Original paper

DOI: https://doi.org/10.4038/sljpsyc.v16i2.8629

The double burden: Depression's role in quality of life deterioration among Type 2 diabetes patients in Sri Lanka

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Abstract

Background

A person with Type-2 Diabetes Mellitus (T2DM) has an increased risk of mental health issues, including depression. Identifying the relationship between these two variables can be effective and important in the Sri Lankan context.

Aims

This study aimed to determine the relationship between Quality of Life and Depression among patients with T2DM.

Methods

This descriptive cross-sectional study was conducted among 123 participants (above 40 years) who have clinically diagnosed with T2DM. The Sociodemographic Questionnaire, the World Health Organization Quality of Life Questionnaire, and the Epidemiological Studies Center Depression Scale were used for the data collection from two selected hospitals.

Results

The majority of participants were females (51.2%) and 78.8% were on Oral Hypoglycemic agents, 66.7% experienced diabetes-related complications, while perception on QoL (67.5%) and Health was mostly neutral (49.6%). The Depression levels were prevalent (13% severe and moderate 20.3%), and it revealed a significant negative correlation between depression and four domains of; physical health ($r = -0.511$, $p=0.000$), psychological ($r = -0.501$, $p=0.004$), social relationship ($r = -0.487$, $p=0.000$), and environment ($r = -0.515$, $p=0.000$), ($p<0.05$).

Conclusion

The study highlights the negative correlation between depression and quality of life in T2DM patients in Sri Lanka. It suggests that future research should include larger, more varied samples and focus on mental health care to improve patient outcomes. The findings can inform the development of specific interventions to enhance the physical, mental, and social well-being of patients with T2DM.

SL J Psychiatry 2025; 16(2): 17-27

Introduction

Diabetes Mellitus (DM) is a chronic disease characterized by elevated blood glucose levels, affecting various bodily organs and systems. Based on estimated data, 1 in 10 individuals aged 20-79 has diabetes, the prevalence is expected to reach 643 million by 2030 and 783 million by 2045 (1-3). Type-2 DM (T2DM) is a major global epidemiological challenge, leading to chronic consequences such as blindness, heart failure, renal failure, micro and macro vascular complications, sexual dysfunction, and lower limb amputations. The cost of treating diabetes is rising due to its long-term consequences (4-8).

The World Health Organization defines health as mental, physical, and social wellness, not just the absence of illness (9), while the Quality of Life (QoL) is a person's assessment of their place in life, including psychological condition, independence, social life, and personal views (10). DM leads to metabolic issues and secondary pathophysiological alterations, affecting a person's QoL (11). Mental health and psychosocial behaviors are also influenced by DM, affecting their self-care and increasing their risk of long-term consequences (11,12).

Depression is a severe mood disorder that impairs feelings, thoughts, and daily activities. In Sri Lanka, 4.8% of men and 8.1% of women reported having depressive episodes at some time in their lives, with 18.9% having more than one (13,14). Diabetes may increase the prevalence or risk of depression, whereas depression may increase the prevalence or risk of diabetes in the future (15).

Diagnosing depression is crucial for minimizing consequences and enhancing an individual's QoL. Researchers show that 45% of diabetes patients do not have a diagnosis of depression. But depression can deteriorate glycemic control, increase the risk of complications, decrease medication adherence, and lower the QoL for T2DM patients (16). Poor glycemic management, dietary practices, and exercise adherence are associated with depression or depressive symptoms in individuals with T2DM. Preventing, diagnosing, and managing health issues is crucial for cultivating a healthy society, and understanding co-morbidity is crucial for diabetic specialists (17,18). The current study aimed to determine the relationship between QoL and Depression among patients with T2DM in selected hospital settings in Sri Lanka.

Methods

The study was conducted at the North Colombo Teaching Hospital and Base Hospital, Warakapola (July-October 2024), by recruiting a total of 123 patients who were clinically diagnosed with T2DM above the age of 40 years through a purposive sampling method. Inclusion criteria required participants to have visited a general practitioner and/or hospital clinic at least once in the past three months, and have been suffering from T2DM for a minimum of five years. Individuals with other metabolic diseases, gestational diabetes, cancer, liver disease, renal disease, hypertension, psychosis, or psychiatric admissions in the six months before the study, and participants with a history of substance misuse, significant cognitive impairments were excluded.

