## Research Article

# Stigmata of complications on the quality of life of type 2 diabetic patients

## Babulal Meena*, Deepak Kumar, Veer Bahadur Singh, Sanjay Sharma, Subhash Chandra

Department of of Medicine, SPMC, Bikaner, Rajasthan, India

**Received:** 25 November 2015
**Accepted:** 19 December 2015

**\*Correspondence:**
Dr. Babulal Meena,
E-mail: drblmeena@gmail.com

### ABSTRACT

**Background:** Diabetes is a chronic metabolic disorder the prevalence of which has continued to evolve with time. For such chronic illness where there is no permanent remedy, it is important to establish that therapy really makes people feel better. The purpose of the study was to analyze the quality of life (QOL) in a group of diabetic patients with or without complications and its impact on their day to day living.

**Methods:** 270 type 2 DM patients were enrolled for this retrospective done at S P Medical College Bikaner. Assessment of QOL was done with "The audit of diabetes dependent quality of life scale (ADDQoL)." This composed of 19 domain specific items and their response options.

**Results:** All 19 parameter of QOL were found to be negatively impacted (-4.28 to -6.08) in DM patients. Most negatively impacted parameters were personal life, sexual life and physical work (-6.08, -5.57, -5.11 respectively).Widower patients had worst quality of life as compared to married patients. Modality of treatment had major impact on QOL with patient on insulin therapy having worse QOL as compared to other treatment modality.

**Conclusions:** Patients with DM not only have impairments in their physical functioning but have statistically significant impairment of all aspects of QOL. The stigmata of living with diabetes had influence on every aspect including physical, psychological and social aspects of QOL. Optimal glycaemic control will not only prevent the development of long standing complication but will also help in improving QOL and general wellbeing of the patients.

**Keywords:** Diabetes, Quality of life, Stigmata of complications

## INTRODUCTION

Diabetes is a progressive disease with a complex hormonal background and multiple potential outcome and therapeutic options. It can be a tough illness to live with for many patients owning to the demand of self-care that can be burdensome, frustrating and overwhelming.[1,2] Quality of life (QOL) is increasingly recognized as an important health outcome in its own right, representing the ultimate goal of all health interventions.[3] It may influence the patient's self-care activities that may consequently impact their diabetic control and management. If the demand of treatment regime does not

fit in with how the patient wishes to live their lives, they may choose to compromise achieving tight blood glucose control in order to protect their QOL. The QOL is defined as "what the patient says it is". In other words, QOL is how good or bad a person feels their life to be. The most essential feature of measuring QOL, which is to capture the individual's subjective evaluation of their QOL and not what other imagine it to be. Most of the patients mostly associate better glucose control with worse QOL contrary to health professionals who tend to assume that better glucose control would be associated with better QOL.

There are three major ways in which diabetes can negatively affect physical wellbeing. The most potent among them is the development of long term complications. There is likely to be a significant drop in perceived QOL. The patient's ability to complete household tasks, his ability to do work and enjoy pleasurable activities may either be severely limited or disabled completely. Second determinant being the development of short term complication and third major factor concerns about physical symptoms and life style changes resulting from the demands of the diabetic regimen.[4]

QOL has importance for the people with diabetes and their health care providers for several reasons. Diabetes over whelm us leads to diminished self-care, which in turn leads to worsened glycemic control, increased risk for complications and exacerbation of diabetes overwhelms in both the short run and long run. Thus, quality of life issues are crucially important, because they may powerfully predict an individual's capacity to manage his disease and maintain long term health and well-being.[5] Various questionnaires claiming to measure QOL, actually measures quality of health rather than QOL. It is likely that health status will have some correlation with how good or bad a person feel their life to be, but QOL and quality of health are not the same thing. Efforts to achieve excellent health may damage QOL. Therefore results can be highly misleading if we interpret health status measure as if they are measure of QOL. This present study was planned to find out what the patient of diabetes feel about their quality of life affected by this disease, its complication and treatment.

