

Quality Of Life of Patients with Type 2 Diabetes

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Abstract:

Introduction: Quality of life is important for people with diabetes and their healthcare providers for several reasons. This is because many people who suffer from diabetes and who have poor quality of life, often have less attention to their self-care and disease management. When self-care is diminished in diabetes, it in turn leads to poor glycemic control and increased risk of complications. Thus, quality of life issues are crucially important because they may powerfully predict an individual's capacity to manage his/her disease and maintain long term health and wellbeing. **Aim:** To assess the HRQOL among Type 2 Diabetic subjects in Visakhapatnam district of Andhra Pradesh state so as to study the correlation between demographic characters of T2DM subjects with various domains of HRQOL and to contribute to the existing epidemiological data of the country.

Methods: After obtaining approval from the IEC and valid informed consent, the patients were recruited into the study. A cross-sectional descriptive questionnaire-based study was conducted amongst T2DM subjects. The study was carried out in 454 subjects who were chosen from outpatient / in patient departments in hospitals/clinics from Visakhapatnam of Andhra Pradesh state.

Results: Our results suggest that complications had a negative impact on the following fields of QoL: role limitation due to physical health, physical endurance, general health, symptom botherness, treatment satisfaction, financial worries, emotional / mental health and diet satisfaction. **Conclusion:** Diabetes does impair the QoL of patients. There is a need to specifically target and improve the QoL of diabetics who are at risk of a poor QoL. QoL assessment should be routinely practiced in diabetic clinics.

Keywords: Questionnaires, Awareness, health-care providers, Diabetes mellitus, and quality of life.

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I. Introduction

Studies have shown that HRQOL survey scores for diabetics are much lower than those reported for non-diabetics^{1,2}. The reason for lower scores for diabetics is probably multifactorial. Compared with non-diabetics, diabetics tend to be older; tend to be overweight; are less likely to exercise; are much more likely to have co-morbidities (e.g., hypertension, coronary artery disease, hypercholesterolemia); and are more likely to suffer complications such as painful polyneuropathy, upper gastrointestinal symptoms, impotence, retinopathy, nephropathy, amputations, symptomatic hyperglycemia, and hypoglycemia^{3,4}. All these studies have been associated with lower health-related quality of life scores.

Diabetes mellitus is a costly disease with an escalating prevalence which exerts significant burden on the physical, mental and social well-being of patients. To provide a more holistic management of DM, HRQOL outcomes are increasingly used to quantify the impact of chronic diseases such as DM. Despite the large body of literature on HRQOL issues in DM, few of these studies were performed in Asia and India^{5,6,7}. Clearly, the volume of research activity does not match the magnitude of the problem that DM poses for India. Although India is expected to be at the forefront of an impending DM epidemic, our knowledge of the impact of DM on HRQOL among various states of India is lacking, especially when compared to the potential magnitude of this problem. In this context, a pilot study was planned to assess the HRQOL among Type 2 Diabetic subjects in Visakhapatnam district of Andhra Pradesh state.

II. Aims And Objectives

To assess the HRQOL among Type 2 Diabetic subjects in Visakhapatnam district of Andhra Pradesh state so as to study the correlation between demographic characters of T2DM subjects with various domains of HRQOL and to contribute to the existing epidemiological data of the country.

III. Materials and Methods

Study design and study population: After obtaining approval from the IEC and valid informed consent, the participants were recruited into the study. A cross-sectional descriptive questionnaire-based study was conducted amongst T2DM subjects. The study was carried out in 454 subjects who were chosen from outpatient / in patient departments in hospitals/clinics from Visakhapatnam of Andhra Pradesh state. A non-probability purposive sampling technique was used to select type 2 diabetic patients.

Study tool: Quality of Life of the patients included in the study receiving allopathic / ayurvedic / life style modification treatment was assessed in line with QOLID (Quality of Life Instrument for Indian Diabetes Patients) in the following domains: Role limitation due to physical health, Physical endurance, General health, Treatment satisfaction, Symptom botherness, Financial worries, Emotional / Mental health, Diet satisfaction⁸. Before starting the interview, willingness to participate was sought and later verbal and written consent was taken from the subjects. Self-administered questionnaires were provided and data was collected.

Statistical analysis: Statistical analysis was done using descriptive statistics. HRQOL characters of the population were expressed as percentages and Mean \pm Standard Deviation.

IV. Results & Discussion

4.3.1 Role Limitation Due to Physical Health

The results of information on role limitation due to physical health are given in table 4.3.1. As per the results obtained, it was seen that 9.9% (n=38) subjects always missed their work, where as 10.41% (n=40) subjects frequently missed their work due to diabetes. 32.55% (n=125) subjects often missed their work, 39.84% (n=153) sometimes missed their and 7.3% (n = 28) subjects never missed their work due to diabetes. On an average the results indicated that majority of the subjects often to sometimes missed their work due to diabetes (3.24 ± 1.06) indicating that disease had an impact on the presence or absence to work.

The results on how often the subjects work was affected due to diabetes indicated that majority of the subjects often had an effect on their work (3.17 ± 0.97). 8.3% (n=32) reported that their work was always affected, 11.4% (n = 44) reported that their work was frequently affected, 38.3% (n=147) reported that their work was often affected, 38% (n=146) reported that their work was sometimes affected and 4% (n=15) reported that their work was never affected due to diabetes.

