

# Assessment of quality of life among patients with type 2 diabetes mellitus attending a tertiary health care facility of Odisha, India

Dr bijan kumar panda<sup>1</sup>, dr trilochan sahu<sup>2</sup>, dr lipilekha patnaik<sup>3</sup>,

<sup>1</sup>*Assistant professor*

*Department of community medicine, Government medical college and hospital, Balangir, State: odisha*

<sup>2</sup>*Professor & head*

*Department of community medicine, Ims & sum hospital, Siksha 'o' anusandhan deemed to be university, Bhubaneswar, Dist.: khordha state: odisha, pin: 751003*

<sup>3</sup>*Professor*

*Department of community medicine, Ims & sum hospital, Bhubaneswar Siksha 'o' anusandhan deemed to be university, Bhubaneswar, Dist.: khordha state: odisha, pin751003*

*Ims & sum hospital, siksha 'o' anusandhan deemed to be university, bhubaneswar, odisha, india*

<sup>1</sup>*bijanpanda65@gmail.com*

<sup>2</sup>*sahu\_trilochan2006@rediffmail.com*

<sup>3</sup>*drlipilekha@yahoo.co.in*

**Abstract:**

**Background:** Health associated with Quality of life is most important for people with diabetes but this aspect is given less attention.

**Objectives:** To assess quality of life among type 2 diabetes mellitus patients and its socio-demographic determinants

**Methods:** A hospital based cross sectional study was conducted in a tertiary care hospital from June 2014 to September 2016. 130 diagnosed patients of Type 2 diabetes mellitus were included. A pre-structured questionnaire was used and data related to demographic profile, history of diabetes, quality of life, stress etc. were collected. Data were analysed using SPSS version 20.

**Results:** Out of 130 study subjects selected for the study, 58.5% were males. The mean age 53.68 years  $\pm$ 10.48. The average period of diabetes of participants was 5.88  $\pm$ 4.70 years. Among participants, 11.5% were suffering from neuropathy. The sleeping hours was less than 7 hours in 27.7% participants. The mean stress scores of the participants was 14.61  $\pm$  2.90 and 6.9% were having stress score 20 and above. The suggested score of the health related excellence of life study participants was 122.42  $\pm$  14.37. The mean HRQoL score was 72.43 and found that 24.6% of the patients showed good score, 56.9% moderate score and 18.5% of the patients showed poor HRQoL score.

**Conclusion:** Steps should be taken in individual and community level to get better the quality of life like counselling for reduction of psychological distress, practice of Yoga and meditation, diabetic diet at diabetic clinics and hospitals.

**Key words:** HRQoL score, stress, quality of life

## 1. INTRODUCTION:

“Course of life is always a complex evaluation of individual’s body, mind and social security as scrutinized by every person or by cluster of persons.”(1) In context of physical condition; excellence of life is usually stated as health associated superiority for life (HRQoL).

Overall wellbeing in majority of constant diseases can be worsened by limiting the capacity to live well, limiting the functional status, productivity and HRQoL. Health care costs are increased by these diseases. Health associated value of life include areas associated to physical, mental, emotional, and communal functioning. The measurement of wellbeing should include all signs of changes in the tendency of occurrence of diseases and estimation of well-being which can be evaluated by measuring the improvement in life.

The pervasiveness of diabetes have been quickly increasing throughout the planet earth at an alarming rate.(3) Approximately 90% of all people with diabetes are estimated to have type 2 diabetes, with world prevalence of 8.3% in the year 2015 and International Diabetes Federation estimated that this may rise to 10.4% by the year 2040. (4) Low per capita income countries contribute around 80% of the total diabetes for the age range of 19 to 79 years.(5) Diabetic people and giant for healthcare providers, health associated quality of life is important because majority of diabetics leads a poor life quality but often have less attentive. (6) The poor excellence of life hampers in taking care, which often leads to poor glycemic manage, jeopardies for complications, and accelerate of diabetes. (7) It is also a very important that a good daily routine of one patient to manage his disease and impart health and happiness in long-term. (8) The assessment of the HRQoL is helpful for assessing patients’ perceived burden of chronic disease, tracking of health changes over time and assessing treatment effects. (9)

To assess these dimensions most effectively, evaluation should emphasize on the patient's

apparent physical function and poignant distress, diabetes-related social situations, self-mediation and relevant challenging situations, interfering with ordinary role activities and loss of autonomy due to diabetes. The above assessment can give way to further counselling and change in treatment pattern. As India being the diabetes center of the world having numbers of diabetes cases, it becomes important to measure the Health associated life quality for better care and control.

