QUALITY OF LIFE OF ELDERLY PATIENTS WITH TYPE 2 DIABETES AT THAI BINH PROVINCIAL GENERAL HOSPITAL

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ABSTRACT

Objective: This study aimed to assess the QoL of elderly patients with T2DM at Thai Binh Provincial General Hospital and identify associated factors influencing their QoL.

Method: A total of 303 elderly patients aged 60 and above were recruited. QoL was measured using SF-36 questionnaire. Socio-demographic data, nutritional status, and comorbidities were also collected. Statistical analyses were conducted to evaluate associations between these variables and QoL scores.

Results: The average QoL score among participants was 48.7 ± 7.4. Significant differences in QoL were observed by age, with patients aged 60-69 reporting the highest scores (50.7 ± 7.2) and those aged 80 and older the lowest (46.0 ± 6.6), p = 0.0002. Comorbidities significantly impacted QoL; patients with neurological disorders had scores of 46.9 ± 7.1 compared to 50.0 ± 7.3 for those without (p = 0.0002).

Conclusion: Elderly patients with T2DM at Thai Binh Provincial General Hospital experience a reduced QoL, primarily influenced by age and comorbidities. Comprehensive management strategies addressing these factors are essential for enhancing the QoL of this population. These findings underscore the importance of targeted interventions and resource allocation to improve diabetes care and overall well-being, particularly for elderly patients in resource-limited settings.

Keywords: *quality of life; diabetes; elderly; comorbidities; associated factors*

I. INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a prevalent chronic condition that poses considerable health, economic, and social challenges worldwide [1] related morbidity and mortality, as well as diabetes-related health expenditures at global, regional

and national levels. The IDF Diabetes Atlas also introduces readers to the pathophysiology of diabetes, its classification and its diagnostic criteria. It presents the global picture of diabetes for different types of diabetes and populations and provides information on specific actions that can be taken, such as proven measures to prevent type 2 diabetes and best management of all forms of diabetes to avoid subsequent complications. The credibility of diabetes estimates relies on the rigorous methods used for the selection and analysis of high-quality data sources. For every edition, the IDF Diabetes Atlas Committee – composed of thematic experts from each of the seven IDF Regions – reviews the methods underlying the IDF Diabetes Atlas estimates and projections and available data sources. The majority of the data sources used are population-based studies that have been published in peer-reviewed journals. In this edition, we have also included data from national diabetes registries. With the establishment of electronic records and national registries becoming more common, we anticipate more data like these will be featured in the future. Furthermore, information from national health surveys, including some of the World Health Organization (WHO. Characterized by insulin resistance and a gradual decline in insulin production, T2DM requires ongoing management to mitigate risks of severe complications such as cardiovascular disease, neuropathy, retinopathy, and nephropathy. For elderly patients, these complications pose even greater risks, as age-related declines in health and physical function often exacerbate the impact of diabetes [1]related morbidity and mortality, as well as diabetes-related health expenditures at global, regional and national levels. The IDF Diabetes Atlas also introduces readers to the pathophysiology of diabetes, its classification and its diagnostic criteria. It presents the global picture of diabetes for different types of diabetes and populations and provides information on specific actions that can be taken, such as proven measures to prevent type 2 diabetes and best management of all forms of diabetes to avoid subsequent complications. The credibility of diabetes estimates relies on the rigorous methods

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In recent years, the concept of quality of life (QoL) has gained prominence in the field of diabetes care, particularly for elderly individuals who often face multiple age-related challenges [3]. QoL is not only a key indicator of treatment success but also a critical factor in ensuring patient adherence to diabetes management plans, particularly for elderly individuals who may already be coping with comorbidities and physical decline. Moreover, focusing on QoL aligns with the broader goals of improving patient-centered care and enhancing the overall well-being of this vulnerable population. Quality of life is a multifaceted measure that reflects physical, mental, and social well-being, as well as an individual's ability to perform daily activities and maintain social roles. For elderly individuals with T2DM, maintaining a high QoL is vital, as the disease can impact multiple domains of life, from physical function to emotional health and social engagement. The burden of managing diabetes, along with potential physical limitations, pain, fatigue, and emotional stress, can all negatively affect the QoL of elderly patients, leading to poorer health outcomes and reduced life satisfaction [3].

