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Perception of Quality of Life among People with Diabetes

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Abstract

Diabetes is a chronic disease that affects a patient's quality of life. This cross-sectional study aimed to determine the socio-demographic and disease profile factors associated with poor quality of life among patients with diabetes. The study was conducted at a primary health care clinic in Kuching between August to November 2010. Short Form - 36 (SF - 36) questionnaire was used to assess the quality of life of diabetic patients aged ≥ 18. A total of 142 respondents participated in the survey. After adjusting for age, those with no education scored lower at vitality (p=0.043) and emotional health (p=0.033) compared with those who have tertiary education. Those working in the private sector scored better for physical functioning (p=0.042) compared with pensioners and the unemployed. Patients with uncontrolled diabetes scored lower in the role-emotional domain (p=0.003). Participants who were on <3 (p=0.014) and ≥3 (p=0.024) oral medications had better score for role-physical than those on insulin. Those on insulin had worse score for bodily pain than those on oral medication only (vs <3 oral drugs, p=0.026; vs ≥3 oral drugs, p=0.001). Various socio-demographic factors, uncontrolled diabetes and insulin usage were found to have negative impact on a diabetic patient's quality of life. Programmes addressing the physical and emotional needs of diabetic patients at the primary health care setting are essential to help improve their quality of life.

Introduction

Globally, the number of people with diabetes has increased sharply and are projected to increase by over 80% in upper-middle income countries.[1] In Malaysia, the prevalence of diabetes is also on the upward trend. [2-3] Chronic diseases like diabetes may affect a person's quality of life in many ways. Although better glycaemic control is associated with higher quality of life, complexity of regimens aimed at achieving the glycaemic control may have an adverse impact on patients' quality of life.[4] The negative impact of insulin injections on patients' quality of life are often overlooked. Newer mode of insulin delivery, such as non-invasive insulin inhalers, could address this shortcoming and help improve quality of life.[5] Reduced compliance to diet and medications[6] and increased risk of diabetes-related complications[7] are also associated with depression among diabetic patients, which may affect their quality of life. Thus, a diabetic patient's quality of life should be a primary consideration when prescribing a treatment regimen.

Studies have documented poor quality of life among diabetic patients who have suffered from this condition for a long time[8-9] and is associated with old age,[8,10] gender (especially women),[8,11-12] diabetic complications[8,13-14] concomitant diseases[8,15-16] and disease severity.[17]

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Understanding the factors that contribute to poor quality of life among people with diabetes may help physicians in improving care. Studies on diabetes in Malaysia mainly focus on relationship between diabetes management, depression and quality of life.[18-21] There are few studies that look at the relationship between the socio-demographic characteristics and disease profile of diabetic patients and quality of life, particularly in a primary health care clinic. Furthermore, in a multi-cultural society such as Malaysia people have unique health beliefs and practices[22] which may influence their quality of life. Thus, this study aimed to determine the socio-demographic and disease profile factors associated with poor quality of life among diabetes patients in a primary health care clinic.

Methods

This was a cross-sectional study conducted at the Mosque Road Polyclinic, in Kuching. Kuching, the capital of Sarawak, is the fourth largest urban area in Malaysia with an estimated population of 579,900 people compromising Chinese, Malays, and indigenous groups such as Iban, Bidayuhs, Melanaus and Orang Ulu.

Mosque Road Polyclinic is the largest primary health care clinic in Kuching with a dedicated diabetic clinic managed by a team of health care professionals. Until June 2010, the clinic had 9,956 registered diabetic patients. The clinic operates twice weekly, with an estimated 25-30 patients a day. We took three months to conduct the study and collected data once a week. A total of 180 respondents were recruited. We conducted universal sampling among patients with type 2 diabetes mellitus aged 18 and above who were treated in the clinic during the study period.