Despite many epidemiological studies on diabetes, there are limited studies in Odisha exclusively on excellence for the life of the individuals suffering with Type 2 Diabetes. As diabetes load in Odisha is increasing day by day, it is essential to calculate their status of leading the life for better treatment outcome. So the current study aims to measure the health connected with the living style in persons with Type 2 Diabetes Mellitus presence the tertiary health care facility in Odisha and its socio-demographic determinants.

## 2. MATERIALS AND METHODS:

A cross investigation has been conducted for checking health status in a tertiary health facilities from June 2014 to September 2016. The patients diagnosed as type-2 diabetes presence Endocrinology OPD of the tertiary Hospital has been included in the study.

Sample lot was intended depends on the preceding hospital based study in South India where prevalence of good value of life for the persons diagnose with type 2 diabetic was 69% and allowable error was 12%. (10) Final sample size calculated was 126 which is rounded off to 130 participants. Patient confirms as Type 2 Diabetes for more than 1 or 2 year and who had given consent were constituted the study population. Age of the patients was more than 18 years. The patients with impaired mental function, critically ill patients and expecting women remained excluded from the study. A pre-structured interview schedule was used and data related to demographic profile, history of diabetes, quality of life, stress etc. were collected. The superiority of life apparatus for Indian diabetes patients have been using to measure the health connected advantage of life for patients confirmed as type 2 diabetes mellitus. Data were analysed using SPSS version 20.

## 3. RESULTS:

In current study, participants chosen for the study with average age with 53.68 years  $\pm$ 10.47 and most of them (86.6%) belonged to age less than 60 years. Among them 58.5% were male and 41.5% were female (Fig 1). Majority belonged to Hindu religion (97.7%), 70% were of general 27.7% category. All the study participants were living with their family, of which 80% belonged to joint family, 97.7% of participants were married. Out of total participants 53.8% were educated above secondary level and majority of the participants (51.5%) were belonged to upper social class followed by 46.9% were in middle class (Table 1)

Out of total participants, 24.6% participants were having good HRQoL score, 56.9% of moderate HRQoL score and 18.5 % of participants were having poor HRQoL score (Fig 1). Table 2 shows domain of role restriction due to corporeal health HRQoL score of the participants was good score (17.7%), moderate score (58.5%) poor score (23.8%), in the domain of physical endurance good score (20%), moderate score (54.6%) and poor score (25.4%), in the domain of general health, good score (34.6%), moderate score (47.7%), poor score (18.7%), in the domain of treatment satisfaction good score (20.8%), moderate score (60.8%), poor score (18.4%), in the domain of symptoms botherness good score (51.5%), moderate score (33.8%), poor score (14.6%),

in the domain of financial worries good score (35.7%), moderate score (46.2%), poor score (16.1%), in the domain of emotional/mental health good score (44.6%), moderate score (38.5%), poor score (16.9%). In the domain of diet satisfaction good score (15.3%), moderate score (65.4%) and poor score (19.2%).

The HRQoL score of participants with less than 60 years of age was considerably higher than the participants with age 60 years and above ( $P < 0.001$ ). Gender, religion, caste, type of family, marital status were not associated with HRQoL score. The HRQoL score was significantly higher in participants having education above 10th standard than those educated up to 10<sup>th</sup> standard ( $p = 0.016$ ). The participants in upper class showed significantly higher HRQoL score than the other social classes ( $P = 0.021$ ). (Table 3)

Cohen's perceived stress scale was used to assess stress. Mean score of stress of the participants was  $14.61 \pm 2.9$ . Out of total participants, 65 (50%) were having stress score between 13 - 20 and 6.9% were having high stress. The HRQoL score was significantly higher in participants with average stress ( $125.04 \pm 14.73$ , 95% CI: 121.78-128.30) than participants with more than average stress ( $118.10 \pm 12.77$ , 95% CI: 114.43-121.77) ( $P = 0.007$ ). (Table 4)

The HRQoL score was higher with the study participants, sleeping 6-8 hrs a day (mean score  $126.13 \pm 13.20$ , 95% CI: 123.42-128.83) than those were sleeping less than 6 hours (mean score  $112.75 \pm 12.85$ , 95% CI: 108.4-117.1) and the variation was statistically noteworthy ( $P = 0.001$ ).

