

The Impact of Diabetes Mellitus on Patients' Quality of Life

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Abstract

Objective: This study aimed to measure the impact of diabetes mellitus (DM) on patients' quality of life (QoL). **Materials and Methods:** This cross-sectional study involved DM patients that underwent follow-up at a hospital in central Malaysia. Data were collected using self-developed and self-administered questionnaire. Statistical analysis was performed using Statistical Package for the Social Sciences version 24. **Results:** Around 75 (56.8%) of the patients were satisfied with their daily routine life activities. A total of 88 (66.7%) were also satisfied with their family and friends' relationships. On the contrary, 109 (82.6%) were not satisfied with their sexual life. There was a statistically significant correlation observed between age and QoL. **Conclusion:** This study showed that the majority of DM patients had moderate QoL. Diet, living conditions, and concerns about the future had also a greater influence on their overall QoL.

Key words: Diabetes mellitus, Diabetes mellitus patients, Quality of life

INTRODUCTION

Diabetes mellitus (DM) is one of the main health problems worldwide which may affect any person of either gender, at any age from any race and socioeconomic background.^[1] DM is a chronic disease that usually results in severe complications and requires long-term care.^[2] A recent statistic by the International Diabetes Federation showed that more than 385 million people worldwide have been diagnosed with DM.^[3] Among Western Pacific countries, more than 135 million people were present with a prevalence of 8.5% and approximately 53.6% were undiagnosed cases of DM.^[3] In the year 2012, DM had caused 1.5 million deaths worldwide and which increased to around 5 million in 2014.^[3]

According to the International Diabetes Federation, the number of people living with DM keeps increasing with a prevalence of more than 16% annually.^[4,5] On the other side, the number and the rate of deaths are also exceedingly mounting every year worldwide.^[1,2]

In Malaysia, DM prevalence is also continuously increasing every year, showing a significant burden on the healthcare sector.^[4,5] DM is a chronic disease that has both physical and physiological impact on patients suffering from it.^[6] Numerous studies have reported that diabetic patients are having a lower quality of life (QoL) as compared to healthy individuals. In literature, it is reported that the impact of DM on QoL is significantly influenced by several factors such as age, gender, and presence or severity of complications and comorbid conditions.^[1,2,6]

QoL is a multidimensional concept that consisted of numerous attributes influencing the physical and emotional well-being of the studied individuals.^[7] The management of DM is based

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on numerous disease-related factors and social aspects that sturdily influence the treatment outcomes.^[8] Continuous monitoring and apt control of blood glucose levels are key to avoid life-threatening complications.^[9] Numerous studies reported that the prolonged adverse effects immensely affect the self-care behaviors of the DM patients and result in compromised QoL among them.^[8-10] Different studies reported that DM has a negative impact on the overall QoL of DM patients.^[11-14] Nevertheless, as these studies, different tools were used among different populations; hence, it is still debatable to know the correct findings of the QoL of DM patients in different cohorts of patients in different countries.^[11-14] There are two main types of research tools which usually use to measure QoL among DM patients, that is, generic or disease-specific.^[8,15,16] This study was conducted in central Malaysia to determine QoL in DM patients using a self-developed tool.

MATERIALS AND METHODS

Study design and participants

This cross-sectional study, which involved DM patients undergoing follow-up at an endocrine department in a famous hospital in Malaysia, was conducted from June to September 2016. Study subjects were screened for inclusion and exclusion criteria and given consent forms and patient's information sheet to fill up before being included in the study. The inclusion criteria were as follows: Age above 18 years old, on treatment or medication for at least 1 year, and undergo follow-up in the hospital and free from cancer. A total of 132 DM patients who met the inclusion criteria were screened to be recruited.

Ethical considerations

The study proposal together with a self-administered questionnaire was sent to the concerned authorities for evaluation and registration. Then, the research approval was obtained from the concerned authorities to conduct the study. This study was conducted under the strict protocol of the institute.

Research tool

The self-developed research tool was consisted of various general and specific questions that measure the impact of QoL in DM patients. The 10 routine life questions were included in the self-developed tool. They were mainly related to daily activities of the patients, that is, working environment, family life, friendships and social life, sexual life, physical appearance and health, leisure and personal activities, feelings about the future, financial and current living situation, and freedom to eat and drink favorites. In the dichotomous question of the research tool, each question

was given 1 point for Yes and 0 for No answer. A score of 8 Yes answers (80%) or above was considered as good QoL, and 4–6 Yes answers (60–40%) as moderate QoL, whereas less than 4 Yes answers (40%) were evaluated as low QoL. Before beginning the actual study, the questionnaire was translated and validated by two qualified bi-lingual speakers using forward-backward translations. The Malay version questionnaire was also tested during the pilot study.

