

Quality of Life of Type 2 Diabetic Patients in Pokhara Metropolitan, Kaski, Nepal: a Cross-Sectional Analytical Study

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ABSTRACT

Introduction: Prevalence of diabetes mellitus is increasing globally. Quality of Life is a multi-dimensional and recognized as an important outcome of health, representing the ultimate goal of all healthcare interventions. The study assessed the quality of life and its associated factors of type 2 diabetes mellitus patients.

Methods: A community-based cross-sectional analytical study was conducted among the 184 type 2 diabetes patients of Pokhara Metropolitan, Kaski district using consecutive sampling technique. Data were collected through interviewer administrative questionnaire. Diabetes-39 tool was adopted to assess quality of life of type 2 diabetes patients. Ethical approval was taken from the Institutional Review Committee of Pokhara University. Chi-square test was used to identify the association between independent variables and quality of life. Multivariate analyses was done to identify the influence of family type, occupation, International Wealth Index with quality of life.

Results: More than half (51.6%) of the participants were of age group of 40–60 years with a mean age of 56 years \pm 11. More than two-thirds (69%) of the participants had a good quality of life. Anxiety and worries dimension had the highest mean score (Mean 46.95 \pm 21.14) of QoL among five dimension. Family types, occupation, respondent income, IWI, the time duration of exercise per day and seriousness in illness were found significantly associated with QoL ($p < 0.05$).

Conclusions: Most of the participants had good quality of life among diabetic patients. Family types, occupation, respondent income, IWI, the time duration of exercise per day, seriousness in illness, are the predictors of QoL of types 2 diabetes patients. Emphasis should be given on raising awareness, involving regular physical activities, promoting social support and avoiding alcohol & tobacco use to improve QoL in diabetes.

Keywords: Diabetes, health, knowledge, Nepal, quality of life

INTRODUCTION

Diabetes mellitus¹ is one of the most common and complex diseases worldwide with steadily increasing prevalence.²⁻⁴ It is believed that worldwide diabetes would become the main cause of morbidity and fatality in the next 25 years.⁵

Around 70% global death were due to Non-Communicable Disease (NCDs). Diabetes is one of the four most common NCDs. Diabetes cause around 1.6 million death among 39.5 million deaths due to NCDs.⁶ Worldwide a predictable around 422 million adults were living with diabetes in 2014 AD, compared to 108 million in 1980 AD.³ Asia has bears 60% of the world diabetic population.⁷

In Nepal, prevalence of type 2 diabetes mellitus was found 8.4% which was higher than the current national estimation of 4.5% in 2015⁹ where International Diabetes Federation estimated the prevalence of the diabetes was 7.1%.⁸

Quality of life issues is vital because they predict the individual's capacity to manage his disease and maintain long-term health and well-being.¹⁰ Health-related quality of life provides a multidimensional viewpoint that encompasses a dimensions to assess diabetes control, anxiety/worry, social burden, sexual function, energy/mobility¹¹, and overall QoL.¹² Physical exercise, nutrition and health status were believed to be the most factors of type 2 diabetes mellitus.¹³

METHODS

A community-based cross-sectional analytical study was conducted among type 2 diabetes mellitus patients in Pokhara Metropolitan, Kaski district, from December 24, 2018 to August

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23, 2019. Ethical approval was taken from IRC of Pokhara University. The quantitative survey method was adapted for collecting the required information. We conducted a face-to-face interview with 184 type 2 diabetes mellitus patients using a semi-structured interview schedule. For capturing the individual diabetes patients consecutive sampling technique was applied on the basis.

The D-39 instrument was chosen because of the possibility of being used on the whole population of patients with types 2 DM, regardless of demographic variables, gender, age, educational level, health status or ethnic group. It is an instrument originally developed in English and specifically designed to determine the quality of life related to health of people with T2DM. The D-39 instrument was adapted and validated for the Brazilian context showing good internal consistency, with a Cronbach's alpha of 0.917. The instrument can be self-administered. It consists of 39 items, covering five dimensions (domains) of the quality of life of people with DM: energy and mobility (15 items), diabetes control (12 items), anxiety and worry (4 items), social impact (5 items), and sexual behavior (3 items).

