

Quality of Life among Diabetic Patients - A Review

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1. Introduction

Diabetes is an important public health problem, one of four priority non communicable diseases (NCDs) targeted for action by world leaders. Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades.¹ Diabetes is on the rise. No longer a disease of predominantly rich nations, the prevalence of diabetes is steadily increasing everywhere, most markedly in the world's middle-income countries.²

The starting point for living well with diabetes is an early diagnosis – the longer a person lives with undiagnosed and untreated diabetes, the worse their health outcomes are likely to be. For those who are diagnosed with diabetes, a series of cost-effective interventions can improve their outcomes, regardless of what type of diabetes they may have. These interventions include blood glucose control, through a combination of diet, physical activity and, if necessary, medication; control of blood pressure and lipids to reduce cardiovascular risk and other complications; and regular screening for damage to the eyes, kidneys and feet, to facilitate early treatment. Diabetes management can be strengthened through the use of standards and protocols.¹

Uncontrolled diabetes causes life threatening complications and decreases the quality of life. Diabetic retinopathy is a leading cause of blindness and visual disability. Findings, from different studies suggest that after 15 years of diabetes, approximately 2% of people become blind, while about 10% develop severe visual handicap. Glycemic control can delay the onset and progression of diabetic retinopathy. Early detection and treatment can prevent blindness related to retinopathy. Diabetes is one of the leading causes of kidney failure, and early detection is an important means of prevention. Heart disease accounts for approximately 50% of all deaths among people with diabetes in industrialized countries. Risk factors for heart disease in people with diabetes include smoking, high blood pressure, high serum cholesterol, and obesity. Management of these conditions may delay or prevent heart disease in people with diabetes. Diabetic neuropathy is probably the most common complication of diabetes. Studies suggest that up to 50% of people with diabetes are affectedly diabetic retinopathy which leads to sensory loss and damage to the limbs. It is also a major cause of impotence in diabetic men. Diabetic foot disease, often leads to ulceration and subsequent limb amputation. Diabetes and its management causes much financial problems to the affected in developing countries and disadvantaged minorities.²

2. Review

A cross-sectional study was done in All India Institute of Medical Sciences, Patna among 85 diabetic patients and 85 age- and sex-matched normal comparison group. The World Health Organization Quality of Life Questionnaire—short version (WHO QoL-BREF) was used to assess QoL. The mean age was 49.5 and 48.8 years for diabetic persons and non diabetic persons respectively, while 50.6% in diabetic cases and 25.9% in non diabetic cases had history of smoking. History of regular alcohol intake (current and past) was present in 38.8% diabetic persons while only 20% in non diabetic persons. Regular exercise and physical activities were reported in only 32.9% of diabetic persons while it was present in 48.2% of non diabetic persons. Family history of diabetes was present in 35.3% of diabetic persons but only in 31.8% of non diabetic persons. Most of the diabetic cases (56.5%) rate their QoL as an average. Only 32.9% of diabetic cases had rated their overall QoL as good, while 52.9% non diabetic persons had rated their QoL as good, and this relation was statistically significant. About 28.2% were not satisfied with their general health, while only 14.1% non diabetic persons were not satisfied. The QoL of diabetic persons was poor in all the domains (physical, psychological, social, and environmental) in comparison with non-diabetic persons.. About 75.3% non diabetic persons showed good QoL in physical domain, while only 55.3% diabetic persons showed good QoL in physical domain, and this association was statistically significant. The mean QOL-BREF instrument score, indicating the QoL of the patients, was 57.80. Domain-wise, 55% of the patients revealed good physical QoL, 47% good psychological QoL, 55% good social QoL, and 45% good environmental QoL.⁵

