patients. By taking all the consecutive diabetic subjects who attended JSS hospital for the first time in the study period till the sample size was reached.

Information regarding socio-demographic characteristics like gender, education, occupation was collected in a pretested proforma by interview technique. Assessment of Quality of life was done by using the WHO BREF Questionnaire.

Glycaemic status of type II diabetic patient was assessed taking HbA1C as criteria. For comparing of QOL and health seeking behaviour between controlled and uncontrolled diabetic status glycaemic index was used. (HbA1C >7 - uncontrolled, HbA1C<7–controlled).[9]

Statistical analysis

Data thus obtained was coded and entered into Microsoft excel Work sheet. This was analysed using SPSS 22 version. Descriptive statistics like mean and standard deviation of QOL calculated. To find out the association of QOL with above factors, chi-square test or Fisher exact test was applied for each factor. The statistical significance was evaluated at 5% level of significance with 95% Confidence Interval. Man-Whitney U test was used to find the association of QOL of life with controlled and uncontrolled status of diabetes.

RESULTS

Out of 200 subjects majority of them 53.5% belongs to age group 41-80 years and 39.5% belongs to 61-80 years. 57.5% were males and 42.0% were females. Majority 47.5% were non-literate, majority of them around 57.5% were Unemployed which includes housewife, retired and those who are not working, 26.5% were semiskilled workers and 12.5 % were unskilled workers. Majority of them 67.5% belongs to lower socio-economic status according BG Prasad scale of socio economic status classification. 85% were married (Table 1).

Diabetic profile and associated co-morbidities

Out of 200, 44.5% were having family history of diabetes and 48% were hypertensive. Majority 51% were obese, 25%and 2.5 %were underweight. Out of 200 subjects 59% were having uncontrolled status of diabetes (HBA1c>7) and 41% were having controlled status of diabetes (HBA1c <7).

68.5% were on oral hypoglycemic agents, 10.5% were on Insulin, 20.5% were on both (Table 2).

Out of 200 subjects only 13% had classical symptoms of Diabetes like generalised weakness, polyuria and polydipsia, 30% had generalised weakness before diagnosis of diabetes, 15% had polyuria and 12.5% didn't

had any symptoms got diagnosed during pre-operative check-up and Regular checkup (Table 3).

Quality of life of type II diabetes mellitus subjects

Mean score of overall QOL was 75.6±12.7, mean score of physical domain was 435.7±99.8. Pyscological domain was 351.7±75.1, social domain was 67.1±18.6 and environmental domain was 606.5±93.2.

The QOL scores were further converted into categorical variable by obtaining the mean score and dividing the group into those who got a score above the mean and those below the mean. They were labelled as good and poor QoL.

It is observed that, 114 (57%) had poor total QOL, 114 (57%) had poor physical QOL and 86 (43), 109 (54.5%) had poor psychological QOL, 108(54%) had poor social QOL, 113 (56.5%) had poor environmental QOL (Table 4).

Association of QOL of life of diabetes patient with age and educational status was statistically significant.

Table 1: Socio-demographic characteristics of study subjects.

Determinants	Overall QoL		Total	Percentage	Chi-square value	P-value
	Poor QoL	Good QoL				
Age -group						
20-40	2	8	10	5.0	10.8	0.01
41-60	58	49	107	53.5		
61-80	53	26	79	39.5		
81 & above	1	3	4	2.0		
Sex						
Female	60	55	115	57.5	3.12	0.2
Male	53	31	84	42.5		
Educational status						
Non literate	69	26	95	47.5	19.4	0.02
Primary school	10	14	24	12.0		
Middle school	12	15	27	13.5		
High school	15	18	33	16.5		
Intermediate	5	5	10	5.0		
Graduate	3	8	11	5.5		
Occupation						
Unemployment	73	42	115	57.5	9.0	0.1
Unskilled	12	13	25	12.5		
Semiskilled	27	26	53	26.5		
Skilled	0	2	2	1.0		
Semi-professional	2	1	3	1.5		
Professional	0	2	2	1.0		
Socio-economic status						
Upper	1	0	1	0.5	6.5	0.16
Upper middle	1	3	4	2.0		
Middle	5	6	11	5.5		
Lower middle	23	26	49	24.5		
Lower	84	51	135	67.5		
Marital status						
Married	95	75	170	85.0	3.34	0.18
Widow	18	8	26	13.0		
Single	1	3	4	2.0		
Total	114	86	200	100		