In Vietnam, the burden of T2DM has been on the rise, reflecting global trends, and impacting a growing segment of the elderly population [4–6]. Despite this, research focusing specifically on the quality of life of elderly individuals with T2DM remains limited. While prior studies have explored QoL in patients with T2DM, there is a significant gap in understanding the unique socio-cultural, healthcare access, and disease management challenges faced by elderly individuals in Vietnam. This study aims to address this gap, providing new insights into the lived experiences of this population and the specific factors that influence their QoL. Understanding the factors that influence QoL among this population is essential for developing targeted interventions that can improve diabetes care and, more importantly, enhance overall well-being [3,4]. Thai Binh Provincial General Hospital, a major healthcare provider in northern Vietnam, serves a large elderly population with T2DM, providing a unique opportunity to investigate the QoL in this group and address their specific healthcare needs.

This study aims to assess the quality of life of elderly patients with T2DM at Thai Binh Provincial General Hospital, examining various dimensions that contribute to overall well-being of T2DM elderly patients.

II. SUBJECT AND METHODOLOGY

2.1. Subjects, location and duration

2.1.1. Study subjects

Elderly patients with T2DM undergoing inpatient treatment at Thai Binh Provincial General Hospital.

Inclusion criteria: Elderly patients, defined as individuals aged 60 years or older, receiving treatment at Thai Binh Provincial General Hospital, diagnosed with type 2 diabetes, completed all research questionnaire items, and consented to participate in the study.

Exclusion criteria: Patients who did not consent to participate in the study or did not respond or provided incomplete responses in the questionnaire.

2.1.2. Study location

This study was conducted at Outpatient Department, Thai Binh Provincial General Hospital.

2.1.3. Study duration

From December 2023 to September 2024.

2.2. Methodology

2.2.1. Study design

This was a descriptive cross-sectional study a. The sample size was calculated based on the formula for cross-sectional study with confidence level set at a probability threshold of $\alpha = 0.05$ and margin of error between the sample value and the actual population value $d = 0.05$. According to the

study by Ngo Van Manh [7], the proportion of elderly people with a good quality of life was 78.4% (p = 0.784). The minimum number of patients required for the study was 261. In practice, we included 303 elderly with T2DM.

2.2.2. Sampling methods and patient selection

This was a convenience sampling method. Elderly patients with T2DM admitted in the Outpatient Department at the time of the study, meeting the inclusion criteria and not meeting any exclusion criteria were selected and invited to participate into this study. Patients were selected on an accumulative basis until the required sample size was achieved.

2.2.3. Data collection

Two questionnaires were used for data collection. The first questionnaire was established to collect the socio-demographic information including age, gender, occupation, marital status and comorbidities. SF-36 questionnaire was used to investigate QoL of the patients according to previous study [8]. This had been validated in Vietnamese [9]. The QoL questionnaire consists of 11 main questions, containing 36 sub-questions, divided into 8 domains: 1) Limitations in physical activities because of health problems. 2) Limitations in social activities because of physical or emotional problems 3) Limitations in usual role activities because of physical health problems 4) Bodily pain 5) General mental health (psychological distress and well-being) 6) Limitations in usual role activities because of emotional problems 7) Vitality (energy and fatigue) 8) General health perceptions.

The calculation of QoL score was performed according to the instructions [8]. QoL scores range from 1 to 100 [8,9].

2.2.4. Data analysis

Data was cleaned and entered into the system using Epidata software. STATA 18.0 software was used for analysis. Qualitative variables were described by percentage and frequency. Quantitative variables were presented in mean and standard deviation. To analyze the relationships between independent variables and the QoL of the patients, with the outcome variable being the QoL score (a continuous variable), we performed firstly univariate analysis. T-test or One-way ANOVA was used to compare the average quality of life scores between two or more groups. Variables with a p-value < 0.20 in the univariate analysis in univariate analysis were selected for inclusion in the multivariate analysis using a linear regression model. Results are presented as OR (Odds Ratio) and 95% Confidence Interval (CI). The statistic test was considered as significant with p value <0.05.