Patel B et al in their study assessed QOL in type-2 diabetics receiving drug therapy using WHOQOL-BREF scale and Appraisal of Diabetes Scale (ADS) and compared QOL between controlled and uncontrolled diabetics. Patients diagnosed with type-2 diabetes and on drug therapy for at least 1 month were included in the study. Total 114 patients were enrolled with mean (\pm SD) age and duration of diabetes of 56.8 ± 10.5 and 8.3 ± 9.4 years respectively. Mean ADS and total WHOQOL-BREF scores for uncontrolled and controlled diabetics were significantly different ($P < 0.001$ and 0.042 for ADS and WHOQOL-BREF respectively). Age, duration of diabetes, number of symptoms, number of co-morbidities and number of non-pharmacological measures were significantly correlated with Health Related QOL (HRQOL) scores ($P < 0.05$). Total scores of both the scales were significantly correlated ($P < 0.01$). QOL was significantly more impaired in patients with uncontrolled diabetics than controlled diabetics. Age, duration of diabetes, number of symptoms, number of co-morbid illness,

blood glucose level and number of non-pharmacological measures may be predictors of QOL for type-2 diabetics.⁶

A study was conducted in Sydney to examine whether a type 2 diabetes mellitus (T2DM) diagnosis increases the odds of psychological distress, a worsening in overall quality of life, and a potential reduction in social contacts. Longitudinal data were obtained from the 45 and Up Study (baseline 2006–2008; 3.4±0.95years follow-up time). Results showed moderate increase in the odds of psychological distress associated with T2DM diagnosis (OR=1.30) was not statistically significant (95% CI 0.75 to 2.25). A T2DM diagnosis was associated with a fivefold increase in the odds of a participant reporting that their quality of life had become significantly poorer (OR 5.49, 95% CI 1.26 to 23.88). T2DM diagnosis was also associated with a reduction in times spent with friends and family (RR 0.88, 95% CI 0.82 to 0.95), contacts by telephone (RR 0.95, 95% CI 0.87 to 1.02), attendance at social clubs or religious groups (RR 0.82, 95% CI 0.73 to 0.91), and the number of people nearby but outside the home that participants felt they could rely on (RR 0.92, 95% CI 0.86 to 0.98). Type 2 DM diagnosis can have important impacts on quality of life and on social contacts, which may have negative impacts on mental health and T2DM management in the longer term.⁷

Mustapha W et al. conducted a study among 200 diabetic patients to examine the effects of diabetes, its effective management and its impact on the Lebanese community of Sydney. Management of diabetes was measured using the Patient Activation Measurement (PAM) scale, while quality of life (QOL) was measured by using the CES-D scale. The results showed the mean age of participants to be 48 years; the majority were male (78%) and married (94%). More than a third had formal education and less than half were employed at the time of the study. Of the components of QOL, over a third of the participants reported impeded mobility, less than half (48.5%) struggled with personal care and hygiene, and 74% experienced difficulties at work. Moreover, diabetes incapacitated 80% of those attempting to do household chores; more than 75% experienced pain and discomfort while 73.5% endured bouts of anxiety and depression due to diabetes. The t-test results indicated that males were more likely to follow a medical plan than their female counterparts, while ANOVA showed that the middle-aged participants were significantly more confident at following their medication plans compared to the young and older cohorts, both results were significant at $p < 0.05$. The results of this study suggest that diabetes affects both the physical and emotional health of the participants of the study and that individuals with diabetes may experience considerable anxiety and stress as they attempt to manage their disease. Effective and focused education tailored to women, as well as to younger and older cohorts is needed to improve their self-care and understanding of treatment regimes, hence enhancing their quality of life through effective management of diabetes.⁸

