

Quality of Life of Persons with Type 2 Diabetes Mellitus (T2DM) in the Philippines

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Background. Type 2 diabetes mellitus is a widespread chronic condition that significantly impacts health-related quality of life (QoL), particularly in ASEAN countries, including the Philippines. Despite existing research, limited data are available on the specific factors influencing QoL among Filipinos with Type 2 diabetes. This study aims to assess the QoL of individuals with the condition and to examine key determinants, including glycemic control, comorbidities, and complications.

Methodology. A retrospective analysis was conducted using data from the PhilDiabcare 2020 study, a population-based cross-sectional survey on diabetes care in the Philippines. Participants completed the Asian Quality of Life Questionnaire during their medical visits, providing insights into various QoL domains.

Results. Among 337 participants, most reported good QoL in domains of diet (88%), energy (84%), cognition (92%), and finances (75%). However, among the 58% who responded to the interpersonal domain, 79% reported poor QoL, notably citing declined sexual relationships (40%) and sexual difficulties (43%). Bivariate analysis showed that younger age, shorter diabetes duration, and lower HbA1c were correlated with better QoL, while longer duration of current management showed a positive correlation. Multivariable logistic regression identified having a partner (AOR 3.24), absence of neuropathy (AOR 2.36), taking oral medications only (AOR 2.34), and being aged 60 years and above (AOR 2.26) as the strongest factors associated with better overall QoL.

Conclusion. These findings highlight the necessity of a comprehensive approach to diabetes care that integrates interpersonal and sexual health support alongside medical management. Addressing these factors may improve the overall well-being of individuals with Type 2 Diabetes Mellitus.

Keywords. Quality of life; diabetes, Filipino, determinants

Introduction

Type 2 diabetes mellitus (T2DM) is a common chronic disease worldwide, and the Philippines is no exception, bearing a significant burden of diabetes among its population. Based on the 2018 Philippine National Health and Nutrition survey, T2DM prevalence was 7.9%, aligning closely with the global prevalence of 9.8% reported in the 2021 IDF Diabetes Atlas and the Philippine prevalence of 7.1% [1,2,3]

The management of T2DM goes beyond clinical measures and disease control; it also involves assessing the individual's quality of life (QoL). QoL is a multidimensional concept that encompasses various aspects of an individual's well-being, including physical, psychological, social, and functional aspects. A

systematic review has shown that people with diabetes in ASEAN countries experience lower health-related quality of life (HRQoL) compared to those without the condition. [4]

Various factors influence the QoL of individuals with T2DM, including glycemic control, comorbidities, treatment regimens, lifestyle factors, duration of diabetes, and adherence to self-management practices. [5,6,7,8] However, limited research has specifically examined the QoL of Filipinos with T2DM.

Therefore, the main goal of this research is to determine the QoL of Filipinos with T2DM and explore its determinants, particularly focusing on glycemic control, the presence of comorbidities, and diabetic complications. By investigating these factors, this study aims to contribute to the improvement of diabetes care and enhance the overall health outcomes for individuals with T2DM in the Philippines.

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Materials and Methodology

Study Design

This research involves a retrospective analysis of the database results obtained from the Phildiabcare 2020 study. It is a population-based cross-sectional study designed to evaluate the current state of diabetes care in the Philippines. [9] The primary focus of this analysis is to examine the quality of life (QoL) among patients with diabetes.

Subject Recruitment

Subjects for this study were recruited from the clinics of diabetologists who have completed courses at the Institute for the Studies on Diabetes Foundation, Inc. (ISDFI). These diabetologists were selected from various clinics across the major islands in the Philippines. Informed consent was obtained from eligible respondents, who were then asked to complete the Asian Quality of Life Questionnaire during visits to their diabetologists.

Inclusion Criteria

- Adults aged 18-75 years old, diagnosed with diabetes for at least six months
- Patients receiving care from diabetologists affiliated with the Institute for the Studies on Diabetes Foundation, Inc. (ISDFI) for at least six months

Exclusion Criteria

- Pregnant subjects
- Patients with end-stage renal disease (ESRD) currently on dialysis
- Patients who refused to provide informed consent for data privacy
- Patients with hemoglobinopathies or conditions that affect red blood cell turnover
- Terminally ill patients, such as those with malignancy or currently receiving cancer treatment
- Patients currently receiving oral or parenteral corticosteroids
- Patients hospitalized within three months prior to the study
- Patients with severe liver dysfunction

Data Collection, Analysis, and Sample Size Calculation

The original data from the Phildiabcare 2020 study was obtained, and the relevant information needed for analysis was extracted. Data processing was conducted using an Excel file, while statistical analysis was accomplished using GraphPad software.