Data were collected using a set of pre-tested and validated questionnaire consisting of socio-demographic characteristics (age, race, sex, marital status, education level, and occupation), disease profile (duration of diabetes, co-morbidities, treatment, diabetes control/management and blood pressure control), and the SF-36® questionnaire. The disease profile was obtained from the patient's record. For the assessment of diabetes control, the latest HbA1c readings were taken into account if available; otherwise, fasting blood sugar (FBS) readings were recorded. If both HbA1c and FBS readings were unavailable, the latest random blood sugar (RBS) readings were taken. Patients who had HbA1c readings of less than 6.5% or FBS in the range of 4.4 mmol/L to 6.1 mmol/L or RBS in the range of 4.4 mmol/L to 8.0 mmol/L were defined as having controlled DM.[23]

Controlled blood pressure is defined as systolic blood pressure of ≤130 mmHg and diastolic blood pressure of ≤80 mmHg and for those with normal renal function, and systolic blood pressure ≤125 mmHg and diastolic blood pressure ≤75 mmHg for those with renal impairment/ gross proteinuria.[24] The complications and self-reported co-morbidities include asthma, hypertension, hyperlipidemia, ischemic heart disease, retinopathy and foot problem. The treatment for diabetes mellitus was divided into < 3 oral hypoglycaemic drugs, ≥3 oral hypoglycaemic drugs and insulin with or without oral hypoglycemic drugs.

The SF-36 Health Survey is a generic questionnaire designed to examine a person's perceived health status. The validated questionnaires are in three languages - English, Malay[25] and Chinese.[26] It measures the following eight health concepts (1) general health; (2) role limitation due to physical health; (3) bodily pain; (4) physical functioning; (5) role limitation due to emotional problems; (6) energy/fatigue; (7) social functioning; (8) emotional health.

We conducted face-to-face interviews with the respondents who were waiting to be seen by a doctor at the clinic. The purpose of the study was explained to them and consent

was obtained.

The study was approved by the Malaysia Research Ethics Committee, Ministry of Health Malaysia (NMRR-10-770-6873).

All statistical analyses were performed using SPSS version 16.0 (IBM Corporation, New York). For descriptive data, percentages, mean and standard deviation were used. ANCOVA was used to compare the differences between groups under each subscale. Post hoc tests were conducted to determine which groups were significantly different. P-value of less than 0.05 is regarded as statistically significant.

Results

A total of 142 diabetes patients participated in this study, with a response rate of 79%. The average age of respondents was 55.7(SD 11.12) years, and 81.7% of them were female. Approximately 90% of the respondents were married. Majority of the respondents were ethnic Malays (59.9%). More than 70% of the respondents had primary and secondary school level education. Approximately 49% of the respondents were housewives. Further information on the socio-demographic background is presented in Table 1.

Table 1: Socio-demographic profile of the respondents (n=142)

Variable	n	%	Mean ± S.D.
Age			55.67 ± 11.12
< 50 years	43	30.3	
50-59 years	45	31.7	
60-69 years	41	28.9	
≥ 70 years	13	9.2	
Gender			
Male	26	18.3	
Female	116	81.7	
Marital status			
Married	130	91.5	
Single	8	5.6	
Divorced	4	2.8	
Race			
Malay	85	59.9	
Chinese	42	29.6	
Pribumi & others	15	10.6	
Education level			
No formal education	26	18.3	
Primary	51	35.9	
Secondary	52	36.6	
University	13	9.2	
Occupation			
Government	13	9.2	
Private	28	19.7	
Housewife	69	48.6	
Pensioner/ unemployed	32	22.5	

Table 2 shows the disease profile of the respondents. Majority of the respondents had diabetes for 1-10 years (63.4%) with the mean duration of 6.10 (SD 6.54) years. Most of the respondents (n=126, 88.7%) had co-morbid conditions, and the most common co-morbid conditions were hypertension (68.3%) and hyperlipidaemia (38.7%). Forty-six respondents (32.4%) had well controlled blood glucose while 56 (39.4%) had their blood pressure controlled to target. Majority of the patients (n=116, 81.7%) were taking less than 3 oral hypoglycaemic medications and only 16 respondents (11.3%) took insulin with or without oral hypoglycaemic medications. Approximately 65 respondents (45.8%) took only hypoglycaemic medications while 77 respondents (54.2%) took hypoglycaemic medications together with other medications.