### Ethnic statement

A written informed consent was obtained from each subject included in the study. Ethical approval for the study was obtained from the Ethical committee S P Medical College, PBM and A.G of hospitals Bikaner, Rajasthan prior to the commencement of the study.

## METHODS

Present study was conducted among the patient admitted to Medicine Department PBM and A.G of Hospital, a tertiary care center of North West Rajasthan, India from January 2014 to December 2014. Patients above 18 years diagnosed according to ADA revised criteria 2013 were included in the study. Patients who were seriously ill, known case of type 1 DM, who were unable to speak, listen or understand Hindi were excluded from the study. A thorough clinical examination was conducted and the findings along with other demographic data were recorded on predesigned and pretested performa. History regarding duration and treatment of diabetes was noted. Patient's Compliance with the medication was also noted. Patients were also evaluated for the presence of sexual dysfunction, peripheral vascular disease and other macro and micro vascular complications.

The diagnosis of sexual dysfunction was done with following criteria.

- A sexually competent male must have desire for his sexual partner (libido).
- Be able to divert blood from iliac artery in to corpora cavernosa to achieve penile tumescence and rigidity (erection).
- Discharge sperm and prostatic/seminal fluid through urethra (ejaculation).
- Finally experience a sense of pleasure (orgasm).

Hypoceptive sexual disease (HSD) (according to DSM IV) was defined as persistently and recurrently deficient sexual fantasy and desire for sexual activity leading to marked distress or interpersonal difficulty. In male diabetics predominant disorder is of erectile dysfunction but HSD is also seen however in female diabetic the predominant form of sexual dysfunction is HSD. Local examination of genitalia was also performed to rule out any congenital deformity. Testis was felt for size and consistency, sensation over penis and bulbocavernous reflex. Other relevant evaluations were performed regarding evaluation of peripheral vascular disease and other micro as well as macrovascular complications.

For the assessment of QOL, we used "The audit of diabetes dependent quality of life scale (ADDQoL)." This scale composed of 19 domain specific items and their response options developed by professor C Bradle.[6]This scale allow the respondents to indicate aspect of life that are not applicable to them, rate the amount of impact of diabetes-positive or negative, on the applicable aspect of life and rate the perceived importance of each applicable aspect of life for their QOL. This scale represents a comprehensive list of 13 life domains that diabetes might affect and includes employment/career opportunity, social life, family relationships, friendships, sex life, recreational activity, ease of travel, personal worries about the future, worries about the future of one's family and friends, motivation to achieve things, physical activity, potential loss of independence and eating enjoyment. Patients were asked to indicate on 5 point likert scale, the degree to which each particular domain might be different "if I did not have diabetes". Potential score range from -3 indicating that life in this domain would be a great deal better to +1, indicating that life in this domain would have been worse. Patient are then directed to rate how personally important each domain is to them along a 4 point scale ranging from very important to not important at all. Finally a patient's 13 scores can then be arithmetically weighted, such that the total QOL score is more strongly influenced by that domain that a patient has selected as being most important. The data obtained was tabulated on Microsoft Excel spreadsheet. Categorical data was expressed as rates, ratios and percentages. Continuous data was expressed as mean ± standard deviation (SD) .Chi square test was used for comparison between 2 groups. Independent sample t test was done to find out significance with various

complications. SPSS 18 trial version software was used for analysis.

**RESULTS**

This study was conducted among 270 type 2 DM patients attending either OPD, diabetic clinic or was admitted to medicine ward. The baseline anthropometric characteristics of patients included in the study are shown in Table 1. About 68.9% of the patients studied were male, 46-55yrs of age group either overweight or obese predominantly belonging to middle socioeconomic status.

