

## ASSESSMENT OF QUALITY OF LIFE IN PATIENTS OF TYPE 2 DIABETES MELLITUS USING THE DIABETES-39 QUESTIONNAIRE

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### ABSTRACT

**Objective:** The objective of this study is to assess the quality of life (QOL) using the Diabetes-39 (D-39) questionnaire in the patients of Type 2 diabetes mellitus (DM).

**Methods:** A cross-sectional study was performed in the outpatient department (OPD). The study population was consisted of 160 Type 2 DM patients attending the OPD. This study was carried out for 3 months.

**Results:** Our study showed a total of 93 males (58.13%) and 67 females (41.88%). Mean age in our study was 48.72±8.17 years. Mean duration of diabetes in our study was 5±3.06 years. Our study shows that 61 (38.12%) has hypertension as a comorbidity, 28 (17.5%) has hyperlipidemia, and 2 (1.25%) has renal dysfunction. The D-39 instrument evaluation containing five dimensions: Energy and mobility (15 items), diabetes control (12), anxiety and worry (4), social overload (5), and sexual behavior (3) were used.

**Conclusion:** This study demonstrated that the QOL in patients of diabetes is clearly affected by the complication and comorbidities associated with Type 2 diabetes. Longer studies are needed to completely assess the QOL.

**Keywords:** Type 2 diabetes mellitus, Quality of life, Diabetes-39 questionnaire.

### INTRODUCTION

Diabetes is a disease of paramount public health concern. Worldwide, an estimated 422 million adults were suffering from diabetes in 2014; also it caused 1.5 million deaths in 2012. For the past decades, the prevalence of diabetes has been ascended more in low- and middle-income countries [1]. Nearly, three-quarter of the people with diabetes reside in low- and middle-income countries. In India, there were nearly 61 million patients with Type 2 diabetes mellitus (DM), in 2011, which will rise to 101 million by 2030 [2].

Diabetes in long run cause many problems in the body which could be microvascular as well as macrovascular as cardiac problem, renal failure, poor vision, nerve damage, poor wound healing, etc., that in turn increase the risk of morbidity and mortality also remarkably hamper quality of life (QOL) of the patient [1,3]. The World Health Organization defines QOL as an individual's perception 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 [4].

Diabetes and its complications cause considerable financial deficit to patients and their families, and to health systems and national economies through direct medicinal expenses and loss of employment and income [1]. Lack of proper compliance and management of diabetes has an adverse effect on glycemic control. Patients with controlled diabetes have superior QOL as compare to uncontrolled diabetic patients [5].

Diabetes is a chronic health situation causes grave constraints on patient's performance. There is a call for education and behavior change to deal with the situation. Lifestyle changes have to fit in careful dietary scheduling, compliance of medication, and home blood glucose monitoring for all diabetic patients [6]. The attainment of information about the disease is acknowledged as a significant aspect lead to enhancement in self-care behavior [5].

The diabetes-39 (D-39) instrument evaluation containing five dimensions: Energy and mobility (15 items), diabetes control (12), anxiety and worry (4), social overload (5), and sexual behavior (3) were used to assess the QOL in Type 2 diabetic patients.

### METHODS

A cross-sectional study was performed in the Outpatient Department (OPD) of Medicine in Gandhi Medical College, Bhopal. The study population was consisted of 160 Type 2 DM patients attending the OPD. This study was carried out for 3 months. This study was carried out in patients over the age of 18 years and who gave consent to participate in the study.

To obtain the information of the study population, a form was provided to which included the sociodemographic data such as age, sex, duration of diabetes, whether they live in rural or urban area, comorbidities if any present, and if diabetes is present in immediate family members. The second form was the D-39 assessment questionnaire which was translated into the local language if needed for the participants. This instrument was used as it was easy to administer and easy to understand, and it was based on Likert scale, which uses a 7 point category as "unaffected" and "very much affected" as the highest and the lowest values, based on previous research [7]. Results will be analyzed by excel software.

### RESULTS

It was noted that in terms of demography of the population, there were 93 males (58.13%) and 67 females (41.88%) (Fig. 1). Mean age in our study was 48.72±8.17 years. Mean duration of diabetes in our study was 5±3.06 years.

Our study shows that 61 (38.12%) has hypertension as a comorbidity, 28 (17.5%) has hyperlipidemia, and 2 (1.25%) has renal dysfunction (Fig. 2).

Out of the total diabetic patients attended the OPD, a total of 88 (55%) has one member in the family as diabetic, 34 (21.25%) patients has 2 members in their family as diabetic, and 38 (23.75%) patients has none of the family members diagnosed a diabetic. Of the total study population who attended the OPD, 62 (38.75%) lives in urban area and 98 (61.25%) lives in rural area.