The results on efficiency of work due to presence of diabetes showed that majority of the subjects often had an effect on their work i.e. (3.37 ± 1.12). 8.6% (n=33) reported that they always had an effect on work efficiency; 10.7% (n=41) reported frequent effect on work efficiency; 29.7% (n=114) often had effect on work efficiency; 36.4% (n=140) sometimes had an effect on work efficiency and 14.6% (n=56) never had an effect on work efficiency due to presence of diabetes.

The results on diabetes limiting social life indicated that majority of the subjects often had an effect on their social life due to presence of diabetes (3.57 ± 1.17). 8.33% (n=32) reported that their social life was always limited, 9.63% (n=37) reported that their social life was frequently limited, 20.31% (n=78) reported that their social life was often limited, 39.6% (152) reported that their social life was sometimes limited and 22.13% (n=85) reported that their social life was never limited due to presence of diabetes.

It was seen from the results that, 9.9% (n=38) subjects always avoided travelling due to diabetes, where as 8.9% (n=34) subjects frequently avoided travelling; 24.5% (n=94) subjects often avoided travelling; 35.7% (n=137) sometimes avoided travelling and 21% (n=81) subjects never avoided travelling due to presence of diabetes. On an average the results indicated that majority of the subjects often to sometimes avoided travelling due to diabetes (3.49 ± 1.20), indicating that disease had an impact on the travel plans (business tours, holidays, general outings etc).

The results on limitation of social activities (visiting friends / partying) due to diabetes, indicated that majority of the subjects frequently had an effect on their social activities (2.94 ± 1.16) compared to subjects friends or relatives of similar age who don't have diabetes. 13.54% (n=52) reported that their social activities were always limited; 21.61% (n=83) reported that their social activities were frequently limited; 31.25% (n=120) reported that their social activities were often limited; 24.47% (n=94) reported that their social activities were sometimes limited and 9.1% (n=35) reported that their social activities were never limited, due to diabetes.

In a study by⁹ on QOL in 200 patients of type 2 diabetes with special emphasis on role limitation due to physical health reported that, 41% of the study subjects said that they never missed work due to their diabetes. 19% said diabetes prevented them from attending to their work and that they missed work always. 29% missed frequently, 9% missed often and 23% missed their work sometimes due to diabetes. Almost 48% of the patients

said the dietary regulation and medication for diabetes never affected their work. 66% of the patients collectively said that diabetes affected their efficiency at work always or more frequently. Diabetes has never caused limitation of social activity in 60% of the patients studied. 40% of the patients avoided travelling on business tours, holidays and general outings to a great extent due to diabetes. More than 50% of the patients said diabetes limited their social activities such as visiting a friend or partying either always or frequently, compared to others of their age.

Diabetes mellitus has implications for physical and social functioning, general health and well-being. Diabetes mellitus patients have been shown to be more susceptible to depression¹⁰, have poorer social integration¹¹, and poorer functioning and general health than the general population¹². However, the relationship between diabetes mellitus and well-being is not a simple one. Studies in the United States and Finland have shown no substantial differences between diabetic patients, patients with no chronic conditions, the general population and controls on well-being¹². It is possible that the impact of the disease on well-being is mediated by diabetic complications.

4.3.2 Physical Endurance

The results obtained on physical endurance are presented in table 4.3.2 Results on overall health problems in past three months which limited vigorous activities like lifting heavy bags / objects, running, skipping, jumping etc, showed that majority of the subjects frequently (2.11 ± 1.09) had health issues which limited them to perform any vigorous activities. It was seen that 37.8% (n=245) subjects always had limitation in vigorous activities, where as 26.6% (n=102) subjects frequently experienced limitation in vigorous activities due to presence of diabetes. 24.4% (n=94) subjects often had limitation in vigorous activities, 8.6% (n=33) subjects sometimes and 2.6% (n = 10) subjects never had any limitation in vigorous activities due to diabetes.

Results on information on overall health problems in past three months which limited moderate activities like moving a table, carrying groceries or utensils etc showed that majority of the subjects frequently (2.11 ± 1.09) had issues, which limited their moderate physical activities. 37.5% (n=144) subjects always had limitation to perform moderate activities, 27.6% (n = 106) subjects reported frequent limitation, 23% (n=88) subjects often felt limited, 9.6% (n=37) subjects sometimes were limited and 2.3% (n=9) subjects never had any limitations to perform moderate activities due to presence of diabetes.

Results on information on overall health problems in past three months which limited the subjects from walking uphill / climbing 1.2 floors (2.54 ± 1.27) and walking 1 – 2 km stretch (2.58 ± 1.30), showed that presence of diabetes often had an effect on performing such tasks. 30% (n=115) subjects reported that walking uphill or climbing 1- 2 floor was always limited, 19.8% (n = 76) reported frequent limitation, 20.8% (n=80) often had limitation, 24.4% (n=94) sometimes had limitation and 5% (n=19) never had any problem walking uphill or climbing 1-2 floor due to diabetes. Similarly 30.2% subjects (n=116) reported that walking 1-2km at a stretch was always limited, 17.4% (n = 67) reported that walking 1-2km at a stretch was frequently limited, 21.4% (n=82) reported that walking 1-2km at a stretch was often limited, 25.3% (n=97) reported that walking 1-2km at a stretch was sometimes limited and 5.7% (n=22) reported that walking 1-2km at a stretch was never affected due to diabetes.