The study used a sociodemographic questionnaire, the WHO Quality of Life (WHOQOL)-BREF, and the Epidemiological Studies Center Depression Scale (CES-D) in both Sinhala and English languages. The WHOQOL-BREF is a self-report instrument used to assess a person's QoL in four domains: Physical health, Psychological health, Social interactions, and Environment (19,20). This includes 24 questions to cover the above mentioned domains, along with two questions measuring overall QoL and Health Status. Responses are reported on a 5-point Likert scale, and raw scores for each domain are converted to a 0-100 linear score (21,22). A score below 45 indicates low QoL, 46 and 65 indicates moderate QoL, and a score above 65 indicates relatively high QoL (23,24). The CES-D is a self-reporting tool that assesses depressive symptoms in both clinical and general populations via 20 questions, each scored by a 4-point Likert scale (0 to 3). A total score of 16 on the CES-D suggests moderate depression, a score of 22 and above indicates severe depression. Total scores ranging from 0 to 60 (25,26).

Data was analyzed using descriptive statistics and Pearson's correlation coefficient to identify the statistical correlation between the variables. The IBM SPSS Statistics for Windows (Version 26.0), used as the analysis software. Ethical clearance obtained from the Ethics Review Committee, Faculty of Medicine, University of Kelaniya.

Results

The questionnaires were distributed to 130 patients who met specific inclusion and exclusion criteria. The response rate was 94.62% (seven questionnaires were incomplete). The data analysis included only completed (n=123) questionnaires.

Table 1 indicates the summary of sociodemographic details and satisfaction with the living environment. The majority of the participants were females (n=63,51.2%). The summary of the educational, employment, financial status, and the summary of engagement in social activities are represented in Table 2. Table 3 indicates the summary of du=diabetic medication methods and complications.

Most of the individuals' overall perception of QoL was "neither poor nor good" (n=83, 67.5%). When it comes to the individual's overall perception of their health, 61(49.6%) people stated as "neither satisfied nor dissatisfied". Under the four domains of WHOQOL-BREF, 55(44.7%) with high QoL in Physical Domain, 67(54.5%) with high QoL in Psychological Health Domain, 62(50.4%) with high QoL in Social Relationships Domain, and 62(50.4%) with high QoL in Environmental Domain. The CES-D findings indicate that 82(66.7%) people did not show signs of depression, while 25(20.3%) with moderate and 16(13%) with severe depressive symptoms (Table 4).

The study used Pearso's correlation coefficient to identify the relationship between QoL domains and the Depression scores ($p<0.05$). The results show a significant negative correlation between the physical health domain and depression ($r=-0.511$, $p=0.000$), for the psychological domain and depression ($r=-0.501$, $p=0.004$), for the social relationship domain and depression ($r=-0.487$, $p=0.000$), and the environment domain and depression ($r=-0.515$, $p=0.000$). It indicates that there is a moderate negative correlation between depression and all four domains of QoL (Table 5).

Table 1. Summary of the socio-demographic details, living conditions, and satisfaction of living environment (n=123)

Variable	Mean (±SD)	Frequency	Percentage (%)
Gender			
Male		60	48.8
Female		63	51.2
Weight (kg)	56.72 (±7.188)		
40 kg - 45 kg		05	04.1
46 kg - 50 kg		15	12.2
51 kg - 55 kg		35	28.5
56 kg - 60 kg		50	40.6
61 kg - 65 kg		08	06.5
66 kg - 70 kg		06	04.9
71 kg - 75 kg		00	00.0
76 kg - 80 kg		02	01.6
81 kg - 85 kg		02	01.6
Height	160.80 (±9.517)		
131 cm - 140 cm		01	00.8
141 cm - 150 cm		10	08.2
151 cm - 160 cm		52	42.3
161 cm - 170 cm		41	33.3
171 cm - 180 cm		16	13.0
181 cm - 190 cm		03	02.4
BMI	21.999 (±2.8396)		
Below 18.5		06	04.9
18.5 - 24.9		101	82.1
25.0 - 29.9		15	12.2
30.0 and above		01	00.8
Living conditions			
Living in the family		105	85.4
Living with parents		02	01.6
Living with parents/ relatives		12	09.7
Living with relatives		04	03.3
Current problems in work life/ day today life			
No		46	37.4
Yes		77	62.6
Particular caregiving method			
No		119	96.7
Yes		04	03.3
Satisfaction on living environment			
No		17	13.8
Yes		106	86.2

