

Original Research Article

“A STUDY ON QUALITY OF LIFE IN TYPE II DIABETES MELLITUS PATIENTS IN RURAL AREA OF A DISTRICT”

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ABSTRACT:

Background: Health related quality of life (HRQOL) is a synonym for self-perceived health and is useful in predicting morbidity and mortality. Type II diabetes inflicts a significant burden in terms of disability and impaired QOL.⁵ HRQOL is an important outcome for persons with type II diabetes and this well-being is used to evaluate the impact of the disease and its treatment on individuals and health care costs.

OBJECTIVES:

- 1) To assess health related quality of life among known type II diabetes mellitus patients.
- 2) To identify socio- demographic factors affecting the health related quality of life among known type II diabetes mellitus patients.

Material & Methods: Study Design: Community based cross- sectional study. **Study area:** study was carried out in RHTC practice area of Department of Community Medicine, Katutri Medical College and Hospital, Guntur. **Study Period:** July 2021 – June 2022. **Study population:** Adult population (>30 years of age) who were known type II diabetes mellitus patients residing in rural area. **Sample size:** 1025 patients were included in our study. **Sampling method:** Probability Proportion to Size (PPS) method. **Method of data collection:** Participants were asked to rate their QOL using the WHOQOL-BREF questionnaire translated into Telugu and to provide ratings of their opinion. The WHOQOL-BREF is an abbreviated version of the WHOQOL-100 QOL assessment. It produces scores for four domains (physical health, psychological, social relationships and environment) related to QOL. The four domain scores denote an individual's perception of QOL in each particular domain.

Results: Maximum number of respondents (51.6%) were satisfied with themselves and 41% respondents had negative feelings such as blue mood, despair, anxiety and depression very rarely. Overall psychological health was found to be better in males compared to female respondents. Enjoyment in life and self- satisfaction in relation to psychological health was found to be statistically significant ($p < 0.05$).

CONCLUSION: This study concluded that diabetes is associated with decreased level of QOL in physical, mental, social and environmental health component. QOL is viewed as a critical outcome of disease treatment and control.

Key words: Health related quality of life, Type II diabetes, Domain scores

INTRODUCTION:

Non-communicable diseases (NCDs) are one of the major health and development challenges of the 21st century, in terms of both the human suffering and the harm they impose on the socioeconomic development of countries, particularly low- and middle-income countries. NCDs currently cause more deaths than all other causes combined and NCD deaths are projected to increase from 38 million in 2012 to 52 million by 2030.¹

According to data from National Family Health Survey 4 (NFHS 4), prevalence of Diabetes mellitus in women is 12.1% and in men it is 16.2%² in India. In Andhra Pradesh prevalence among women is 18%, among men it is 20%.³ In Telangana state, it is 13.8% among women and 12.2% in men.⁴

Diabetes mellitus is an important marker of risk for the arterial disease of the coronary, cerebral and peripheral arterial trees, and for micro vascular disease leading to blindness and renal failure. Diabetes is a demanding disease, which affects life in many ways. Managing diabetes can be stressful. Diabetes is not yet a curable disease. Dietary restrictions, medications including insulin injections, and diabetes-associated morbidities seriously deteriorate the quality of life of patients with diabetes.⁵

Health related quality of life (HRQOL) is a synonym for self-perceived health and is useful in predicting morbidity and mortality. Type II diabetes inflicts a significant burden in terms of disability and impaired QOL.⁵ HRQOL is an important outcome for persons with type II diabetes and this well-being is used to evaluate the impact of the disease and its treatment on individuals and health care costs.⁶

On the individual level, HRQOL includes perception regarding physical and mental and social health (e.g., energy level, mood) and their associated factors—including health conditions and risks, functional status, social support, and socioeconomic status. On the community level, HRQOL includes community-level resources, conditions, policies, and practices that influence a population's health perceptions and functional status. Therefore, CDC has defined HRQOL as “an individual's or group's perceived physical and mental health over time”.⁷

Analysis of HRQOL surveillance data can identify subgroups with relatively poor perceived health and help to guide the physicians to improve their situations and avert more serious consequences that are likely to follow. Interpretation and publication of this kind of data can help identify needs for health policies and legislation, help to allocate resources for unmet needs, guide the development of strategic plans, and monitor the effectiveness of community interventions and programs. Hence the present study was undertaken to study the HRQOL in diabetic patients in rural India.