**Table 1: Anthropometric characteristics of diabetic patient and average quality of life score.**

| Characteristics | Cases (n=270) | | Average score of QOL | |
|---|---|---|---|---|
| | No | % | Mean | SD |
| **1. Age group** | | | | |
| < 45 years | 48 | 17.8 | -3.98 | 0.68 |
| 46-55 years | 93 | 34.4 | -4.46 | 0.88 |
| 56-65 years | 87 | 32.2 | -4.94 | 0.96 |
| >65 years | 42 | 15.6 | -5.13 | 0.80 |
| **2. Sex** | | | | |
| Male | 84 | 31.1 | -5.02 | 0.78 |
| Female | 186 | 68.9 | -4.46 | 0.95 |
| **3. Marital status** | | | | |
| Married | 258 | 95.6 | -4.60 | 0.94 |
| Single(widow/unmarried) | 12 | 4.4 | -5.36 | 0.68 |
| **4. Duration (years)** | | | | |
| ≤5 years | 102 | 37.8 | -4.25 | 0.94 |
| 6-10 years | 78 | 28.9 | -4.65 | 0.90 |
| >10 years | 90 | 33.3 | -5.05 | 0.78 |
| **5. Obesity** | | | | |
| Positive | 153 | 56.7 | -4.81 | 0.93 |
| Negative | 117 | 43.3 | -4.63 | 0.94 |
| **6. BMI** | | | | |
| 0-17.99 | 21 | 7.8 | -4.23 | 0.66 |
| 18-25.99 | 126 | 46.7 | -4.55 | 0.88 |
| 26-29.99 | 78 | 28.9 | -4.51 | 0.91 |
| >29.99 | 45 | 16.7 | -5.25 | 1.06 |
| **7. Waist hip ratio** | | | | |
| 0.70-0.79 | 3 | 1.1 | -5.50 | 0.00 |
| 0.80-0.89 | 66 | 24.4 | -4.33 | 0.87 |
| 0.90-0.99 | 189 | 70 | -4.69 | 0.96 |
| >0.99 | 12 | 4.4 | -5.19 | 0.51 |
| **8. Socioeconomic status** | | | | |
| Poor | 3 | 1.11 | -4.31 | 0.00 |
| Lower | 30 | 11.11 | -4.76 | 1.06 |
| Middle | 117 | 43.33 | -4.67 | 0.92 |
| Upper | 120 | 44.44 | -4.57 | 0.95 |
| **9. SBP** | | | | |
| ≤120 | 45 | 16.67 | -4.06 | 0.84 |
| 121-140 | 84 | 31.11 | -4.47 | 0.83 |
| 141-160 | 108 | 40 | -4.79 | 0.94 |
| >160 | 33 | 12.22 | -5.30 | 0.83 |
| **10. DBP** | | | | |
| ≤70 | 18 | 6.67 | -4.16 | 1.11 |
| 71-80 | 93 | 34.44 | -4.21 | 0.75 |
| 81-90 | 78 | 28.89 | -4.74 | 0.72 |
| >90 | 81 | 30 | -5.11 | 1.06 |

Table 2 describes the biochemical parameters and average QOL score in diabetic patients. It was seen that patient with poor glycemic control as detected with elevated HbA1c and raised creatinine were more likely to have poor QOL scores.

