ORIGINAL ARTICLE

Assessment of Health-related Quality of Life among Diabetic Out patients at Warangal Region Telangana India- A Cross-sectional Study

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ABSTRACT

Objective: The effect of glycemic control on overall health-related quality of life (HRQoL) in patients with diabetes has not been explored in the Telangana state of India. Therefore, this study aimed to assess the HRQoL among diabetic patients in the Warangal region of Telangana. **Methods:** A prospective interview-based study was conducted among diabetic outpatients of the endocrinology department in the Warangal region of Telangana between July 2019 and March 2020. The HRQoL of the patients was assessed using the quality of life instrument for indian diabetes patients. Data were analyzed by IBM Statistical Package for Social Science (SPSS) Statistics 26 (IBM Inc., Chicago, IL, USA). **Results:** Out of 402 diabetic patients more males 259 (64.4%), than females were observed 143 (35.6%). Their mean age was 52.39 ± (SD, 11.01). About 26.1% of the patients (n = 105) had good physical HRQoL, while 38.3%(n = 154) reported poor general health. The domains such as diet and treatment satisfaction were found to have 30.8% (n = 124), 33.1% (n = 133) good HRQoL. The HRQoL toward emotional/mental health was reported poorly, only 15.7% (n = 63) of them were found to have good HRQoL. **Conclusion:** The findings indicated that patients in this study had relatively poor HRQoL associated with diabetes. The QoL has impaired mainly general, emotional health, also the domain of symptoms botherness. Therefore, better management of diabetes is needed for improved quality of life of patients through patient education.

Key words: General health, health-related quality of life diabetic, out patients, physical health, warangal

INTRODUCTION

Diabetes mellitus (DM) is becoming uncontrollable in terms of prevalence, incidence, and consequences, resulting in diabetes-related injuries, which are driving up hospital costs and putting a strain on world health.[1] The disease's progression was previously emphasized in a paper, and it was found to be prevalent in both middle- and low-income countries.[1,2] Poor glycemic control in diabetes leads to a slew of disease-related consequences that cause chaos on the patients' health and quality of life (HRQoL).[3,4] For people with diabetes, health-related quality of life (HRQoL) is very crucial in all parts of their lives to have a balanced and healthy lifestyle. There was some evidence to suggest that enhanced HRQoL was seen as a vital goal of all healthcare interventions, including DM management programs.[5,6] HRQoL is a measure of how satisfied people are with their lives, and it can be impacted by a wide range of health issues.[7,8] The HRQoL is defined by the WHO as a person's view of their living circumstances in light of the culture and value systems in which they live, as well as in connection to their objectives, expectations, standards, and worries.[9]

Since then, DM has become a significant and growing problem in developing countries like India, primarily due to population growth, a lack of physical activity, unhealthy dietary habits, and sedentary western lifestyles[7,8] all of which contribute to multiple comorbidities, as well as

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cardiovascular and endocrinological complications, and disrupted daily activities that lead to an uncontrolled glycemic index which results in lengthy hospital admissions, costly therapies, and a subsequent fear of death, all of which have a severe impact on patients' day-to-day activities and lower health status.[1,10,11] Because of this, understanding the level of HRQoL among diabetes patients with the enormous burden of the disease at the national and international levels is critical. Multidimensional patient-oriented HRQoL is widely utilized in research projects. In addition, it is essentially important to recognize various barriers and factors that are related to reduced HRQOL among patients particularly in the Indian context, which may further help health care professionals and policymakers with focusing on subsidizing and execute intercessions to improve the QOL.