2.3. Ethics statement

The study protocol was approved by Thai Binh University of Medicine and Pharmacy (Decision No. 451/2023) and was permitted by the leadership of Thai Binh Provincial General Hospital. The study was performed according to the good clinical practices recommended by the Declaration of Helsinki and its amendments. Patients voluntarily consented to participate in the research. All information about research subjects and survey data were kept confidential to ensure the privacy of participants. This study had no direct impact on the research subjects.

III. RESULTS

3.1. Socio-demographic characteristics of the study population

A total of 303 elderly patients with T2DM were included, with a predominance of those aged 70 to 79 years (43.6%), followed by those aged 60 to 69 years. The male gender comprised 50.5% of the participants, and 72.6% were from rural district areas (Table 1).

Table 1. Socio-demographic characteristics of the study population (n = 303)

Characteristics	n	%
Age group		
60 – 69	122	40.2
70 – 79	132	43.6
≥ 80	49	16.2

Characteristics	n	%
Gender		
Male	153	50.5
Female	150	49.5
Address		
Thai Binh city	78	25.7
District in Thai Binh province	220	72.6
Other	5	1.7

Before the age of 60 years, the primary occupation of the study participants was farming, accounting for 44.2% (134/303), followed by public officials/employees at 39.3% (119/303) and others (50/303, 16.5%). The majority of participants lived with their spouses, representing 66.3% (201/303) of the population, following by living with family member (66/303, 21.8%), with relatives (25/303, 8.3%) and single (11/303, 3.6%). In terms of economic status, 41.3% (125/303).

Most participants (188/303, 62.1%) were classified as having normal nutritional status, 25.1% (76/303) were overweight, 9.2% (28/303) were obesity and 3.6% (11/303) were malnutrition. Cardiovascular disease was the most common condition, affecting 87.8% (266/303) of patients, followed by eye disease at 83.5% (253/303), musculoskeletal and mobility diseases (242/303, 79.9%), oral and maxillofacial disorders (213/303, 70.3%), neurology diseases (127/303, 41.9%), gastrointestinal diseases (89/303, 29.4%), respiratory diseases (84/303, 27.7%), urinary diseases (28/303, 9.2%) and skin diseases (12/303, 4.0%).
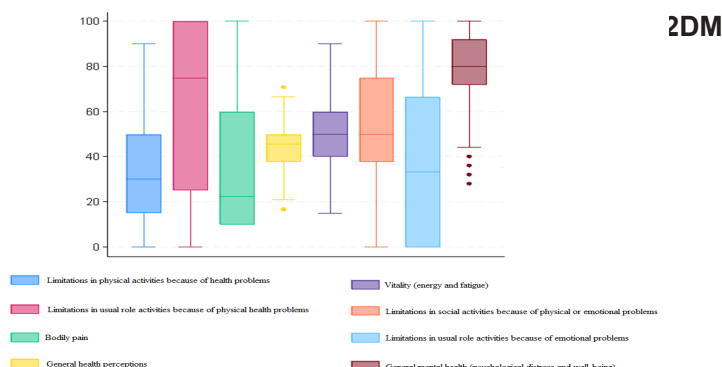
3.2. Quality of life an 2DM

Figure 1. Quality of life scores according to 8 health domains

The average QoL score for the study subjects was 48.7 ± 7.4, with the lowest score being 25.8 and the highest score being 71.0. Average QoL scores across various domains ranged from 32.2 (functional activities) to 78.0 (mental health assessment) (Figure 1).