Table 1 shows that the distribution of patients diagnosed with Type 2 DM according to the responses of the D-39 questionnaire, which is divided into five dimensions. In column 1 and column 7, the highest and the lowest values being marked can be seen, the values above 50% being considered significant.

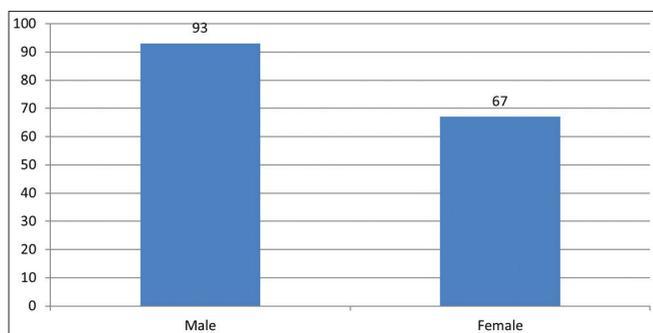


Fig. 1: Age-wise distribution of patients

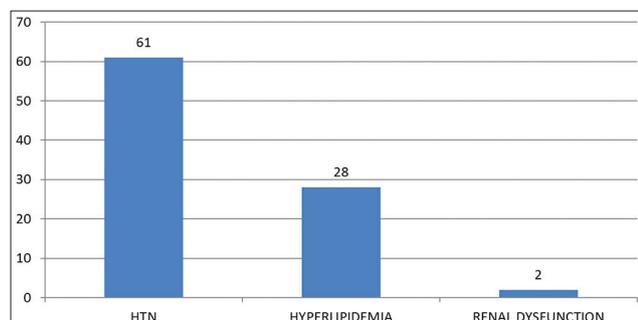


Fig. 2: Comorbidities

In relation to energy and mobility, dimension of the D-39 questionnaire (Items 3, 7, 9, 10, 11, 12, 13, 16, 25, 29, 32, 33, 34, 35, and 36).

In relation to energy and mobility, dimension 1 of the D-39 questionnaire, none of the values were significant. Although the question 9, feeling of weakness 31.88% patients were least affected, whereas question 13. Not being able to do what you want, 23.75% were also least affected. The rest of the questions in dimension 1 were in a range of 7.50-31.88%, while question 29 had an even distribution across the table. Question 12; loss or blurring of vision; 23.75% were severely affected.

Dimension 2; diabetes control question 4, 46.25% were not affected, whereas only 0.63% were severely affected. While in question 1; 36.88% patients were not affected and were not significant. Overall in dimension 2, the percentage in the least affected was in the range from 5.63% to 46.25% which were insignificant, whereas it ranged from 0.63% to 15.63% who were more affected in the questions described in the dimension 2 of the D-39 questionnaire.

Dimension 3; anxiety and worry, question 6, concerns about your future, the maximum score was 28.75% who were least affected and 18.12% were greatly affected. Overall, the score was 3.13-25% in all the questions in dimension 3 who were least affected, whereas it ranged from 5.62% to 18.12% in more severely affected patients.

Dimension 4, all the criteria were not significant, with the percentage ranging from 5% to 11.25% who were least affected in the questions of dimension 4, whereas it ranged from 9.38% to 12.50%, who were severely affected.

Dimension 5, sexual behavior, 35% of the patients in problems with sexual functioning were least affected, whereas only 5% patients had difficulty, rest all the dimension were not significant overall.

Table 2 indicates the general evaluation of life. Overall QOL shows that only 15% patients were severely affected and 8.75% patients were least affected, while for question; How severe you think your diabetes is?; indicates that a total of 19.38% patients were severely affected and 9.38% patients were least affected.

**DISCUSSION**

This study was done to assess, the overall QOL in patients of Type 2 diabetes using the D-39 questionnaire. It is an easy understanding that

Table 1: Percentage distribution of patients with DM according to the responses to the items of the five dimensions of the D-39