OBJECTIVES:

- 1) To assess health related quality of life among known type II diabetes mellitus patients.
- 2) To identify socio- demographic factors affecting the health related quality of life among known type II diabetes mellitus patients.

Material & Methods:

Study Design: Community based cross-sectional study.

Study area: study was carried out in RHTC practice area of Department of Community Medicine, Katuri Medical College and Hospital, Guntur.

Study Period: July 2021 – June 2022.

Study population: Adult population (>30 years of age) who were known type II diabetes mellitus patients residing in rural area.

Sample size: 1025 patients were included in our study.

Sampling method: Probability Proportion to Size (PPS) method.

Inclusion criteria:

- 1) Individuals with known Type 2 Diabetes mellitus.
- 2) Who are willing to participate in the study.
- 3) Age 30 years and more (both male and female).
- 4) Duration of DM more than 1 years.

Exclusion criteria:

- 1) Individuals who are chronically ill.
- 2) Pregnant women.
- 3) Patient who did not agree to participate.
- 4) Gestational DM.
- 5) Inability to communicate due to physical or mental disability.

Method of data collection:

After explaining nature and scope of the study, informed consent was taken from the participants. Data was collected by interviewing the participants by house to house visit. If the individuals were not available at the time of study or the house was locked then a second visit was made to the house after one week. If the person was still unavailable then he was excluded from the study. People who did not give consent or those who met the exclusion criteria were excluded and the next numbers on the list were included.

Participants were asked to rate their QOL using the WHOQOL-BREF questionnaire translated into Telugu and to provide ratings of their opinion. The WHOQOL-BREF is an abbreviated version of the WHOQOL-100 QOL assessment. It produces scores for four domains (physical health, psychological, social relationships and environment) related to QOL. The four domain scores denote an individual's perception of QOL in each particular domain. Domain scores are scaled in a positive direction (i.e. higher scores denote higher QOL). The mean score of items within each domain is used to calculate the domain score. Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100.⁸

Statistical analysis:

In the data analysis, categorical variables were expressed in percentages and frequencies. Chi-square tests and t test were applied wherever applicable. Later univariate and multivariate simple linear regression analysis was done to find out the risk factors associated with the various domain of HRQOL in type II diabetes mellitus patients. A p value of <0.05 was considered significant for both univariate as well as multivariate analysis.

Observations & Results:**Table 1: Age and gender wise distribution of respondents**

Age Group(years)	Male n (%)	Female n (%)	Total n (%)
30-40	79 (7.7)	49 (4.8)	128 (12.5)
41-50	202 (19.6)	165 (16.1)	367 (35.7)
51-60	143 (14.0)	135 (13.2)	278 (27.1)
61-70	96 (9.4)	76 (7.4)	172 (16.8)
70 and above	49 (4.8)	31 (3.0)	80 (7.8)
Total	569 (55.5)	456 (44.5)	1025 (100.0)

Among the total respondents, 55.5% were males while 44.5% were females. Majority of the respondents were in the age group of 41-50 years i.e. 278 respondents, followed by 61-70 years age group i.e. 172 respondents. The least number of respondents were observed in 70 years and above age group.

Table 2: Respondents baseline characteristics

Characteristic	Male (Mean \pm SD)	Female (Mean \pm SD)	t value	p value
Age (years)	53.09 \pm 11.2	53.60 \pm 10.8	0.724	0.469
Height (cm)	159.07 \pm 6.3	152.34 \pm 5.8	17.562	0.000
Weight (kg)	62.55 \pm 7.7	57.75 \pm 8.1	9.641	0.000
BMI (kg/m ²)	24.69 \pm 2.5	24.86 \pm 3.1	0.974	0.330
Waist circumference (cm)	95.68 \pm 9.6	92.77 \pm 10.35	4.643	0.000
Hip circumference (cm)	102.83 \pm 9.6	99.9 \pm 10.31	4.673	0.000
WHR	0.93 \pm 0.02	0.92 \pm 0.02	1.645	0.000

The mean age of male respondents was 54 years and that of females was 53 years. The mean height, weight, waist and hip circumference were higher in males as compared to females and this was found to be statistically significant ($p < 0.05$). The mean Body Mass Index was found to be similar in both the sexes that is around 25kg/m².