Comparison of quality of life of diabetic subjects between controlled and uncontrolled diabetes status

On applying Man-Whitney U test to find association of quality of life of diabetics patients with controlled and

uncontrolled diabetes status, median score of overall QoL was less in uncontrolled diabetes when compared to controlled diabetes status, this difference showed statistical significance (p=0.04). Median score of physical domain of QoL was less in uncontrolled diabetes when compared to controlled diabetes status, this difference was statistically significant (p=0.05).
Median score of psychological domain of QoL was less in uncontrolled diabetes when compared to controlled diabetes status, this difference was statistically significant (p=0.04) (Table 5).

Table 2: Diabetes profile and associated co-morbidities.

Determinants	Frequency	Percentage
Family history of diabetes		
Yes	89	44.5
No	111	65.5
Hypertension		
Yes	96	48
No	104	52
BMI		
Underweight	5	2.5
Normal	50	25
Overweight	43	21.5
Obese	102	51
Medication		
Oral hypo glycaemic agents	137	68.5
Insulin	21	10.5
Both	42	21
Total	200	100

Table 3: Distribution of study subjects based on symptoms during diagnosis.

Symptoms	Frequency	Percentage
Generalised weakness	60	30.0
Polyuria	30	15.0
Polydipsia	6	3.0
Non healing wound	12	6.0
By self	9	4.5
Pre-operative investigation	16	8.0
Headache	7	3.5
Fever	19	9.5
Blurring of vision	4	2.0
Burning foot	6	3.0
Pedal edema	4	2.0
GDM	1	0.5
Generalised weakness, Polyuria & polydipsia	26	13.0
Total	200	100.0

Table 4: Distribution of study subjects based on quality of life.

Determinants	Good (%) >50%	Poor (%) <50%
Total score	86(43)	114(57)
Physical QOL	86(43)	114(57)
Psychological QOL	91(45.5)	109(54.5)
Social QOL	92(46)	108(54)
Environmental QOL	87(43.5)	113(56.5)

Table 5: Comparison of quality of life of diabetic subjects between controlled and uncontrolled diabetes status.

QOL parameters	Controlled	Uncontrolled		
	Median (IQR)	Median (IQR)	U-value	P-value
Overall QOL	76 (69-88.5)	72 (65.5-80)	4167.0	**0.04**
Physical QOL score	432 (360-552)	408 (360-480)	4250.0	**0.05**
Psychological QOL score	380 (310-420)	340 (300-380)	4167.5	**0.04**
Social QOL score	80 (80-88)	72 (60-80)	4368.5	0.1
Environmental QOL score	600 (552-696)	600 (528-660)	4651.0	0.39

DISCUSSION

The prevalence of diabetes mellitus is steadily increasing in India due to population growth, aging, urbanization, increasing prevalence of obesity and physical inactivity. QOL refers to the physical, psychological, and social domains of health that are influenced by a person's experiences, beliefs, expectations, and perceptions.[10]

The first approaches to health-related quality of life in the field of diabetes were made through the assessment of health status. However, it is important to note that even if health status is an area of health-related quality of life, there are other domains to consider (e.g. emotional well-being, personal care, physical, social, and cognitive functioning).

Assessing the quality of life and the factors affecting it helps to give better quality care to the patients. In present scenario such studies are gaining more importance, which needs to be conducted to understand the patients perception and the factors influencing it.

In the present study comprising of 200 study subjects, majority of them 107 (53.5%) belonged to age group 41-80 years, 115 (57.5%) were males and 84 (42.0 %) were females. Majority of them 95 (47.5%) were Non-literate and Most of them 115 (57.5%) were housewife. Majority of them 135 (67.5%) belongs to lower socio-economic status.170 (85%) were married.

Out of 200 subjects, 89 (44.5%) were having family history of diabetes. 96 (48%) of them had hypertension and 104 (52%) didn't had hypertension.

118 (59%) had uncontrolled status of diabetes mellitus (HBA1c>7) and 82 (41%) had controlled status of diabetes mellitus (HBA1c <7)**.** Majority 137 (68.5%) were on oral hypo-glycaemic agents. 102 (51%) were obese.