Among diabetic patients, 66.1% were overweight and 2.4% were obese. Neuropathy was found in 11.5% of study participants, followed by nephropathy in one (0.8%) participant. One participant was having peripheral arterial disease. Hypertension was the major co-morbidity present with the study participants i.e. 30% followed by cardiovascular disease comprised of 0.8%. (Table 5)

The HRQoL score of the participants having normal BMI (mean  $129.20 \pm 16.43$ , 95% CI: 124.01-134.38) showed higher score than those were having high BMI ( $119.30 \pm 12.20$ , 95% CI: 116.73-121.88) and the dissimilarity was statistically important ( $p = 0.001$ ). The score of HRQoL of the participants with associated co-morbidity (mean score  $116.48 \pm 13.48$ , 95% CI: 112.16-120.79) was less than those were not having co-morbidity (mean score  $125.07 \pm 14.03$ , 95% CI: 122.13-128.01). The dissimilarity had been statistically important ( $p = 0.001$ ) for the study. The HRQoL score was superior in the current study participants those were not having complication due to diabetes (mean score  $125.15 \pm 12.85$ , 95% CI: 122.77-127.52) than those with complication (mean score  $101.53 \pm 5.47$ , 95% CI: 98.50-104.57). The difference was statistically significant ( $P = 0.0001$ ).

#### 4. DISCUSSION

People who experience from chronic diseases have miserable excellence of life; often having lack of interest in concentration to their self-care and disease organization, leading to early onset of complications and disability. Neuropathy was the most widespread complication (11.5%) among the patients. In many studies in India, neuropathy was the most frequent complication among type 2 diabetes patients 26.2% and 24.6%, respectively. It was observed that in 30% of the patients, hypertension was present as co-morbidity and it was the major co-morbidity among the study participants. Pantalone KM in USA found that the most prevalent type 2 diabetes related co-morbidity was hypertension. (11) A study by Long AN et al found that about 75% of adults with diabetes also had hypertension. (12)

HRQoL score was assessed using QLIID for Indian diabetes and found that 24.6% of the patients showed good score, 56.9% moderate score and 18.5% of the patients showed poor

HRQoL score. The poor HRQoL score in the patients may be due to older age, complication of diabetes or adverse life style, which mainly found in the domain of role restriction due to corporeal health and physical endurance, where poor HRQoL score was 23.8% and 25.6% respectively. It is comparable to the study by Mathew A et al in India, where very good HRQoL score was 4%, good HRQoL score was 38%, moderate HRQoL score was 57% and poor HRQoL score was 1%. (13) Issa BA et al in Nigeria found good quality of life score was 20.7%, fair quality of life score 65.4% and poor quality of life score was 13.9%. (14) In contrast to this study Jain V et al India observed that HRQoL score of all participants were poor, which may be attributed to variation in the socio economic status of the patients attending the hospital. (15)

Gender has no influence on total HRQoL score. Significant difference of overall HRQoL score across gender also was not found by Jain V et al in India. (15) Lindsay G et al in UK also did not find any significant difference of overall HRQoL score across gender. With increased age there was decrease of HRQoL score ( $r = -0.581$ ,  $p < 0.002$ ). Patients, who are 60 years of age showed higher overall HRQoL score than the geriatric group (more than 60 years) ( $p < 0.01$ ). Similar results were seen in a study by Morales MC et al in Spain, HRQoL score was higher in patients aged below 60 years. (17) Sakamak H et al in Japan observed that QoL score was lower in 70 years and older age group for mobility and usual activities, which was assessed with SF-36 tool ( $P < 0.01$ ). (18) No significant difference in HRQoL score was found between different religions, castes, types of family and between married and unmarried participants. Similar result was observed in the studies done by Mathew A et al in India where, no important difference was experiential between nuclear and joint family. (13) Ayman A et al in Saudi Arabia, found no important differentiation in HRQoL score among the married and unmarried participants. (19) Those who were educated above 10th standard showed significantly higher overall HRQoL score ( $p = 0.016$ ). This may be due to their knowledge regarding diabetes control and high income than the other group. Ronald N et al in Uganda observed that those who were above secondary education had higher HRQoL score. (20) Wexler DJ et al observed, patients with four years of college education or advanced degree, showed high HRQoL score ( $p = 0.0001$ ). (21) The overall HRQoL score of participants with higher income groups were considerably high in comparison to the other group ( $P = 0.021$ ). Similar assumptions were observed in the learning by Ayman A et al in Saudi Arabia, where patients with moderate economic status had significantly higher HRQoL than the poor economic status ( $P < 0.05$ ). (19)