There were several studies from developed and developing countries that evaluated the diabetes patients HRQoL, reported that diabetes significantly impaired the QOL of however the impairment differed from one study to another.[12-16] However, despite the increased prevalence of the DM, strategies to evaluate the effect of the disease also outcomes of health care intervention and health care policies at both national and international levels are needed.[17] In Warangal as of now, only one study evaluated the diabetic's HRQoL concerning physical, psychological, and social aspects of health.[18] While two more studies evaluated the HRQoL of HIV and breast cancer patients from the same regions of India.[19,20] There was a lack of studies conducted to measure the diabetic patient's HRQoL particularly in Warangal city, India. Therefore, this study was aimed to assess the HRQoL of diabetic patients attending outpatints clinic in, Warangal India.

SUBJECTS AND METHODS

Study design and setting

A prospective cross-sectional study was conducted in the outpatient endocrinology department in Warangal, region, Telangana, India. The data collection was carried out over 9 months Between July 2019 and March 2020. The study included patients with diabetes, those aged above 18 years, at least 6 months of diagnosis, and on treatment were included. The patient's diabetes during pregnancy, mentally ill patients with DM, were excluded from the study. Before data collection, the objective of the research and its importance were explained by the researcher also participants have been given the right to withdraw from the study at any period. The participants were also assured that their data would only be used for research purposes and confidentiality would be maintained. Participants were also informed that there was no risk associated with participation in this study. In addition, participants provided informed consent before answering survey questions.This was a non-intervention-based research survey that measured HRQoL behaviors among diabetic patients.

The sample size for this study was calculated based on the previous prevalence of DM in the region of Warangal, India (i.e., 16.5%)[21] using the following formula:

$$n=z2\times p\times q/d2,$$

where n is the sample size, z isthe standard normal deviation of 1.96 corresponding to the 95% confidence interval, p is the expected prevalence in proportion of one, q is (1−p), and d is the precision in proportion of one; if 5%, d=0.05.

$$n=(1.96)2\times 0.165\ (1–0.165)/(0.05)2$$

$$n=211$$

Questionnaire design and data collection

For patients who met the inclusion criteria, the demographic characters of the respondents include, age, gender, marital status, employment status, duration of the disease, type of treatment undergoing, and social status, body mass index (BMI) was collected through the interviews. The patient's QoL was assessed using quality of life instrument for indian diabetes (QOLID) questionnaire.[22,23] The questionnaire for this study were developed after an extensive review of the literature and adapted from previously published studies.[22,23] The original QOLID Patients where a total of 34 items divided into 8 domains.[22] The QOLID questionnaire were. A total of 31 items are included in the research tool, which is divided into eight categories: Role Restriction Due to Physical Illness (6-items) Strength and Stamina (5-items) Health in General (3-items) Satisfaction with the Treatment (4 items) symptoms bothered (3-items) Financial Worries (3 items) Mental Health (5-items) satisfaction with one's diet (2-items). All items were rated on a Likert scale from 1 to 5 where "1" indicated the poorest quality of life for selections like "always" in case of questions like "How often do you feel tired by your health problems" or for "very dissatisfied" in case of questions like "How satisfied with the amount of time it takes to manage diabetes." The highest rating of "5" denoted the best quality of life standing for "never" or "very satisfied in the case of the above two questions. Before data collection, the research questionnairewas reviewed by experts in the field and further piloted among a small group of patients to ensure capturing local context. According to the opinions of experts, to reduce the length of the time in data collecting the 3- items were removed from the original questionnaire and the final version of the questionnaire was 31-items. The Cronbach's alpha of the questionnaire was 0.83, indicating that questionnairewere valid to carry out the study.

Data analysis

Descriptive statistics were used to report on study population demographics. Statistical package for social science

version 26 was used for analysis. Frequency tables of various scenarios of QoL answering on a five-point Likert scale by the study population were all reported. The total QoL of each subdomain was calculated by combining the variables score of 1 and 2 represents poor QoL, while a score of 3–4 is considered as moderate QoL, and patients who scored 5 are regarded as having good QoL.