The results on limitation in bending ,squatting or turning due to diabetes indicated that majority of the subjects often (3.36 ± 1.26) had limitation in bending, squatting or turning. 12.8% (n=49) reported that bending, squatting was always limited, 10.1% (n = 39) reported that bending, squatting was frequently limited, 24% (n=92) reported that bending, squatting was often limited, 33.6% (n=129) reported that bending, squatting was sometimes limited and 19.5% (n=75) reported that bending, squatting was never affected due to diabetes.

The results on limitation in daily chores (eating, dressing, bathing, using toilet etc) due to diabetes, indicated that majority of the subjects never (4.58 ± 0.98) had limitation in performing their daily chores. 4% (n=15) subjects reported that their daily chores were always limited, 2.6% (n = 10) reported that their daily chores were frequently limited, 5% (n=19) reported that their daily chores were often limited, 8.3% (n=32) reported that their daily chores were sometimes limited and 80.1% (n=308) reported that their daily chores were never affected due to diabetes.

In a study by ⁹ on physical endurance and related QOL in 200 patients of type 2 diabetes reported that, as many as 38% of the patients said vigorous activities such as lifting heavy bags, running, etc. were always limited by diabetes. Almost 50% of the patients said diabetes never limited them from doing moderate activities like moving a table or carrying groceries, utensils, etc. However, with regards to limitation of walking uphill or climbing 1-2 stairs resulting from overall health problems, almost 42% of the patients were equivocal, with one group saying that the limitation was more frequent and an equally strong group saying it was less frequent. More than 50% of the patients said that their overall health problem has, very frequently, limited them from walking 1-2km at a stretch. Diabetes limited activities such as bending, squatting or turning in only 30% of the patients, and other activities such as eating, dressing, bathing or using the toilet in only 12% of the patients.

Physical activity has a beneficial effect on HRQOL in patients with depression, intermittent claudication¹³, coronary disease, and multiple organ dysfunctions¹⁴. In 2001, a review concluded that physical activity, often in the form of endurance and/or resistance training exercise, was positively associated with HRQOL, regardless of age, health and activity status. Data from the 2001 Behavioral Risk Factor Surveillance System, consisting of a large sample with a wide range of demographic and physical characteristics, found that people attaining the recommended amounts of physical activity had higher HRQOL than their less active counterparts¹⁵. However, few of these studies have addressed the relationship between physical activity and all domains of HRQOL in healthy and older adults.

In aging populations, the health benefits from physical activity (i.e., decreased risk for cardiovascular disease, diabetes, hypertension, cancer, and all-cause mortality) are well-known¹⁶. However, it is not clear whether physical activity improves specific domains of HRQOL. A recent report found that physical activity was associated with less bodily pain in a carefully selected group of sedentary older adults who had either high normal blood pressure or mild hypertension, but who were free of clinical manifestations of chronic diseases. The results of our study show poor physical endurance as majority of the subjects reported limitation in performing vigorous, moderate and light activities which could eventually lead to poor HRQOL.

4.3.3 General Health

The results of data on general health of the subjects are presented in table 4.3.3 As per the results obtained, it was seen that 12.2% (n=47) subjects felt that their health was poor; 25.3% (n=97) subjects felt that their health was fair; 44.5% (n=171) subjects felt good about their health; 17% (n=65) felt that their health was very good and 1% (n = 4) subjects felt that their health was excellent. On an average the results indicated that majority of the subjects felt that their health was good (2.69±0.92), indicating that HRQOL also would be good. Our results are not in agreement with findings of (Stewart *et al.*, 1989) who reported that diabetes mellitus patients were significantly more likely (p<0.01) to rate their functioning and general health as poorer than patients with no chronic condition and the general population.

The results on the subjects ability to concentrate at work (figure 4.3) showed that majority of them were able to concentrate moderately (2.76 ±1.0) on their work, indicating that presence of diabetes did have an impact on their work performance. It was seen that 9.9% (n=38) subjects were not at all able to concentrate at work; 31.3% (n=120) subjects had little concentration on their work; 36.2% (n=139) subjects had moderate concentration on their work, 18.2% (n=70) could concentrate very much on their work and 4.4% (n = 17) subjects had extreme amount of concentration on their work.

The results on feeling of fatigue or tired in the past three months showed that majority of the subjects experienced fatigue / tiredness at work more frequently (2.17 ±1.04). It was seen that 34.4% (n=132) subjects always experienced fatigue; 24.7% (n=95) subjects frequently experienced fatigue; 31% (n=119) subjects often had feelings of fatigue or tiredness; 8.6% (n=33) subjects sometimes had fatigue/tiredness and 1.3% (n = 5) subjects never had any feelings of fatigue or tiredness due to diabetes. One likely reason for fatigue in diabetes (uncomplicated by severe comorbidities) is alterations in blood glucose levels. Altered blood glucose metabolism may result in acute and chronic hyperglycemic episodes, hypoglycemia, or blood glucose fluctuations. These alterations may affect fatigue separately or in tandem. The presence of short and long-term complications of diabetes and their symptoms, including symptoms of hypo or hyperglycemia, cardiac disease, neuropathy, or retinopathy, has also been associated with increased fatigue (Morschel *et al.*, 2006; Weijman *et al.*, 2004).

Our findings are similar to observations⁹ in 200 patients of type 2 diabetes, who reported that almost 36% of the patients stated that, in their opinion, their health is fair, and 28% opined that they are in poor health. Only 31% stated that their health is good. 36% of the patients said that their ability to concentrate in regular activities like driving, working, reading, etc. was “a little”. Almost 47% of the patients stated having experienced fatigue frequently, and 20% always.

