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Health-Related Quality of Life Among Comorbidity Patients with Type 2 Diabetes Mellitus and Hypertension at Can Tho Cardiovascular Hospital in Vietnam

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ABSTRACT

Introduction: Assessing Health-Related Quality of Life (HRQoL) is crucial to increasing the compliance rate and treatment effectiveness for hypertension and diabetes patients. This study evaluated HRQoL and related factors among comorbidity patients with type 2 diabetes mellitus and hypertension at Can Tho Hospital, Vietnam.

Material and Methods: A cross-sectional study was conducted on 310 outpatients at the polyclinic using the Short Form-36 Health Survey (SF-36) from July 2021 to July 2022. All patients who met the criteria were selected for the study.

Results: The finding showed that the mean score of HRQoL in patients was 50.56 ± 21.73. 68.7% of patients had normal HRQoL, 16.8% had good HRQoL, and 14.5% had poor HRQoL. Patients with lower education, older age, and patients who were female, unemployed, used insulin, and had complications were more likely to have lower HRQoL. Patients with higher education, younger age, patients who were male, had a job, did not use insulin, and control of diseases well were more likely to have higher HRQoL. HRQoL in patients with diabetes and hypertension was significantly associated with age, occupation, education, and treatment results.

Conclusion: Our findings suggest that health workers should routinely monitor the emotional status and HRQoL of patients who have complications and use insulin.

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INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood glucose. Hyperglycaemia, also called raised blood glucose or blood sugar, is a common effect of uncontrolled diabetes and, over time, leads to severe damage to many of the body's systems, especially the nerves and blood vessels. In 2014, 8.5% of adults aged 18 and above had diabetes. In 2019, diabetes was the direct cause of 1.5 million deaths, and 48% of all deaths due to diabetes occurred before the age of 70 years. Another 460.000 kidney disease deaths were caused by diabetes, and raised blood glucose causes around 20% of cardiovascular deaths. It can cause serious health problems such as heart disease, vision loss, and kidney disease [1–3].

Hypertension is a status when the pressure in your blood vessels is 140/90 mmHg or higher. It is common but can be severe if not treated. People with high blood pressure may not feel symptoms. The only way to know is to get their blood pressure checked. Risk factors of hypertension include older age, genetics, being overweight, not being physically active, unhealthy diet, and using alcohol. An estimated of 1.28 billion adults aged 30–79 years worldwide have hypertension, most of them live in low- and middle-income countries. Less than half of adults with hypertension are diagnosed and treated. Hypertension is a significant cause of premature death worldwide. One of the global targets for non-

communicable diseases is reducing hypertension prevalence by 33% between 2010 and 2030 [4–6].

Vietnam is one of the countries in the Western Pacific Region with the fastest-increasing rate of diabetes globally, with more than 200 million adults living with diabetes [7]. According to the International Diabetes Federation, nearly 4 million adults lived with diabetes, equivalent to 6.1% of the age-adjusted comparative prevalence of diabetes [7]. The pooled prevalence of measured hypertension in Vietnam was 21.1% (95% confidence interval = 18.5-23.7) based on 10 studies and 18.4% (95% confidence interval = 15.2-21.8) based on 3 national surveys [8].

Hypertension and diabetes are critical public-health challenges worldwide. Prevention, detection, treatment, and control of these conditions should be prioritized. Comorbidity patients with hypertension and diabetes need long-term adherence to treatment, and they experience many difficulties in terms of work, social, economic, physical, and psychological well-being. These affect the outcome of treatment. Therefore, clinicians should carefully consider their psychology and quality of life [9–12].

Health-related quality of life (HRQoL) is a multi-dimensional concept that persists in an individual's perception of physical, emotional, and social well-being. This study aimed to evaluate the HRQoL and some related factors among comorbid patients with hypertension and diabetes at clinics in Vietnam. This information is necessary to improve HRQoL and treatment efficiency for patients.

MATERIAL AND METHODS

Participants

All comorbidity patients diagnosed with type II diabetes mellitus and hypertension for at least 6 months agreed to participate and could answer the questionnaire, were chosen and invited to enroll in the study. Other patients who did not meet the criteria were excluded from the study. This study was carried out in the medicine department of Can Tho Heart Hospital, Vietnam, from July 2021 to July 2022.