RESULTS

A total of 402 patients were approached for the study. Of the enrolled patients in the study, 259 (64.4%) were male, and 143 (35.6%) were females. Their mean age was 52.39 ± (SD, 11.01). Of the interviewed patient's majority of them were married 336 (83.6%) only 9 (2.2%) were single, 159 (39.6%) were graduated, while 84 (20.9%) were completed secondary school and 107 (26.6%) were lacking the education. Among the respondents, 148 (36.8%) were smokers and most of them were 254 (63.2%) were alcoholic users. slightly more than half 59.2% (n = 238) had a normal BMI (18.5–24.9), and 29.4% (n = 118) were overweight. Among the respondents, about 186 (46.3%) had a disease duration of <5 years, while 42.5% had a disease duration of 6–10 years since diagnosis. The Demographics characteristics of eligible patients are displayed in Table 1.

Physical HRQoL was good in about 26.1% of patients (n = 105), while general health was poor in about 38.3% of patients (n = 154). Diet and treatment satisfaction were found to have good HRQoL in 30.8% of cases (n = 124) and 33.1% of cases (n = 133). Only 15.7% (n = 63) of those surveyed had good HRQoL in terms of emotional/mental health, according to the results. Figure 1 shows the detailresponses of all the domains of health related quality of life.

Effects of physical health on diabetes-related quality of life

There were 25.6% (n = 103) of respondents who often missed work because of physical health, while 2.7 % (n = 11) never missed it. About 22 % (n = 85) of respondents agreed that

Table 1: General characteristics of the study sample (n=402)

Characteristics	Category	Frequency (n)	Percentage
Sex	Male	259	64.4
	Female	143	35.6
Age (in years)	<32 years	10	2.5
	32–42 years	55	13.7
	43–52 years	138	34.3
	52–60 years	106	26.4
	>60 years	93	23.1
Marital status	Married	336	83.6
	Single	9	2.2
	Divorced/separated/widowed	57	14.2
Education level	Illiterate	107	26.6
	Literate (basic education and above)	295	73.4
Smoking status	Yes	148	36.8
	No	254	63.2
Alcohol status	Yes	254	63.2
	No	148	36.8
Diseases duration	<5	186	46.3
	6–10 years	171	42.5
	>10 years	45	11.2
Type of anti-diabetic medication	Insulin injection or combination	85	21.1
	Oral medication	202	50.2
	Combination of diet, exercise, and tablets	115	28
Body mass index	Underweight	43	10.7
	Normal weight	238	59.2
	Overweight	118	28.4
	Obese (>30.00)	3	0.7