Mean score of overall QoL was 75.6±12.7, mean score of physical domain was 435.7±99.8, mean score of pyschological domain was 351.7±75.1, mean score of social domain was 67.1±18.6 and mean score of environmental domain was 606.5±93.2.

57% had poor QOL score, 57% had bad physical QoL score, 54.5% poor psychological QoL score, 54% had poor social QoL score and 56.5% had poor environmental QoL score.

In a cross-sectional study conducted in Thiruvananthapuram by Varghese RT et al, 62% of the diabetics reported good QoL.[11] The scores are as expected for any person in a community with low education, low standards of living and poor socioeconomic status.

Nevertheless it is important to mention that the instruments used in these two studies were different.

Age has been another parameter which has an effect on the QOL of diabetic patients. In our study Quality of life decreased as the age increases which showed statistical significance (p=0.01).

Hanninen et al, reported that age has no effect on diabetic patient's QOL, however another study reported that patients who are less than 40 years of age have significantly better QOL than other age groups.[12]

As the age increases the glycaemic control decreases, It may be because of neglecting the diabetic care by the patients, they assume they can feel the changes in the body caused by blood sugar variation and neglect regular monitoring of blood sugar level.

Over the past decade, differences between men and women with type II Diabetes Mellitus have been intensively investigated. In our study there was no association with gender and QOL.

But the study conducted by Mikailiukstiene et al showed women with diabetes appeared to have worse QOL and mental well-being than the men with diabetes.[13] Similar observation was made in study conducted by Unden AL et al, which showed women's with diabetes have poor QOL than men.[14]

Gender is also a determinant of QOL of diabetes patients, most of the females who are homemakers will have less knowledge and awareness about diabetes glycaemic control and self-care, which might be the reasons that women have poor QOL.

The reason for no association of gender with QOL may be males were more than females in the study, education, socio-economic status and women of urban area has better knowledge and awareness about the disease.

Education is the other factor which influences the quality of life of diabetics, in our study when we studied association of QoL of diabetics with education it showed statistical significance (p=0.02).

Education determines the knowledge and awareness of the people about disease status and also their Health seeking behaviour which has impact on their glycaemic status and QOL.

In our study socioeconomic status did not showed any association with quality of life.

In contrast study conducted by Eljedi A et al showed low socioeconomic status and patients with a high school education or less had a strong negative impact on QOL of diabetes patients especially in the younger age group.[15] Similar observation was made in study conducted by Wubben DP et al that is people with low socio-economic status had poor QOL.[16]

Socio-economic status determines individual access to better quality health services and also his affordability to better treatment and good nutrient diet, which has impact on QOL. Many studies reported an association between increased duration of diabetes and poor QOL, in both types of diabetes but in our study there was no association with QOL.[17,18]

As the duration of diabetes increases the complications associated with uncontrolled diabetes status increases, it is the number of years the person has lived with diabetes and with decreased QOL. Patient adherence to the treatment and regular monitoring also deceases when compared to initial period after diagnosed with diabetes.

When we studied association between diabetes status with quality of life of diabetic subjects, it was found that there was statistical association of diabetes status and overall QOL of type II diabetics and also with physical and psychological quality of life of diabetes patients.

Even though there was no statistical association with social and environmental QOL with diabetes status, median score were more in controlled status of diabetes when compared with uncontrolled status of diabetes. Results may be influenced by the facts that patients from Mysore district have good roads and transport facilities and good public health infrastructure and access.

Limitations

The study was conducted in Hospital, a longitudinal study involving larger population in community should be conducted to generalize the results.

CONCLUSION

The result of this study indicates a significant association between DM and HRQOL. Factors like age and education showed significant impact on quality of life of diabetics in our study. Results from other studies showed gender, economic status, diabetes treatment type and complication of DM were in dependent risk factors for majority of the subscales of HRQOL.

Understanding the effect of diabetes on QOL is important for day-to-day management and also for public health policy initiatives in order to improve the QOL and health out-comes of those with diabetes.

Recommendations

Socio-demographic development among the patients with Diabetes needs to be ensured, which can improve QOL. Specific efforts should be made to improve awareness of Complications of Diabetes to the Patients and Impact of Uncontrolled glycaemic status.

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