A cross sectional study was done to assess the Quality of life (QoL) among diabetic patients with respect to anthropometry and blood investigations and to assess the influence of risk factors on Quality of Life. Quality of life was assessed by WHOQOL-BREF. A total of 180 patients (90 males and 90 females) were included in the study. The

mean age of males was 59.56 ± 9.64 and females were 60.90 ± 7.51 . Females had higher levels of cholesterol and LDL than males ($p < 0.01$) and no difference was observed with other lipid. All the four domains of QoL had a mean value greater than 50 suggesting decreased QoL among diabetics. Females had higher mean scores of physical, psychological, social and environmental domains compared to males and the difference was statistically significant ($p < 0.01$). Correlation between Quality of life domains and other continuous variables showed significant positive correlation with age for physical, psychological, social and environmental domains ($r = 0.864, 0.396, 0.549, 0.420$ respectively and $p < 0.001$). Cholesterol, LDL, FBS, PPBS and HbA1c were positively correlated at a significant level with respect to physical domain. Cholesterol, LDL, FBS and HbA1c were positively correlated to social domain and only FBS was positively correlated with environmental domain ($r = 0.173, p = 0.02$). Logistic regression showed that increase in age and HbA1c acts as independent factors to assess the Quality of life. There was 10.22 odds for physical domain and 3.52 odds for psychological domain with increase in age and 3.33 odds for physical domain and 3.12 odds for social domain with increase in HbA1c. There was no significance with other variables. Quality of life among diabetics needs improvement with proper treatment regimens ensuring good glycemic control.⁹

A cross sectional study was conducted in Karnataka among 100 patients with diabetes, hypertension or both, who came to primary care clinics, to assess the quality of life among patients with diabetes and hypertension patients. An interview was conducted using WHO BREF questionnaire to assess the quality of life among them. About a quarter (25%) of the patients reported a good quality of life whereas 48% rated their quality of life as poor. About one third (34%) of the patients were satisfied with their health status and almost the same proportion (29%) were dissatisfied. The quality of life and the overall health perception improved significantly with higher income ($r = -0.28$ for QoL, $r = 0.32$ for health satisfaction) and worsened with age ($r = -0.22$ for QoL, $r = 0.40$ for health satisfaction) Physical, psychosocial, social and environmental domains of the quality of life questionnaire along with overall quality of life and health status satisfaction were assessed and compared between males and females. There was no significant difference in any of the domains or overall all quality of life among males and females. Among the four domains, social domain had the highest mean score and psychosocial domain had the worst scores as compared to others. This difference of scores was statistically significant. The factors age, family income, marital status, education level and duration of disease were analysed with quality of life of the patients using univariate logistic regression. Only higher age was found to be significantly associated with poor quality of life of the patients. (p value = 0.05) Low family income ($p = 0.69$), marital status ($p = .88$), education levels ($p = .11$) and longer duration of disease ($p = .56$) did not have a significant association with quality of life. Psychosocial domain had a significantly lower score than other domains. The overall quality of life as well as the individual domain scores was comparable ($p = 0.68$) among diabetics (2.8 ± 0.91), hypertensive (2.7 ± 0.92) or having both (2.6 ± 0.91). Most of the participants irrespective of the disease had an average

to poor quality of life. The social aspect was least affected and the psychosocial aspect was the most adversely affected domain in the quality of life of the patients.¹⁰

A cross-sectional study was conducted among 140 type 2 diabetes mellitus patients, attending the diabetic clinic of a Tertiary care centre in Rajasthan, North India. Patients with type 2 diabetes mellitus between the age group of 25-75 were included in the study and data was collected using pre-designed questionnaire. The QoL of patients were assessed using SF 36V2 questionnaire along with the socio-demographic profile. Results showed that the mean age of subjects were 56±11.6 years and the mean duration of diabetes mellitus was 10.9±8.3 years. 47.9% of patients were overweight and 20.7% were obese. The mean HbA1c was 8.3±1.5%. The patients with type 2 diabetes had significantly lower scores in all domains of QoL. Males had higher QoL scores than females and the difference was found to be statistically significant ($p < 0.05$). Out of the 8 domains in the SF 36V2 questionnaire, the most affected domains were role physical and role emotional. The domains which were least affected were vitality and bodily pain. Males had higher QoL score as compared to females and this difference was found to be statistically significant ($p < 0.05$). This study finding indicates that QoL of patients with type 2 diabetes mellitus is relatively poor. Diabetes mellitus significantly affects the QoL especially in females. Therefore, much attention must be paid to identify and implement measures for achieving better management of diabetes mellitus and ultimately improving the QoL of patients with type 2 diabetes mellitus.¹¹