For data analysis, descriptive statistics were used to characterize the distribution of sample responses in the D-39 instrument. We calculated the percentage distribution of patients with DM in accordance with: the responses to the items of the five dimensions of QoL. D-39 instrument, as with a Likert type response was scored on a seven-point scale that ranged from "not affected at all" (score=1) to "extremely affected" (score=7). The domain score was computed by summing the responses and then applying a linear transformation to a 0-100 scale. On a transformed scale of 0-100, a score closer to 0 indicated the perfect quality of life and a 100 indicated no quality of life. So, Global quality of life scale was reversed to compute the scores, score above 40 was considered to be a bad quality of life and below 40 was considered to be a good quality of life.

The collected data were entered in Epidata, which were exported to Statistical Package for the Social Science (SPSS) for further analysis. Descriptive statistics were reported for socio-demographic, socio-economic information, lifestyle-related information, anthropometric characteristics of the participants, diseases profile of the respondents and quality of life of the participants as frequencies and percentage. Chi square test was used to identify the association between related variable and knowledge, quality of life. Multivariate analyses were done to identify the influence of family type, occupation, IWI with quality of life.

RESULTS

Descriptive information about the research participants.

Table 1: Socio-demographic characteristics of participants

| Characteristics | Number | Percent |
|---|--------|---------|
| Sex | | |
| Male | 99 | 53.8 |
| Female | 85 | 46.2 |
| Age (years) | | |
| < 40 years | 22 | 12 |
| 40-60 years | 95 | 51.6 |
| > 60 years | 67 | 36.4 |
| Mean years 56.23±11.62SD Min. 32 and Max. 85yrs | | |
| Marital status | | |
| Married | 158 | 85.9 |
| Widow | 24 | 13 |
| Others | 2 | 1 |
| Ethnicity | | |
| Bhramin / Chhetri | 98 | 53.3 |
| Janajati | 43 | 23.4 |
| Dalit | 23 | 12.5 |
| Others | 19 | 10.8 |
| Religion | | |
| Hindu | 159 | 86.4 |
| Buddhist | 14 | 7.6 |
| Christian | 7 | 3.8 |
| Others | 4 | 2.1 |
| Educational level | | |
| Illiterate | 34 | 18.5 |
| Informal education | 35 | 19 |
| Primary | 36 | 19.6 |
| Secondary | 54 | 29.3 |
| Graduate | 15 | 8.2 |
| Post-graduated or above | 10 | 5.4 |
| Health Insurance | | |
| Yes | 72 | 39.1 |
| No | 112 | 60.9 |
| Family size | | |
| ≤ 5 members | 122 | 66.3 |
| > 5 members | 62 | 33.7 |
| Median 5 (IQR=2), Min 2 and Max 18 | | |
| Family type | | |
| Nuclear family | 74 | 40.2 |
| Joint family | 110 | 59.8 |

Out of 184 research participants, majority (53.8%) of research participants were male. Similarly, more than half (51.6%) of the research participants were between the age of 40 to 60 years with the mean age of 56±11 SD years. The majority (85.9%) of the research participants was married. More than half (53.3%) of the research participants were Brahmin/Chhetri. Majority (86.4%)

of the research participants were Hindu. Similarly, regarding education, 29.3% participants had completed secondary level education. More than half (60.9%) of the research participants were not enrolled in the social health insurance scheme. Two third (66.3%) of the research participants were from the household with less than or equal to five members. More than half (59.8 %) of the participants were living in a joint family (Table 1).

Table 2: Socioeconomic characteristics of the participants

| Characteristics | Numbers (n=184) | Percent |
|---|--------------------|---------|
| Occupation | | |
| Unemployment or House maker | 63 | 34.2 |
| Business | 34 | 18.5 |
| Agriculture | 29 | 15.8 |
| Government service | 24 | 13 |
| Private services | 10 | 5.4 |
| Labor | 3 | 1.6 |
| Retired | 21 | 11.4 |
| Family Income (NRS) | | |
| ≤ 45000 | 93 | 52.5 |
| > 45000 | 84 | 47.5 |
| Median Rs.450000 (IQR= Rs. 29000), Min Rs.7000 and Max Rs.1250000 | | |
| International Wealth Index | | |
| Lowest quintile | 36 | 19.6 |
| Second quintile | 35 | 19 |
| Medium quintile | 36 | 19.6 |
| Fourth quintile | 22 | 12 |
| Highest quintile | 55 | 29.9 |

Majority of the participants (34.2%) were Homemaker/Unemployed while least 1.6% of the research participants were labor. Similarly, more than half (52.5%) of the family income was less than NRs. 45000 (Median Rs.450000 (IQR= Rs. 29000), Min Rs.7000 and Max Rs.1250000). Likewise, Majority (29.9%) of the participants were on belong to the highest quintile (Table 2).