Glycemic control was determined based on the most recent HbA1c results per patient.

The quality of life of patients with diabetes was assessed using the validated Filipino Version of the ASEAN Diabetes Quality of Life (ADQOL) questionnaire. The Filipino version of the ADQOL demonstrated a high item

content validity index, with scores ranging from 0.80 to 1.00 for clarity. The scale content validity index universal agreement, and average also scored 1.00 for representativeness, relevance, and appropriateness. The comprehension index average was 0.97, while the average clarity index was 0.96. The per-item Cronbach's alpha score ranged from 0.86 to 0.89, with no item scoring lower than 0.70, and the overall Cronbach's alpha was 0.88. Test-retest reliability showed a Bland-Altman Plot repeatability correlation of 0.813 and a Pearson's correlation of 0.820. [10]

Summary statistics, including the number of observations (N), mean, standard deviation, and absolute and relative frequencies for continuous and discrete variables, were calculated respectively. Statistical analyses were performed using GraphPad Version 5 and STATS Direct software.

Logistic regression was conducted to identify independent determinants of a binary 'good QoL' outcome (good vs. poor overall QoL). Predictor variables included age (≥ 60 vs < 60 years), sex, marital status (with vs without partner), education, employment, comorbidities (hypertension, dyslipidemia, heart disease), complications (neuropathy, visual problems, sexual problems), treatment regimen (oral meds only vs insulin), and glycemic control (good vs poor). Crude odds ratios (OR) with 95% confidence intervals were initially calculated (Table 4), followed by multivariable logistic regression with backward stepwise selection ($p < 0.10$ as the retention criterion) to identify dominant adjusted odds ratios (AOR) (Table 5). Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test ($p > 0.05$).

Associations were assessed using prevalence rate ratios, and statistical significance was determined using the chi-square test or Fisher's exact test, as appropriate. Furthermore, 95% confidence intervals were calculated.

Correlations between variables were determined using Pearson's correlation coefficient (Pearson's R) to measure the magnitude of the relationship. Scatter plots were used to visualize the direction of the correlation, and 95% confidence intervals were computed. Statistical significance was defined as a p-value of less than 0.05.

No specific sample size calculation was performed as all available data from the Phildiabcare study were utilized for this analysis.

Limitations

The sample consisted of patients treated by ISDFI-trained diabetologists, representing a distinct subset of people with diabetes, which may affect the broader applicability of the findings.

Results

The majority of the participants have a good quality of life when it comes to the domains of diet (88%), energy (84%), memory and cognition (92%), and the financial domain (75%). However, in terms of interpersonal

relationships, 79% have a poor quality of life. Overall, the majority have a good quality of life (89%). Only 58% have answered the questions on interpersonal relationships; those who did not answer deemed that the question did not apply to them. (See Table 1)

Table 1. Quality of Life of Filipinos with Type 2 diabetes mellitus (T2DM)

Domain	Good Quality of Life	Poor Quality of Life
Diet (n 337)	298 (88%)	39 (12%)
Energy n (336)	283 (84%)	53 (16%)
Memory and Cognition (n 335)	308 (92%)	27 (8%)
Financial (n 335)	250 (75%)	85 (25%)
Interpersonal relationship (n 198)	42 (21%)	156 (79%)
Overall Quality of Life (n 337)	300 (89%)	37 (11%)

Only 58% (n=198/337) of participants completed the interpersonal relationship domain; non-responders deemed questions 'not applicable.' Among responders, 79% reported poor QoL in this domain. The high non-response rate likely reflects cultural sensitivities around sexual health reporting and introduces selection bias

toward those willing to disclose such information. Regarding interpersonal relationships, while 48% reported an improvement in their relationship with their partner, 40% experienced a decline in their sexual relationship, and 43% acknowledged having sexual difficulties. (See table 2)

Table 2. Interpersonal Relationship domain comparing current condition to the condition before the onset of diabetes

	Worst	No change
Relationship with partner n 198	14 (7.07%)	88 (44.44%)
Sexual relationship n 189	76 (40.21%)	74 (39.15%)
Sexual Desire n 188	81 (43.09%)	80 (42.55%)

There is a statistically significant negative correlation between the overall quality of life score and age, duration of diabetes, and current HbA1c. The lower the age, duration of diabetes, and current HbA1c, the better the quality of life of the patient. For the duration of the current management and the overall quality of life score, a statistically significant positive correlation was found. The longer the duration of the current management, the better the quality of life. (see table 3)