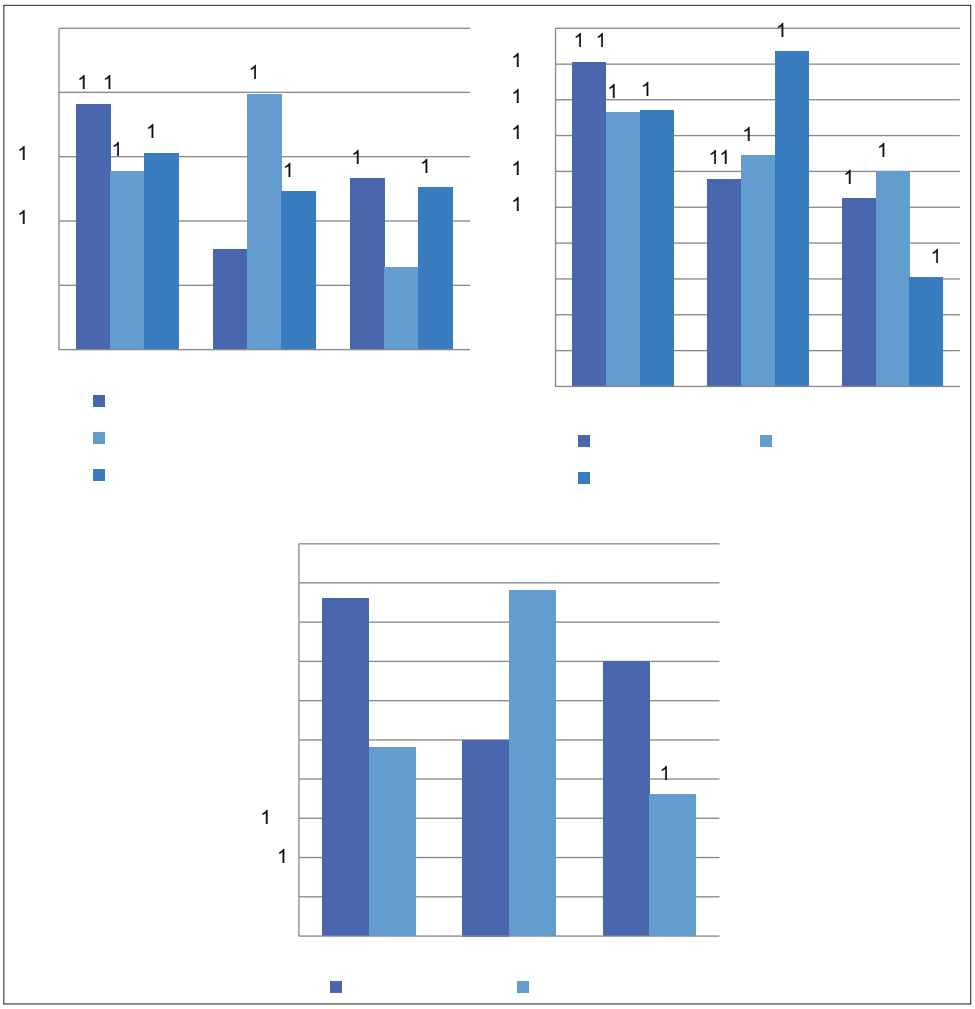

Figure 1: Levels of HRQoL of different domains

following a schedule for eating or taking regular medications frequently affects work, while 9.5 % (n = 38) were never agreed about it. Thirty-one percent of those polled (30.1%; n = 121) said their physical health affected their work efficiency regularly (Always/frequently), while 12.9% (n = 52) said their physical health did not affect their ability to do their jobs effectively. The physical health domain had a mean score of 18.8 and an average standard deviation of 2.91. (Range 0–30). The frequency distribution of patients' responses to the effects of physical health on diabetes quality of life was given in Table-2.

Effects of physical endurance on diabetes-related quality of life

Diabetic patients had poor QoL when it came to physical endurance. Nearly half of those surveyed (always/frequently) said that diabetes had prevented them from engaging in intense workouts over the previous 3 months, while a third said that other health issues had prevented them from eating, dressing, bathing, or using the toilet. Check out Table 2 for more information.

General health

The results found that 40% (n = 161) the respondents had good general health, about 38% (n = 150) of them reported good in concentrating on tasks such as driving, working, and reading, however 31.1% (n = 125) of them felt always/frequently, tired, fatigue in the past 3 months, only 5.5% of them never felt about it. Figure 2a and b show the responses toward general health and frequency of fatigue in the past 3 months.

Symptom botherness

Thirst, excessive hunger, and frequent urination were reported by 44.3% (n = 178), 20.6% (n = 83), and 28.6% (n = 115) of patients in the past 3 months. Only 4% of people (n = 16) reported always thirst or dry mouth, while 3% of (n = 15) excessive hunger and 4% of them (n = 19) reported frequent urination. Only 5%, 7%, or 6.5% of people with diabetes have never experienced complications related to the disease (thirst or dry mouth, excessive hunger, frequent urination). Table 3 shows the frequencies of patients with symptom botherness and diet satisfaction on the quality of life associated with diabetes in more detail in Table 3.

Diet satisfaction

Patients interviewed revealed that 42.6% (*n* = 171) had always/frequent restrictions on their food choices, compared to 18.2% (*n* = 73) and 9.5%t (*n* = 38) who reported having restrictions on their food choices only occasionally or never at all. More than a third (36.1%) of patients always ate food that was restricted to hide their diabetes, while 29.9 % (*n* = 120) and only 1.5 % (*n* = 06) did so frequently or never. Take a look at the following Table 3.