Statistical analysis

The data collected from the patients were analyzed using Statistical Package for the Social Sciences version 24. The level of significance was set as $P < 0.05$. Normality of collected data was checked using frequencies test. The data were analyzed using a one-way ANOVA test, independent *t*-test, and Pearson's correlation test.

RESULTS

Sociodemographic characteristics of the studied population are presented in Table 1. The mean (SD) age of the patients was 58.33 (\pm 12.83) years. The youngest study patient was 22 years old and the oldest study subject was 84 years old. The highest frequency of patients was in the age group of 56–75 years, while the lowest frequency was found among the older age group than 75 years. Among 132 study respondents, the major proportion of respondents were female which accounted for 62.9% ($n = 83$). The remaining proportion of the study subjects was male. Moreover, the majority of the respondents in this study were Malay, followed by Indian, Chinese, and other ethnic. The majority of the respondents in this study also were married and had a secondary level of education. The highest number of patients had less than RM 1500 monthly income and least number of patients had monthly income equal or more than RM 7500.

Basic diabetic (clinical) data of the studied population are presented in Table 2. The mean duration of DM was 11.73 years (\pm 7.71), with the majority of patients found to have more than 11 years duration of DM. Most of the patients had a family history of DM. The number of patients that use insulin and those who did not use insulin was almost equal.

Table 3 shows the research tool questions' response in N (%) as Yes and No. It was observed that the majority of the DM patients in the studied cohort were satisfied with their overall QoL. On the other hand, the majority of them were not satisfied with their sexual life. There were also not much positive responses received regarding freedom to eat and drink their favorites.

Table 4 represents the statistically significant ($P < 0.05$) relationship (correlation) between the male and female patients regarding the overall mean QoL scores. The mean

Table 1: Demographic data of the study participants (n = 132)

Characteristics	Frequency (%)
Age groups	
19–37	12 (9.1)
38–55	33 (25.0)
56–75	79 (59.8)
>75	8 (6.1)
Gender	
Male	49 (37.1)
Female	83 (62.9)
Ethnicity	
Malay	113 (85.6)
Others	
Marital status	19 (14.4)
Single	7 (5.3)
Married	122 (92.4)
Divorced	3 (2.3)
Highest education level	
No formal education	4 (3.0)
School-level	68 (56.1)
Diploma	21 (15.9)
Bachelor	19 (14.4)
Postgraduate	14 (10.6)
Occupation	
Unemployed	30 (22.7)
Government employee	26 (19.7)
Private employee	9 (6.8)
Self-employee	9 (6.8)
Retired	56 (42.4)
Student	2 (1.5)
Monthly income	
≤RM1500	80 (60.6)
>RM1500 to <RM3500	16 (12.1)
>RM3500 to <RM7500	22 (16.7)
≥RM7500	14 (10.6)

QoL score for males was 6.32 ± 4.47 and 7.03 ± 1.55 for female patients. There was a statistically significant correlation ($P < 0.05$) observed among males and females for the QoL for some of the questions such as current family relationships, social life activities satisfaction, sexual life, overall QoL, and eating favorite foods.

DISCUSSION

This study provides detailed information about DM dependent QoL and its assessment among DM patients in a hospital

Table 2: Clinical characteristics of the study participants

Characteristics	Frequency (%)
DM duration (years)	
≤4 years	21 (15.9)
5–10 years	53 (40.2)
≥11 years	58 (43.9)
Family history of DM	
Yes	104 (78.8)
No	28 (21.2)
Insulin use	
Oral hypoglycemic agents only	66 (50.0)
Insulin and oral hypoglycemic agents	66 (50.0)
Home blood-glucose monitoring	
≥Once a day	26 (19.7)
2–3 times a week	59 (44.7)
<Once a week	47 (35.6)
Frequency of hypoglycemia	
Never	33 (25)
Once a few months	73 (53.3)
≥Once a week	18 (13.6)
Daily	8 (6.1)
Number of comorbidities	
Absent	3 (2.3)
1–2	57 (43.2)
3–5	69 (52.3)
>5	3 (2.3)
Number of medications taking	
<5	51 (38.6)
>5	81 (61.4)

DM: Diabetes mellitus

in Malaysia. The overall total mean score among all of the patients was found to be 6.79 ± 6.22 , which reflected that the overall majority of the patients had moderately-good QoL except a few questions. The majority of patients monitored their blood glucose levels at least 2–3 times in a week and the majority of them experienced hypoglycemic once in a few months. The vast majority of patients had 3–5 comorbidities. The average total prescribed medication received or taken by the patients was $5.38 (\pm 1.935)$.