Table 3. Correlation of overall quality of life with determinants

Determinants	Pearson's R	95% confidence interval	P value	interpretation
Age	-0.1212	-0.2255 to -0.01427	0.0265	Negative weak correlation
Duration of Diabetes	-0.2020	-0.3035 to -0.09595	0.0002	Negative weak correlation
Duration of Current Management	0.1351	0.02739 to 0.2397	0.0142	Positive weak correlation
Current Hba1c	-0.1188	-0.2231 to -0.01180	0.0297	Negative weak correlation

Scatter plots confirmed the weak bivariate correlations reported (r values -0.12 to +0.14, all $p < 0.03$): negative trends for age, diabetes duration, HbA1c; positive trend for duration of current management. Due to journal figure limits and weak effect sizes ($r^2 < 0.02$), individual scatter plots are available from authors upon request. Correlations represent bivariate associations between continuous variables and the overall QoL score (higher score = better QoL). Logistic regression analyses (Tables 4-5) predicted binary "good QoL" (good vs. poor) using categorical predictors, adjusted for other factors. These models revealed some determinants with significant

positive associations (e.g., age ≥ 60 years, having a partner, no neuropathy, oral meds only, good glycemic control), while others showed positive trends but lacked statistical significance (e.g., higher education, not working, no comorbidities, no complications). The lack of significance for these latter factors may reflect limited statistical power due to the sample size (n=337), smaller cell sizes in some categories, or weaker effect sizes that did not reach $p < 0.05$ after adjustment.

Table 4. Determinants of Quality of Life

Determinants	With Good Quality of Life (N 300)	With Poor Quality of Life (n 36)	Crude OR (95% CI)	P Value
Age 60 and above	207 91	17	2.542	0.0073
Below 60		19	1.247 to 4.923	
Female	199	23	1.114	0.7697
Male	101	13	0.5557 to 2.259	
With partner	209	4	18.58	<0.0001
Without partner	90	32	6.483 to 49.78	
Not working	189	17	1.920	0.0625
Working	110	19	0.9493 to 3.749	
With Hypertension	189	16 20	2.128	0.0310
Without hypertension	111		1.059 to 4.160	
With dyslipidemia	200	24	1.000	>0.9999
Without dyslipidemia	100	12	0.4881 to 2.052	
With heart disease	36	3 33	1.500	0.5163
Without heart disease	264		0.4536 to 4.858	
With visual problems	82	10	0.9780	0.9549
Without visual problems	218	26	0.4548 to 2.024	
Without neuropathy	201	18	2.269	0.0188
With neuropathy	99	19	1.117 to 4.409	
With sexual problems	41 259	5	0.9815	0.9708
Without sexual problems		31	0.3593 to 2.441	
With good sexual desire	269	27	2.892	0.0102
With poor sexual desire	31	9	1.182 to 6.634	

Oral meds only	179	12	3.034	0.0020
On insulin	118	24	1.484 to 6.175	
Absence of comorbidity	35	2	2.254	0.3994
Presence of comorbidity	264	34	0.5874 to 9.878	
With good glycemic control	155	12	2.153	0.0359
Poor glycemic control	144	24	1.057 to 4.372	
without complications	154	16 20	1.328	0.4234
with complications	145		0.6643 to 2.585	

Logistic regression analysis revealed that the strongest positively associated factors were having a partner (AOR 3.24), absence of neuropathy (AOR 2.36), exclusive use of oral medications (AOR 2.34), and being 60 years or older (AOR 2.26).

Table 5: Logistic regression of determinants

Determinants	Adjusted OR	95% Confidence Interval
60 and above	2.266274	1.046123 to 4.909556
With partner	3.241393	1.047766 to 10.027645
With hypertension	1.843451	0.838157 to 4.054508
Without neuropathy	2.360622	1.077998 to 5.169338
With good sexual desire	2.042846	0.808057 to 5.164512
Oral medications only	2.343976	1.054708 to 5.209237
Good glycemic control	1.401832	0.616316 to 3.188516

Discussion

The study aimed to assess the quality of life of Filipinos with Type 2 diabetes mellitus (T2DM) and identify the determinants associated with good quality of life. The results showed that the majority of participants experienced a good quality of life in various domains such as diet, energy, memory and cognition, and financial aspects. These findings are in contrast with most literature, which states that diabetes has a negative impact on the quality of life. [11-12] However, the interpersonal relationship domain was found to be poor for most participants. This finding was consistent with the results of the association that having a partner is positively associated with good quality of life.