Table 3: Life style related characteristics of the participants

| Characteristics | Numbers (n=184) | Percent |
|---|--------------------|---------|
| Number of days eat fruits in a typical week | | |
| Did not take a single day | 10 | 5.4 |
| 1 | 6 | 3.3 |
| 2 | 22 | 12 |
| 3 | 33 | 17.9 |
| 4 | 29 | 15.8 |
| 5 | 21 | 11.4 |
| 6 | 5 | 2.7 |
| 7 | 58 | 31.5 |

| | | |
|---|-----|------|
| Number of servings of fruits on one of those days | | |
| Did not take a single day | 10 | 5.4 |
| 1 Serving | 53 | 28.8 |
| 2 serving | 4 | 2.2 |
| Half serving | 117 | 63.6 |

| | | |
|--|-----|------|
| Number of days eating vegetables in a typical week | | |
| 1 | 2 | 1.1 |
| 3 | 1 | 0.5 |
| 4 | 2 | 1.1 |
| 5 | 6 | 3.3 |
| 6 | 2 | 1.1 |
| 7 | 171 | 92.9 |

| | | |
|--|-----|------|
| Number of servings' of vegetables on one of those days | | |
| One serving | 72 | 39.1 |
| Two serving | 11 | 6 |
| Three Serving | 1 | 0.5 |
| Half serving | 100 | 54.3 |

Out of 184 research participants, nearly one third (31.5%) of the participants consumed fruits seven days in a week. The majority (63.6%) of the research participants consumed half serving of fruits on one of those days. Similarly, majority (92.9%) of the participants consumed vegetables seven days in a typical week. Likewise, more than half (54.3%) of the research participants consumed half serving of vegetables on one of those days (Table 3).

Table 4: Life style related characteristics of the participants

| Characteristics | Numbers (n=184) | Percent |
|---|--------------------|---------|
| Consumption of any tobacco | | |
| Yes | 39 | 21.2 |
| No | 145 | 78.8 |
| Age at first tobacco consumption(n = 39) | | |
| ≤ 21 years | 20 | 51.3 |
| >21 years | 19 | 49.7 |
| Median 21 years, (IQR=12), Min10 years and Max 55 years | | |
| Frequency of tobacco (n = 39) | | |
| < 10 times | 33 | 84.6 |
| ≥10 times | 6 | 15.4 |
| Type of tobacco consumption (n = 39) | | |
| Smoked tobacco | 10 | 25.6 |
| Smokeless tobacco | 24 | 61.5 |
| Both | 5 | 12.8 |
| Plan for tobacco quitting (n = 39) | | |
| Within one month | 2 | 5.1 |
| Within in 6 months | 9 | 23.1 |
| Any time in the future or not et al | 28 | 71.8 |
| Status of alcohol consumption | | |
| Yes | 26 | 14.1 |
| No | 158 | 85.9 |
| Daily consumption of alcohol (n=26) | | |
| Yes | 6 | 23.1 |
| No | 20 | 76.9 |

Out of 184 research participants (21.2%) consumed tobacco. Among those who had the habit of consumption of tobacco majority (84.6%) had used tobacco less than ten times of day, similarly, 61.5% of the research participants had consumed smokeless tobacco whereas 25.6% had consumed smoke tobacco and remaining 12.8% had consumed both forms of tobacco. More than two-thirds (71.8%) of the research participants had the plan to quit tobacco in near future.

Twenty-six percent of the research participants had the habit of drinking alcohol and among those who drink only 23.1% had consumed alcohol daily. Majority (46.2%) of the research participants had the habit of drinking alcohol more than four times per month followed by 2-3 times 23.1%, 1 times 19.2%, 11.5% and remaining 3-4 times (Table 4).

Table 5: Status of physical activity of participants

| Characteristics | Number (n=184) | Percent |
|---|----------------|---------|
| Regular Exercise | | |
| No | 64 | 25 |
| Yes | 120 | 75 |
| No. of day exercise per week (n=120) | | |
| ≤ 4 days | 41 | 34.2 |
| >4 days | 79 | 65.8 |
| The time duration of exercise per day (n=120) | | |
| ≤ 30 minutes per day | 63 | 52.5 |
| > 30 minutes per day | 57 | 47.5 |
| Median30 (IQR30) =Min10 and Max 120 | | |

Three fourth of the research participants had done regular exercise. Among then 65.8% had done exercise more than 4 days per week and more than half (52.5%) research participants did exercise for 30 minutes or less. The median time for exercise was 30 minutes per day (Table 5).