**Table 2: Biochemical parameter and average QOL in diabetic patients.**

| Characteristics | Cases (n=270) | | Average QOL | |
|---|---|---|---|---|
| | No | % | Mean | SD |
| **1. FBS** | | | | |
| ≤100 mg/dl | 30 | 11.11 | -3.97 | 1.10 |
| 101-125mg/dl | 54 | 20.00 | -3.96 | 1.10 |
| ≥126 mg/dl | 186 | 68.89 | -4.10 | 1.01 |
| **2. HbA1c** | | | | |
| ≤6.4 | 51 | 18.89 | -3.34 | 0.26 |
| 6.5-7.4 | 81 | 30 | -4.14 | 0.28 |
| 7.5-8.4 | 48 | 17.78 | -4.88 | 0.17 |
| 8.5-9.4 | 39 | 14.44 | -5.30 | 0.12 |
| 9.5-10.4 | 21 | 7.78 | -5.61 | 0.03 |
| >10.5 | 30 | 11.11 | -6.19 | 0.43 |
| **3. Serum Creatinine** | | | | |
| <0.80 | 117 | 43.33 | -4.43 | 0.85 |
| 0.81-1.00 | 66 | 24.44 | -4.58 | 0.72 |
| 1.01-1.50 | 39 | 14.44 | -4.59 | 1.33 |
| >1.50 | 48 | 17.78 | -5.23 | 0.88 |
| **4. Serum cholesterol** | | | | |
| <150 | 51 | 18.89 | -4.87 | 0.94 |
| 151-200 | 135 | 50 | -4.51 | 0.98 |
| 201-250 | 21 | 7.78 | -4.80 | 0.83 |
| >250 | 21 | 7.78 | -4.30 | 0.92 |
| **5. HDL** | | | | |
| <40 | 90 | 33.33 | -4.94 | 0.89 |
| 41-50 | 126 | 46.67 | -4.45 | 0.91 |
| 51-60 | 36 | 13.33 | -4.47 | 1.07 |
| >60 | 18 | 6.67 | -4.68 | 0.93 |
| **6. LDL** | | | | |
| <80 | 60 | 22.22 | -4.83 | 0.93 |
| 81-100 | 48 | 17.78 | -4.53 | 1.21 |
| 101-120 | 48 | 17.78 | -4.68 | 0.84 |
| 121-140 | 66 | 24.44 | -4.53 | 0.92 |
| >140 | 48 | 17.78 | -4.57 | 0.82 |
| **7. TG** | | | | |
| <100 | 99 | 36.67 | -4.55 | 1.07 |
| 101-150 | 123 | 45.56 | -4.69 | 0.91 |
| 151-200 | 30 | 11.11 | -4.52 | 0.84 |
| >200 | 18 | 6.67 | -4.85 | 0.51 |

Table 3 describes the correlation between average QOL and complications among the patients and it was seen that QOL was negatively impacted in patients with complications as compared to patient without complication. Table 4 shows the mean scores of QOL parameters among the patients included in the study. It was seen that all parameter of QOL were significantly negatively impacted in the study however among them personal life sexual life and physical work were most effected parameters (-6.08±2.58, 5.57±2.63, 5.11±2.52 respectively).

Table 5 shows mean QOL scores in various age groups. Patients were divided in 4 age groups and it was observed

that as age advances negative impact on QOL increase which was found to be highly significant by independent sample t test (p<0.001).

**Table 3: Average QOL score comparison among patients with/without complications.**

| Characteristics | Cases(n=270) | | Average QOL | |
|---|---|---|---|---|
| | No | % | Mean | SD |
| Retinopathy | | | | |
| Present | 108 | 40 | -5.31 | 0.78 |
| Absent | 162 | 60 | -4.18 | 0.75 |
| Nephropathy | | | | |
| Present | 108 | 40 | -5.38 | 0.80 |
| Absent | 162 | 60 | -4.34 | 0.82 |
| Neuropathy | | | | |
| Present | 108 | 40 | -4.94 | 0.89 |
| Absent | 162 | 60 | -4.16 | 0.81 |
| ED | | | | |
| Present | 48 | 25.81 | -4.21 | 0.93 |
| Absent | 138 | 74.19 | -4.54 | 0.95 |

Table 6 shows qol scores in relation to the treatment. it was observed that quality of life was worse in patient on insulin as compared to patient on oha and in patient on oha as compared to patient who had blood sugar controlled by diet and exercise. this correlation was also found to be associated significantly by independent sample t test (p<0.01).

