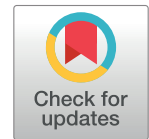


RESEARCH ARTICLE

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Utility analysis of outpatient hypertensive patients with and without comorbidities using the EQ-5D-5L instrument: A study at UPTD Puskesmas Pagerageung, Tasikmalaya Regency, West Java

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Abstract: Hypertension is a chronic condition often requiring lifelong treatment, which can impact patients' quality of life (QoL) in physical, psychological, and social domains. The presence of comorbid conditions alongside hypertension can further deteriorate QoL. Health utility measurement, particularly in hypertensive patients with comorbidities, is crucial for understanding these compounded effects. This study aims to evaluate and compare the quality of life utility in hypertensive patients with and without comorbidities using the EQ-5D-5L instrument, focusing on how comorbid conditions influence overall QoL. A descriptive observational study with a cross-sectional design was conducted among 100 hypertensive patients treated at UPTD Puskesmas Pagerageung, Tasikmalaya, from January to March 2024. Participants were selected through purposive sampling. The EQ-5D-5L questionnaire was used to assess utility scores, which were calculated using an Indonesian-specific value set. Chi-square and Post Hoc LSD analyses were applied to explore relationships between utility scores and demographic factors such as age, gender, and occupation. The average utility score for hypertensive patients without comorbidities was 0.669, higher than that of patients with comorbid conditions. Specifically, patients with diabetes mellitus, osteoarthritis, gastric conditions, heart disease, and severe comorbidities (e.g., kidney disease, cataracts, stroke) had average scores of 0.578, 0.640, 0.651, 0.537, and 0.148, respectively. Age was significantly associated with utility scores ($p = 0.014$), whereas gender and occupation showed no significant impact. Hypertensive patients without comorbidities had a better quality of life utility than those with additional health issues. Targeted management of comorbidities is essential to improve the quality of life among hypertensive patients, especially in those facing compounded health challenges.

Keywords: comorbidities, EQ-5D-5L, health utility, hypertension, quality of life

Introduction

Hypertension is a cardiovascular disease characterized by blood pressure that exceeds normal limits, often referred to as a "silent killer" due to its frequently asymptomatic nature. Without visible symptoms, hypertension can lead to complications and damage vital organs before a patient becomes aware of the condition [1]. Hypertension is defined as a circulatory abnormality resulting in elevated blood pressure, where a systolic reading exceeds 140 mmHg and a diastolic reading exceeds 90 mmHg [2].

While hypertension can be asymptomatic, it may also present symptoms such as headache, blurred vision, neck stiffness, palpitations, fatigue, nosebleeds, and tinnitus [3]. These symptoms can significantly impact patients' lives physically, socially, and psychologically,

reducing comfort and quality of life [4]. Quality of life, or utility, reflects an individual's perception of their life conditions, encompassing various factors affecting well-being, including health status [5]. In healthcare, utility analysis assesses how diseases, treatments, or health interventions influence quality of life [6].

One common approach to measure utility is through standardized questionnaires, such as the European Quality of Life 5 Dimensions-5 Level (EQ-5D-5L) instrument. The European Quality of Life 5 Dimensions-5 Level (EQ-5D-5L) instrument is widely used in health research due to its reliability, validity, and simplicity in assessing quality of life across diverse patient populations [7]. One key advantage of the EQ-5D-5L is its ease of administration and interpretation, making it suitable for both clinical settings and large-

scale research studies [8]. Furthermore, the EQ-5D-5L provides a standardized method to compare quality of life across different diseases and treatments, supporting its use in economic evaluations and health policy decisions [9].

Previous research found that diabetes mellitus (DM) patients report a higher utility value (0.843) than hypertension patients (0.767), suggesting that DM patients may experience a better quality of life compared to those with hypertension [10]. Similarly, a study by Raffli (2023) observed that utility scores among hypertensive patients alone varied widely, ranging from 1 to as low as 0.592 [11]. Given the broad impact that comorbid conditions can have on quality of life, understanding how the presence of additional health issues might further affect the utility of hypertensive patients is essential. Therefore, this study aims to determine the utility values for hypertensive patients with and without comorbidities, providing insight into how additional health burdens influence overall quality of life among hypertensive individuals.

Methods

This study employed a descriptive observational approach with a cross-sectional design, using purposive sampling to select participants. Primary data were collected using the EQ-5D-5L questionnaire. Data collection took place from January to March 2024, with a total of 100 respondents. Inclusion criteria for participation were patients diagnosed with hypertension and treated for over three months at UPTD Puskesmas Pagerageung, Tasikmalaya, between January and March 2024, including those with hypertension and comorbidities. Exclusion criteria included patients who declined to participate and those not adhering to regular treatment.