Treatment satisfaction

Of those who are satisfied or moderately satisfied with their current treatment, 32.3% (*n* = 130) are so; however, 31.1% (*n* = 125) are neither satisfied nor dissatisfied. Only about half of the people surveyed were happy with the amount of time it took to manage their diabetes; the remaining 3.7% and 22.9% (*n* = 15; *n* = 92) were either very dissatisfied or unsatisfied. On the other hand, when asked if they were satisfied with the time spent on regular checkups, 48% (*n* = 193) said they were, while 27.6%(*n* = 111) said they were not. Table 4 shows the results.

Financial worries

Among the interviewed diabetics 6.7 % (*n* = 27) of thought diabetes management was highly expensive, while 37.1% (*n* = 149) thought it was reasonable. Furthermore, nearly a third of respondents (*n* = 117) said diabetes has a significant

Table 2: Effect of physical health and physical endurance on QoL

Sceneries of QoL	Always *n* (%)	Frequently *n* (%)	Often *n* (%)	Sometimes *n* (%)	Never *n* (%)
Physical health					
How often miss your work because of your diabetes?	20 (5.0)	217 (54)	103 (25.6)	51 (12.7)	11 (2.7)
A person with diabetes has the requirement of adhering to a schedule for eating and taking regular medication. How often does this affect your work?	20 (5.0)	85 (21.1)	115 (28.6)	144 (35.8)	38 (9.5)
Effect on work efficiency	33 (8.2)	88 (21.9)	103 (25.6)	126 (31.3)	52 (12.9)
Effect on social life?	11 (2.7)	84 (20.9)	112 (27.9)	106 (26.4)	89 (22.1)
Effect on traveling	12 (3.0)	84 (20.9)	141 (35.1)	105 (26.1)	60 (14.9)
Compared to others of your age, how limited social activities	14 (3.5)	114 (28.4)	126 (31.3)	79 (19.7)	69 (17.2)
Effect of physical endurance on QoL					
How often in the past 3 months has your overall health problems limited the kind of vigorous activities	34 (8.5)	162 (40.3)	104 (25.9)	88 (21.9)	14 (3.5)
How often in the past 3 months has your overall health problems limited you from eating, dressing, bathing, or using the toilet	20 (5.0)	104 (25.9)	116 (28.9)	131 (32.6)	31 (7.7)
2 How often in the past 3 months has your overall health problems limited you from walking uphill or climbing 1–2 flights of stairs?	12 (3.0)	91 (22.6)	104 (25.9)	148 (36.8)	47 (11.7)
How often in the past 3 months has your overall health problems limited you from walking 1–2 km at a time?	13 (3.2)	80 (19.9)	89 (22.1)	126 (31.3)	94 (23.4)
How often in the past 3 months has your overall health problems limited you from bending, squatting, or turning	3 (0.7)	39 (9.7)	138 (34.3)	139 (34.6)	83 (20.6)

Table 3: Frequency of symptom botherness and diet satisfaction on the diabetes-related quality of life

Symptom botherness and diet satisfaction	Always *n* (%)	Frequently *n* (%)	Often *n* (%)	Sometimes *n* (%)	Never *n* (%)
How many times in the past 3 months have you had thirst/dry mouth?	16 (4.0)	178 (44.3)	132 (32.8)	56 (13.9)	20 (5.0)
How many times in the past 3 months have you felt excessive hunger?	15 (3.7)	83 (20.6)	103 (25.6)	171 (42.5)	30 (7.5)
How many times in the past 3 months have you had frequent urination related to diabetes management?	19 (4.7)	115 (28.6)	127 (31.6)	115 (28.6)	26 (6.5)
Restriction in choosing food when eating out	16 (4.0)	155 (38.6)	120 (29.9)	73 (18.2)	38 (9.5)
How often do you eat the food items that you shouldn't hide the fact that you have diabetes?	145 (36.1)	120 (29.9)	52 (12.9)	79 (19.7)	6 (1.5)