Qualitative research has been the primary source of recurring themes about the deleterious effects of fatigue in adults with diabetes¹⁷. Fatigue was among the top four symptoms found to interfere with self-reported quality of life in women with type 2 diabetes who rated their health poorer than women without symptoms. In children with type 1 diabetes, self-reported fatigue was comparable to fatigue in children with cancer and significantly higher than in healthy, age-matched controls¹⁸.

4.3.4 Symptom Botherness

The results of data on symptom botherness of the subjects are presented in table 4.3.4. As per the results obtained on symptoms such as dry mouth/thirst in the past three months, it was seen that 9.9% (n=38) subjects always experienced thirst/dry mouth, where as 11.2% (n=43) subjects frequently experienced thirst/dry mouth. 32.0% (n=123) subjects often had feeling of thirst/dry mouth; 30.8% (n=118) sometimes had thirst/dry mouth symptoms and 16.1% (n = 62) subjects never had any feelings of thirst/dry mouth, due to diabetes. On an

average the results indicated that majority of the subjects often (3.32 ± 1.16) experienced thirst/dry mouth due to diabetes in the past three months.

The results on feeling of excessive hunger in the past three months showed that majority of the subjects sometimes (4.08 ± 1.07) experienced excessive hunger. It was seen that 5.2% (n=20) subjects always experienced excessive hunger; 3.7% (n = 14) subjects frequently experienced excessive hunger; 12.2% (n=47) subjects often had feeling of excessive hunger; 35.7% (n=137) subjects sometimes felt symptoms of excessive hunger and 43.2% (n=166) subjects never had any symptoms of excessive hunger due to diabetes.

The results on symptoms such as frequent urination in the past three months showed that, majority of the subjects experienced symptoms such as frequent urination more frequently (2.39 ± 1.04). It was seen that 26.3% (n=101) subjects always experienced symptoms like frequent urination; 23.7% (n = 91) subjects frequently experienced frequent urination symptoms; 35.2% (n=135) subjects often had symptoms of frequent urination; 14.3% (n=55) subjects sometimes had frequent urination symptoms and 0.5% (n=2) subjects never had any symptoms of frequent urination due to diabetes.

In a study⁹ reported that almost 32% of the patients have experienced thirst or dry mouth very frequently during the past three months. 46% of the patients said they had felt excessive hunger “sometimes” or less frequently, and nearly 60% of the patients said to have experienced frequent urination very frequently during the past three months.

In a study¹⁹, majority of the patients reported that they had physical symptoms and limitations in daily activities due to heart failure, and symptoms and limitations were important factors affecting their QOL. Over 80% of patients with heart failure have physical symptoms such as dyspnea, fatigue, edema, sleeping difficulties, and chest pain²⁰, and symptom burden adversely affects QOL; Worsening symptoms are the main antecedents of hospitalization.

The results of our study indicate that most of the subjects had symptom bothersome more frequently due to diabetes. Subjects experienced various physical and emotional symptoms such as polyurea, polydypsea, polyphagia, dyspnea, fatigue, edema, sleeping difficulties, depression etc. These symptoms limit patients’ daily physical and social activities and result in poor QOL. Therefore, QOL in patients with diabetes should be assessed appropriately to determine its impact on patients’ daily lives.

4.3.5 Treatment Satisfaction

The results obtained on treatment satisfaction in subjects of the study are presented in table 4.3.5.

The results obtained on the current treatment satisfaction in the subjects participated in the study showed that 5.4% (n=21) subjects were very dissatisfied with their current diabetes treatment, where as 11.2% (n=43) subjects were moderately dissatisfied with current diabetes treatment. 26.6% (n=102) subjects were neither satisfied nor dissatisfied with their current diabetes treatment; 38.3% (n=147) subjects were moderately satisfied and 18.5% (n = 71) subjects were very satisfied with their current diabetes treatment. On an average, the results indicated that majority of the subjects were moderately satisfied (3.53 ± 1.08) with their current diabetes treatment.

The results on satisfaction with the amount of time taken to manage diabetes indicated that majority of the subjects were moderately satisfied (3.61 ± 1.09). 4.7% (n=18) subjects reported that they were very dissatisfied; 12.3% (n = 47) subjects were moderately dissatisfied; 22.1% (n=85) subjects were neither satisfied nor dissatisfied; 38.8% (n=149) subjects were moderately satisfied and 22.1% (n=85) subjects reported that they were very satisfied with the amount of time taken to manage diabetes.

The results on satisfaction with the amount of time spent on getting regular checkups indicated that majority of the subjects were moderately satisfied (3.66 ± 1.15). 6.5% (n=25) subjects reported that they were very dissatisfied; 9.9% (n = 38) subjects reported that they were moderately dissatisfied; 20% (n=77) subjects reported that they were neither satisfied nor dissatisfied; 38% (n=146) subjects reported that they were moderately satisfied and 25.6% (n=98) subjects reported that they were very satisfied with the amount of time spent on getting regular checkups. Our results are similar to the findings of the study conducted by (Praveen and Manu, 2015) who reported that 61% of type 2 diabetic patients were “moderately satisfied” with, both, the current treatment for diabetes, as well as the time it takes for management of their diabetes and for regular check-ups.