Sample Size and Technique

The sample size was calculated using the formula to calculate the sample size for a cross-sectional survey. 310 comorbidity patients with type 2 diabetes mellitus and hypertension were recruited in the present study with a confidence level of 95% and a 5% margin of error. All patients who met the criteria were selected for the study.

Measurements and Instruments

The questionnaire was tested for validity by the expert panel and was piloted on 10 patients before the investigation. This questionnaire consisted of three sections:

The first section was sociodemographic variables of participants: including gender, age, occupational, marital status, and family economy.

The second section was the treatment history of diabetes and hypertension: including smoking, alcohol drinking, physical activity, disease duration, comorbidities, complications, clinical and subclinical symptoms, duration of treatment, drug side effects, and treatment adherence).

The third section was HRQoL measurement: The Short Form 36 (SF-36) health survey was used to measure the HRQoL of patients. The SF-36 was designed for use in clinical practice and research, health policy evaluations, and general population surveys.[13] The SF-36 includes assesses eight health concepts: physical functioning, limitations in physical activities because of health problems, bodily pain, general health perceptions, vitality (energy and fatigue), social functioning), limitations in social activities because of physical or emotional problems, and general mental health.

The total score for the SF-36 ranges between 0 and 100, with higher scores indicating a better quality of life. The patient's HRQoL was classified into three levels as follows: Poor quality of life if the total score was from 0 to under 25; Normal quality of life if the total score was from 25 to 75; Good quality of life if the total score was from 75 to 100.

Data Management and Analysis

The data was collected by well-trained undergraduate medical students. Medical staff in the hospital were not chosen to minimize the social desirability bias. Patients were interviewed directly when they finished their regular examination.

The software Excel was used for data entry. The Statistical Package for Social Sciences (SPSS) version 18.0 was used to analyze data. Descriptive statistics were used to summarize the patients' characteristics. Compare the mean difference of two non-normally distributed groups using the Mann–Whitney statistic and the mean difference of more than two non-normally analyzed groups using the Kruskal-Wallis statistics. Significance was considered at a p-value < 0.05.

Ethics

All participants have explained the purpose and content of the study. Participation in the study was completely voluntary, and the questionnaires remained anonymous. All information was kept confidential and for research purposes only.

RESULTS

The Sociodemographic Characteristics of Participants

According to Table 1, 86 (27.7%) participants were male, and 224 (72.3%) were female. The mean age score was 62.8 ± 8.9. There were 8 (2.6%) participants who had primary school or lower, 103 (33.2%) participants had secondary school, and 199 (64.2%) participants had high school or higher. Regarding family economics, there was 7 (2.3%) of participants were poor, 22 (7.1%) of participants were near poor, and 281 (90.6%) of participants were not poor. There were 15 (4.8%) participants who were married, 253 (81.6%) participants were not married, and 42 (13.6%) participants were others.

The Clinical Characteristics of Participants

From Table 2, there were 148 (47.7%) participants had a duration of diseases under 5 years, 80 (25.8%) participants had a duration of diseases from 5 to 10 years, and 82 (26.5%) participants had a duration of diseases over 10 years. 104 (33.5%) participants had complications, and 206 (66.5%) had no complications. 304 (98.1%) participants had comorbidities, and 6 (1.9%) had no comorbidities. There were 16 (5.2%) participants who were underweight, 227 (73.2%) participants who were normal, and 67 (21.6%) participants who were overweight. 58 (18.7%) of participants used insulin, and 252 (81.3%) participants did not use insulin. 87 (28.1%) of participants had the objective of hypertension treatment was positive, and 102 (32.9%) of participants had the objective of diabetes treatment was positive.

The Health-related Quality of Life Scores of Patients

Fig. 1 showed that the mean score of HRQoL in patients was 50.56 (median was 47.84), of which the mean score of physical health was 46.88 (median was 45.12) and the mean score of mental health was 54.24 (median was 54.19).

The HRQoL among Patients and Some Related Factors

According to Table 3, there were 5 factors related to physical functioning, the patients with older age, lower education, were female, had complications, and used insulin were more likely to have lower HRQoL ($p<0.05$). There were three factors related to limitations in physical activities, the patients with younger age, high education, and no insulin treatment were more likely to have higher HRQoL ($p<0.05$).

According to Table 4, there were three factors related to bodily pain; the patients with older age, lower education, and unemployed were more likely to have lower HRQoL ($p<0.05$). There were three factors related to general health, the patients with younger age, were male and had the objective of hypertension treatment were more likely to have higher HRQoL ($p<0.05$).