Table 2. Association between age, gender, address, and occupation with QoL (n = 303)

Variable	Mean	SD	p-value
Age group			
60 – 69	50.7	7.2	
70 – 79	47.9	7.3	0.0002
≥ 80	46.0	6.6	
Gender			
Male	49.0	7.4	0.41
Female	48.3	7.3	
Address			

Variable	Mean	SD	p-value
Thai Binh city	48.1	7.0	
District in Thai Binh province	48.9	7.5	0.65
Other	50.3	6.4	
Occupation before age of 60 years			
Public officials/employees	48.2	6.7	
Farmer	48.8	7.3	0.59
Other	49.5	8.9	

QoL was inversely proportional to the age of participants. Specifically, patients aged 60 to 69 years had the highest QoL score (50.7 ± 7.2), while those aged 80 and older had the lowest QoL score (46.0 ± 6.6). This difference was statistically significant with p = 0.0002. There was no statistically significant correlation between living area and occupation with the QoL of the study subjects, with p-values of 0.65 and 0.59, respectively (Table 2).

Table 3. Association between marital status, monthly income and nutrition status with QoL of participants (n = 303)

Variables	Mean	SD	p-value
Marital status			
Single	49.2	8.3	
Living with spouse	49.2	7.3	0.64
Living with family member	47.9	6.7	
Living with relatives	47.4	8.1	
Monthly income			
<2M VND	48.2	7.9	0.35
≥2M VND	49.0	6.9	
Nutrition status			
Normal	49.3	7.3	
Malnutrition	47.3	6.5	0.31
Overweight	47.8	7.7	
Obesity	47.4	7.1	

Additionally, marital status and monthly income did not show a statistically significant correlation with QoL, with p-values of 0.64 and 0.35, respectively. Furthermore, there was no significant correlation between nutritional status and QoL, with a p-value of 0.31 (Table 3).

Table 4. Association between comorbidities and QoL of patients (n = 303)

Variables		Mean	SD	p-value
Skin disorders	No	48.9	7.3	0.01
	Yes	43.6	6.0	
Cardiovascular diseases	No	50.2	7.7	0.18
	Yes	48.5	7.3	
Respiratory diseases	No	49.0	7.2	0.23
	Yes	47.8	7.8	

Variables		Mean	SD	p-value
Gastrointestinal diseases	No	48.7	7.4	0.90
	Yes	48.6	7.2	
Urinary diseases	No	48.6	7.2	0.74
	Yes	49.1	8.6	
Musculoskeletal and mobility diseases	No	50.0	7.9	0.11
	Yes	48.4	7.2	
Neurology diseases	No	50.0	7.3	0.0002
	Yes	46.9	7.1	
Eye diseases	No	51.1	7.4	0.01
	Yes	48.2	7.3	
Oral and maxillofacial disorders	No	50.3	7.1	0.01
	Yes	48.0	7.4	

Patients with skin disorders reported a statistically significantly lower QoL compared to those without this condition, with average QoL scores of 43.6 ± 6.0 and 48.9 ± 7.3, respectively (p = 0.01). Participants with neurological diseases had a statistically significantly lower QoL compared to those without such diseases, with average QoL scores of 46.9 ± 7.1 and 50.0 ± 7.3, respectively (p = 0.0002). Similarly, those with eye disorders had significantly lower QoL compared to patients without such disorders, with average QoL scores of 48.2 ± 7.3 and 51.1 ± 7.4, respectively (p = 0.01). Elderly patients with oral and maxillofacial disorders also reported a statistically significantly lower QoL compared to those without such disorders, with average scores of 48.0 ± 7.4 and 50.3 ± 7.1, respectively (p = 0.01) (Table 4).

Table 5. Associate factors of QoL of elderly patients with T2DM (multivariate analysis) (n = 303)

Variables	OR	95%CI	p-value
Age			
60 – 69	Reference		
70 – 79	0.14	0.01 - 1.50	0.11
≥ 80	0.05	0.02 - 0.87	0.04
Skin disorders	0.10	0.01 - 0.38	0.02
Cardiovascular diseases	0.24	0.02 - 2.79	0.25
Musculoskeletal and mobility diseases	0.33	0.04 - 2.91	0.32
Neurology diseases	0.10	0.02 - 0.60	0.01
Eye diseases	0.35	0.03 - 4.45	0.42
Oral and maxillofacial disorders	0.89	0.10 - 7.89	0.92

Multivariate analysis revealed that, compared to patients aged 60-69 years, those aged 80 and older had a QoL score that was 20 times lower, with an OR of 0.05 and p = 0.04. Participants with skin diseases had a QoL score that was 10 times lower than those without this comorbidity, with an OR of 0.10 and p = 0.02. Furthermore, individuals with neurological disorders had a QoL score 10 times lower than those without such disorders, with an OR of 0.10 and p = 0.01 (Table 5).