Table 6: Distribution of anthropometric measurements of the participants

| Characteristics | Number (n= 184) | Percent |
|--|-----------------|---------|
| BMI | | |
| Under weight (<18.5 BMI) | 4 | 2.2 |
| Normal (18.5-24.99 BMI) | 90 | 48.9 |
| Overweight (25-29.99 BMI) | 65 | 35.3 |
| Obese (>30 BMI) | 25 | 13.6 |
| Median 24.93, (IQR=4.84), Min 16.4 and Max 46.64 | | |

The majority (48.9%) of the research participants had normal BMI followed by overweight 35.3%, obese 13.6% and remaining were underweight (Table 6).

Table 7: Disease-related information of the respondents

| Characteristics | Number (n=184) | Percent |
|---|----------------|---------|
| Duration of DM | | |
| ≤5 years | 103 | 56 |
| > 5 years | 81 | 44 |
| Presence of any complication due to diabetes | | |
| Yes | 109 | 59.2 |
| No | 75 | 40.8 |
| Presence of specific co-morbidities (n=109) | | |
| Hypertension | 52 | 47.7 |
| Eye problems | 19 | 17.4 |
| Heart disease | 18 | 16.5 |
| Nephropathy | 5 | 4.6 |
| Others (Thyroid , arthritis) | 15 | 13.8 |
| DM treatment cost/month (NRs.) (n=173) | | |
| ≤1000 | 90 | 52 |
| > 1000 | 83 | 48 |
| Median 1000, (IQR=1400), Min 100 and Max 8000 | | |
| Presence of diabetes in other family (n=184) | | |
| Yes | 62 | 33.7 |
| No | 122 | 66.3 |
| Suffer from diabetes in family (n=62) | | |
| Grandmother | 3 | 4.8 |
| Grandfather | 5 | 8.1 |
| Mother | 13 | 21 |
| Father | 20 | 32.3 |
| Brothers | 18 | 29 |
| Sisters | 3 | 4.8 |
| Seriousness in illness (n=184) | | |
| Yes | 68 | 37 |
| No | 116 | 63 |

Nearly half 44% of research participants were suffering from Diabetic for more than five years. It was found that 59.2% of the research participants had complication of Diabetic. Among them with complication, majority (47.7%) of the research participants had co-morbidity of hypertension Out of 173 research participants 52% expands less or equal to 1000 rupees and remaining expands more than 1000 rupees. The median expense was 1000 rupees (Min 100 and Max 8000). Thirty-seven percent of the research participants had a serious illness. One-third of the research participants had another diabetic patient in their house. Among those majority of the research, patient had a father as a diabetic patient followed by brother 27%, mother 21%, grandfather 8.1%, grandmother 4.8% and sister 4.8% (Table 7).

Table 8: Descriptive statistics of a transformed score of QoL

| Quality of life | n=184 | Mean | Std. Deviation |
|----------------------|-------|-------|----------------|
| Energy and mobility | 184 | 46.69 | 17.3 |
| Diabetes and control | 184 | 40.32 | 17.3 |
| Anxiety and worries | 184 | 46.95 | 21.14 |
| Social overload | 184 | 44.08 | 21.46 |
| Sexual behavior | 184 | 44.20 | 27.03 |

The highest mean score was found in anxiety and worries dimension (Mean 46.95±21.14 SD), followed by energy and mobility dimension (mean 46.69±17.3SD) and lowest diabetes and control dimension (Mean 40.32±17.3SD) (Table 8).

Table 9: Categories of QoL based on liner transformed of global quality of life score

| Quality of life | Number (n=184) | Percent |
|-----------------|----------------|---------|
| Bad QoL | 57 | 31 |
| Good QoL | 127 | 69 |

Majority (69%) of the research participants had a good quality of life on the basis of global quality of life score and remaining had bad quality of life (Table 9).