A cross-sectional study was done in Karnataka among 200 patients admitted in a tertiary care hospital to assess the quality of life with the Quality of Life Instrument for Indian Diabetes Patients questionnaire. Of the 200 patients of type 2 diabetes mellitus interviewed, 105 were males and 95 were females. Majority of the patients were in the age-group of 51-60 years. About 73% were diagnosed with diabetes and on treatment since more than a year. Family history of diabetes was present in 56% and 65% of the male diabetics were smokers and 52% consumed alcohol regularly. The mean quality of life score was found to be 107. The mean likert scores were 3.29 for role limitation due to physical health, 3.32 for physical endurance, 2.35 for general health, 3.25 for treatment satisfaction, 2.92 for symptom botherness, 3.27 for financial worries, 3.30 for emotional / mental health and 2.95 for diet satisfaction. Quality of life was found to depreciate with increasing age, years lived with diabetes and lower income class. Quality of life assessment and improvement is essential for appropriate diabetes management.¹²

A cross sectional study was done among 139 diabetic patients on oral hypoglycaemic agents to assess the perceived Health-related quality of life of diabetic patients not on insulin therapy using the WHO QoL-Bref. The study population was predominantly female (61%), majority were 40-60yrs, having had diabetes for less than 5yrs, 75% having more than one complication. Most (75%) of the study participants were poorly controlled with HbA1c mean score of 8.04%. Majority of the study participants (84%) achieved a good score on the HRQoL scale using the WHO QoL-Bref

tool. The determinants of HRQoL in the study were: age of study participants, duration of diabetes, presence of complications and income related factors. All the domains were affected with physical and psychological most affected. There was association between age and HRQoL in the social domain where the older the patient the worse the score with a p-value of 0.037. The correlation between the HRQoL and level of income was found to be significant especially in the psychological domain (p-value of 0.023) and in the social domain (p-value of 0.029). There was association between the overall HRQoL and mode of health care funding with patients with private insurance scoring highest, then self paying, government assistance and last patients on family support with a p-value of 0.011. The domains affected were psychological (p-value 0.006) and environmental (p-value of 0.04). There was significant association between employment status and HRQoL. Having a job improved the scores in physical (p-value of 0.013) and social domains (p-value of 0.020). There was a significant association between HRQoL and duration of diabetes as evident in the physical domain where the p value was 0.007. A significant association between HRQoL and duration of diabetes was seen as evidenced in the physical domain where the p-value was 0.007. There was significant association between HRQoL and number of complications where as the number of complications increased the worse the HRQoL score which was evidenced in physical domain (p-value of <0.0001) and psychological domain (p-value of 0.041) which directly impacted on the overall total score (p-value of 0.041). The results of this study show that diabetes affected HRQoL of participants.¹³