Table 3: Domain scores of WHOQOL-BREF of the respondents

Domain	Minimum Score	Maximum score	Mean score	SD
Physical QOL score	19	88	50.06	11.9
Psychological QOL score	19	94	45.05	12.09
Social QOL score	19	94	56.10	20.7
Environmental QOL score	00	94	46.60	15.9
Total QOL score	00	94	49.95	16.23

The WHOQOL- BREF instrument responses were analyzed. The scores obtained by the respondents are shown in the above table. The domain scores among the study population were calculated. The mean total score of the QOL scale was 49.95. The scores were low for all four domains with relatively lower scores in psychological and environmental health. This means that bad physical and psychological health, deteriorating social relationships and unhealthy environmental conditions are affecting the HRQOL of Diabetes mellitus patients.

Table 4: Health Related Quality of Life in relation to Physical Health among all respondents

Questions of the physical domain	Answers	Total n (%)	Male n (%)	Female n (%)	χ^2 value	p value
Pain and discomfort	1.Not at all	132 (12.9)	68 (6.7)	64 (6.2)	13.71	0.008
	2.A little	306 (29.9)	134 (13.1)	172 (16.8)		
	3.A moderate amount	33 (3.3)	16 (1.6)	17 (1.7)		
	4.Very much	387 (37.7)	268 (26.1)	119 (11.6)		
	5.An extreme amount	167 (16.3)	83 (8.1)	84 (8.2)		
Dependence on medical substances and aids	1.Not at all	61 (6.0)	34 (3.3)	27 (2.6)	5.12	0.274
	2.A little	284 (27.7)	160 (15.6)	124 (12.1)		
	3.A moderate amount	34 (3.3)	25 (2.4)	9 (0.9)		
	4.Very much	476 (46.5)	256 (25.0)	220 (21.5)		
	5.An extreme amount	170 (16.6)	94 (9.2)	76 (7.4)		
Energy	1.Not at all	151 (14.7)	80 (7.8)	71 (6.9)	1.19	0.879
	2.A little	195 (19.0)	111 (10.8)	84 (8.2)		
	3.A moderate amount	234 (22.9)	134 (13.1)	100 (9.8)		
	4.Very much	347 (33.9)	188 (18.3)	159 (15.5)		
	5.An extreme amount	98 (9.6)	56 (5.5)	42 (4.1)		

Satisfaction with sleep	1.Very dissatisfied 2.Dissatisfied 3.Neither satisfied nor dissatisfied 4.Satisfied 5.Very satisfied	238 (23.3) 420 (41.0) 16 (1.6) 109 (10.6) 242 (23.7)	126 (12.3) 244 (23.8) 6 (0.6) 63 (6.1) 130 (12.7)	112 (11.0) 176 (17.2) 10 (1.0) 46 (4.5) 112 (11.0)	4.41	0.352
Satisfaction with activities of daily living	1.Very dissatisfied 2.Dissatisfied 3.Neither satisfied nor dissatisfied 4.Satisfied 5.Very satisfied	147 (14.3) 67 (6.5) 17 (1.6) 775 (75.6) 19 (1.9)	69 (6.7) 31 (3.0) 10 (1.0) 443 (43.2) 16 (1.6)	78 (7.6) 36 (3.5) 7 (0.7) 332 (32.4) 3 (0.3)	13.95	0.007
Work capacity	1.Very dissatisfied 2.Dissatisfied 3.Neither satisfied nor dissatisfied 4.Satisfied 5.Very satisfied	227 (22.1) 275 (26.9) 102 (10.0) 295 (28.8) 126 (12.3)	121 (11.8) 182 (17.8) 53 (5.2) 167 (16.3) 46 (4.5)	106 (10.3) 93 (9.1) 49 (4.8) 128 (12.5) 80 (7.8)	32.21	0.000

Among the total respondents 41% were dissatisfied and 23.3% were very dissatisfied with their sleep. Maximum number of respondents i.e. 75.6% were satisfied with their ability to perform their daily activities. Regarding their capacity for work 28.8% were satisfied and 26.9% were dissatisfied among the respondents. Overall physical health domain of HRQOL was better in male diabetics than female diabetics. On application of a Chi-square test, pain and discomfort, satisfaction with activities of daily living and capacity for work in relation to physical health were found to be statistically significant ($p < 0.05$).