Table 2. Summary of the educational, employment, financial status and the summary of engagement in social activities (n=123)

Variable	Frequency	Percentage (%)
Educational status		
Primary education	28	22.8
O/L	51	41.5
A/L	42	34.1
Graduated	02	01.6
Current Employment		
Employed	55	44.7
Unemployed	68	53.3
Civil Status		
Married	106	86.2
Unmarried	17	13.8
Monthly income		
Less than 10,000	37	30.1
10,000 - 30,000	42	34.1
30, 000 - 60,000	39	31.7
60,000 above	05	04.1
Financial independence		
Yes	55	44.7
No	68	55.3
Engagement in social activities		
Religious Act.	11	09.0
Religious Act., Family gatherings, Visiting friends	02	01.6
Religious Act., other activities	02	01.6
Religious Act., social gatherings	37	30.1
Religious Act., social gatherings, Visiting friends	02	01.6
Religious Act., social gatherings, Visiting friends, other activities	02	01.6
Religious Act., social gatherings, Family gatherings, Visiting friends	02	01.6
Religious Act., social gatherings, Family gatherings,	49	39.9
Visiting friends, other activities	02	01.6
Religious Act., Visiting friends	01	00.8
Religious Act., Visiting friends, other activities	01	00.8
Social gatherings	01	00.8
Visiting friends, other activities	08	06.5
Not applicable	03	02.5
Not answered		

O/L – Ordinary Level Examination, A/L – Advanced Level Examination, Religious Act. – Religious Activities

Table 3. Summary of the diabetic medication methods and complications

Variable	Frequency	Percentage (%)
Duration of the illness		
5 year - 10 years	46	37.4
11 years - 15 years	50	40.7
16 years - 20 years	25	20.3
21 years - 25 years	02	01.6
Diabetic medication method		
Insulin	06	04.9
Insulin + Oral Hypoglycemic agents	20	16.3
Oral Hypoglycemic agents	97	78.8
Diabetic related complications		
Diabetic foot, ischemic heart disease	03	02.5
Diabetic foot, Ketoacidosis	01	00.8
Nephropathy	02	01.6
Neuropathy	02	01.6
Retinopathy	42	34.2
Retinopathy, Diabetic foot	02	01.6
Retinopathy, Diabetic foot, ischemic heart disease	02	01.6
Retinopathy, Diabetic foot, Nephropathy, Ischemic Heart Disease, Ketoacidosis	02	01.6
Retinopathy, Nephropathy	08	06.6
Retinopathy, Nephropathy, Ischemic Heart Disease	02	01.6
Retinopathy, Neuropathy	10	08.2
Retinopathy, Neuropathy, Ketoacidosis	02	01.6
Retinopathy, Neuropathy, Diabetic foot, ischemic heart disease	01	00.8
Retinopathy, Neuropathy, Nephropathy, Ketoacidosis	01	00.8
Retinopathy, Diabetic foot, Ischemic Heart Disease, Ketoacidosis	01	00.8
Retinopathy, Ischemic Heart Disease, Ketoacidosis	01	00.8
No complication	41	33.3
Other Complications		
Blurred vision	05	04.1
Blurred vision, Pain on limbs	04	03.3
Fatigue	08	06.5
Fatigue, Blurred vision	06	04.9
Fatigue, Blurred vision, Pain on limbs	10	08.1
Fatigue, Pain on limbs	03	02.4
Fatigue, Swelling of limbs, Pain on limbs	01	00.8
Pain on limbs	05	04.1
Pain on limbs, Delayed wound healing	02	01.6
Sleep disturbance	04	03.3
Sleep disturbance, Blurred vision	01	00.8
Sleep disturbance, Blurred vision, Pain on limbs	02	01.6
Sleep disturbance, Blurred vision, Swelling of limbs, Pain on limbs, Delayed wound healing	01	00.8
Sleep disturbance, Fatigue	01	00.8