Table 10: Association between socio-demographic characteristics and QoL

| Characteristics | Quality of life | | Chi-Square | Df | p-value |
|-----------------|-----------------|---------------|------------|----|---------|
| | Poor QoL n(%) | Good QoL n(%) | | | |
| Sex | | | | | |
| Male | 26(26.3) | 73(73.7) | 2.2 | 1 | 0.1 |
| Female | 31(36.47) | 54 (63.53) | | | |
| Age | | | | | |
| ≤56 years | 33(33.3) | 66(66.7) | 0.6 | 1 | 0.5 |
| > 56 years | 24(28.2) | 61(71.8) | | | |
| Marital status | | | | | |
| Married | 45(28.50) | 113(71.5) | 3.3 | 1 | 0.07 |
| Others | 12(46.2) | 14(53.8) | | | |
| Education | | | | | |
| Illiterate | 15(44.1) | 19(55.9) | 3.4 | 1 | 0.7 |
| Literate | 42(28.0) | 108(72.0) | | | |
| Family types | | | | | |
| Nuclear | 31(41.9) | 43(58.1) | 6.9 | 1 | 0.009* |
| Joint family | 26(23.6) | 84(76.4) | | | |
| Family size | | | | | |
| ≤ 5 members | 40(32.8) | 82(67.2) | 0.6 | 1 | 0.5 |
| >5 members | 17(27.4) | 45(72.6) | | | |
| Religion | | | | | |
| Hindu | 52(32.70) | 107(67.3) | 1.6 | 1 | 0.2 |
| Others | 5(20.0) | 20(80.0) | | | |
| Ethnicity | | | | | |
| Bhramin/Chhetri | 30(30.6) | 68(69.4) | .013 | | 0.909 |
| Others | 27(31.4) | 27(68.6) | | | |

*p-value significant at <0.05

Among the research participants, majority of the male and female had good QoL. It was found that there was no statistical association between sex and quality of life of the research participants ($\chi^2= 2.2$, $df=1$, $p=0.1$). Likewise, majority of the research participants with age group less than 56 and more than 56 years had a good quality of life. There was no significant association between the age of research participants and quality of life ($\chi^2= 0.55$, $df= 1$, $p=0.45$). There was no statistical association between marital status and quality of life ($\chi^2= 3.3$, $df=1$, $p=0.07$). There was no significant association between the education of research participants and quality of life ($\chi^2= 3.4$, $df= 1$, $p=0.66$). There was a significant association between family types of research participants and quality of life ($\chi^2= 6.9$, $df= 1$, $p=0.009$). There was no statistical association between family size and quality of life ($\chi^2= 0.6$, $df= 1$, $p=0.45$). There was no statistical association between religion and quality of life ($\chi^2= 1.6$, $df= 1$, $p=0.2$). Similarly, there was no significant association between ethnicity and quality of life ($\chi^2= 1.9$, $df=1$, $p=0.6$) (Table 10).

Table 11: Association between socio-economic characteristics and QoL

| Characteristics | Quality of life | | Chi-Square | df | p-value |
|----------------------------|-----------------|---------------|------------|----|---------|
| | Poor QoL n(%) | Good QoL n(%) | | | |
| Occupation | | | | | |
| Unemployment/ House makers | 31(49.2) | 32(50.8) | 14.9 | 1 | <.001* |
| Others occupation | 26(21.5) | 95(78.5) | | | |
| Respondent income (NRs) | | | | | |
| <25000 | 12(19.7) | 49(80.3) | 5.5 | 1 | 0.02* |
| ≥25000 | 45(36.6) | 78(63.4) | | | |
| IWI | | | | | |
| Lowest quintile | 10(27.8) | 26(72.2) | 12.6 | 4 | 0.013* |
| Second quintile | 8(22.9) | 27(77.1) | | | |
| Third quintile | 7(19.4) | 29(80.60) | | | |
| Fourth quintile | 5(22.7) | 17(77.3) | | | |
| Highest quintile | 27(49.1) | 28(50.9) | | | |

*p-value significant at <0.05

There was a statistically significant association between occupation and quality of life ($\chi^2= 14.9$, $df=1$, $p=<.0001$). Respondent income was statistically significantly associated with quality of life ($\chi^2= 5.5$, $df=1$, $p=<.02$). Similarly, there was statistically association between IWI and quality of life ($\chi^2= 12.6$, $df=4$, $p=<.013$) (Table 11).