Table 5: Respondents perception regarding psychological health domain of HRQOL.

Questions of the psychological domain	Answers	Total n (%)	Male n (%)	Female n (%)	χ^2 value	p value
How much do you enjoy life?	1.Not at all 2.A little 3.A moderate amount 4.Very much 5.An extreme amount	111 (10.8) 683 (66.6) 48 (4.6) 157 (15.3) 26 (2.5)	46 (8.2) 394 (69.2) 15 (2.6) 104 (18.2) 10 (1.8)	65 (14.2) 289 (63.4) 33 (7.2) 53 (11.6) 16 (3.5)	19.7	0.001
Meaningful life	1.Not at all 2.A little 3.A moderate amount 4.Very much 5.An extreme amount	419 (40.8) 403 (39.3) 12 (1.1) 172 (16.8) 19 (1.8)	232 (40.8) 223 (39.2) 9 (1.6) 98 (17.2) 7 (1.2)	187 (41.0) 180 (39.5) 3 (0.6) 74 (16.2) 12 (2.6)	4.68	0.32

Concentration	1.Not at all 2.A little 3.A moderate amount 4.Very much 5.An extreme amount	116 (11.3) 681 (66.4) 25 (2.4) 185 (18.0) 18 (1.8)	61 (10.7) 367 (64.5) 17 (3.0) 117 (20.5) 7 (1.2)	55 (12.1) 314 (68.9) 8 (1.8) 68 (14.9) 11 (2.4)	9.19	0.056
Bodily image and appearance	1.Not at all 2.A little 3.A moderate amount 4.Very much 5.An extreme amount	294 (28.7) 218 (21.3) 253 (24.7) 92 (9.0) 168 (16.4)	158 (27.8) 117 (20.6) 148 (26.0) 53 (9.3) 93 (16.3)	136 (29.8) 101 (22.1) 105 (23.0) 39 (8.6) 75 (16.4)	1.75	0.78
Satisfaction with yourself	1.Very dissatisfied 2.Dissatisfied 3.Neither satisfied nor dissatisfied 4.Satisfied 5.Very satisfied	89 (8.7) 140 (13.7) 219 (21.4) 529 (51.6) 48 (4.7)	53 (9.3) 61 (10.7) 96 (16.9) 332 (58.3) 27 (4.7)	36 (7.9) 79 (17.3) 123 (27.0) 197(43.2) 21 (4.6)	32.02	0.000
Negative feelings	1.Never 2.Seldom 3.Quite often 4.Very often 5.Always	274 (26.7) 419 (40.9) 44 (4.3) 157 (15.3) 131 (12.8)	164 (28.8) 225 (39.5) 29 (5.1) 77 (13.5) 74 (13.0)	110 (24.1) 194 (42.5) 15 (3.3) 80 (17.5) 57 (12.5)	7.2	0.12

Maximum number of respondents (51.6%) were satisfied with themselves and 41% respondents had negative feelings such as blue mood, despair, anxiety and depression very rarely. Overall psychological health was found to be better in males compared to female respondents. Enjoyment in life and self- satisfaction in relation to psychological health was found to be statistically significant ($p < 0.05$).

Table 6: Respondents perception regarding social health domain of HRQOL

Questions of the social domain	Answers	Total n (%)	Male n (%)	Female n (%)	χ^2 value	p value
Personal relationships	1.Very dissatisfied	251 (24.5)	139 (24.4)	112 (24.6)	1.39	0.84
	2.Dissatisfied	46 (4.5)	29 (5.1)	17 (3.7)		
	3.Neither satisfied nor dissatisfied	35 (3.4)	19 (3.3)	16 (3.5)		
	4.Satisfied	490 (47.8)	267 (47.0)	223 (49.0)		
	5.Very satisfied	203 (19.8)	115 (20.2)	88 (19.3)		
Social support	1.Very dissatisfied	276 (27.0)	151 (26.5)	125 (27.4)	1.32	0.85
	2.Dissatisfied	46 (4.5)	29 (5.1)	17 (3.7)		
	3.Neither satisfied nor dissatisfied	24 (2.3)	14 (2.5)	10 (2.2)		
	4.Satisfied	476 (46.4)	261 (45.9)	215 (47.1)		
	5.Very satisfied	203 (19.8)	114 (20.0)	89 (19.5)		