Adjusted mean differences for SF36 with its sub-scales are presented in Table 3. Malay respondents were reported to have significantly higher adjusted mean score in emotional health component (81.3, CI=77.5 to 85.2) compared with Chinese (68.8, CI=63.4 to 74.3)(p=0.002).

Table 2: Disease Profile of the Respondents

Variable	n(%)	Mean ± S.D.
Duration of Diabetes		6.10±6.54
<1 year	32(22.5)	
1-5 years	53(37.3)	
6-10 years	37(26.1)	
> 10 years	20(14.1)	
Without co-morbid condition	16(11.3)	
With co-morbid condition	126(88.7)	
Co-morbid conditions and complications		
Asthma	3(2.1)	
Hypertension	97(68.3)	
Hyperlipidemia	55(38.7)	
Ischaemic Heart Disease	3(2.1)	
Retinopathy	28(19.7)	
Foot Problem	19(13.4)	
Diabetes Mellitus control		
Controlled	46(32.4)	
Uncontrolled	96(67.9)	
Blood Pressure control		
Controlled	56(39.4)	
Uncontrolled	86(60.6)	
Diabetes Medications		
<3 oral hypoglycaemic medications	116(81.7)	
≥3 oral hypoglycaemic medications	10(7)	
Insulin ±oral hypoglycaemic medications	16(11.3)	
Diabetic Treatment Type		
Diabetic medications only	65(45.8)	
Diabetic medications +other medications	77(54.2)	

Table 3: Adjusted mean* SF-36 by socio-demographic factors and Disease Profile of Respondents (N=142)