The results on satisfaction about the time spent on regular exercise (35 – 45 minutes, 4 times a week), indicated that majority of the subjects were neither satisfied nor dissatisfied (3.66 ± 1.15) with their regular exercise regime. 6.5% (n=25) subjects reported that they were very dissatisfied; 11.5% (n = 44) had moderate dissatisfaction; 28.4% (n=109) subjects were neither satisfied nor dissatisfied; 37% (n=142) subjects were moderately satisfied and 16.6% (n=64) subjects were very satisfied with the amount of time spent on regular exercise.

In cross-sectional researches on type 2 diabetes, self-efficacy²¹ and diabetes coping²² were associated with good treatment adherence and good glycemic control, whereas stressful life events and daily environmental stress factors have been shown to be associated with poor metabolic control. Depression has been shown to have a significant association with increased HbA1c²³. Poorly controlled type 2 diabetes mellitus is associated with increased vascular complication rates and increased cardiovascular risk, impaired patient quality of life, less satisfaction with treatment, and greater healthcare expense per patient²⁴.

Many effective pharmacological treatments for diabetes are now available that can be initiated after the behavioural modifications of exercise and diet. However, despite the progress in treatment strategies, many patients still face difficulties in achieving or maintaining good glycemic control. Moreover, diabetes is often accompanied by complications, stemming from various reasons including nonadherence to treatment and delayed adjustment of treatment regimen leading to progressive loss of β -cell function²⁵. These complications have a negative impact on patients' satisfaction with treatment as well as patients' quality of life (QOL)²⁶. The results of our study also indicate moderate satisfaction with respect to treatment of diabetes which has an impact on the quality of life.

4.3.6 Financial Worries

The results obtained on financial worries are presented in table 4.3.6. As per the results obtained on the cost involved in management of diabetes, majority of the subjects reported that, it was very expensive (1.54 ± 0.73) to bear the expenses of diabetes treatment. The results obtained show that 59.4% (n=228) subjects felt that the cost involved in management of diabetes was very expensive; 26.6% (n=102) subjects felt, it was little expensive; 13.8% (n=53) subjects felt the cost was reasonable; 0.2% (n=1) felt that the cost involved in management of diabetes was not at all expensive. Almost all the subjects participated in our study felt that the cost involved in management of diabetes was expensive and was a cause of financial worry. Results on extent of expenditure shifted towards diabetes management, showed that, majority of the subjects (1.76 ± 0.87) felt that they had a high priority to shift the expenditure towards diabetes management. It was seen that 49% (n=188) subjects had a lot of priority; 28.6% (n=110) subjects highly prioritized; 19.3% (n=74) subjects had little priority; 2.9% (n=11) subjects had very little priority and only 0.2% (n = 1) subjects not at all prioritized their expenditure shift towards diabetes management.

Results show that extent of family budget got highly affected (1.92 ± 0.96) by expenses related to the management of diabetes. It was found that majority of subjects (43%, n=165) felt that their family budget was affected a lot, by expenses related to diabetes management; whereas 29.7% (n=114) subjects felt that it was highly affected; 20% (n=77) subjects felt it was little affected; 7.3% (n=28) subjects felt they were very little affected and 0% (n = 0) subjects were never affected by expenses related to the management of diabetes.

Results on limitation in expenditure towards other aspects of life (movies, outings, parties etc), (2.04 ± 1.07) was highly affected in majority of the subjects which was a reason for financial worries. It was seen that 39.8% (n=153) subjects were affected a lot; 30% (n=1145) subjects were highly affected; 17.2% (n=66) subjects were little affected; 11.7% (n=45) subjects were very little affected and only 1.3% (n = 5) subjects were not at all affected with the expenditures towards other aspects of life.

In a study⁹ reported that, almost 32% of the patients perceive the cost involved in management of their diabetes to be "not at all expensive", while 20% said it was "very expensive". 36% of the patients said they never prioritized their expenditure towards management of diabetes, and 38% of the patients said that their family budget was not at all affected by their diabetes. Almost 40% of the patients said that the cost of diabetes management did not limit their expenditure on other aspects of life such as movies, outing, parties, etc. Another study reported that most of the patients found the cost factor to be either reasonable or not expensive at all in the management of diabetes. Most (77.77%) of the grade 1 hepatic steatosis patients and 42.85% of the grade 3 hepatic steatosis patients felt that there has been only a little shift in their priority of expenditure towards diabetes management. Most opined that the family budget was not getting affected due to the costs involved in the management of diabetes. Our results are not similar to the findings of the above studies. The results of our study indicated that almost all the subjects faced financial worries and a high to little shift in priority of expenditure towards diabetes management which can be a reason for poor quality of life in the subjects.

4.3.7 Emotional / Mental Health

The results obtained on Emotional Mental/Health in subjects of the study are presented in table 4.3.7. The results obtained regarding self-satisfaction among the subjects participated in the study showed that 19.7% (n=76) subjects were very dissatisfied; 26.8% (n=103) subjects were moderately dissatisfied; 29.9% (n=115) subjects were neither satisfied nor dissatisfied; 21.8% (n=84) subjects were moderately satisfied and 1.8% (n = 7) subjects were very satisfied. On an average, the results indicated that majority of the subjects were neither satisfied nor dissatisfied (2.59 ± 1.08) indicating that HRQOL due to diabetes is affecting their levels of satisfaction with themselves.