(Continued)

Variable	Frequency	Percentage (%)
Sleep disturbance, Fatigue, Blurred vision	04	03.3
Sleep disturbance, Fatigue, Blurred vision, Pain on limbs	08	06.5
Sleep disturbance, Fatigue, Blurred vision, Pain on limbs, Delayed wound healing	03	02.4
Sleep disturbance, Fatigue, Blurred vision, Swelling of limbs	02	01.6
Sleep disturbance, Fatigue, Blurred vision, Swelling of limbs, Pain on limbs	06	04.9
Sleep disturbance, Fatigue, Blurred vision, Swelling of limbs, Pain on limbs, Delayed wound healing	05	04.1
Sleep disturbance, Fatigue, Pain on limbs	04	03.3
Sleep disturbance, Fatigue, Swelling of limbs, Pain on limbs	03	02.4
Sleep disturbance, Pain on limbs	07	05.7
Sleep disturbance, Swelling of limbs	02	01.6
Sleep disturbance, Swelling of limbs, Pain on limbs	02	01.6
Swelling of limbs, Pain on limbs	03	02.4
Swelling of limbs, Pain on limbs, Delayed wound healing	02	01.6
No complications	19	15.5

Table 4. Level of QoL and Depression among type 2 diabetes patients.

Variable	Mean (±SD)	Frequency	Percentage (%)
Individual's overall perception of QOL	3.37 (± 0.75)		
Very poor		00	00.0
Poor		05	04.0
Neither poor nor good		83	67.5
Good		20	16.3
Very good		15	12.2
Individual's overall perception of their health	3.27 (± 0.89)		
Very dissatisfied		05	04.1
Dissatisfied		12	09.8
Neither satisfied nor dissatisfied		61	49.6
Satisfied		35	28.4
Very satisfied		10	08.1
Domains			
Physical health – domain 1	61.51 (±20.41)		
Low		36	29.3
Moderate		32	26.0
High		55	44.7
Psychological health – domain 2	68.06 (±15.70)		
Low		13	10.5
Moderate		43	35.0
High		67	54.5

(Continued)

Variable	Mean (±SD)	Frequency	Percentage (%)
Social relationship – domain 3	64.41 (±18.63)		
Low		19	15.5
Moderate		42	34.1
High		62	50.4
Environment – domain 4	65.59 (±15.14)		
Low		14	11.4
Moderate		47	38.2
High		62	50.4
Level of Depression			
No Signs		82	66.7
Moderate Signs		25	20.3
Severe Signs		16	13.0

Table 5. Correlation between Quality of Life (QoL) Domains and Depression (n=123)

	Domains			
	Physical Health Vs. Depression	Psychological Health Vs. Depression	Social Relationship Vs. Depression	Environment Vs. Depression
Pearson's Value (p value)	-0.511(0.000)	-0.501(0.004)	-0.487(0.000)	-.0.515(0.000)

Significance at $p<0.05$

Discussion

This study examined the sociodemographic characteristics, QoL, and depression levels among 123 patients with T2DM in Sri Lanka, achieving a high response rate of 94.62%. The findings revealed key insights into the lived experiences of this population, particularly regarding their health perceptions, socioeconomic challenges, and psychosocial well-being.