	Adjusted Mean(95%CI)							
	General Health	Role-physical	Bodily Pain	Physical Functioning	Role-emotional	Vitality	Social Functioning	Emotional Health
Gender								
Male (n=26)	2.9(2.8,3.1)	72.9(57.8,88.2)	85.3(76.5,94.1)	84.5(76.1,93.0)	76.8(62.3,91.4)	73.6(66.2,81.1)	86.5(79.2,93.9)	75.5(68.3,82.8)
Female (n=116)	2.9(2.8,3.1)	62.50(55.3,69.7)	76.8(72.6,81.0)	76.7(72.7,80.7)	77.6(70.7,84.5)	69.9(66.4,73.4)	87.5(84.0,90.9)	77.3(73.9,80.7)
p-value	0.939	0.222	0.087	0.099	0.926	0.374	0.816	0.658
Race								
Malay (n=85)	2.9(2.8,3.0)	61.0(52.6,69.4)	76.9(71.9,81.9)	77.2(72.4,81.9)	74.6(66.5,82.6)	72.3(68.2,76.4)	88.9(84.9,93.0)	81.4(77.5,85.2)
Chinese (n=42)	3.1(3.0,3.3)	72.2(60.1,84.2)	79.6(72.5,86.6)	80.8(74.1,87.5)	81.2(69.7,92.6)	65.5(59.7,71.3)	83.3(77.5,89.1)	68.8(63.3,74.3)
Pribumi & Others (n=15)	3.0(2.8,3.3)	67.2(45.1,82.2)	83.1(71.4,94.9)	76.3(65.1,87.5)	83.6(64.5,102.7)	75.4(65.7,85.1)	89.2(79.5,98.9)	73.0(66.0,84.2)
p-value	0.041[a]	0.319	0.580	0.647	0.519	0.103	0.264	0.001[b]
Education								
None (n=26)	2.9(2.7,3.1)	65.2(49.7,80.6)	83.6(74.6,92.6)	70.7(62.0,79.3)	80.7(65.8,95.6)	65.0(57.6,72.5)	82.0(74.5,89.5)	69.9(62.7,77.2)
Primary (n=51)	2.9(2.8,3.1)	57.4(46.6,68.3)	72.8(66.4,79.1)	77.8(71.7,83.8)	74.8(64.4,85.3)	71.3(66.1,76.5)	89.1(83.8,94.4)	78.3(73.2,83.4)
Secondary (n=52)	3.0(2.9,3.1)	65.4(54.5,76.3)	79.4(73.0,85.7)	80.7(74.6,86.8)	75.2(64.7,85.7)	69.6(64.4,74.9)	87.9(82.6,93.2)	76.5(71.4,81.7)
University (n=13)	2.9(2.7,3.2)	86.5(65.0,107.9)	85.8(73.3,98.3)	84.3(72.3,96.3)	90.5(69.8,111.1)	82.9(72.5,93.2)	88.6(78.1,99.1)	87.8(77.7,97.9)
p-value	0.878	0.131	0.119	0.224	0.532	0.054[c]	0.472	0.041[d]
Occupation								
Government (n=13)	3.1(2.7,3.4)	79.1(56.7,101.6)	74.3(61.1,87.5)	84.4(72.2,96.7)	91.3(69.9,112.7)	75.4(64.4,86.4)	85.7(74.9,96.5)	83.5(72.9,94.2)
Private (n=28)	2.9(2.7,3.1)	71.7(56.7,86.6)	80.7(71.9,89.5)	87.2(79.1,95.4)	71.1(56.9,85.3)	72.4(65.1,79.7)	92.9(85.7,100.1)	78.9(71.8,86.0)
Housewife (n=69)	2.9(2.8,3.0)	61.9(52.6,71.3)	77.6(72.1,83.1)	76.6(71.5,81.7)	79.2(70.3,88.1)	70.7(66.1,75.2)	85.0(80.5,89.5)	77.33(72.9,81.8)
Pensioner/ unemployed(n=32)	3.16(0.57)	54.69(44.65)	76.25(25.77)	66.56(26.41)	70.83(41.26)	66.09(16.84)	88.28(17.94)	72.00(17.39)
p-value	0.174	0.097	0.741	0.000[e]	0.222	0.337	0.301	0.247
Duration of diabetes								
<1 year (n=32)	2.9(2.8,3.1)	58.5(44.7,72.4)	78.2(70.0,86.4)	78.8(71.0,86.6)	77.6(64.2,90.9)	70.6(63.8,77.4)	87.6(80.8,94.3)	81.1(74.5,87.7)
1-5 years (n=53)	2.9(2.8,3.1)	64.4(53.8,75.1)	77.8(71.5,84.1)	79.7(73.7,85.6)	78.8(68.6,89.1)	72.5(67.2,77.7)	88.7(83.5,93.9)	77.1(72.1,82.2)
6-10 years (n=37)	3.0(2.8,3.1)	75.0(62.2,87.8)	80.3(72.7,87.9)	75.3(68.1,82.5)	74.3(62.0.86.7)	69.4(63.0,75.7)	85.8(79.5,92.0)	74.7(68.6,80.8)
>10 years (n=20)	3.2(2.9,3.4)	54.3(37.0,71.7)	76.5(66.2,86.8)	78.2(68.5,88.0)	79.5(62.8,96.3)	68.0(59.5,76.6)	86.2(77.7,94.7)	74.2(66.0,82.5)
p-value	0.380	0.199	0.936	0.843	0.944	0.804	0.901	0.482

Table 3: *(Continued)* **Adjusted mean* SF-36 by socio-demographic factors and Disease Profile of Respondents (N=142)**