The results on satisfaction with personal relations like family, friends, relatives, indicated that majority of the subjects were neither satisfied nor dissatisfied (3.0 ± 1.09). 12.5% (n=48) subjects reported that they were very dissatisfied; 17.4% (n = 67) subjects were moderately dissatisfied; 31.8% (n=122) subjects were neither satisfied nor dissatisfied; 33.3% (n=128) subjects were moderately satisfied and 5% (n=19) subjects reported that they were very satisfied with their personal relationships. The results on satisfaction with the emotional support got from friends or family members indicated that majority of the subjects were neither satisfied nor dissatisfied (3.02 ± 1.11). 12% (n=46) subjects reported that they were very dissatisfied; 19.8% (n = 76) subjects were moderately dissatisfied; 30.2% (n=116) subjects were neither satisfied nor dissatisfied; 32.8% (n=126) subjects reported that they were moderately satisfied and 5.2% (n=24) subjects were very satisfied with the emotional support received from friends and family.

The results on discouragement among the subjects due to health problems associated with diabetes, indicated that majority of the subjects were moderately dissatisfied (2.38 ± 1.11). 27.9% (n=107) subjects reported that they were very dissatisfied; 26% (n= 100) were moderately dissatisfied; 28.4% (n=109) subjects were neither satisfied nor dissatisfied; 15.7% (n=60) subjects were moderately satisfied and 2% (n=8) subjects were very satisfied.

The results regarding feeling of living a purposeful life, indicated that majority of the subjects were moderately dissatisfied (2.85 ± 1.10). 10.7% (n=41) subjects reported that they were very dissatisfied; 29% (n= 111) felt moderate dissatisfaction; 32.5% (n=125) subjects were neither satisfied nor dissatisfied; 19.8% (n=76) subjects were moderately satisfied and 8.0% (n=31) subjects were very satisfied regarding the feeling of living a purposeful life.

Our results are contradictory to the observations⁹ in 200 patients of type 2 diabetes, who reported that almost 50% of the patients said they were “moderately satisfied” with themselves and personal relationships. 43% patients said that they were “very satisfied” and 45% said that they were “moderately satisfied” with the emotional support that they get from their friends and family. Discouragement due to their health problems was frequent among 36% of the patients studied. 30% of the patients said they were not at all able to fulfill their roles in life. Diabetes-related emotional distress is an important element that may influence adherence to self-care, glycaemic control and risk of complications²⁷. During recent years there has been increasing appreciation of the need to estimate the degree to which DM affects QOL (e.g. mental, physical, social and occupational functioning) and enhances the psychological distress of the patient. In general, psychosocial determinants of chronic illness have not gained the consideration that they need in the field of clinical practice and research in general practice/family medicine. Thus, while it is recognized that psychosocial factors may have an impact on QOL, it is still unknown to what extent life with type 2 diabetes affects the QOL of people.

It is well recognized fact that diabetes mellitus is associated with increased morbidity and mortality. But, how this disease affects emotional and mental health status and sense of wellbeing is still not well established. The apparent difference between one's expectations and one's actual physical, emotional, and social functioning is HRQOL. The results of our study show that majority of the subjects with type 2 diabetes rated their HRQOL significantly less favorably, where all the domains of emotional and mental health have received very poor scores.

Information acquired from the HRQOL questionnaires, allows doctors to understand the way patients perceive their health status, preferences and expectations, and can facilitate the recognition of emotional / mental or psychological problems that might otherwise be overlooked. Furthermore, our results reveal the necessity of paying attention to the effect of different life domains, such as mental health, social functioning, family status or marital intimacy on HRQOL.

4.3.8 Diet Satisfaction

Diet therapy should be the basic treatment approach for all patients with type 2 diabetes and the efficacy of diet therapy in diabetes is widely recognized in achieving good glycemic control. Diabetes mellitus permanently changes a patient's life. Patient's self-care, consisting of daily insulin injections or oral anti-diabetic agents, self-monitoring of blood glucose, and diabetic diet has an impact on quality of life (QOL). Diet education for diabetic patients is aimed at improving the patients' QOL while maintaining proper glycemic control. Accordingly, determination of the diet related QOL is of great significance (Bradley and Speight, 2002).

The results of data on diet satisfaction of the subjects are presented in table 4.3.8. As per the results obtained regarding restrictions in choosing food when eating out, it was seen that 32.8% (n=126) of subjects always felt restricted when eating out because of diabetes; 42.4% (n=163) subjects frequently felt restricted when eating out; 19.3% (n=74) subjects often felt restricted when eating out; 5% (n=19) subjects sometimes felt restricted when eating out and 0.5% (n = 2) subjects never felt restricted when eating out because of diabetes. On an average the results indicated that majority of the subjects (1.97 ± 0.87) always felt restricted when eating out because of diabetes.

The results regarding having enough choice in eating meals / snacks at buffets / parties, showed that 0.2% (n=1) of subjects always were able to make their own choice when they go out to eat; 2.6% (n=10) of subjects frequently were able to make their own choice; 34.9% (n=134) of subjects often were able to make their own choice; 45.3% (n=174) of subjects were sometimes able to make their own choice and 17% (n=65) of subjects never were able to make their own choice when they went out to eat. The results regarding eating foods that shouldn't be eaten, showed that 41.4% (n=159) of the subjects have never eaten and 40.6% (n=156) of subjects sometimes ate those foods which they are not supposed to eat in order to hide the fact that they were suffering from diabetes. 1.8% (n=7) of subjects were eating restricted food frequently and 16.2% (n=62) of subjects were eating restricted food often in order to hide their diabetes situation.