Table 12: Association between lifestyle-related characteristics and QoL

| Characteristics | Quality of life | | Chi-Square | df | p-value |
|----------------------------|------------------|------------------|------------|----|---------|
| | Poor QoL n(%) | Good QoL n(%) | | | |
| Consumption of any tobacco | | | | | |
| Yes | 8(20.50) | 31(79.5) | 2.5 | 1 | 0.1 |
| No | 49(33.8) | 96(66.2) | | | |
| Age at first smoking | | | | | |
| ≤ 21 years | 3(15.0) | 17(85.0) | 2.679≠ | 1 | 0.102 |
| > 21 years | 5(26.3) | 14(73.7) | | | |
| Consumption of alcohol | | | | | |
| Yes | 7(26.9) | 19(73.1) | 0.2 | 1 | 0.6 |
| No | 50(31.6) | 108(68.4) | | | |

[≠]Fisher's Exact test

Among the research participants who consumed tobacco, majority of them have the high quality of life and the same with those who did not consume tobacco. Tobacco consumption ($\chi^2=2.5$, $df=1$, $p<0.1$) and consumption of alcohol ($\chi^2= 2.3$, $df=1$, $p<0.6$) were not significant associated with quality of life (Table 12).

Table 13: Association between physical activity of participants and QoL

| Characteristics | Quality of life | | Chi-Square | df | p-value |
|-----------------------------------|------------------|------------------|------------|----|---------|
| | Poor QoL n(%) | Good QoL n(%) | | | |
| No. days spend excises per weeks | | | | | |
| ≤4 days | 11(26.8) | 30(73.2) | 0.3 | 1 | 0.6 |
| > 4 days | 25(31.6) | 54(68.4) | | | |
| Time duration of exercise per day | | | | | |
| ≤ 30 minutes | 27(42.9) | 36(57.1) | 10.44 | 1 | 0.001* |
| > 30 minutes | 9(15.8) | 48(84.2) | | | |

*p-value significant at <0.05

Majority of the research participants who did exercise had a good quality of life. There is no statistically significant association between days spend in exercise per week and quality of life. However, the time duration of exercise per day was statistically associated with quality of life ($\chi^2= 10.44$, $df=1$, $p<0.001$) (Table 13).

Table 14: Association between weight of the participants and QoL

| Characteristics | Quality of life | | Chi-Square | Df | p-value |
|-----------------|------------------|------------------|------------|----|---------|
| | Poor QoL n(%) | Good QoL n(%) | | | |
| Weight | | | | | |
| Non overweight | 32(34.0) | 62(66.0) | 0.844 | 1 | 0.36 |
| Overweight | 25(27.8) | 65(72.2) | | | |

*p-value significant at <0.05

Majority of the participants had a good quality of life. There was no statistically significant association between the weight of participants and quality of life ($\chi^2= 0.844$, $df=1$, $p<0.36$) (Table 14).

Table 15: Association between disease condition of the participants and QoL

| Characteristics | Quality of life | | Chi-Square | df | p-value |
|--|------------------|------------------|------------|----|---------|
| | Poor QoL n(%) | Good QoL n(%) | | | |
| Duration of DM | | | | | |
| ≤ 5 years | 28(27.2) | 75(72.8) | 1.6 | 1 | 0.2 |
| > 5 years | 29(35.8) | 52(64.2) | | | |
| Presence Co-morbidity | | | | | |
| Hypertension | 15(28.8) | 37(71.2) | 0.55 | 2 | 0.973 |
| Eye problems | 6(31.6) | 13(68.4) | | | |
| Others (Thyroid, arthritis) | 11(28.9) | 27(71.1) | | | |
| Presence of DM in other family members | | | | | |
| Yes | 20(32.3) | 42(67.7) | 0.07 | 1 | 0.8 |
| No | 37(30.3) | 85(69.7) | | | |
| Seriousness in illness | | | | | |
| Yes | 29(42.6) | 39(57.4) | 6.9 | 1 | 0.009* |
| No | 28(24.1) | 88(75.9) | | | |

*p-value significant at <0.05

There was no significant association between duration of DM and QoL ($\chi^2= 1.6$, $df=1$, $p=0.2$). Similarly Majority of the research participants with (57.4%) and without (75.9%) serious illness had a good QoL. There was a significant association between seriousness in illness & QoL ($\chi^2= 6.9$, $df=1$, $p=0.009$) (Table 15).