Items	N (%)						
	1	2	3	4	5	6	7
First dimension: Energy and mobility							
3. Limited energy levels	34 (21.25)	43 (26.88)	15 (9.38)	21 (13.13)	27 (16.88)	12 (7.50)	8 (5.0)
7. Other health problems besides diabetes	16 (10.0)	23 (14.38)	26 (16.25)	29 (18.13)	34 (21.25)	22 (13.75)	10 (6.25)
9. Feelings of weakness	51 (31.88)	11 (6.88)	28 (17.50)	20 (12.50)	23 (14.38)	13 (8.13)	14 (8.75)
10. Restrictions on how far you can walk	25 (15.63)	19 (11.88)	24 (15.0)	15 (9.38)	18 (11.25)	41 (25.63)	18 (11.25)
11. Any daily exercises for your diabetes	20 (12.50)	27 (16.88)	22 (13.75)	27 (16.88)	28 (17.50)	21 (13.13)	15 (9.38)
12. Loss or blurring of vision	30 (18.75)	43 (26.88)	20 (12.50)	12 (7.50)	9 (5.63)	8 (5)	38 (23.75)
13. Not being able to do what you want	38 (23.75)	18 (11.25)	20 (12.50)	28 (17.50)	16 (10.0)	28 (17.50)	12 (7.5)
16. Other health problems besides diabetes	16 (10.0)	23 (14.38)	26 (16.25)	29 (18.13)	34 (51.25)	22 (13.75)	10 (6.25)
25. Other illnesses besides diabetes	14 (8.75)	20 (12.50)	22 (13.75)	26 (16.25)	36 (22.50)	27 (16.88)	15 (9.38)
29. Complications from your diabetes	29 (18.13)	21 (13.13)	22 (13.75)	23 (14.38)	28 (17.50)	20 (12.50)	17 (10.63)
29. Not being able to do housework or other jobs around the house	15 (9.38)	24 (15.0)	23 (14.38)	21 (13.13)	32 (20.0)	32 (20.0)	13 (8.13)
32. Needing to rest often	16 (10.0)	23 (14.38)	23 (14.38)	24 (15.0)	41 (25.63)	26 (16.25)	7 (4.38)
33. Problems in climbing stairs or walking up steps	29 (18.13)	30 (18.75)	24 (15.0)	26 (16.25)	24 (15.0)	15 (9.38)	12 (7.5)
34. Having trouble caring for yourself	16 (10.0)	22 (13.75)	22 (13.75)	28 (17.50)	25 (15.63)	32 (20.0)	15 (9.38)
35. Restless sleep	12 (7.50)	21 (13.13)	21 (13.13)	23 (14.38)	38 (23.75)	29 (18.13)	16 (10.0)
36. Walking more slowly than others	16 (10.0)	22 (13.75)	20 (12.50)	25 (15.63)	44 (27.50)	25 (15.63)	8 (5.0)
Second dimension diabetes control							
1. Your diabetes medication schedule	59 (36.88)	28 (17.5)	8 (5.0)	22 (13.75)	17 (10.62)	13 (8.12)	13 (8.12)

(Contd...)

Table 1: (Continued)