Majority (47.8%) of the respondents were satisfied with their personal relationships with their family members and peer. About 46.4% of the respondents were satisfied with the support they get from their family and friends. Overall social health domain of HRQOL was better in male diabetics than female diabetics. This difference was not found to be statistically significant ($p > 0.05$).

Table 7: Respondents perception regarding environmental health domain of HRQOL

Questions of the environmental domain	Answers	Total n (%)	Male n (%)	Female n (%)	χ^2 value	p value
Safety and security	1.Not at all	191 (18.6)	101 (17.7)	90 (19.7)	5.08	0.27
	2.A little	453 (44.2)	247 (43.4)	206 (45.2)		
	3.A moderate amount	44 (4.3)	22 (3.9)	22 (4.8)		
	4.Very much	305 (29.8)	184 (32.3)	121 (26.5)		
	5.An extreme amount	32 (3.1)	15 (2.6)	17 (3.7)		
How healthy is your physical environment?	1.Not at all	181 (17.6)	98 (17.2)	83 (18.2)	6.05	0.194
	2.A little	176 (17.1)	90 (15.8)	86 (18.8)		
	3.A moderate amount	374 (36.5)	201 (35.3)	173 (37.9)		
	4.Very much	175 (17.1)	109 (19.2)	66 (14.5)		
	5.An extreme amount	119 (11.6)	71 (12.5)	48 (10.5)		
Financial resources	1.Not at all	367 (35.8)	203 (35.7)	164 (36.0)	3.05	0.55
	2.A little	518 (50.5)	285 (50.1)	233 (51.1)		
	3.A moderate amount	27 (2.6)	16 (2.8)	11 (2.4)		
	4.Very much	71 (6.9)	45 (7.9)	26 (5.7)		
	5.An extreme amount	42 (4.1)	20 (3.5)	22 (4.8)		
Opportunities for acquiring new information	1.Not at all	289 (28.2)	168 (29.5)	121 (26.5)	7.78	0.10
	2.A little	438 (42.7)	247 (43.4)	191 (41.8)		
	3.A moderate amount	27 (2.6)	19 (3.3)	8 (1.7)		
	4.Very much	236 (23.0)	115 (20.2)	121 (26.5)		
	5.An extreme amount	35 (3.4)	20 (3.5)	15 (3.3)		
Opportunity for leisure activities	1.Not at all	247 (24.1)	151 (26.5)	96 (21.0)	20.29	0.000
	2.A little	497 (48.5)	268 (47.1)	229 (50.2)		
	3.A moderate amount	19 (1.9)	11 (1.9)	8 (1.7)		
	4.Very much	153 (14.9)	97 (17.0)	56 (12.3)		
	5.An extreme amount	109 (10.6)	42 (7.4)	67 (14.7)		
Satisfaction with home environment	1.Very dissatisfied	256 (25.0)	137 (24.1)	119 (26.1)	8.9	0.06
	2.Dissatisfied	29 (2.8)	21 (3.7)	8 (1.7)		
	3.Neither satisfied nor dissatisfied	25 (2.4)	10 (1.7)	15 (3.2)		
	4.Satisfied	454 (44.3)	265 (46.6)	189 (41.4)		
	5.Very satisfied	261 (25.5)	136 (23.9)	125 (27.4)		

Health care accessibility	1.Very dissatisfied	250 (24.4)	136 (23.9)	114 (25.0)	3.37	0.49
	2.Dissatisfied	23 (2.2)	14 (2.5)	9 (2.0)		
	3.Neither satisfied nor dissatisfied	19 (1.9)	7 (1.2)	12 (2.6)		
	4.Satisfied					
	5.Very satisfied	552 (53.9)	308 (54.1)	244 (53.5)		
		181 (17.7)	104 (18.3)	77 (16.9)		

63% of the respondents did not feel any kind of safety and security in their daily life and 35.8% said that they have no money at all to meet their daily expenses. 44.3% were satisfied with the conditions of their living place and surroundings. 53.9% respondents were satisfied with their access to health care services. The overall perception of environmental health was better in male respondents than female respondents. Opportunity for leisure activities and transport facilities in relation to environmental health were found to be significant ($p < 0.05$).