Table 16: Influence of occupations, family types, IWI status on QoL

| Characteristics | Model -I* | | | Model -II** | | | Model -III** | | |
|----------------------------|-----------|-----------------|-------|-------------|------------------|-------|--------------|------------------|--------|
| | OR | 95% C.I. for OR | | AOR | 95% C.I. for AOR | | AOR | 95% C.I. for AOR | |
| | | Lower | Upper | | Lower | Upper | | Lower | Upper |
| Occupation of participants | | | | | | | | | |
| Unemployment/ House makers | Ref. | | | Ref. | | | Ref. | | |
| Others occupation | 0.283 | 0.146 | 0.545 | 0.291 | 0.149 | 0.568 | 0.251 | 0.123 | 0.513 |
| Family types | | | | | | | | | |
| Nuclear family | | | | Ref. | | | Ref. | | |
| Joint family | | | | 0.448 | 0.23 | 0.87 | 0.462 | 0.229 | 0.934 |
| IWI | | | | | | | | | |
| Lowest quintile | | | | | | | Ref. | | |
| Second quintile | | | | | | | 3.119 | 1.166 | 8.343 |
| Medium quintile | | | | | | | 3.993 | 1.418 | 11.238 |
| Fourth quintile | | | | | | | 4.397 | 1.533 | 12.61 |
| Highest quintile | | | | | | | 3.223 | 0.994 | 10.455 |

Model-I* Occupation of the participant and QoL, Model-II** Occupation of the participants, family types and QoL, Model-III*** Occupation of the participants, family types, IWI and QoL

There is reduction in odd ratio of occupation in third model. It shows that occupation of respondent is affected by the controlling variable; family type and IWI. The odd ratio of family type has increased in the third model. The analysis shows that in comparison to the respondents belonging to the nuclear family, respondents belonging to joint family (Table 16).

DISCUSSION

One of the most important findings in this study was only 23.4% of the respondents had an overall satisfactory/good knowledge regarding diabetes. This is a matter of concern because Nepal has around 8.4% type 2 diabetes mellitus prevalence but poor knowledge about their own health status and disease may be one of the barriers for healthful living. Further knowledge can serve as an important resource base for improving their own health and that of the society. It has been repeatedly and consistently stated that diabetes has detrimental effects on QOL. Diabetes has been stated to impair all dimensions of health.

In this study, most of the participants were in the 40-60 years age group and the mean age of the participants was 56±11SD which is similar to the other studies.^{14,15} Majority 53.8% of the participants were male and rest was female^{14,16} which is contrast to the findings of other studies.^{16,17} Majority 85.9 % of the participants was married. Others study also show that most of the married people are suffering from diabetes mellitus and obese with diabetes those who are currently married.^{16,18} Majority (86.4%) of the research participants were Hindus and others study also show that majority of participants were Hindus (Gyawali, 2015, Gautam, 2009).

In this study the highest number of respondents, 81.5% were literate and others study also show similar findings.^{17,19} More

than half (60.9%) of the research participants have not enrolled in social health insurance scheme another study reveal that (53.6%) did not have any health insurance.²⁰

This study showed that, patients' socio-demographic characteristics (patients' age, sex, family types, family size, religion, and ethnicity) were not significant on the knowledge level of types 2 DM patients. On the other hand, patients education had a significant association with diabetes knowledge levels. This result is similar to the KAP study of diabetes in Nepal, Bangladesh and UAE which stated that diabetes knowledge was significantly associated with the education.²¹⁻²³ The possible reason is that educated patients gave more concern on the information and can capture the information more than those of uneducated patients.

This study showed that, patients' socio-demographic characteristics (patients' age, sex, marital status, education status, family size, religion, and ethnicity) were not significant with QoL of types 2 DM patients, On the other hand, family types significantly association with QoL of types 2 DM patients.²⁴

Although occupation, income and IWI of participants was not significantly associated with level of diabetic knowledge but others studies shows that positive association between occupation, socioeconomic status and diabetes knowledge levels.²⁵ This study showed a positive association between occupations, respondents income (NRs./month) and IWI with QoL of types 2 DM patients which is similar with different studies conducted in Turkey and Colombia.^{26,27}