**Table 4: Mean scores of quality of life parameters in type 2 DM patients.**

| Quality of life parameters | Mean QoL score | SD |
|---|---|---|
| Hobbies | -4.40 | 2.22 |
| Work life | -4.83 | 2.33 |
| Travel | -4.72 | 2.43 |
| Holiday | -4.41 | 2.38 |
| Physical Work | -5.11 | 2.52 |
| Family Life | -4.55 | 2.52 |
| Social life | -4.66 | 2.68 |
| Personal Life | -6.08 | 2.58 |
| Sexual Life | -5.57 | 2.63 |
| Physical appearance | -4.63 | 2.51 |
| Self confidence | -4.41 | 2.41 |
| Motivation | -4.58 | 2.44 |
| Behaviour | -4.24 | 2.35 |
| Future | -4.33 | 2.27 |
| Finance | -4.64 | 2.33 |
| Living Condition | -4.60 | 2.30 |
| Dependence | -4.56 | 2.20 |
| Free to Eat | -4.32 | 1.56 |
| Freedom to Drink | -4.28 | 1.41 |

Table 7 shows average QOL score in type 2 DM patients in relation to micro and macrovascular complication and these score were found to be significantly correlated to each other (p<0.05).

**Table 5: Mean scores of quality of life parameters in various age groups.**

| Quality of life | Age group (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ≤ 45 (n=48) | | 46-55 (n=93) | | 56-65 (n=87) | | >65 (n=42) | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Hobbies | -4.06 | 2.21 | -3.87 | 2.33 | -4.17 | 2.02 | -4.71 | 1.86 |
| Work life | -4.56 | 2.66 | -3.71 | 1.55 | -4.59 | 2.59 | -4.93 | 2.43 |
| Travel | -3.75 | 2.14 | -4.16 | 2.39 | -4.66 | 2.82 | -4.21 | 1.93 |
| Holiday | -3.50 | 1.97 | -3.58 | 2.23 | -4.14 | 2.50 | -4.86 | 2.48 |
| Physical Work | -3.63 | 2.42 | -4.03 | 2.54 | -4.72 | 2.67 | -2.86 | 2.38 |
| Family Life | -3.56 | 2.34 | -3.94 | 2.90 | -3.83 | 2.59 | -5.57 | 2.41 |
| Social life | -4.06 | 2.59 | -3.68 | 2.82 | -4.03 | 2.83 | -5.57 | 2.59 |
| Personal Life | -2.88 | 3.87 | -4.26 | 3.83 | -3.69 | 4.03 | -3.07 | 2.99 |
| Sexual Life | -2.50 | 2.94 | -4.23 | 3.66 | -3.96 | 3.35 | -4.43 | 4.07 |
| Physical appearance | -3.81 | 2.48 | -3.35 | 3.26 | -3.86 | 2.66 | -4.29 | 1.94 |
| Self confidence | -3.25 | 2.18 | -3.74 | 2.44 | -4.17 | 2.70 | -4.00 | 2.18 |
| Motivation | -2.94 | 3.15 | -3.90 | 2.62 | -3.59 | 2.60 | -4.64 | 2.59 |
| Behaviour | -3.44 | 2.28 | -3.84 | 2.45 | -4.17 | 2.67 | -4.57 | 2.14 |
| Future | -3.50 | 1.83 | -3.90 | 2.18 | -3.96 | 2.95 | -4.36 | 2.27 |
| Finance | -3.75 | 1.73 | -4.71 | 2.65 | -5.17 | 2.35 | -3.50 | 1.87 |
| Living Condition | -4.63 | 2.50 | -3.87 | 2.75 | -4.10 | 2.60 | -4.64 | 1.91 |
| Dependence | -3.94 | 2.24 | -4.00 | 2.57 | -4.31 | 2.27 | -4.29 | 2.16 |
| Free to Eat | -3.69 | 1.54 | -4.06 | 1.46 | -4.79 | 1.54 | -4.64 | 1.60 |
| Freedom to Drink | -3.75 | 1.77 | -4.03 | 1.35 | -4.52 | 1.33 | -4.64 | 1.60 |
| Average Total Score | -3.98 | 0.68 | -4.46 | 0.88 | -4.94 | 0.96 | -5.13 | 0.79 |

During the course of study it was seen that female patients were more negatively impacted than male patients and this correlation was found to be very significant by independent sample t test (p<0.007). It was also observed that as the duration of diabetes after diagnosis increased, negative impact on QOL was found to be increased in statistically significant proportion (p<0.002).