In the current study, the mean scores of the WHOQOL domains are as follows: physical health 61.51 (±20.41), psychological 68.06 (±15.70), social relationships 64.41 (±18.63), and environmental 65.59 (±15.14). Notably, psychological health and the environmental domain have the highest mean value among these four domains. The physical and social domains have moderate mean values. Amin and Colleagues (2022), where the psychological health domain scored as 44.2 (±21.0), 37.2 (±20.5) for the physical health domain, 39.6 (±23.2) for the social relationship domain, and 41.6 (±19.5) for the environmental domain (27). Pandey and Colleagues from their study: physical domain 54.1 (±16.9), psychological domain 54.9(±16.9), social domain 56.2 (±20.4), and environmental domain 54.8(±17.4). The social domain indicated a higher moderate mean value (28). Additionally, a study done by Hsieh in 2020, following mean scores found: 13.15 (±2.87) for physiological health, 12.76 (±2.90) for psychological health, 13.76 (±2.43) for the social relationships, and 13.74 (±2.35) for the environmental domain (29).

The findings from the current study demonstrate higher mean scores across all WHOQOL domains compared to previous studies (27-29). Specifically, the psychological health (68.06±15.70) and environmental domains (65.59±15.14) scored the highest, indicating better perceived quality of life in these areas among the study population. The physical health (61.51±20.41) and social relationships (64.41±18.63) domains also showed moderate but relatively higher scores compared to prior research. In contrast, Amin and Colleagues reported significantly lower scores across all domains, psycho-

logical health (44.2±21.0) and physical health (37.2±20.5) being particularly low. Pandey in 2020 found moderate scores, with the social domain (56.2±20.4) being the highest, while Hsieh in 2020 reported much lower scores.

In the current study, most of the individuals' overall perception of QoL (3.37±0.75) was neither poor nor good (n=83,67.5%), 15 (12.2%) had a very good perception, and 5 (4.0%) had poor perception. When it comes to the individual's overall perception of their health (3.27±0.89), 61(49.6%) of people were neither satisfied nor dissatisfied with their health, 10(8.1%) were very satisfied, 5 (4.1%) were dissatisfied. In the study conducted by Amin in 2022, 54% of respondents stated their perception of QoL as neither poor nor good, and 51.2% reported neither satisfied nor dissatisfied about their health (27). However, Pandey and colleagues in 2020 found, only 29.9% of diabetes patients reported good QoL, while 35.5% were satisfied with their overall health (28).

The current study reveals that the majority of participants (67.5%) perceived their overall QoL as neutral, and half (49.6%) were neutral on health satisfaction. These findings align with Amin's findings, where a similar trend was observed among 54% of respondents who rated their QoL as neutral, and 51.2% were indifferent about their health. In contrast, Pandey 2020 reported lower levels of perceived QoL and health satisfaction, with only 29.9% reporting good QoL and 35.5% being satisfied with their health. Overall, while most individuals in the current study and findings from Amin (2022) hold a moderate perception of their QoL and health, populations with chronic conditions may experience lower satisfaction.

The number of people commented on higher satisfaction in QoL in four domains as follows: 55 (44.7%) physical health domain, 67 (54.5%) psychological health, 62(50.4%) under social relationships, and 62 (50.4%) under environmental domain. The study done by Vijay and Colleagues (2024) found, 55.83% of individuals rated higher satisfaction in the physical health, 49.1% in the psychological health domain, 49.69% social relationship domain, and 57.1% in the environmental domain (30). When comparing the findings of the current study with above mentioned study, the findings show both similarities and differences. To compare the findings of the current study and Vijay's study, both studies indicated the approximate percentages indicated under the social relationship domain. This discrepancy may stem from differences in study populations, health conditions, or socio-cultural factors influencing perceptions of well-being in different contexts. These variations may be attributed to differences in study populations, cultural contexts, and sample characteristics. The consistently higher scores in the current study suggest better overall QoL among participants, particularly in psychological and environmental aspects.

To discuss the depression levels of the current study, results show that 66.7% (n=82) of people did not show any signs of depression, 20.3% (n=25) had moderate depression, while 13%(n=16) had severe depressive symptoms. A cross-sectional study found that the prevalence of moderate to severe depressive disorder among 33.6%, and mild depression was identified among 30.8% (31). Also, based on the results of another scientific study, most of the participants (25.1%) experienced mild depression, 16.7% participants with moderate depression, 3.4% participants with moderately severe depression, and 1.9% participants with severe depression (32). In another research, over half of the participants had none to minimal depression (81.1%), whereas 19.9% had mild depression, 5.0% had moderate depression, and 1.3% had moderately severe depression (33).