In this study, nearly one third (31.5%) of the participants consumed fruits seven days in a week. Similarly, majority (92.9%) of the participants consumed vegetables seven days in

a typical week. Majority 78.8% of the participants was currently non-smoker and among the smoker similarly, 61.5% of the research participants had consumed smokeless tobacco whereas 25.6% had consumed smoke tobacco and remaining 12.8% had consumed both forms of tobacco. 26 % percent of the research participants had the habit of drinking alcohol. A study conducted in Nepal among diabetic patients found that few respondents were smokers (5.7%) or consumed alcohol (8.3%) or any form of tobacco products (12.7%).²⁴ Another study conducted show that Substance abuse (alcohol and tobacco) was present among 41.8% of male and 8.9% of female respondents.¹⁴ A study in India found that of the study population 89% never smoked and 6% were past smokers.²⁸ In this study there was no significant association between vegetable intake, consumption of tobacco, consumption of alcohol, number of days spend excises per weeks between the quality of life. Although there was a significant association between intake of fruits, a time duration of exercise per week and quality of life among types 2 DM patients.

In this study majority (48.9%) of the research, participants had normal BMI followed by overweight 35.3%, obese 13.6% and remaining were underweight. A similar, study conducted in India body mass index (BMI) of all subjects and found that 46.2% of the male and 59.8% of the female respondents were either overweight or obese.¹⁴ Most of the diabetics were either overweight or obese.^{14,18} Study shows that there was no statistically significant between the weight of participants and quality of life. In contrast to this, a study conducted tertiary care hospitals in Delhi significant association between weight and QoL.²⁹

This study (44%) of research participants were suffering from Diabetic for more than five years. A study conducted in New York, India, Malaysia majority of the study shows that duration of the disease is more than 5 years.^{14,18,24} The study found that the longer duration of diabetes is no association with QoL.^{28,30} This study also found that there is no association between duration of diabetes and quality of life.

This study 59.2% of the research participants had the complication of Diabetic. Among them with complication, the majority (47.7%) of the research participants had co-morbidity of Hypertension followed by eye problem 17.4%, heart problem 16.5%, nephropathy 4.6% and remaining had others. Various study revel that most of the participants were suffering from one or more micro and/or macrovascular complications of diabetes mellitus. Hypertension^{13,14}, retinopathy, neuropathy, cardiac complication, nephropathy (Letchuman, 2010), dental caries.¹³ According to this study, no association found between co-morbidity and QoL. But the complication of disease was found to be associated with quality of life.

In this study, 37% of the research participants had the seriousness of the illness. According to this study, there was significant association between the seriousness of illness and quality of life ($\chi^2= 6.9$, $df=1$, $p=0.009$).

This study shows that 59.2% of research participants had another diabetic patient in their house. Among those majority of the research, the patient had a father as a diabetic patient followed by brother 27%, mother 21%, grandfather 8.1%, grandmother 4.8%, and sister 4.8%. a study conducted in Nepal found that 76% had no history of diabetes.¹⁹

In this study, 76.6% of the research participants had poor knowledge on diabetes and remaining had satisfactory or good knowledge on diabetes. A study conducted in India result shows that only 24% of the respondents had an overall good knowledge regarding diabetes.²⁵ Another study in India different level of knowledge was as follows: 21.3 % had highly insufficient, 22.5 % had insufficient, 23 % had sufficient, 20.9 % had satisfactory and 12.3 % had highly satisfactory knowledge.²¹ Another study in Pakistan shows that 54% had poor knowledge about diabetes, 34% had a fair knowledge about diabetes while only 13% had good knowledge.¹⁵

In this study the highest mean score was found in anxiety and worries dimension (Mean \pm SD 446.95 \pm 21.14), followed by energy and mobility dimension (Mean \pm SD 46.69 \pm 17.3) and lowest diabetes and control dimension (Mean \pm SD40.32 \pm 17.3). In this study the had a majority (69%) of the research, participants good quality of life on the basis of global quality of life score and reaming had a bad quality of life. A study conducted in Nepal shows that in physical and mental health majority 56% of respondents had obtained a score above 50 and 42% of respondents had obtained score below 50 while only 2% had obtained score 50 in mental health.¹⁹ Another study in India shows that 68 % of participants had a good quality life and 32 % of participants had a poor quality of life.²⁸

CONCLUSION

More than two-thirds of the total participants had better Quality of Life. There was a significant association between family types of participants and their quality of life. There was a significant association between socio-economic characteristics (Occupation, respondent income, IWI) and quality of life of the type 2 DM patients. Emphasis should be given for improving QOL of diabetic patients involving in regular physical activities, improving literacy and social support system, avoidance of alcohol and tobacco use. Further quantitative studies in large sample and qualitative studies should be conducted for further interpretation of this issue.

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