Lower age, shorter duration of diabetes (time since diagnosis), and better glycemic control (lower HbA1c) showed weak negative correlations with overall QoL score in bivariate analysis, indicating better QoL with younger age, shorter disease duration, and tighter glycemic control. Conversely, longer duration of current management (time on the present regimen) showed a weak positive correlation (Pearson's $r=0.135$, $p=0.014$), suggesting that stability on an effective regimen—regardless of total disease durations supports better QoL.

The positive OR for age ≥ 60 years (crude OR=2.542, $p=0.007$; adjusted OR=2.27) appears to contradict the negative age correlation but reflects multivariable adjustment for confounders like disease duration, HbA1c, complications, and treatment. Younger patients often have longer cumulative exposure to suboptimal control or complications, while older patients (≥ 60) represent "survivors" on more stable regimens with adaptive coping, yielding higher odds of "good QoL" after adjustment.

The impact of diabetes on sexual health and interpersonal dynamics of individuals with T2DM was evident in the study. While a significant number of participants reported improvements in their relationships with their partners, a considerable proportion experienced worsening sexual relationships and sexual problems. This is consistent with findings of other studies on the importance of sexual health in the quality of life of people living with diabetes. [13-14] These findings highlight the need to address and support the sexual and interpersonal aspects of individuals with T2DM.

Furthermore, the study revealed significant correlations between the overall quality of life score and certain factors. Lower age, shorter duration of diabetes, and better glycemic control were associated with a higher quality of life. On the other hand, a longer duration of current management was positively correlated with overall quality of life. The findings coincide with the findings of other studies, which showed that duration of diabetes, age, and HbA1c level are related to the quality of life of those with type 2 diabetes.[5,15] These findings indicate that early diagnosis, effective management, and control of diabetes are crucial in improving the quality of life of individuals with T2DM.

Based on crude odds ratio, having a partner has the highest statistically significant positive association with good quality of life. Those with a good quality of life have 18 times more odds of being with a partner. Moreover, logistic regression analysis identified several determinants significantly associated with good quality of life. Having a partner, absence of neuropathy, taking oral medications only, and being 60 years old and above were found to have the most dominant positive associations. The findings on the above-mentioned determinants are compatible with the results of other studies, which showed that the following determinants are positively associated with good quality of life: better control of risk factors and complications, higher

educational attainment, being married, not using insulin, and female gender. [4,6,16-17]

These findings emphasize the importance of social support, absence of complications, appropriate medication management, and age-related factors in promoting a better quality of life for individuals with T2DM.

The outcomes of this study carry substantial implications for healthcare professionals caring for individuals with T2DM. It underscores the necessity of addressing the interpersonal and sexual dimensions of patients' lives and offering suitable support and interventions. Moreover, it emphasizes the importance of early diagnosis, effective management, and diabetes control to improve patients' quality of life.

Clinical implications: Physicians should prioritize early diagnosis to minimize disease duration, aim for stable glycemic control without overtreatment, and favor oral regimens, when possible, to enhance QoL. For patients with long-standing diabetes, focus on prevention of complications (e.g., neuropathy screening), partner support, and psychosocial interventions, as these emerged as key modifiable determinants.

Conclusion

In conclusion, this study offers valuable insights into the quality of life of Filipinos with T2DM. It underscores the importance of addressing interpersonal and sexual aspects, as well as optimizing diabetes management, to improve the overall well-being of individuals with T2DM. Healthcare professionals should consider these factors when developing interventions and support strategies for patients living with diabetes.

Limitations of the Study

It is essential to recognize certain limitations within this study. The sample size of the interpersonal relationship domain was relatively small, which may have impacted the generalizability of the results. Furthermore, the study's reliance on self-reported data introduces the possibility of recall bias and social desirability bias.

The study was conducted during the ongoing COVID-19 pandemic, which may have affected access to care, diabetes management patterns, and psychosocial stressors. However, because the original dataset did not collect information on pandemic-related disruptions or changes in diabetes care, we were unable to assess their influence on QoL. Future prospective studies should consider incorporating such contextual variables.

A major limitation is the 42% non-response rate ($n=139/337$) for interpersonal/sexual health questions, likely due to cultural stigma in the Filipino context. This opt-out bias may overestimate poor interpersonal QoL among responders and preclude population estimates for this domain. Future studies should use more culturally adapted wording or optional skipping with sensitivity analyses.

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