A single centre, cross-sectional study was conducted among patients with hypertension and diabetes mellitus in Patiala, Punjab. Patients suffering from hypertension were recruited in study and were divided into two groups, Group 1 consisted of patient suffering from hypertension and diabetes mellitus whereas Group 2 consisted of patients suffering from hypertension. Patients were assessed on Short form health Survey (SF-36) and the WHOQOL – Bref scores. A total of 41 patients participated in the study, 21 patients suffering from hypertension and diabetes were included in Group 1 and 20 patients suffering for hypertension only were included in Group 2. Both the groups were comparable at baseline except for random blood sugar which was significantly higher ($p < 0.05$ in patients in Group1 (180.35±65.64 vs. 121.25±13.96) as compared to group 2. The patients in Group 1 were of lower age group (55.65±9.79 vs. 58.3±12.82) and had slightly higher systolic and diastolic blood pressure though it was not statistically significant. *SF-36 Scores:* There were significantly ($p < 0.05$) worse pain scores in patients in Group 1 (52.03±33.6 vs. 75±22.24) as compared to Group 2. The Group1 had better aspect of physical functioning (50±20.46 vs. 47.5±29.0), role limitation due to physical health (31.25±40.54 vs. 20±35.91), role limitation due to emotional problem (46.67±48.85 vs. 35±46.49), energy/fatigue (37.5±22.09 vs. 34±19.97) as compared to Group2. Whereas, Group2 had better aspect of social functioning (73.75±25.62 vs. 60±28.56) and general health (46.75±21.54 vs. 43.25±15.58) as compared to Group 1. The emotional wellbeing score was comparable in both groups (51.2±22.72 and 51.4±15.86). *WHO-QOL Bref Scores:* Group 1 had

higher scores in all the 4 domains that is, physical health (49.85±14.47 vs. 48.95±18.81), psychological (51.65±16.26 vs. 47.85±14.28), social relationship (69.6±13.2 vs. 64.7±16.62) and environment (68.2±14.03 vs. 62.95±16.39) but it was not statistically significant. It has been observed that SF-36 Score has significant ($p < 0.05$) correlation with physical health, psychological and social relationship in both groups.¹⁴

A descriptive survey was conducted to assess the quality of life among Type II diabetes mellitus in Mangalore, India. The Quality of Life Instrument for Indian Diabetes Patients (QOLID) was used to collect the data. The data were collected from 100 type II diabetes mellitus patients. Majority of the subjects (57%) had moderate quality of life, followed by good quality of life for 38%, very good quality of life for 4%, and only 1% of the subject had poor quality of life. The mean percentage of quality of life was 54.8%, which indicates that there was moderate quality of life for type II diabetes mellitus patients. There was significant association between the quality of life and demographic variables like type of family occupation, monthly income, and duration of illness. The findings of the study highlighted the significance of patient education to achieve a better quality of life.¹⁵

A facility-based cross-sectional study assessed the QoL of patients attending the diabetic clinic using WHO QoL BREF instrument. The QoL was analyzed domain-wise and various socio-demographic factors affecting the QoL were studied. The mean total score of the QoL scale was 58.05 (95% CI, 22.18–93.88). Domain-wise, 63% had good physical, 69% had good psychological, 27% had good social and 85% had good environmental QoL scores. Majority of the patients (68%) had an overall good QoL. On analysis of the perceived QoL questions, 72% had good perceived QoL. Males, currently married and those with BMI more than 25 had a statistically significant better QoL compared to their counterparts. The scores were as expected for any person in a community with low education, low standards of living and poor socioeconomic status except the high percentage of the study population (85%) that scored well in environmental QoL. The study concluded that diabetes impair the QoL of patients but not to a great extent.¹⁶

A study was done in Saudi Arabia to assess QOL and to identify the possible risk factors associated with lower QOL among four hundred diabetic patients. Audit of Diabetes-Dependent QOL (ADDQOL) was used to assess QOL. Most patients were with type 2 diabetes, most (56%) of them were with duration of diabetes between 10 - 20 years and half of them (50.5%), were treated with oral hypoglycaemic agents. In almost half of cases, diabetes control was favourable, being either excellent (25%) or good (25.5%). Complications of diabetes were mainly retinopathy (42.5%) or neuropathy (28.3%). Patients with type 2 diabetes had significantly worse QOL than those with type 1 diabetes ($p = 0.029$). Most diabetic patients (78.7%) had negative (*i.e.*, unfavorable) ADDQOL scores. Diabetic patients' age, education and occupation were not significantly associated with their QOL. Female patients had significantly worse QOL than male patients ($p = 0.026$). Married patients had significantly worse QOL compared with non-married