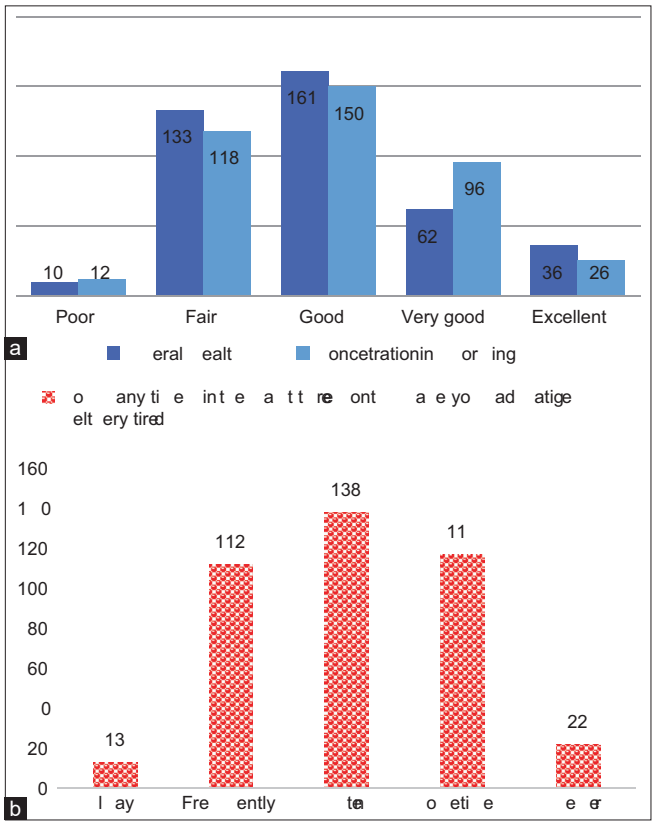

Figure 2: (a) Overall general health and concentration activities. (b) Frequency of fatigue in the past 3 months

impact on their family's budget, while 22.9% and 20.6% said it had a little impact. Around 18 % of the patients interviewed said diabetes had no impact on their spending on restaurants, entertainment, or outings. Table-5 also included frequency information.

Emotional/mental health

In this study, 20.4% of the patients were moderately satisfied with their emotional or mental health, while slightly more than 32.3% (n = 130) were neither satisfied nor dissatisfied. Only 6.5% of the patients were very satisfied with their relationships, while 31.1%were is moderately satisfied. Although, only a tiny percentage of patients were dissatisfied, 5.0% were extremely dissatisfied. Approximately, 28% of patients (n = 112) and 29.9% (n = 120) were frequently and occasionally discouraged by health difficulties, respectively. Table 6 shows the results.

DISCUSSION

This study attempted to assess the overall HRQoL profile of diabetic patients in the Warangal region of Telangana. According to this finding, the overall mean of HRQoL among study participants was moderately poor (96.66 ± 7.80). In this research, 26.1% of diabetics had great physical health,