Patients showed decrease HRQoL score with increase fasting blood sugar level ( $r = -0.183$ ,  $P < 0.037$ ) and postprandial blood sugar reading ( $r = -0.208$ ,  $P < 0.017$ ), which was comparable to the study conducted by Navicharern R in Thailand where a substantial negative alliance concerning blood sugar level at fasting and value of life ( $r = -0.32$ ,  $p < 0.05$ ) was found, (22) but Redekop WK et al in Netherland did not find significant correlation of blood sugar level with HRQoL score of diabetes patients. (23)

Higher HRQoL score was observed in patient with BMI  $< 22.99$  than those who were with BMI  $\geq 23$  ( $0.01$ ). The participants with normal BMI, their physical fitness may be good than the overweight participants. Similar observations were very frequent to seeing in a study by Eckert K et al in Germany where HRQoL score was lowest in the group with BMI  $\geq 35$ . (24) Manjunath K et al in India found that the HRQoL score of the participants with BMI ( $< 25$ ) was higher than those with BMI ( $> 25$ ) ( $p < 0.05$ ) and ( $0.049$ ) respectively. (10)

Complication in diabetes decreased the overall HRQoL score of the patients ( $P < 0.01$ ). Literature showed developments of complications reduce the physical functioning in diabetes. This may result in psychological upset which may reduce the perceived well-being of the patients.

A study have been done by Sakamak H et al in Japan establish that QoL score was considerably lower in participants with complication in comparison to persons without complication ( $p=0.044$ ). (18) A study conducted by Redekop WK et al in Netherland establish that the HRQoL of the participants with complication was significantly lower than those were not having complication. (23) The overall HRQoL score was inferior for the patients with co-morbidity ( $p<0.01$ ). Papadopoulos AA et al and Redekop WK et al found that the HRQoL score was poor in the participants with co morbidity than those were without co-morbidity. (23)

Patients doing regular physical exercise showed higher overall HRQoL score than those were not doing ( $p<0.01$ ). As per the literature, regular physical exercise help in keeping the body active and reduce the stress and depression in people. (23) This may explain the possibility of higher HRQoL score in the patients doing regular physical exercise. Similar result was also experimental in a revise by Painter P et al, that active individuals had higher QoL scores. (24)

HRQoL score of the patients with regular sleeping period 6-8 hours a day was higher than those sleeping less than 6 hours a day ( $p<0.01$ ). Shan Z et al found that those were sleeping less than 6 hours had significantly lower QoL score (all  $P < .001$ ). (28) Stress affects the quality of life. The study subjects whose stress was average and below (stress score  $< 15$ ) showed higher overall HRQoL score (0.007). Continues stress increases the blood glucose level and reduce the sleeping hours in diabetes patients. Both these factors decrease the physical activity and increases the mental worries, which leads to increase disease symptoms and reduced the treatment satisfaction.

## 5. CONCLUSION

Steps should be taken in individual and community level to recover the excellence of life. In the ipersonal level counselling for reduction of psychological distress, practice of Yoga and meditation and spiritual activities, diabetic diet and health education at the diabetic clinics should be strengthened. Health education on diabetes through SMS services regarding treatment, diet and physical activities may be initiated. The patients with complications and with associated co-morbidity should be evaluated frequently by the physicians to progress the excellence in life.

### Limitations

Patients of the study might not be demonstrative of the whole diabetes people but observations relating to HRQoL may be applicable to type 2 diabetic patients regardless of the country and health care system.