IV. DISCUSSION

This study provides valuable insights into the QoL of elderly patients with T2DM at Thai Binh Provincial General Hospital. The findings reveal a nuanced understanding of the socio-demographic characteristics and the factors influencing QoL among this vulnerable population.

4.1. Socio-demographic characteristics

Our study showed a predominance of elderly patients aged 70 to 79 years, with a notable representation of individuals from rural areas. This demographic aligns with trends indicating that aging populations are increasingly common in rural settings [2]. The high percentage of patients with a background in agriculture and public service reflects the socioeconomic dynamics prevalent in these regions, where agricultural livelihoods are predominant. Understanding these socio-demographic factors is crucial, as they can significantly influence access to healthcare resources and overall health outcomes [10].

4.2. Nutritional status and QoL

Despite the majority of participants being classified as having a normal nutritional status, the presence of malnutrition (3.6%) and overweight individuals (25.1%) is concerning. Previous studies indicated that malnutrition and obesity can adversely affect the health and QoL of elderly individuals [3,4,11]. However, our analysis found no significant correlation between nutritional status and QoL. This finding underscores the multifactorial nature of QoL in elderly T2DM patients, where factors beyond nutritional status, such as the presence of comorbidities and psychological stress, may play more critical roles.

4.3. Comorbidities and their impact on QoL

A striking finding of this study is the significant correlation between comorbidities and reduced QoL. The prevalence of cardiovascular and eye diseases among participants was alarmingly high, affecting 87.8% and 83.5%, respectively. These conditions are well-documented complications of T2DM, which can further exacerbate the patient's health status and hinder their ability to manage diabetes effectively. Patients with comorbidities reported a substantially lower QoL, underscoring the need for comprehensive management strategies that address multiple health issues simultaneously [12,13].

The multivariate analysis highlighted that elderly patient aged 80 and older experienced a markedly lower QoL compared to those aged 60-69 years. This age-related decline is consistent with existing literature, indicating that older age is associated with increased physical and cognitive decline, which negatively impacts QoL [3,4,12,13]leading to damage to various organs of the patients and a

reduction of their life expectancy and quality of life (QOL. Moreover, specific comorbidities, particularly neurological disorders, and skin diseases, emerged as significant predictors of reduced QoL [3,4,11–13]leading to damage to various organs of the patients and a reduction of their life expectancy and quality of life (QOL. This finding emphasizes the importance of routine screening and management of these conditions in improving the overall health outcomes for elderly T2DM patients.

Considering these findings, interventions should focus on tailored strategies to improve QoL. These could include integrated healthcare programs combining routine monitoring of comorbidities, personalized diabetes education, and mental health support. Specifically, enhancing access to eye care services and cardiovascular management in rural settings could substantially reduce the burden of these conditions on elderly patients. Additionally, promoting community-based physical activity programs and nutritional counseling tailored to local contexts may also improve both physical and psychological well-being.

While this study provides important insights, it is not without limitations. The cross-sectional design restricts causal inferences, and the self-reported nature of QoL assessments may introduce bias. The reliance on a hospital-based sample may also limit the generalizability of findings to the broader elderly population with T2DM. Furthermore, the use of convenience sampling may introduce bias due to the lack of randomness, potentially limiting the representativeness of the findings to the broader elderly population with T2DM. Future longitudinal studies could provide more comprehensive data on the evolution of QoL in this population over time. Additionally, a more extensive qualitative approach could enhance our understanding of the subjective experiences and challenges faced by elderly patients with T2DM.