patients ($p = 0.012$). Patients with type 2 diabetes had significantly worse QOL than those with type 1 diabetes ($p = 0.029$). The degree of diabetes control was significantly associated with QOL score ($p < 0.001$). The worst QOL was identified among poorly controlled diabetes while the best was among patients with excellent control. QOL of diabetics was less among those who had diabetes complications, *i.e.*, neuropathy ($p = 0.03$), retinopathy ($p < 0.001$), and diabetic foot ($p = 0.031$). However, the difference was not significant to those with nephropathy. Oral hypoglycemic treatment was associated with relatively better QOL compared with those who were on insulin treatment or those with combined oral hypoglycemic and insulin. In this study personal characteristics associated with worse QOL among diabetics included female gender and being married. Disease characteristics associated with worse QOL include being a type 2 diabetic and those with uncontrolled diabetes. Main complications associated with worse QOL among diabetics were retinopathy, diabetic foot and neuropathy.¹⁷

Mehta Z et al conducted the “United Kingdom Prospective Diabetes Study (UKPDS)” to determine the effects on quality of life (QOL) of therapies for improving blood glucose control and for improving blood pressure (BP) control, diabetic complications, and hypoglycemic episodes in patients with type 2 DM. Two cross-sectional studies were performed on patients enrolled in randomized controlled trials of an intensive blood glucose control policy compared with a conventional blood glucose control policy, and a tight BP control policy compared with a less tight BP control policy. Subjects' QOL was assessed before or at the time of randomization and from 6 months to 6 years after randomization. Two cross-sectional samples of type 2 diabetic patients were randomized to therapies for blood glucose control: 1) 2,431 patients, mean age 60, duration from randomization 8.0 years, completed a “specific” questionnaire covering four aspects of QOL, and 2) 3,104 patients, mean age 62, duration from randomization 11 years, completed a “generic” QOL measure. Of these samples, 628 and 747 patients, respectively, were also randomized to therapies for BP control. Sample of 122 nondiabetic control subjects, average age 62, were also given the specific questionnaire. Also undertaken was a longitudinal study with a sample of 374 type 2 diabetic patients randomized to either intensive or conventional blood glucose policies, mean age at randomization 52, were given the specific questionnaire. Sample sizes at 6 months and 1, 2, 3, 4, 5, and 6 years after randomization were 322, 307, 280, 253, 225, 163, and 184, respectively. The specific questionnaire assessed specific domains of QOL, including mood disturbance (Profile of Mood State), cognitive mistakes (Cognitive Failures Questionnaire), symptoms, and work satisfaction; the generic questionnaire (EQ5D) assessed general health. Both questionnaires were self-administered. The cross-sectional studies showed that allocated therapies were neutral in effect, with neither improvement nor deterioration in QOL scores for mood, cognitive mistakes, symptoms, work satisfaction, or general health. The longitudinal study also showed no difference in QOL scores for the specific domains assessed, other than showing marginally more symptoms in patients allocated to conventional than to intensive policy. In the cross-sectional studies, patients who had had a macro vascular complication

in the last year had worse general health, as measured by the generic questionnaire, than those without complications, with scale scores median 60 and 78 respectively ($P = 0.0006$) and tariff scores median 0.73 and 0.83 respectively ($P = 0.0012$); more problems with mobility, 64 and 36%, respectively ($P = 0.0001$); and more problems with usual activities, 48 and 28% respectively ($P = 0.0023$). As measured by the specific questionnaire, they also showed reduced vigor ($P = 0.0077$). Patients who had had a microvascular complication in the last year reported more tension ($P = 0.0082$) and total mood disturbance ($P = 0.0054$), as measured by the specific questionnaire than patients without complications. Patients treated with insulin who had had two or more hypoglycemic episodes during the previous year reported more tension ($P = 0.0023$), more overall mood disturbance ($P = 0.0009$), and less work satisfaction ($P = 0.0042$), as measured by the specific questionnaire, than those with no hypoglycemic attacks, after adjusting for age, duration from randomisation, systolic BP, HbA1c, and gender in a multivariate polychotomous regression. In patients with type 2 diabetes, complications of the disease affected QOL, whereas therapeutic policies shown to reduce the risk of complications had no effect on QOL.¹⁸