**Table 6: Mean scores of quality of life parameters in relation to treatment.**

| Quality of life | Treatment | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D and E (n=9) | | OHA (n=204) | | OHA+Insulin (n=30) | | Insulin (n=24) | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Hobbies | -3.67 | 0.58 | -4.43 | 2.25 | -3.64 | 1.63 | -5.50 | 2.78 |
| Work life | -3.67 | 0.58 | -4.88 | 2.38 | -4.73 | 2.41 | -5.00 | 2.33 |
| Travel | -3.67 | 0.58 | 4.73 | 2.42 | -4.73 | 3.10 | -5.00 | 2.20 |
| Holiday | -3.00 | 1.73 | -4.22 | 2.37 | -5.40 | 1.71 | -5.25 | 3.01 |
| Physical work | -3.00 | 1.73 | -5.08 | 2.53 | -5.60 | 2.59 | -5.57 | 2.51 |
| Family life | -3.00 | 1.73 | -4.54 | 2.48 | -4.00 | 2.45 | -6.00 | 2.93 |
| Social life | -4.00 | 1.73 | -4.69 | 2.56 | -4.27 | 2.94 | -5.25 | 3.73 |
| Personal life | -1.00 | 0.00 | -6.37 | 2.55 | -6.13 | 2.10 | -4.20 | 2.04 |
| Sexual life | -4.00 | 0.00 | -5.23 | 2.63 | -6.82 | 2.23 | -6.50 | 2.95 |
| Physical appearance | -4.33 | 1.53 | -4.48 | 2.58 | -5.30 | 2.16 | -5.29 | 2.75 |
| Self confidence | -2.67 | 1.53 | -4.25 | 2.36 | -5.18 | 2.44 | -5.25 | 2.82 |
| Motivation | -3.00 | 1.73 | -4.63 | 2.50 | -4.91 | 2.55 | -4.29 | 2.14 |
| Behaviour | -4.33 | 1.53 | -4.18 | 2.33 | -4.27 | 2.94 | -4.71 | 2.14 |
| Future | -2.67 | 1.53 | -4.35 | 2.35 | -4.80 | 1.93 | -4.13 | 2.23 |
| Finance | -3.67 | 0.58 | -4.42 | 2.31 | -5.09 | 2.30 | -6.25 | 2.49 |
| Living condition | -5.33 | 3.21 | -4.55 | 2.36 | -4.40 | 1.90 | -5.00 | 2.33 |
| Dependence | -3.33 | 0.58 | -4.79 | 2.24 | -4.36 | 2.25 | -3.29 | 1.80 |
| Free to eat | -3.00 | 0.00 | -4.28 | 1.56 | -4.82 | 1.40 | -4.50 | 1.85 |
| Freedom to drink | -3.33 | 0.58 | -4.24 | 1.39 | -4.64 | 1.36 | -4.50 | 1.85 |
| Average total score | -3.47 | 0.13 | -4.60 | 0.92 | -4.85 | 0.99 | -5.02 | 0.86 |