Compared to the current study, other studies reported varying prevalence rates of depression, with some indicating higher levels of moderate to severe depression (30.8%-33.6%) but lower rates of severe depression (1.9%-3.1%) (31,32). Another study (33) aligned more closely with the current findings, showing that most individuals (81.1%) had minimal to no depression, while a smaller percentage experienced mild (19.9%) or moderate (5.0%) symptoms. These differences may stem from variations in study populations, cultural contexts, assessment tools, or underlying health conditions. The relatively higher prevalence of moderate to severe depression (33.3%) in the current study, compared to some other research, suggests a need for targeted mental health interventions, particularly for at-risk groups.

To discuss the relationship between QoL domains and depression in current study, the results show a significant negative correlation between the physical health domain vs. depression ($r=-0.511$, $p=0.000$), for the psychological domain vs. depression ($r=-0.501$, $p=0.004$), for the social relationship domain vs. depression ($r=-0.487$, $p=0.000$), and the environment domain vs. depression ($r=-0.515$, $p=0.000$). Therefore, based on the results, there is a significant negative correlation between the level of QoL and the level of depression, and there is a statistically significant relationship between QoL and depression.

Mahammad and colleagues found a negative correlation between QoL and Depression ($r=-0.617$). There is a significant negative correlation between depression and QoL subscales, demonstrating that high depression scores may lead to lower physical ($r=-0.587$) and psychological health ($r=-0.567$), influencing social interactions ($r=-0.448$) and environmental health ($r=-0.548$). The results are statistically significant ($p=0.00$) ($p<0.05$) (34). This research revealed a strong inverse relationship between depression and various QoL subscales, indicating that higher depression scores are associated with lower physical and psychological health,

which in turn affects social interactions and environmental health. In another study, a significant negative correlation was found between depression and QoL domains. A negative correlation was identified between a lower QoL vs. higher prevalence of depressive symptoms ($r=-0.221$, $p<0.01$) (35).

The present study demonstrates a significant negative correlation between all domains of QoL and depression, with the strongest associations observed in the physical health ($r=-0.511$) and environmental ($r=-0.515$) domains. These findings align with previous research, including Mohammad's study (34), which reported a similarly strong inverse relationship between depression and QoL subscales ($r=-0.617$), particularly in physical ($r=-0.587$) and psychological health ($r=-0.567$). The other study further supports these results, confirming that higher depression scores correlate with poorer QoL ($r=-0.221$, $p<0.01$) (35).

The strong negative correlation between depression and QoL across multiple studies confirms that depression significantly worsens QoL, particularly in physical and psychological health. These findings emphasize the need to incorporate mental health care into overall health strategies to improve well-being.

Limitations

While the research maintained a strong response rate of 94.6%, the exclusion of seven incomplete surveys may have introduced some degree of selection bias. This could potentially limit the broader applicability of the results, as we were unable to capture the views of participants who partially completed the questionnaires.

Conclusions

This study explored the experiences and challenges of patients with T2DM in selected Sri Lankan Hospitals, highlighting the critical gaps in physical health, social relationships, psychological health, and living environment. These findings underscore the need for integrated care addressing both mental and physical health in diabetes management. This study highlights the critical need for patient-focused approaches, such as community education initiatives, cost-effective treatment solutions, and enhanced psychological support for individuals with Diabetes. Tackling these systemic issues could lead to better long-term health results and lessen the impact of T2DM in Sri Lanka. Further studies should explore culturally adapted lifestyle strategies and the potential of digital health technologies in improving diabetes management. Future research should explore underlying causes and factors for better interventions, while clinically, regular depression screenings and comprehensive QoL evaluations should be implemented for high-risk groups. To strengthen future studies, consider implementing more rigorous follow-up procedures to reduce incomplete responses and improve overall data quality. The findings add to the broader conversation on non-communicable diseases in resource-limited environments, calling for policy changes that support comprehensive and accessible diabetes care in Sri Lanka.

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