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Table 1: Socio-demographic profile of the participants

Variable	Number (%)
<b>Age</b>	
Age <60 years	86(66.15)
Age ≥60 years	44(33.85)
<b>Gender</b>	
Female	53(42.5)
Male	75(57.5)
<b>Religion</b>	
Hindu	127(97.7)
Muslim	2(1.5)
Christian	1(0.8)
<b>Caste</b>	
General	91(70.0)
SC	36(27.7)
OBC	3(2.3)
<b>Type of family</b>	
Joint	104(80)
Nuclear	26(20)
<b>Marital Status</b>	
Unmarried	3(2.3)
Married	127(97.7)
<b>Education status</b>	
Primary (up to 7th std.)	41(31.5)
Secondary (8th to 10th std.)	17(13.1)
Higher Secondary(12th)	29(22.3)
Graduate and above	41(31.5)
No Schooling	2(1.5)
<b>Socio-economic status</b>	
Upper Class	67(51.5)
Middle Class	63 (48.5)

Table 2: Health related Quality of life (HRQoL) score of participants

HRQoL domain (Total Score)	< 3 <sup>rd</sup> percentile (Very poor) in	3 <sup>rd</sup> – 25 <sup>th</sup> percentile (poor) in %	25 <sup>th</sup> – 75 <sup>th</sup> percentile (moderate)	75 <sup>th</sup> – 97 <sup>th</sup> percentile (good) in %	≥ 97 <sup>th</sup> percentile ( very

	%		in %		good) in %
Role limitation due to physical health	1.5	22.3	58.5	14.6	3.1
Physical endurance	2.3	23.1	54.6	17.7	2.3
General health	5.4	12.3	47.7	29.2	5.4
Treatment satisfaction	3.8	14.6	60.8	8.5	12.3
Symptoms botherness	3.9	10.7	33.3	6.9	44.6
Financial worries	3.8	12.3	46.2	12.3	25.4
Emotional/mental health	1.5	15.4	38.5	33.1	11.5
Diet satisfaction	4.6	14.6	65.4	13.8	1.5
Overall HRQoL in all domains	2.3	16.2	56.9	21.5	3.1

Table 3: Socio-demographic variables and Quality of life

Variable	Overall HRQoL Mean ± SD(95% CI)	P value
<b>Age</b>		
Age <60 years	128.21 ± 12.30 (125.60-130.85)	0.0001
Age ≥60 years	111.36 ± 11.32 (107.69-114.49)	
<b>Gender</b>		
Male	123.37 ± 15.19 (123.37 ± 15.19)	0.217
Female	121.09 ± 13.16 (117.50-124.69)	
<b>Religion</b>		
Hindu	122.69 ± 14.14 (120.21-125.18)	0.165
Others	111.00 ± 22.86 (54.19-167.81)	
<b>Caste</b>		
General	123.09 ± 13.13 (120.31-125.87)	0.485

Others	121.02±16.77 (115.80-126.25)	
<b>Type of family</b>		
Joint	121.76 ±14.21(119.00-124.52)	0.294
Nuclear	125.08 ±15.02 (119.01-131.14)	
<b>Marital Status</b>		
Unmarried	131.00±3.60 (122.04-139.96)	0.298
Married	122.22±14.47 (119.68-124.76)	
<b>Education status</b>		
Upto 10 <sup>th</sup> standard	119.17±14.07 (115.53-122.8)	0.016
Above 10 <sup>th</sup> standard	125.21±14.14 (121.84-128.59)	
<b>Socio-economic status</b>		
Upper Class	125.24± 13.26 (122.00-128.47)	0.021
Middle Class	119.43±15.00 (115.65-123.21)	

Table 4: Stress among participants

<b>Stress among participants</b>	
<b>Mean Stress score</b>	14.61± 2.9
<b>Stress Score &lt;13 (Average stress)</b>	56 (43.1%)
<b>Stress Score 13-20</b>	65 (50%)
<b>Stress Score ≥20 (High Stress)</b>	9 (6.9%)

Table 5: Diabetes related complications and Comorbidities

<b>Complications</b>	<b>Number (%)</b>
Neuropathy	15(11.5)
Nephropathy	1(0.8)

Peripheral arterial disease	1(0.8)
<b>Co-morbidities</b>	
Hypertension	39(30)
Cardiovascular disease	1(0.8)
Overweight and Obese	89 (68.5)

Fig 1: Categorization of Overall HRQoL score