Schram M T et al conducted a systematic literature search using MEDLINE, Psycinfo, Social SciSearch, SciSearch and EMBASE from January 1990 until September 2007. Studies that compared the quality of life between diabetic individuals with and without depressive symptoms were identified. A total of twenty studies were identified, including eighteen cross-sectional and two longitudinal studies. Quality of life was measured as generic, diabetes-specific and domain-specific quality of life. The four studies that used more extensive versions of the Short Form Health Survey (SF-20 to SF-36) allowed a comparison based on the subscales of the Short Form; physical function, role function, overall health, social function, pain and mental health. This comparison showed that depressive symptoms were most strongly associated with role function and social function. Its associations with physical function, overall health and mental health were moderate, while pain was only mild to moderately lower among individuals with both depressive symptoms and diabetes. Four studies investigated the association of depressive symptoms with diabetes-specific quality of life. These studies show a moderate to severely worse diabetes-specific quality of life in the presence of depressive symptoms. Individuals with both diabetes and depressive symptoms were less satisfied with their treatment, experienced a greater impact of the treatment, worried more about the impact of diabetes in the future and about the social and vocational impact of diabetes. Six studies evaluated the quality of life by use of domain-specific questionnaires, mainly Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) questionnaires. Several studies have shown that both ADL and IADL are more impaired in diabetic individuals with depressive symptoms as compared to individuals with diabetes alone. Problems with ADL activities were reported more often by diabetic individuals with depressive symptoms as compared to individuals with diabetes alone. The difference in the prevalence of ADL problems between diabetic individuals with and without depressive symptoms

was mild to moderate, ranging from 4.2 to 16.9. IADL was severely worse in individuals with diabetes and depressive symptoms. The difference in prevalence of IADL problems between diabetic individuals with and without depressive symptoms was moderate; ranging from 13.3 to 27.6%. Functional limitations appeared to be closely related to IADL. Individuals with both depression and diabetes reported 20% more functional limitations than individuals with diabetes alone. Another study also reported on cognitive problems and self-reported health and showed that the individuals with both depression and diabetes more frequently had cognitive problems (difference 20%) and their self-reported health was 13% lower as compared to individuals with diabetes alone. All studies reported a negative association between depressive symptoms and at least one aspect of quality of life in people with diabetes. Diabetic individuals with depressive symptoms also had a severely lower diabetes-specific quality of life. Generic and domain-specific quality of life was found to be mild to moderately lower in the presence of depressive symptoms. Therefore, increased awareness and monitoring for depression is needed within different diabetes care settings¹⁸

A cross-sectional study was done in Sweden to compare different aspects of health, QoL, and quality of care (QoC) between men and women with diabetes as a basis for planning and managing diabetes care. Data were collected about self-rated health (SRH), QoL, QoC, diabetes-related worries, occupational status, physical activity level, living arrangements, and educational background. Glycosylated hemoglobin (HbA1c) values were obtained from medical records. In the younger age group (20-30 years), 49 men and 74 women responded to the questionnaire; in the middle-aged group (50-60 years) 120 men and 93 women responded. Middle-aged women rated their mental well-being and QoL as worse compared with men ($P < 0.001$ and $P < 0.05$, respectively). In both age groups, women reported more diabetes-related worries and less ability to cope ($P < 0.05$ for the younger age group and $P < 0.001$ for the middle-aged group for both variables), thus the differences were more marked for middle-aged women. Although there were no gender differences in metabolic control, middle-aged women reported less satisfaction with diabetes care ($P < 0.001$). Higher HbA1c was related to worse SRH in both men and women when analyzing the age groups together ($P < 0.05$). This association was most prominent in young women, in whom having more diabetes-related worries was also related to higher HbA1c ($P < 0.01$). The study concluded that women with diabetes appeared to have worse QoL and mental well-being compared with men with diabetes. Therefore, identifying strategies to improve SRH and QoL among diabetic patients, especially among women, is of great importance¹⁹