According to Table 5, there were 5 factors related to vitality, the patients with older age, unemployed, lower education, used insulin, and had no objective of hypertension treatment were more likely to have lower HRQoL ($p<0.05$). There were two factors related to General mental health; the younger and working patients were more likely to have higher HRQoL ($p<0.05$).

Table 1. The Sociodemographic Characteristics of Participants (n=310)

Sociodemographic Characteristics		Frequency (n)	Percent (%)
Age Groups (years)	< 50	19	6.1
	50-60	106	34.2
	61-70	131	42.3
	>70	54	17.4
Gender	Male	86	27.7
	Female	224	72.3
Educational Attainment	Primary school or lower	8	2.6
	Secondary school	103	33.2
	High school or higher	199	64.2
Family Economic	Poor	7	2.3
	Near poor	22	7.1
	Not poor	281	90.6
Marital Status	Married	15	4.8
	Not married	253	81.6
	Others	42	13.6
Mean age (± SD)		62.8 ± 8.9	

Table 2. The Clinical Characteristics of Participants (n=310)

Clinical Characteristics		Frequency (n)	Percent (%)
Duration of Diseases (year)	< 5	148	47.7
	5 - 10	80	25.8
	>10	82	26.5
Complications	Yes	104	33.5
	No	206	66.5
Comorbidities	Yes	304	98.1
	No	6	1.9
BMI	Underweight (< 23)	16	5.2
	Normal (23-25)	227	73.2
	Overweight (> 25)	67	21.6
Insulin Treatment	Yes	58	18.7
	No	252	81.3
Objective of Hypertension Treatment	Positive	87	28.1
	Negative	223	71.9
Objective of Diabetes Treatment	Positive	102	32.9
	Negative	208	67.1

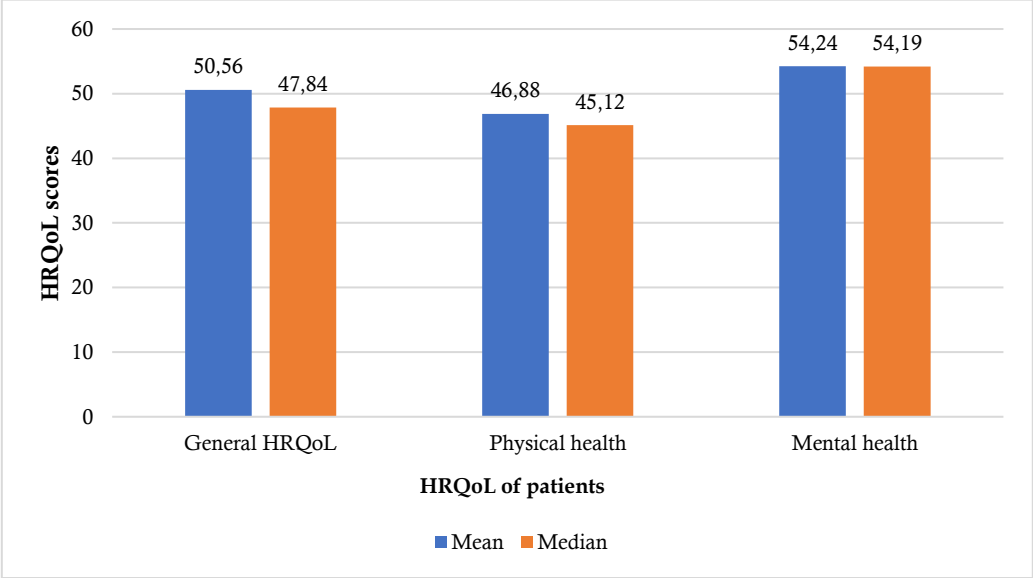

Fig. 1. The HRQoL Scores among Patients (n= 310)

DISCUSSION

The mean age score of patients in this study was 62,8 ± 8,9. It was lower than the study in Vietnam, with a mean age score of patients was 67.1 ± 8.5 [13], and higher than in Australia, with a mean age score of 55.8 ± 11.1 [14] 2.6% of participants had primary school or lower, secondary school 33.2%, and high school or higher 64.2%. Low education will limit the ability to absorb necessary information about patients' diseases, causing negative impacts on the treatment and monitoring of the disease. High education helps patients have better self-monitoring knowledge and more effective treatment adherence. Self-care, including blood sugar monitoring, dietary modification, regular foot exams, and routine eye exams, has significantly reduced the frequency and progression of disease-related complications [15].