Our findings are similar to observations⁹ in 200 patients of type 2 diabetes, who reported that almost 29% of the patients said they always felt a restriction in choosing the foods while they were eating outdoors. As much as 52% of the patients said they have no choice at all while eating meals or snacks away from home. Almost 40% of the patients said that they have never eaten those foods which they are supposed to eat in order to hide the fact that they are suffering from diabetes. The results of our study show burden and difficulty felt in adhering to diet restrictions, as well as the conflict between having to carry out social roles and the necessity to sustain self-management behaviors, which were all determinants to better quality of life in Type II Diabetes Mellitus.

Table: 4.3.1 Role Limitation Due to Physical Health

S. No	Question	Always n (%)	Frequentl y n (%)	Often n (%)	Sometime n (%)	Never n (%)	Mean ± SD
1	How often do you miss your work because of your diabetes	38 (9.89)	40 (10.41)	125 (32.55)	153 (39.84)	28 (7.29)	3.24 ± 1.06
2	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?	32 (8.33)	44 (11.45)	147 (38.28)	146 (38.0)	15 (3.9)	3.17 ± 0.97
3	How often does diabetes affect your efficiency at work?	33 (8.59)	41 (10.67)	114 (29.68)	140 (36.45)	56 (14.58)	3.37 ± 1.12
4	How often do you find diabetes limiting your social life?	32 (8.33)	37 (9.63)	78 (20.31)	152 (39.58)	85 (22.13)	3.57 ± 1.17
5	To what extent do you avoid traveling (business tour, holiday, general outings) because of your diabetes?	38 (9.89)	34 (8.85)	94 (24.47)	137 (35.67)	81 (21.09)	3.49 ± 1.20
6	Compared to others of your age are your social activities (visiting friends/partying) limited because of your diabetes?	52 (13.54)	83 (21.61)	120 (31.25)	94 (24.47)	35 (9.11)	2.94 ± 1.16

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

Table-4.3.2. Physical Endurance

S. No	Question	Always n (%)	Frequentl y n (%)	Often n (%)	Sometime n (%)	Never n (%)	Mean ± S.D
1	How often in last three months has your overall health problems limited the kind of vigorous activities you can do like lifting heavy bags/objects, running, skipping, jumping.	145 (37.76)	102 (26.56)	94 (24.4)	33 (8.59)	10 (2.60)	2.11 ± 1.09
2	How often in last three months has your overall health problems limited the kind of moderate activities you can do like moving a table, carrying groceries or utensils.	144 (37.5)	106 (27.60)	88 (22.91)	37 (9.63)	9 (2.34)	2.11 ± 1.09
3	How often in last three months has your overall health problems limited you from walking uphill or climbing 1-2 floor	115 (29.94)	76 (19.79)	80 (20.83)	94 (24.47)	19 (4.94)	2.54 ± 1.27
4	How often in last three months has	116 (30.20)	67 (17.44)	82 (21.35)	97 (25.26)	22 (5.72)	2.58 ±

	your overall health problems limited you from walking 1-2 km at a stretch.						1.30
5.	How often in last three months has your overall health problems limited you from bending, squatting, or turning.	49 (12.76)	39 (10.15)	92 (23.95)	129 (33.59)	75 (19.53)	3.36 ± 1.26
6	How often in last three months has your overall health problems limited you from eating, dressing, bathing, or using the toilet	15 (3.9)	10 (2.6)	19 (4.94)	32 (8.33)	308 (80.20)	4.58 ± 0.98

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD.

Table-4.3.3. General Health

S. No	Question	Poor n (%)	Fair n (%)	Good n (%)	Very Good n (%)	Excellent n (%)	Mean ± SD
1	In general would you say your health is	47 (12.23)	97 (25.26)	171 (44.53)	65 (16.92)	4 (1.04)	2.69 ± 0.92
		Not at all n (%)	A little n (%)	Moderate n (%)	Very much n (%)	Extremely n (%)	Mean ± SD
2	How well are you able to concentrate in everything like working, driving, reading etc?	38 (9.89)	120 (31.25)	139 (36.19)	70 (18.22)	17 (4.42)	2.76 ± 1.0
		Always n (%)	Frequently n (%)	Often n (%)	Sometimes n (%)	Never n (%)	Mean ± SD
3	How many times in the past three months have you had fatigue/ felt very tired?	132 (34.37)	95 (24.73)	119 (30.98)	33 (8.59)	5 (1.3)	2.17 ± 1.04

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

Table-4.3.4. Symptom Botherness

S. No	Question	Always n (%)	Frequently n (%)	Often n (%)	Sometimes n (%)	Never n (%)	Mean ± SD
1	How many times in the past three months have you had thirst/dry mouth?	38 (9.89)	43 (11.19)	123 (32.03)	118 (30.72)	62 (16.14)	3.32 ± 1.16
2	How many times in the past three months have you felt excessive hunger?	20 (5.20)	14 (3.64)	47 (12.23)	137 (35.67)	166 (43.22)	4.08 ± 1.07
3	How many times in the past three months have you had frequent urination related to diabetes management?	101 (26.30)	91 (23.69)	135 (35.15)	55 (14.32)	2 (0.52)	2.39 ± 1.04