V. CONCLUSION

Elderly patients with T2DM at Thai Binh Provincial General Hospital experience a reduced QoL, primarily influenced by age and comorbidities. Comprehensive management strategies addressing these factors are essential for enhancing the QoL of this population. Future research should focus on developing targeted interventions aimed at improving both the physical and psychosocial well-being of elderly patients with T2DM, particularly in

rural settings where healthcare resources may be limited.

REFERENCES

1. **Magliano, D. J., Boyko, E. J., & IDF Diabetes Atlas 10th edition scientific committee. (2021).** IDF Diabetes Atlas (10th ed.). International Diabetes Federation. Retrieved October 31, 2024, from http://www.ncbi.nlm.nih.gov/books/NBK581934/

2. **World Health Organization. (n.d.).** World report on ageing and health. Retrieved October 31, 2024, from https://www.who.int/publications/i/item/9789241565042

3. **Moghaddam, H. R., Sobhi, E., & Soola, A. H. (2022)**. Determinants of quality of life among elderly patients with type 2 diabetes in northwest of Iran: Based on problem areas in diabetes. Frontiers in Endocrinology, 13, 924451. https://doi.org/10.3389/fendo.2022.924451

4. **Nguyen, H. T. T., Moir, M. P., Nguyen, T. X., et al. (2018).** Health-related quality of life in elderly diabetic outpatients in Vietnam. Patient Preference and Adherence, 12, 1347–1354. https://doi.org/10.2147/PPA.S162892

5. **Vu, T. H. L., Bui, T. T. Q., Tran, Q. B., et al. (2023).** Comorbidities of diabetes and hypertension in Vietnam: Current burden, trends over time, and correlated factors. BMC Public Health, 23(1), 2419. https://doi.org/10.1186/s12889-023-17383-z

6. **World Health Organization. (n.d.).** The growing burden of diabetes in Vietnam. Retrieved October 31, 2024, from https://www.who.int/vietnam/news/feature-stories/detail/the-growing-burden-of-diabetes-in-viet-nam

7. **Manh, N. V., & Dieu, B. T. H. (2023).** Quality of life of the elderly in Kien Xuong District, Thai Binh Province, during the COVID-19 pandemic in 2022. Vietnam Medical Journal, 525(1B). https://doi.org/10.51298/vmj.v525i1B.5115

8. **Physiopedia. (n.d.).** 36-Item Short Form Survey (SF-36). Retrieved October 31, 2024, from https://www.physio-pedia.com/36-Item_Short_Form_Survey_(SF-36)

9. **Watkins, R. E., Plant, A. J., Sang, D., O'Rourke, T., & Gushulak, B. (2000).** Development of a Vietnamese version of the Short Form-36 Health Survey. Asia-Pacific Journal of Public Health, 12(2), 118–123. https://doi.org/10.1177/101053950001200211

10. **McMaughan, D. J., Oloruntoba, O., & Smith, M. L. (2020).** Socioeconomic status and access to healthcare: Interrelated drivers for healthy aging. Frontiers in Public Health, 8, 231. https://doi.org/10.3389/fpubh.2020.00231

11. **Praveen, V., & M, A. R. (2016).** Quality of life among elderly in a rural area. International Journal of Community Medicine and Public Health, 3(3), 754–757. https://doi.org/10.18203/2394-6040.ijcmph20160646

12. **Pati, S., Pati, S., van den Akker, M., Schellevis, F. G., Jena, S., & Burgers, J. S. (2020)**. Impact of comorbidity on health-related quality of life among type 2 diabetic patients in primary care. Primary Health Care Research & Development, 21, e9. https://doi.org/10.1017/S1463423620000055

13. **Mannan, A., Akter, F., Chy, N. U. H. A., et al. (2022)**. The relationship between medical comorbidities and health-related quality of life among adults with type 2 diabetes: The experience of different hospitals in southern Bangladesh. PLOS ONE, 17(5), e0267713. https://doi.org/10.1371/journal.pone.0267713.