Table 4: Responses of patients toward treatment satisfaction domain of QoL

Sceneries of QoL	*n*	%
How satisfied are you with your current diabetes treatment?		
Very dissatisfied	17	4.2
Moderately dissatisfied	130	32.3
Neither satisfied nor dissatisfied	125	31.1
Moderately satisfied	103	25.6
Very satisfied	27	6.7
How satisfied are you with the amount of time it takes to manage your diabetes?		
Very dissatisfied	15	3.7
Moderately dissatisfied	117	29.1
Neither satisfied nor dissatisfied	92	22.9
Moderately satisfied	144	35.8
Very satisfied	34	8.5
How satisfied are you with the amount of time you spend getting regular checkups (once in 3–6 months)?		
Very dissatisfied	8	2.0
Moderately dissatisfied	103	25.6
Neither satisfied nor dissatisfied	98	24.4
Moderately satisfied	149	37.1
Very satisfied	44	10.9
A person with diabetes needs to exercise for 150 min/week. Keeping this in mind, how satisfied are you with the time you spend exercising?		
Very dissatisfied	3	0.7
Moderately dissatisfied	71	17.7
Neither satisfied nor dissatisfied	134	33.3
Moderately satisfied	176	43.8
Very satisfied	18	4.5

whereas 29.9% had outstanding physical endurance. The patient's general health was poor, and only 15.2% of those with diabetes who were interviewed described their condition as excellent. The HRQoL score was 33.1% when looking at patient satisfaction with treatment. Manjunath *et al*. found that 63% and 69% of Type 2 diabetic patients had satisfactory physical and psychological HRQoL in their earlier study.[24] However, the previous study found poor HRQoL concerning the social domain of the study instrument, which is comparable to our findings.[24] Similarly Tang *et al*., in 2006 among the Chinese population, found that the HRQoL score for physical health was 70.33 (SD = 26.75), whereas the score for general health was 42.08 (SD = 15.95). In a recent study, 30.92 percent of elderly diabetics (n = 951) reported having a satisfactory HRQoL.[25] HRQoL has been deteriorating among diabetics, according to these data.[25] A previous research has revealed that decreased HRQoL ratings could be attributable to patient

Table 5: Responses toward financial worries

Sceneries of QoL	*n*	%
What do you think about the cost involved in your management of diabetes?		
Very expensive	27	6.7
Little expensive	177	44.0
Reasonable	149	37.1
Not at all expensive	49	12.2
To what extent has your family budget been affected by the expenses related to the management of diabetes)?		
A lot	15	3.7
Highly	117	29.1
little	92	22.9
Little very little	83	20.6
Not at all	95	23.6
To what extent has your diabetes limited your expenditures on other aspects of life (Restaurants, entertainment, outings, parties, etc.)?		
A lot	18	4.5
Highly	113	28.1
Little	106	26.4
Little very little	93	23.1
Not at all	72	17.9

Table 6: Respondents responses toward emotional/ mental health questionnaire in QoL

Sceneries of QoL	*n* (%)
How satisfied are you with yourself?	
Very dissatisfied	5 (1.2)
Moderately dissatisfied	178 (44.3)
Neither satisfied nor dissatisfied	130 (32.3)
Moderately satisfied	82 (20.4)
Very satisfied	7 (1.7)
How satisfied are you with your relationships (family, friends)?	
Very dissatisfied	13 (3.2)
Moderately dissatisfied	115 (28.6)
Neither satisfied nor dissatisfied	129 (32.1)
Moderately satisfied	119 (29.6)
Very satisfied	26 (6.5)
How satisfied are you with the emotional support from your friends and family?	
Very dissatisfied	20 (5.0)
Moderately dissatisfied	102 (25.4)
Neither satisfied nor dissatisfied	138 (34.3)
Moderately satisfied	125 (31.1)
Very satisfied	17 (4.2)
How often are you discouraged by your health problems?	
Always	20 (5.0)
Frequently	112 (27.9)
Often	128 (31.8)
Sometimes	120 (29.9)
Never	22 (5.5)
All people want to fulfill certain roles and purposefully lead their lives. To what extent do you feel that you have been able to lead your life in the same way?	
Not at all	17 (4.2)
A little	123 (30.6)
Moderate	157 (39.1)
Very much	78 (19.4)
An extreme amount	27 (6.7)

comorbidities such as hypertension, heart failure history, or diabetes-related problems.[26]