Our study brought that the mean score of HRQoL in patients was 50.56, of which the physical health score was 46.88, and the mental was 54.24. The physical health score in this study was similar to the study in Colombia [16] but it was lower than the study in America [11], Malaysia [17], and China [18]. The mental health score in this study was lower than the study in Singapore [19]. This can be explained by the fact that most patients in our study were elderly, had a long duration of diseases, used insulin, and had complications and comorbidity hypertension and diabetes, affecting the patient's mobility. On the other

Table 3. The HRQoL of Physical Health related to Characteristics of Patients (n=310)

Characteristics		Frequency (n)	Physical Functioning		Limitations in Physical Activities	
			Mean ± SD	*p*	Mean ± SD	*p*
Age Groups (year)	< 50	19	79.74± 24.63	< 0.001	44.74 ± 32.89	0.018
	50-60	106	70.14 ± 21.84		34.62 ± 31.75	
	61-70	131	59.59 ± 25.25		33.02 ± 35.66	
	> 70	54	44.58 ± 26.07		20.83 ± 28.21	
Gender	Male	86	71.92 ± 24.63	< 0.001	36.28 ± 33.82	0.164
	Female	224	57.94 ± 25.62		30.58 ± 33.10	
Educational Attainment	Primary school or lower	8	52.84 ± 25.47	< 0.001	25.0 ± 37.80	0.023
	Secondary school	103	63.13 ± 26.33		25.0 ± 29.50	
	High school or higher	199	66.41 ± 24.84		36.16 ± 34.52	
Complications	Yes	104	56.13 ± 26.59	0.008	29.04 ± 35.90	0.009
	No	206	64.89 ± 25.39		33.74 ± 31.95	
Insulin Treatment	Yes	58	56.66 ± 27.10	0.009	25.00 ± 29.99	0.08
	No	252	63.00 ± 25.74		33.81 ± 33.91	

Table 4. The HRQoL of Physical Health related to Characteristics of Patients (n=310)

Characteristics		Frequency (n)	Bodily Pain		General Health	
			Mean ± SD	*p*	Mean ± SD	*p*
Age Groups (year)	< 50	19	76,18 ± 35,05	0.021	43,22 ± 21,85	0.006
	50-60	106	64,06 ± 29,73		34,55 ± 21,86	
	61-70	131	58,02 ± 29,72		33,48 ± 25,35	
	> 70	54	54,77 ± 28,10		24,65 ± 20,09	
Gender	Male	86	65,93 ± 29,98	0.057	38,42 ± 25,49	0.03
	Female	224	58,60 ± 29,54		30,78 ± 22,30	
Occupation	Farmers	29	41,90 ± 27,08	0.001	27,44 ± 27,06	0.087
	Workers	19	63,02 ± 30,86		32,46 ± 24,40	
	Staffs	27	74,72 ± 18,31		43,83 ± 23,30	
	Business	68	57,33 ± 31,41		31,84 ± 21,53	
	Others	167	62,68 ± 29,53		32,57 ± 23,17	
Educational Attainment	Primary school or lower	8	50,94 ± 35,07	0.003	32,81± 25,63	0.211
	Secondary school	103	53,03 ± 28,83		29,09 ± 21,75	
	High school or higher	199	64,95 ± 29,35		34,88 ± 24,06	
Objective of Hypertension Treatment	Positive	84	63,59 ± 28,68	0.281	39,18 ± 26,58	0.013
	Negative	223	59,48 ± 30,21		30,45 ± 21,67	

hand, the study also showed that 14.5% of patients had poor HRQoL. It was lower than the study in China, with over 24% of patients having poor HRQoL [20].