Items	N (%)						
	1	2	3	4	5	6	7
4. Following your doctor's prescribed treatment plan for diabetes	74 (46.25)	19 (11.88)	16 (10.0)	24 (15.0)	17 (10.63)	9 (5.63)	1 (0.63)
5. Food restrictions required to control your diabetes	22 (13.75)	15 (9.38)	22 (13.75)	26 (16.25)	20 (12.50)	32 (20.0)	23 (14.38)
14. Having diabetes	19 (11.88)	25 (15.63)	27 (16.88)	24 (15.0)	22 (13.75)	27 (16.88)	16 (10.0)
15. Losing control of your blood sugar levels	27 (16.88)	15 (9.38)	20 (12.50)	22 (13.75)	25 (15.63)	26 (16.25)	25 (15.63)
17. Testing your blood sugar levels	24 (15.0)	20 (12.50)	25 (15.63)	16 (10.0)	20 (12.50)	39 (24.38)	16 (10.0)
18. The time required to control your diabetes	52 (32.50)	27 (16.88)	21 (13.13)	21 (13.13)	18 (11.25)	11 (6.88)	10 (6.25)
24. Getting your diabetes well controlled	14 (8.75)	18 (11.25)	21 (13.13)	27 (16.88)	45 (28.13)	28 (17.50)	7 (4.38)
27. Keeping a record of your blood sugar levels	15 (9.38)	19 (11.38)	21 (13.13)	26 (16.25)	28 (17.50)	27 (16.88)	24 (15.0)
28. The need to eat at regular intervals	24 (15.0)	17 (10.63)	17 (10.63)	27 (16.88)	35 (21.88)	22 (13.75)	18 (11.25)
31. Having to organize your daily life around diabetes	9 (5.63)	16 (10.0)	20 (12.5)	31 (19.38)	41 (25.63)	26 (16.25)	17 (10.63)
39. Diabetes in general	13 (8.13)	17 (10.63)	20 (12.50)	30 (18.75)	28 (17.50)	27 (16.88)	25 (15.63)
Third dimension: Anxiety and worry							
2. Worries about money matters	40 (25.0)	36 (22.5)	16 (10.0)	18 (11.25)	28 (17.5)	13 (8.12)	9 (5.62)
6. Concerns about your future	46 (28.75)	4 (2.5)	10 (6.25)	26 (16.25)	23 (14.37)	23 (14.37)	29 (18.12)
8. Stress or pressure in your life	5 (3.13)	12 (7.50)	22 (13.75)	37 (23.13)	45 (28.13)	25 (15.63)	14 (8.75)
22. Feeling depressed or low	16 (10.0)	18 (11.25)	23 (14.38)	27 (16.88)	26 (16.25)	32 (20.0)	18 (11.25)
Fourth dimension: Social							
19. The restrictions your diabetes places on your family and friends	11 (6.88)	20 (12.5)	23 (14.38)	28 (17.50)	33 (20.63)	30 (18.75)	15 (9.38)
20. Being embarrassed because you have diabetes	8 (5.0)	17 (10.63)	20 (12.50)	32 (20.0)	40 (25.0)	27 (16.88)	16 (10.0)
26. Doing things that your family and friends do not do	18 (11.25)	22 (13.75)	19 (11.88)	27 (16.88)	33 (20.63)	26 (16.25)	15 (9.38)
37. Being identified as a diabetic	16 (10.0)	20 (12.50)	21 (13.13)	23 (14.38)	30 (18.75)	30 (18.75)	20 (12.50)
38. Having diabetes interfere with your family life	16 (10.0)	18 (11.25)	25 (15.63)	28 (17.50)	28 (17.50)	29 (18.13)	16 (10.0)
Fifth dimension: Sexual behavior							
21. Diabetes interfering with your sex life	36 (22.50)	29 (18.13)	20 (12.50)	21 (13.13)	28 (17.50)	16 (10.0)	10 (6.25)
23. Problems with sexual functioning	56 (35.0)	36 (22.50)	21 (13.13)	14 (8.75)	11 (6.88)	14 (8.75)	8 (5.0)
30. A decreased interest in sex	22 (13.75)	28 (17.50)	25 (15.63)	24 (15.0)	28 (17.50)	22 (13.75)	11 (6.88)

DM: Diabetes mellitus, D-39: Diabetes-39

Table 2: General evaluation of life

Items	N (%)						
	1	2	3	4	5	6	7
Overall QOL	14 (8.75)	13 (8.13)	31 (19.38)	34 (21.25)	25 (15.63)	19 (11.88)	24 (15.00)
How severe you think your diabetes is?	15 (9.38)	20 (12.50)	22 (13.75)	20 (12.50)	27 (16.88)	25 (15.63)	31 (19.38)

QOL: Quality of life

the older patients were severely affected by the comorbidities and the complications of Type 2 diabetes. Similar studies should be carried out in different locations so that we have a better understanding of the QOL in patients and a better patient education system can be included. This study has its limitations, which include that it was only carried out for 3 months, and it was single-centric study. A lengthier study should be carried out so that a better understanding of the QOL can be assessed and more detailed analysis can be done.

REFERENCES

1. Roglic G, World Health Organization, editors. Global Report on Diabetes. Geneva, Switzerland: World Health Organization; 2016. p. 86.
2. Gupta M, Singh R, Lehl SS. Diabetes in India: A long way to go. Int J Sci Rep 2015;1(1):1-2.

3. Spasić A, Radovanović RV, Đorđević AC, Stefanović N, Cvetković T. Quality of life in Type 2 diabetic patients. Acta Fac Med Naissensis 2014;31(3):193-200.
4. The World Health Organization Quality of Life Assessment (WHOQOL): Development and general psychometric properties. Soc Sci Med 1998;46(12):1569-85.
5. Al-Aboudi IS, Hassali MA, Shafie AA. Knowledge, attitudes, and quality of life of type 2 diabetes patients in Riyadh, Saudi Arabia. J Pharm Bioallied Sci 2016;8(3):195-202.
6. Al-Hayek AA, Robert AA, Al-Saeed A, Alzaid AA, Al-Sabaan FS. Factors associated with health-related quality of life among Saudi patients with Type 2 diabetes mellitus: A cross-sectional survey. Diabetes Metab J 2014;38(3):220-9.
7. Queiroz FA, Pace AE, Santos CB. Cross-cultural adaptation and validation of the instrument diabetes-39 (D-39): Brazilian version for Type 2 diabetes mellitus patients - Stage 1. Rev Latinoam Enferm 2009;17(5):708-15.