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

Table-4.3.5 Treatment Satisfaction

S. No	Question	Very dissatisfied n (%)	Moderately dissatisfied n (%)	Neither satisfied nor dissatisfied n (%)	Moderately satisfied n (%)	Very satisfied n (%)	Mean ± SD
1	How satisfied are you with your current diabetes treatment?	21 (5.46)	43 (11.19)	102 (26.56)	147 (38.28%)	71 (18.48)	3.53 ± 1.08
2	How satisfied are you with amount of time it takes to manage your diabetes?	18 (4.68)	47 (12.23)	85 (22.13)	149 (38.8%)	85 (22.13)	3.61 ± 1.09
3	How satisfied are you with the amount of	25	38 (9.89)	77 (20.05)	146	98	3.66 ±

	time you spend getting regular checkups (once in 3 months)?	(6.51)			(38.02%)	(25.52)	1.15
4	A person with diabetes needs to exercise for 35-45 min, 4 times a week. Keeping this in mind how satisfied are you with the time you spend exercising?	25 (6.51)	44 (11.45)	109 (23.38)	149 (38.8)	64 (16.66%)	3.45 ± 1.09

Note: Values are expressed as n (%) in which, “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

Table-4.3.6 Financial Worries

S. No	Question	Very expensive n (%)	Little expensive n (%)	Reasonable n (%)	Not expensive n (%)	--	Mean ± SD
1	What do you think about the cost involved in your management of diabetes?	228 (59.37)	102 (26.56)	53 (13.8)	1 (0.26)	--	1.54 ± 0.73
		A lot n (%)	Highly n (%)	Little n (%)	Very little n (%)	Not at all n (%)	Mean ± SD
2	To what extent has your priority of expenditure shifted towards diabetes management?	188 (48.95)	110 (26.04)	74 (19.27)	11 (2.86)	1 (0.26)	1.76 ± 0.87
3	To what extent has your family budget got affected by the expenses related to the management of diabetes?	165 (42.96)	114 (29.68)	77 (20.05)	28 (7.29)	0 (0)	1.92 ± 0.96
4	To what extent has your diabetes limited your expenditure on other aspects of life (Movies, outings, parties etc)?	153 (39.84)	115 (29.94)	66 (17.18)	45 (11.71)	5 (1.3)	2.04 ± 1.07

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

Table-4.3.7 Emotional / Mental Health

S. No	Question	Very dissatisfied n (%)	Moderately dissatisfied n (%)	Neither satisfied nor dissatisfied n (%)	Moderately satisfied n (%)	Very satisfied n (%)	Mean ± SD
1	How satisfied are you with yourself?	76 (19.79)	103 (26.82)	115 (29.94)	84 (21.87)	7 (1.82)	2.59 ± 1.08
2	How satisfied are you with your personal relationships (family, friends, relatives)	48 (12.5)	67 (17.44)	122 (31.77)	128 (33.33)	19 (4.94)	3.0 ± 1.09
3	How satisfied are you with the emotional support you get from your friends and family?	46 (11.97)	76 (19.79)	116 (30.20)	126 (32.81)	24 (6.25)	3.02 ± 1.11
4	How often are you discouraged by your health problems?	107 (27.86)	100 (26.04)	109 (28.38)	60 (15.62)	8 (2.08)	2.38 ± 1.11
5	All people want to fulfill certain roles and lead their lives in a purposeful manner. To what extent do you feel that you have been able to lead your life in the same way?	41 (10.67)	111 (28.9)	125 (32.55)	76 (19.79)	31 (8.07)	2.85 ± 1.10

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

Table-4.3.8 Diet Satisfaction

S. No	Question	Always n (%)	Frequently n (%)	Often n (%)	Sometime n (%)	Never n (%)	Mean ± SD
1	How often do you feel because of your diabetes a restriction in choosing your food when eating out?	126 (32.81)	163 (42.44)	74 (19.27)	19 (4.94)	2 (0.52)	1.97 ± 0.87
2	As you have diabetes, how much choice do you feel you have in eating your meals or	1 (0.26)	10 (2.6)	134 (34.89)	174 (45.31)	65 (16.92)	2.23 ± 0.76

	snacks away from home e.g. if you go in a party and there is a buffet where there are also a lot of fried snacks and desserts would you be able to make enough choice?						
3	How often do you eat the food items that you shouldn't, in order to hide the fact that you are having diabetes.	0 (0)	7 (1.82)	62 (16.14)	156 (40.62)	159 (41.4)	4.21 ± 0.77

Note: Values are expressed as n (%), in which “n” represents the number of people who responded for the given answer out of 384 subjects and “%” is the percent of subjects. Values in the last column (average of responses for each question) are expressed as Mean ± SD

V. Conclusion

Numerous studies have been conducted on quality of life in patients with type 2 diabetes. In agreement with the findings of most of these studies, we demonstrated that diabetes has a negative impact on quality of life. Similar data has been presented by studies of quality of life of patients with type 2 diabetes performed in the USA, Holland, Estonia, and other countries, showing that patients with Diabetes Mellitus evaluate their physical health as poorer than persons without Diabetes Mellitus.

People with Diabetes Mellitus have a lower quality of life than the general population²⁸. In the present study, health-related quality of life was associated with diabetic complications. Our results suggest that complications had a negative impact on the following fields of QoL: role limitation due to physical health, physical endurance, general health, symptom bothersomeness, treatment satisfaction, financial worries, emotional / mental health and diet satisfaction. There is a need to specifically target and improve the QoL of diabetics who are at risk of a poor QoL. QoL assessment should be routinely practiced in diabetic clinics.

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