**Table 7: Mean score of QOL in relation to presence or absence of micro and macrovascular complications.**

| Quality of life | Absent (n=78) | | Microvascular (n=81) | | Macrovascular (n=129) | | Mixed(n=192) | |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Hobbies | -3.85 | 2.29 | -4.57 | 2.19 | -4.74 | 2.18 | -4.63 | 2.16 |
| Work life | -4.42 | 2.56 | -4.85 | 2.34 | -5.37 | 2.31 | -5.00 | 2.22 |
| Travel | -3.69 | 1.89 | -5.20 | 2.52 | -5.48 | 2.47 | -5.15 | 2.51 |
| Holiday | -4.20 | 2.24 | -4.57 | 2.32 | -4.78 | 2.43 | -4.49 | 2.44 |
| Physical work | -4.91 | 1.68 | -5.37 | 2.63 | -5.58 | 2.86 | -5.18 | 2.77 |
| Family life | -3.45 | 1.77 | -4.90 | 2.58 | -5.17 | 2.84 | -4.94 | 2.65 |
| Social life | -4.39 | 2.76 | -4.73 | 2.75 | -5.18 | 2.70 | -4.78 | 2.66 |
| Personal life | -5.09 | 2.43 | -6.26 | 2.51 | -6.53 | 2.47 | -6.29 | 2.58 |
| Sexual life | -4.67 | 2.46 | -6.06 | 2.60 | -5.65 | 2.65 | -5.96 | 2.63 |
| Physical appearance | -4.76 | 2.37 | -4.64 | 2.50 | -4.87 | 2.52 | -4.58 | 2.58 |
| Self confidence | -4.35 | 2.33 | -4.56 | 2.51 | -4.78 | 2.49 | -4.43 | 2.46 |
| Motivation | -4.71 | 2.46 | -4.54 | 2.44 | -4.93 | 2.55 | -5.52 | 2.45 |
| Behaviour | -3.64 | 1.93 | -4.36 | 2.42 | -5.63 | 2.56 | -4.48 | 2.47 |
| Future | -3.12 | 1.39 | -4.77 | 2.31 | -4.78 | 2.37 | -4.82 | 2.38 |
| Finance | -3.88 | 1.95 | -4.92 | 2.34 | -4.86 | 2.47 | -4.95 | 2.42 |
| Living condition | -3.36 | 1.98 | -5.02 | 2.27 | -5.15 | 2.32 | -5.09 | 2.25 |
| Dependence | -4.32 | 1.91 | -4.69 | 2.33 | -4.98 | 2.45 | -4.67 | 2.32 |
| Free to eat | -3.92 | 1.06 | -4.49 | 1.71 | -4.79 | 1.73 | -4.48 | 1.70 |
| Freedom to drink | -3.77 | 1.03 | -4.50 | 1.51 | -4.74 | 1.56 | -4.49 | 1.50 |
| Average total score | -4.10 | 0.66 | -4.85 | 0.91 | -5.07 | 0.90 | -4.85 | 0.95 |

## DISCUSSION

Quality of life has importance for people with diabetes and their health care providers. Diabetes overwhelmus leads to diminished care, which in turn lead to worse glycemic control, increased risk of complications and exacerbation of diabetes in both short and long run. QOL are crucially important because they may predict an individual capacity to manage his disease and maintain long term health and well-being. 270 previously known cases of type 2 DM of different age and sex were taken and QOL was measured by using Hindi version of ADDQoL.

Numerous studies have been published that claims to measure QOL using questionnaires which in fact actually are measures of health status and quality of health rather than QOL. However Singh and Bradley have validated measures of QOL that allow the individual to respond to only those aspect of life that are relevant to them, rate the impact of diabetes on these aspect of life and rate the importance of each aspect for their QOL. Rather than asking about the degree to which problem associated with diabetes are occurring, this scale ask patients to imagine how life might be different without diabetes. Due to these reason the above scale was used in this study. One of the greatest advantages of this approach is that it allows respondents to indicate how diabetes may be having a positive effect in certain domains.