The most affected domains in this cohort were current family relations, social and leisure life, sexual life, overall QoL, and eating favorite foods. The results of this study were quite similar to a study conducted in Solvenia by Turk *et al.* using the ADDQOL tool, among 125,000 DM patients which found that the most affected domain was “freedom to eat” and the least affected domain was “people’s reaction.^{[17]”} According to another study, freedom to eat among DM patients is of vital importance. This indicates that there was a strong influence of

Table 3: Distribution of QoL tool response by the studied patients

QoL questions	No		Yes	
	n	%	n	%
Are you satisfied with your daily routine life activities	57	43.2	75	56.8
Are you happy with your current family relations	44	33.3	88	66.7
Are you happy with your social and leisure life	45	34.1	87	65.9
Are you satisfied with your sexual life	109	82.6	23	17.4
Are you satisfied with your body appearance and self-confidence	68	51.5	64	48.5
Do you think you are self-motivated and satisfied from your working environment	60	45.5	72	54.5
Are you worried about your future endeavors	76	57.6	56	42.4
Are you satisfied with your current financial position	67	50.8	65	49.2
Are you satisfied with your overall quality of life	46	34.8	86	65.2
Do you feel freedom eating your favorite foods	89	67.4	43	32.6

QoL: Quality of life

Table 4: Statistical correlation among male and female DM patients regarding overall mean QoL score

Statements	P-value
Current family relations satisfaction	0.037*
Social and leisure life satisfaction	0.017*
Sexual life satisfaction	0.009*
Overall QoL satisfaction	0.043*
Eating favorite foods satisfaction	0.025*

*Significant at 0.05 level (2-tailed). DM: Diabetes mellitus, QoL: Quality of life

dietary restrictions on the QoL.^[18] Based on the results of the study, there was a small, positive correlation between age and the impact of the disease on the overall QoL was also found. The result was statistically significant, which indicated that the increase in age significantly contributed to a higher QoL total score and reflected the higher negative impact of DM on patients' QoL. This increase in the negative impact of DM on patients' QoL might be due to the aging process or DM complications (macrovascular and microvascular) that were experienced by the studied patients. A few other pieces of evidence showed that the Asian population develops DM at a younger age than the Western population.^[19]

An observational and cross-sectional study in DM patients in 661 healthcare centers conducted in Spain also showed

that the mean (\pm SD) age of the study population was 64.00 (\pm 11.00) years, which was much higher than this study.^[20] In another study in Korea, it was shown that the mean age of the study population was 57.5 (\pm 12.00), which was lower than the mean age of study in Slovenia, Spain, and slightly lower compared to this study^[21]. A local study by Inche *et al.* about the prevalence and determinants of appropriate health-seeking behavior among DM patients in a different area found that the mean age of DM patients was 53.5 (\pm 13.00) years.^[22] This indicated that different populations may result in different mean age. Regarding other aspects of aging, some patients might experience a gradual decline in body function due to biological senescence. Aging is commonly associated with more body fat and reduced muscle mass, which usually starts around age 50 in healthy individuals and often leads to a decline in a person QoL and independence. In addition, another study showed that the presence of multiple chronic comorbidities progressively increased with an increase in age and often contributed to the low QoL. Likewise, the possibility for developing comorbidities such as myocardial infarction, stroke, and reduced cognitive and physical functioning also increases with an increase in age and ultimately results in decreased QoL.

The majority of DM patients were worried about possible complications that may lie ahead of them at some stage in the future and the possible need for insulin injections if their DM got worsen. Such future worries often pose an excessive impact on their overall QoL. Thus, all healthcare providers, including doctors, nurses, pharmacists, psychologists, and nutritionists, should work as a team to provide the best disease management to DM patients. Indeed, effective communication between the healthcare providers and DM patients is vital to identify and implement appropriate interventions which could improve their overall QoL.

CONCLUSION

This study suggested that healthcare providers' interventions to DM patients should be more focused on brain-storming, diet management, precise pharmacotherapy, and emotional support to improve their overall QoL. A precise diet plan, active physical lifestyle, regular self-monitoring, continuous blood glucose measurement, and refrain from stress triggers are important elements that can help DM patients to enjoy a healthy life with improved QoL. In addition, psychologists can also help DM patients to improve their emotional health, health beliefs, and behaviors.