	Adjusted Mean(95%CI)							
	General Health	Role-physical	Bodily Pain	Physical Functioning	Role-emotional	Vitality	Social Functioning	Emotional Health
Presence of co morbid condition								
No co morbid condition (n=16)	3.1(2.9,3.4)	66.5(46.7,86.4)	69.4(57.9,80.9)	80.1(75.1,97.0)	73.9(55.1,92.8)	69.2(59.6,78.9)	88.3(78.7,97.9)	75.7(66.3,85.1)
With co morbid condition (n=126)	3.0(2.9,3.1)	64.2(57.2,71.1)	79.5(75.5,83.5)	77.1(73.3,81.0)	77.9(71.3,84.5)	70.8(67.4,74.2)	87.2(83.8,90.6)	77.1(73.9,80.4)
p-value	0.271	0.827	0.103	0.132	0.698	0.763	0.829	0.776
DM control								
Controlled (n=46)	2.9(2.8,3.1)	68.5(57.0,80.0)	75.6(68.9,82.3)	76.7(70.3,83.1)	91.0(80.4,101.6)	72.2(66.7,77.8)	89.9(84.4,95.5)	80.3(74.9,85.7)
Uncontrolled (n=96)	3.0(2.9,3.1)	62.5(54.6,70.5)	79.7(75.1,84.3)	78.8(74.4,83.2)	71.1(63.7,78.3)	69.8(65.9,73.7)	86.1(82.2,89.9)	75.4(71.7,79.2)
p-value	0.876	0.401	0.324	0.598	0.003[f]	0.479	0.255	0.146
BP control								
Controlled (n=56)	3.0(2.8,3.1)	62.1(51.7,72.6)	79.7(73.6,85.8)	80.6(74.8,86.4)	79.2(69.2,89.1)	69.6(64.5,74.7)	85.7(80.7,90.7)	75.1(70.2,80.0)
Uncontrolled (n=86)	3.00(2.9,3.1)	66.0(57.5,74.4)	77.5(72.6,82.4)	76.5(71.9,81.2)	76.4(68.4,84.4)	71.2(67.1,75.3)	88.4(84.3,92.4)	78.2(74.2,82.2)
p-value	0.627	0.574	0.580	0.279	0.666	0.625	0.414	0.338
Treatment Medication of Diabetes								
<3 oral drugs (n=116)	2.9(2.8,3.0)	66.9(59.8,73.9)	78.9(74.9,83.0)	78.9(74.9,82.9)	79.8(72.9,86.6)	71.4(67.9,74.9)	88.3(84.8,91.7)	78.6(75.2,81.9)
≥3 oral drugs (n=10)	3.1(2.8,3.4)	79.5(55.3,103.7)	95.9(82.0,109.8)	79.4(65.6,93.3)	69.6(46.0,93.1)	75.0(63.0,87.1)	78.6(66.6,90.5)	69.4(57.8,81.1)
Insulin ± oral drugs (n=16)	3.0(2.8,3.3)	37.5(18.5,56.4)	63.2(52.3,74.2)	72.0(61.1,82.8)	65.6(47.2,84.1)	62.3(52.9,71.7)	86.0(76.6,95.4)	70.3(61.1,79.4)
p-value	0.721	0.009[g]	0.001[h]	0.493	0.288	0.155	0.296	0.103
Diabetic Treatment Type								
Diabetic medicine only (n=65)	3.1(2.9,3.2)	66.7(57.0,76.3)	76.5(70.9,82.2)	78.2(72.8,83.5)	78.3(69.1,87.5)	70.8(66.1,75.5)	89.0(84.4,93.7)	78.7(74.1,83.2)
Diabetic medicine + other medications (n=77)	2.9(2.8,3.0)	62.5(53.6,71.4)	79.9(74.7,85.1)	78.1(73.2,83.0)	76.8(68.3,85.2)	70.4(66.1,74.7)	85.9(81.6,90.1)	75.6(71.4,79.8)
p-value	0.103	0.532	0.385	0.986	0.811	0.890	0.324	0.325

*Adjusted for age.

Post-hoc test

[a] Malays vs Chinese, p=0.041, [b] Malays vs Chinese, p=0.001, [c] University vs no education, p=0.043, [d] University vs no education, p=0.033, [e] Private vs pensioner, p=0.042, [f] DM controlled vs DM uncontrolled, p=0.003, [g] <3 oral drugs vs insulin, p=0.014; 3 or more oral drugs vs Insulin, p=0.024, [h] <3 oral drugs vs insulin, p=0.026; 3 or more oral drugs vs Insulin, p=0.001

The respondents with no formal education had significantly lower adjusted mean score in vitality (p=0.043), and emotional health (p=0.033) when compared with those possessing university qualifications.

The pensioners or unemployed group had significantly lower adjusted mean score in physical functioning component when compared with those in the private sector (p=0.042).

The mean scores in the general health component did not differ between respondents whose diabetes were controlled and uncontrolled as seen in Table 3. However, the respondents with uncontrolled diabetes had significantly lower adjusted mean score in the role-emotional component (p=0.003) compared with those with controlled diabetes.