Jacobson AM conducted a review on the current literature that examines the effects of diabetes on the health-related quality of life (HRQOL). Numerous studies have shown that diabetes is associated with significant reductions in HRQOL. In particular, diabetes-related complications lead to diminished quality of life. Use of intensive diabetes treatment does not appear to reduce HRQOL, and alternative therapeutic strategies, as well as education and support, may benefit the quality of life in patients with diabetes. The

study concluded that early and aggressive intensive therapy leading to improved glycemic control is likely to reduce the impact of diabetes on the HRQOL, by slowing the onset and progression of complications.²⁰

A study was conducted to compare and contrast the health-related quality of life of elderly (> or = 65 years) and younger individuals with diabetes using reliable and valid assessment tools. A total of 191 adults (> or = 30 years) with diabetes currently on an insulin regimen were recruited. Medical and demographic data were gathered from the medical chart. Participants completed a generic quality of life measure (SF-36) and 3 diabetes-specific measures. Statistical analyses compared adults (30-64 years) to elderly adults (> or = 65 years). On the generic SF-36, physical and mental summary scores did not differ. However, elderly participants reported greater role limitations due to physical problems, and better social function. On diabetes-specific measures, elderly participants reported higher satisfaction with diabetes-related aspects of their lives, less diabetes-related emotional distress, and better ability to cope with their diabetes²¹

A review was done by Rubin RR on the published, English-language literature on self-perceived quality of life among adults with diabetes. Quality of life is measured as physical and social functioning and perceived physical and mental well-being. People with diabetes had worse quality of life than people with no chronic illness, but a better quality of life than people with most other serious chronic diseases. Duration and type of diabetes are not consistently associated with quality of life. Intensive treatment does not impair quality of life and having better glycemic control is associated with better quality of life. Complications of diabetes are the most important disease-specific determinant of quality of life. Numerous demographic and psychosocial factors influence the quality of life and should be controlled when comparing subgroups. Studies of clinical and educational interventions suggest those improving patients' health status and perceived ability to control their disease results in improved quality of life.²²

Wandell PA et al conducted a comparative study to identify the health-related quality of life (HRQOL) of patients with type 2 diabetes mellitus or angina pectoris with that of a standard population sample (SPS). The HRQOL was assessed by the Swedish Health-Related Quality of Life Survey (SWED-QUAL), a generic HRQOL questionnaire adapted from the Medical Outcomes Study (MOS), with twelve scales tapping aspects of physical, mental, social and general health. Subjects between 45 and 84 years of age who answered the questionnaire were included, i.e. 266 patients with type 2 diabetes, 758 patients with mild angina pectoris (Canadian Classes I and II) and 908 with severe angina (Canadian Classes III and IV). As controls, 1126 subjects from the SPS were used. Patients with type 2 diabetes, mild angina and severe angina showed an increasing degree of health disturbance, compared with the SPS. Diabetic patients with no heart disease showed only a minor impact on the HRQOL, while the presence of heart disease showed a considerable impact. In angina patients, the presence of diabetes also to some extent added to the decrease in HRQOL. On comparing the impact of heart disease and

diabetes on the HRQOL, the heart disease showed a stronger effect on most aspects of the HRQOL than diabetes. It is concluded that coronary heart disease is an important predictor of the impact on the HRQOL of type 2 diabetes patients²³

3. Conclusion

Diabetes and its complications significantly affects the QOL. Patient teaching is an inevitable component of diabetes management. Self management programmes using different teaching modalities and audiovisual aids are used to manage diabetes. This review focus on different self management programmes used for improving quality of life among patients with diabetes.

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