The factors that had a positive effect on the HRQoL of patients included: higher education, younger age, patients were male, had a job, not used insulin, and control of diseases, accordingly the patients who were above subjects were more likely to have higher HRQoL ($p<0.05$). The research results of Mohammad R showed that patients under 50 years of age had higher HRQoL [21]. The study of Papazafiropoulou AK and Kresimir Gabric also showed that age-related to HRQoL of patients [22–24]. Aldona Mikailiukstiene's research showed that higher education patients had higher HRQoL [25]. The study of Svedbo Engström Maria in Sweden on 4948 diabetic patients showed that patients with better blood sugar control often had better HRQoL [26,27]. The patients with well-controlled blood pressure also had higher HRQoL [28,29]. Some studies in Vietnam and other countries also showed that patients who were male had higher HRQoL than females [12,30–32]. Because of the difference in biological characteristics between the sexes, females were often more concerned and worried about their health than

Table 5. The HRQoL of Mental Health related to Characteristics of Patients (n=310)

Characteristics		Frequency (n)	Vitality		General Mental Health	
			Mean ± SD	*p*	Mean ± SD	*p*
Age Groups (year)	< 50	19	58.68 ± 20.40	0.019	57.89 ± 23.11	0.026
	50-60	106	57.22 ± 21.48		48.19 ± 25.83	
	61-70	131	50.96 ± 21.24		44.79 ± 26.04	
	> 70	54	46.85 ± 20.67		38.15 ± 17.06	
Occupation	Farmers	29	41.21 ± 19.98	0.008	35.03 ± 26.16	0.017
	Workers	19	52.68 ± 19.36		48.42 ± 27.77	
	Staffs	27	62.42 ± 20.12		58.22 ± 24.36	
	Business	68	52.46 ± 22.42		45.59 ± 25.89	
	Others	167	53.52 ± 21.08		45.08 ± 26.00	
Educational Attainment	Primary school or lower	8	42.05 ± 19.46	0.024	45.50 ± 28.04	0.065
	Secondary school	103	49.20 ± 21.17		40.23 ± 24.28	
	High school or higher	199	55.16 ± 21.40		48.38 ± 26.89	
Insulin Treatment	Yes	58	46.59 ± 22.30	0.009	41.72 ± 22.19	0.366
	No	252	54.30 ± 21.05		46.49 ± 27.09	
Objective of Hypertension Treatment	Positive	84	57.31 ± 21.94	0.017	50.48 ± 26.75	0.074
	Negative	223	51.12 ± 21.07		43.70 ± 25.90	

males, thus creating a difference in HRQoL between the two sexes.

The factors that had a negative effect on the HRQoL of patients included: lower education, older age, patients were female, unemployed, used insulin, and had a complication; accordingly, the patients who were above subjects were more likely to have lower HRQoL ($p<0.05$). This can be explained as follows, some side effects when using injectable insulin such as discomfort, pain, hypoglycemia, muscular dystrophy, and weight gain; these factors also contributed to decrease HRQoL of patients [33]. In addition, patients with complications often have symptoms such as intermittent claudication, chest pain, or shortness of breath, significantly affecting the patient's daily activities. Aldona Mikailiukstiene's study also showed that complications of lower extremity peripheral artery disease reduced the HRQoL score of patients with type 2 diabetes in many health components, especially those in the mental health field [25]. In this study, we found that the patients with older age had lower HRQoL scores than others. This result was consistent with the psychophysiological characteristics of people, the older the age, the lower the physical and mental health. Meng Xiao's study on 567 hypertensive patients in Zhongqing, China, a study by Hoang Van Minh and Monika, also provided similar results [9,34,35].

Strengths and Limitations

Our study suggests that HRQoL of comorbidity patients with diabetes and hypertension can be affected by various factors, including demographic (age, gender, occupation, education) and clinical (insulin treatment, control of blood sugar and blood pressure, complications). Educational counseling programs would help patients understand their health status and treatment, thereby improving their adherence and positive attitude toward diabetes and hypertension. Furthermore, it is crucial to provide interventions to limit diabetes and hypertension complications and medical side effects and offer psychological support during treatment. These factors play an essential role in improving the HRQoL of patients.

The findings of this study cannot be generalized because it was deployed at a hospital with a mall sample size, and it was impossible to conclude the cause-and-effect relationship between HRQoL and associated factors. On the other hand, the SF-36 is one of the most common HRQoL measurements; however, based on their intentions, researchers can choose to assess health quality via different tools. Thus, it may lead to different findings.

CONCLUSION

The HRQoL in comorbidity patients with diabetes and hypertension was significantly associated with gender, age, educational attainment, diabetes or hypertension complication, and treatment therapy of patients. Those were risk factors for both the physical and mental components of HRQoL. The assessment of the quality of life in patients could improve patients'

well-being. Further large-scale studies are needed to validate our findings in comorbidity patients with diabetes and hypertension.

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The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

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