The respondents taking insulin had significantly lower adjusted mean scores in role-physical (p=0.014) and bodily pain (p=0.026) components compared with respondents taking <3 oral drugs. Similar associations were found between respondents with insulin and those taking 3 or more drugs for both sub-scales (role-physical, p=0.024; bodily pain, p=0.001).

For other socio-demographic factors and disease profile (gender, duration of diabetes, presence of co morbid condition, blood pressure control and diabetes treatment type), no significant differences were found in the adjusted mean scores for general health component and its sub-scales.

Discussion

Most studies found no association between ethnicity and quality of life among diabetic patients.[10,27] However, one study found that Chinese immigrants to the United States have scored lower on quality of life assessement compared with European-Americans.[28] In our study, although ethnic Malays have significantly higher adjusted mean score in emotional health compared with Chinese, their general health component adjusted mean score was lower. Cultural background and health beliefs may have affected the perception of both general health and emotional health of different ethnic groups. In addition, as the Malays constitute the biggest sample size in this study, the finding is inconclusive. Further study is needed to clarify the nature of this relationship.

Under the subscale level for all components, respondents with university education had the highest adjusted mean scores compared with other groups. Significant difference was noted between those with university level education and those without education (vitality and emotional health). This is consistent with other studies.[10,27] Patients who have better glycaemic control tend to be more optimistic and thus, cope well with the disease resulting in better quality of life.[27] Patients with higher education are more likely to equip themselves with knowledge on the disease that helps them to manage it better.[27]

Pensioners and the unemployed had significantly lower adjusted mean score in physical functioning component compared with those working in the private sector. As pensioners and the unemployed may have lower income, this may explain the lower physical functioning score for these two categories as other studies have found that older patients have lower physical functioning score[10,29] and those with lower incomes have lower scores in all components of quality of life.[10]

This study did not find any significant difference between respondents with comorbidity condition and without comorbidity condition terms of general health component and all sub-scales. This finding is different from a study by Redekop et al[13] which found that co-morbidities can have a negative effect on patient's quality of life. Comorbidities, such as hypertension and dyslipidaemia may lead to coronary artery disease which may affect

patient's quality of life.[12] A prevalence of high of co-morbidity (88.7%) in this study may have contributed to the insignificant mean scores for quality of life between the groups.

Respondents with controlled and uncontrolled diabetes did not differ much in their general health scores. This is consistent with the study conducted by Murali et al where poorer glycaemic control did not result in a lower quality of life.[30] At the subscale level, only role-emotional component was found to be associated glycaemic control. Patients who have better glycaemic control tend to be more optimistic and thus, cope well with the disease resulting in better quality of life.[31]

For blood pressure control, there was no significant differences between uncontrolled and controlled group in general health score and its sub-scales. This may be due to hypertension which is often asymptomatic.[12]

In terms of diabetes treatment, there is a huge disparity in the adjusted mean score for role-physical and bodily pain components between those with on oral medications (either < 3 or >3) and insulin. This finding is consistent with the study by Redekop et al[12] which found that insulin therapy is one of the factors that lead to lower health-related quality of life. Injection of insulin injections may create fear and have adverse effects, such as hypoglycaemia.[13]

There is a relationship between the comorbidities and the amount of medications and this directly affect patients' quality of life.[32] Those consuming more drugs have poorer quality of life compared with those who do not.[32] In addition, adverse effects of drugs can also affect patient's quality of life.[33] However, in this study, we did not find any significant difference in the quality of life between those who were on diabetes medications only and those on additional drugs.

The strength of this study is that it included indigenous population of East Malaysia. The limitation of this study is that most of the respondents were Malays which is attributed to the sampling method. A majority of the patients who were on follow-up at the government clinics were Malays. Further study is needed to ascertain whether there is any differences in quality of life between the ethnic groups.

Conclusion

Lower education level, unemployment, uncontrolled diabetes and insulin treatment were found to have a negative impact on the quality of life among diabetic patients. Programmes addressing the physical and emotional needs of patients are essential to improve their quality of life. Health education should also cater to those who have low education level. A more holistic healthcare system that looks into the psychological aspect of the patients should be considered.

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