Although the possible justification for the low HRQL as perceived by patients in the current settings could be because glycemic control often occurs without warning, and to suddenly find oneself in a hospital is a frightening experience for most diabetics, which impacting extremely on HRQoL. The sudden and often profound physiological and psychological impact of the acute onset of diabetes, as well as the psychosocial impact of hospitalization, often, and understandably, harms HRQL. Many studies at both national and international levels reported an overall poor or moderate levels of HRQL of life among diabetics.[27-29] In this study, the HRQL of the patient was lower concerning several domains mainly mental, general health, and symptoms of Botherness. These current findings were comparable to previous findings by John *et al*. among Indian diabetic patients, who reported lower scores in the HRQL domains of diet satisfaction and general health.[29] This lower score might be due to the number of facts including glycemic control and of the patient and social and economic status as reported by many studies.[24,30]

Pr *et al*. evaluated the HRQL of diabetic patients using the SF-36 WHO well-being questionnaire, diabetes specific quality of life scale questionnaire.[19] The author reported that 23% of adults and 57% of geriatrics diabetics were found to have low HRQOL, using WHO well-being questionnaire, while using diabetes the specific quality of life questionnaire about 97% (n = 325) adults and 95% (n = 325) geriatric reported moderate HRQOL.[19] This finding suggested that HRQOL might be different, and mainly depends on the type of study questionnaire used, a sample of the study involved, disease duration, and the ratio of gender in the study also scoring of the scales, this might be another potential reason for possible of getting lower percentages in the HRQOL. In this study, the prevalence of diabetes was found to be higher

in males in comparison to females. This is possibly due to the higher population of male patients surveyed in the study due to the more males in the hospital in comparison with females. However, the WHO in 2008 reported that in a statement that the lifetime risk of developing diabetes is expected to be more in females (39%) in comparison to males.[31]

Although, in this study, we did not establish any association between demographics or mean scores, our aim of this study is to describe the patient's perceptions about HRQL. Although, this study has some limitations. Firstly, the data were collected through a face-to-face interview by considering the different social and economic backgrounds of respondents, which might be prone to social desirability bias and could overestimate the result. Secondly, it given that the data included herein were limited to only one region of Telangana, Warangal city; therefore, our findings cannot be the generalized entirety of Telangana as the findings are derived from one region, and thus, non-representative. Thirdly, the cross-sectional nature of the study design could not found the relationship between the variables, thus studies needed to evaluate the factors affecting the poor HRQL of among Indian context is needed. Fourthly, selection bias might have occurred since participants who attend PHCCs typically care more about their health. Finally, the relationship between patients and their physician, affecting their level of HRQoL to DM medication, was not included in this study. As a result, a good physician-patient relationship could be associated with better HRQoL and high patient satisfaction. Alsoin this study, we included both types of diabetic patients (Type 1 and Type 2), this study did not differentiate between the types of DM. On the other hand, the main strengths of this study are that there have been no previously published studies evaluating HRQoL among Indian DM patients in the Warangal governorate of Telangana, India. The strength of this study was a relatively larger sample size with multiple outpatient centers from endocrinology departments in the Warangal region, also this study used validated QOLID questionnaire for Indian adults. Besides this, the study addressed the patient's perceptions of HRQL, which may have been considered as the baseline characteristics for the upcoming studies.

CONCLUSION

According to the findings, diabetes patients in Telangana's Warangal region have poor HRQoL. Overall, the HRQoL has deteriorated, especially in terms of emotional well-being, which includes bothersome symptoms. The physical, psychological, and social mental aspects of life that have been caused by DM-related QoL have placed a significant burden on those affected. The chronic nature of the DM, along with multiple comorbidities necessities the use of antidiabetic medication promptly to control the patient glycemic index which is associated with better HRQoL. Therefore, much more attention should be paid to investigate the factors affecting the HRQoL to identify and implement appropriate policies for achieving better management of diabetes and ultimately improving the quality of life of diabetic patients in this region.

Declaration of patient consent

The authors of this study declare that they have obtained all appropriate written patient consent forms.

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