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REFERENCES

- Jannoo Z, Wah YB, Lazim AM. Examining diabetes distress, medication adherence, diabetes self-care activities, diabetes-specific quality of life and health-related quality of life among Type 2 diabetes mellitus patients. *J Clin Transl Endocrinol* 2017;26:48-54.
- American Diabetes Association. Standards of medical care in diabetes-2016. *Diabetes Care* 2016;39:S1-2.
- International Diabetes Federation. About Diabetes; 2020. Available from: <https://www.idf.org/our-activities/epidemiology-research.html>. [Last accessed on 2020 May 15].
- Feta I. Physical and psychological health domains of QOL in relation to clinical factors of diabetes mellitus in Egypt. *Int Res J Med Med Sci* 2016;4:7-16.
- Rodríguez-Gutiérrez RM. Glycemic control for patients with Type 2 diabetes mellitus: Our evolving faith in the face of evidence. *Circ Cardiovasc Qual Outcomes* 2016;9:504-12.
- Verma S, Hussain ME. Obesity and diabetes: An update. *Diabetes Metab Syndr Clin Res Rev* 2017;11:73-9.
- Zhang P, Lou P, Chang G, Chen P, Zhang L, Li T, *et al.* Combined effects of sleep quality and depression on quality of life in patients with Type 2 diabetes. *BMC Fam Pract* 2016;17:40.
- da Mata AR, Álvares J, Diniz LM, da Silva MR, dos Santos BR, Guerra AA Jr., *et al.* Quality of life of patients with diabetes mellitus Types 1 and 2 from a referral health centre in Minas Gerais, Brazil. *Expert Rev Clin Pharmacol* 2016;9:739-46.
- Dedefo MG, Abate SK, Ejeta BM, Korsu AT. Predictors of poor glycemic control and level of glycemic control among diabetic patients in West Ethiopia. *Ann Med Surg (Lond)* 2020;55:238-43.
- Hasan SS, Thiruchelvam K, Ahmed SI, Clavarino AM, Mamun AA, Kairuz T. Psychological health and menopause-specific quality of life of Malaysian women with Type 2 diabetes. *Asian J Psychiatr* 2016;23:56-63.
- Yimam Ahmed M, Ejigu SH, Zeleke AZ, Hassen MY. Glycemic control, diabetes complications and their determinants among ambulatory diabetes mellitus patients in Southwest Ethiopia: A prospective cross-sectional study. *Diabetes Metab Syndr Obes* 2020;13:1089-95.
- Altınok A, Marakoğlu KK. Evaluation of quality of life and depression levels in individuals with Type 2 diabetes. *J Fam Med Prim Care* 2016;5:302-8.
- Zurita-Cruz JN, Manuel-Apolinar L, Arellano-Flores ML, Gutierrez-Gonzalez A, Najera-Ahumada AG, Cisneros-González N. Health and quality of life outcomes impairment of quality of life in Type 2 diabetes mellitus: A cross-sectional study. *Health Qual Life Outcomes* 2018;16:94.
- Mutashambara G. HRQOL factors among patients with DM in Botswana. *Alexandria J Med* 2018;54:111-8.
- Jusoh Z, Tohid H, Omar K, Muhammad NA, Ahmad S. Clinical and sociodemographic predictors of the quality of life among patients with Type 2 diabetes mellitus on the East coast of peninsular Malaysia. *Malays J Med Sci* 2018;25:84-95.
- Chew BH, Mohd-Sidik S, Shariff-Ghazali S. Negative effects of diabetes-related distress on health-related quality of life: An evaluation among the adult patients with Type 2 diabetes mellitus in three primary healthcare clinics in Malaysia. *Health Qual Life Outcomes* 2015;13:187.
- Turk E, Rupel VP, Tapajner A, Leyshon S, Isola A. An audit of diabetes-dependent quality of life (ADDQOL) in older patients with diabetes mellitus Type 2 in Slovenia. *Value Health Reg Issues* 2013;2:248-53.
- Alfian SD, Sukandar H, Lestari K. Medication adherence contributes to an improved QOL T2DM patients. *Diabetes Ther* 2016;7:755-64.
- Ramachandran A, Snehalatha C, Shetty AS, Nanditha A. Trends in prevalence of diabetes in Asian countries. *World J Diabetes* 2012;3:110-7.
- Jódar-Gimeno E, Álvarez-Guisasaola F, Ávila-Lachica L, Palomares-Ortega R, Roldán-Suárez C, Lizán-Tudela L. Quality of life and fear for 40 hypoglycemia in patients with Type 2 diabetes mellitus. *Rev Clín Esp* 2015;215:91-7.
- Lee WJ, Song KH, Noh JH, Choi YJ, Jo MW. Health-related quality of life using the EuroQol 5D questionnaire in Korean patients with Type 2 diabetes. *J Korean Med Sci* 2012;27:255-60.
- Sheleaswani IZ, Rosnah S, Khadijah S. Prevalence and determinants of appropriate health seeking behaviour among known diabetics: Results from a community-based survey. *Adv Epidemiol* 2014;2014:1-7.

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