DISCUSSION:

Pertaining the age and HRQOL, that not all of the QOL domains of the diabetic patients were affected by the aging process. In our study only the psychological domain is affected with age. It showed that HRQOL decreased with increase in age group that is above 50 years. The other domains of HRQOL also decreased with increase in age but there is no statistical significance in difference in less than 50 and more than 50 years age groups. The psychological and environmental domains had lesser scores than physical and social domains. The social domain scores were better than the other domain scores because in India people try to maintain a healthy relationship with one another.

Environmental domain scores were second lowest because most of study population lacked financial resources, freedom, and leisure activities as a result of the financial burden and responsibilities associated with their families and home environment. This in turn adds to the expenses and psychological impact of DM on them. In summary, there was a significant effect of the aging process on the psychological domain of HRQOL of the diabetic individuals while the effect of age on the physical, social and environmental domains of HRQOL was with a very little difference but not significant.

The study results were consistent with the findings of Rubin and Peyrot, they found there was no meaningful pattern of association between age and HRQOL.⁹ The present study results also agreed with a review of articles on HRQOL among diabetic patients by Wandell et al, it found that weak predictors on HRQOL were micro vascular complications, age, sex, metabolic level, and education.¹⁰ On other hand, there was disagreement with a study by Glasgow et al. study who suggested there is an association between age and specific aspects of well-being. Glasgow found that younger persons had significantly higher scores than older persons on SF-20 scales measuring physical functioning and social functioning.¹¹

Gender wise overall perception of QOL is different. QOL is slightly more affected in females rather than in males. Gender had no impacts on QOL domains because of the fact that men and women carry the same burden of DM regardless the gender. This agreed with a study by Botic-Zivanovic D et al¹² who performed a cross-sectional study at the outpatient department of a health centre in Siberia.

Regarding the socio-economic status, there was a positive association between the HRQOL and the income status. In other words, the higher the monthly income, the better the QOL scores. SES is significantly associated with all the domains of HRQOL in diabetic individuals. We can conclude from this part that a good economic situation is an important factors for the QOL of the patients especially those who suffer from chronic diseases. This was supported by the study of Pappa et al. which aimed to assess the influence of SES on HRQOL; low total household income was related to important decline in HRQOL.¹³ In a study by Unden et al which was to compare different aspects of health, QOL, and quality of care (QoC) between men and women with 74 diabetes as a basis for planning and managing diabetes care showed that women rated their mental well-being and QOL as worse compared with men. Women reported more diabetes-related worries and less ability to cope and less satisfaction with diabetes care.¹⁵

Regarding the duration of DM and HRQOL, the results showed that all domains of QOL are affected by duration of diabetes. With increase in the number of years of the disease there is decrease in the physical, psychological, social and environmental health scores indicating poor HRQOL. These results corresponded well with the findings reported by several previous studies; a study conducted by Redekop et al. to estimate the HRQOL and treatment satisfaction for patients with type II DM in the Netherlands; it is found that longer duration of DM was associated with a lower HRQOL.¹⁴

Regarding the effect of mode of treatment of DM on the HRQOL, the physical, psychological and social domains of HRQOL for diabetic individuals who were treated by OHAs were slightly better than those who were treated by Insulin. This can be attributed to the reason that patients unpleasantly accept being injected by insulin once or twice daily. These results are in disagreement with the research that has shown increasing treatment intensity in patients with type II DM from diet and exercise alone, to oral medications, to insulin, is associated with worsening QOL.¹⁶

CONCLUSION:

This study concluded that diabetes is associated with decreased level of QOL in physical, mental, social and environmental health component. QOL is viewed as a critical outcome of disease treatment and control. Majority of the subjects had a good quality of life, followed by poor and very poor quality of life. There was a significant association between the quality of life and socio- demographic variables like gender, socio-economic status, BMI, duration of diabetes, hypertension, mode of treatment. Smoking and alcohol consumption had no relation with HRQOL.

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