During the present study it was observed that as age advances negative impact on QOL also increased. The probable explanation of this correlation may be due to increasing number of complication of diabetes as age advances. Similar results were also observed by Bosseri et al (2005) and Wexler et al (2006).[7,8] In the present study we observed a more negative impact on QOL in female (-5.02) as compared to male (-4.46). Similar observations have been reported by other workers like Redekop et al (2002) and Coffey et al (2002).[9,10] Possible explanation behind this as female mostly have to manage routine household works ,care of children as well as low level of literacy moreover social problems like separation ,death of life partner may further deteriorate their QOL. It was also observed that longer the duration of diabetes more the negative impact on QOL. This might be due to the fact that duration increases both micro as well as macro vascular complication of diabetes. Moreover longer the illness more will be the financial problem due to prolonged costly therapy as well as restriction of job and work. Poor QOL was also observed in patient with poor glycemic control and this in turn was associated not only with more incidence of both micro and macro vascular complications but also of greater limitation of physical activity and raised financial burden. Surprisingly in the present study we observed worse QOL in patient on insulin therapy as compared to patient on OHA and on diet regime to control their blood sugar. Probable cause of worse QOL in insulin treated patient might be due to the fact that usually type 2 DM patient have phobia and stigma associated with injection treatment. Moreover these patients were put on insulin therapy due to various complications which by itself lowered QOL. Such results were not observed in most of the studies by Wexler et al and others. Finally it was also observed that there doesn't exist any definitive correlation between QOL and lipid levels. This may be probably due to the fact that dyslipidemia usually causes its manifestations in the later stages of the disease. Similar results were also observed by Coffey et al and Wexler et al.

Some limitation of the study should be kept in mind while interpreting the results. Most important is the sample size. The results would be better and generalized with larger population sample. Secondly most of patient selected were from government hospital that belong to low-middle socioeconomic group. They usually have low QOL of life most likely due to financial constraints moreover high cost of treatment further deteoriate there QOL. Thus better outcome can be drawn by including patients from other sections of the society. Finally patient's self-recorded duration of diabetes, weight and height values for calculation of BMI may not as reliable as that noted in medical records.

## CONCLUSION

QOL is increasingly recognized as important health outcome in its own right, represents the ultimate goal of all interventions. This study demonstrated that being female, obese; having type 2DM on insulin and OHA for a longer period of tine are associated with worst QOL. The worst effected parameters were personal life, sexual life and physical work. Therefore, while managing these patients emphasis should be on improving this parameter. The ultimate aim should not only to improve health status by good glycemic control and prevent complication but also to improve the feeling of wellbeing and that is quality of life.

## REFERENCES

1. Plsek PE, Greenhalgh T. The challenge of complexity in health care. Br Med J. 2001;323:625-8.
2. Plsek Pe, Wilson T. Complexity, leadership, and management in healthcare organization. Br Med J. 2001;323:746-9.
3. Constitution of the WHO. In World Health Organization. Handbook of Basic Documents. 5th ed Geneva, Palais des Nations. 1952:3-20.
4. Polonsky WH, Dudl RJ, Peterson M, Steffian G, Less J, Hokai H. The PAID 2:a newly revised and expanded version of problem areas in diabetic scale in preparation.

5. Rubin RR, Peyrot M. Quality of life and diabetes. Diabetes metabolism res rev. 1999;15(3):205-18.

6. Bradley C, Todd C, Gorton T, Symonds E, Martin A, Plowright R. The development of an individualized questionnaire measure of perceived impact of diabetes on quality of life: The ADDQoL. Qual life res. 1999;8:79-91.

7. Bosseri SSA. Value of ADDQoL individualized diabetic specific quality of life questionnaire in determining the difficulty in coping with diabetes.18th international diabetes federation congress. 2003.

8. Wexler DJ, Grant RW, Wittenberg E, Bosch JL, Cagliero E, Delahanty L et al. Correlates of health related quality of life in typre2 DM. Diabetologia. 2006;49(7):1489-97.

9. Redekop WK, Koopmanschap MA, Stolk RP, Rutten GEHM, Wolffenbuttel BHR, Niessen LW. HRQoL and treatment satisfaction in dutch patient with type 2 DM patient. Diabetes care. 2002;25:458-63.

10. Coffey JT, Brandle M, Zhou H, Marriot D, Burke R, Tabaei BP et al. Valuing health related quality of life in diabetes. Diabetes care. 2002;25(12):2238-43.