Before completing the questionnaire, respondents provided informed consent, confirming their willingness to participate. They then completed the EQ-5D-5L questionnaire based on their personal perceptions and current health conditions. The EQ-5D-5L instrument measures health-related quality of life (HRQOL) through five dimensions—mobility, self-care, usual activities, pain/discomfort, and anxiety/depression—each rated on five levels. The highest utility score of 1.000, achieved with a health status code of “11111,” indicates that the patient has no problems in any dimension, representing optimal health. Utility scores were classified as “good” for values above 0.55. Conversely, a lower score, such

as 0.549, reflects limitations in multiple domains, categorizing the utility as low [11].

Data analysis and organization were conducted using Microsoft Excel 2019 and IBM SPSS Version 29.0. The study's dependent variable was the utility score of hypertensive patients, while independent variables included patient characteristics potentially affecting utility scores, such as gender, age, occupation, and comorbidities.

A chi-square analysis was used to assess associations between patient characteristics and utility values, and a Post Hoc LSD test was conducted to evaluate differences in utility scores between hypertensive patients with and without comorbidities.

Results

Respondents in this study included patients with hypertension, both with and without comorbid conditions, who were undergoing treatment at Puskesmas Pagerageung, Tasikmalaya. A total of 100 respondents completed the EQ-5D-5L questionnaire. The sample was predominantly female, with 70% of participants, and most were under 60 years old (Table 1).

The distribution of respondents included 48 individuals with only hypertension, who generally reported good utility scores. Among those with hypertension and additional conditions, 28 had diabetes mellitus, 11 had osteoarthritis, 8 had gastric disease, and 2 had heart disease, all showing average utility scores in the good category (Table 2). However, respondents with comorbid stroke, kidney, and cataract diseases (one each) showed poor utility scores, indicating reduced quality of life in these groups.

Discussion

The study found no significant association between utility and gender ($p = 0.641$) or occupation ($p = 0.372$). However, a significant relationship was observed between utility and age ($p = 0.014$). Notably, while men are often at greater risk for elevated blood pressure due to lifestyle factors, this study showed no significant difference in utility between genders. Age-related structural changes in blood vessels, such as atherosclerosis, could explain why older patients demonstrated higher blood pressure, which aligns with findings [12]. While homemakers represented a large segment of respondents, there was no significant

Table 1. Characteristics of respondents based on gender, age, and occupation

Category	Number	Percentage
Gender		
Male	30	30%
Female	70	70%
Age		
< 60	57	57%
> 60	43	43%
Occupation		
Homemaker	70	70%
Labourer	9	9%
Farmer	7	7%
Self-employed	14	14%

Table 2. Average utility value of hypertension with and without comorbidities

Disease	Number	Average utility
Hypertension	48	0.669
Hypertension with DM	28	0.578
Hypertension with osteoarthritis	11	0.640
Hypertension with gastric disease	8	0.651
Hypertension with heart disease	2	0.537
Hypertension with other diseases	3	0.148

correlation between occupation and utility, despite the known impact of stress and physical inactivity on hypertension.

Hypertensive patients with comorbid conditions generally showed decreased utility scores. Patients with diabetes mellitus comorbidities had an average utility score of 0.578. Those with the best utility (health status of 11122, utility of 0.835) had minor issues with pain and anxiety, while those with the lowest utility (health status of 33343, utility of 0.18) had mild to severe challenges in mobility, self-care, and pain. Similarly, respondents with osteoarthritis comorbidities had an average utility score of 0.640, with pain as a significant factor reducing utility. Pain from osteoarthritis limits physical activities, contributes to emotional stress, and can lead to depressive symptoms [13].

For those with gastric disease comorbidities, utility averaged 0.651. Patients reported minor issues related to pain, discomfort, and anxiety, with factors such as diet and stress contributing to increased gastric acid production and subsequent discomfort [14]. Hypertensive patients with heart disease comorbidities reported average utility values of 0.681, with limitations

in mobility, pain, and anxiety as key influences on their utility scores. Anxiety, often due to the risk of relapse, further reduces quality of life in these patients [15].

Other comorbidities, including kidney disease, stroke, and cataracts, showed notably lower utility scores. For instance, stroke patients exhibited severe impairments across all health dimensions, with utility as low as -0.281. Stroke-related physical limitations and emotional distress are primary contributors to the reduced quality of life in these patients [16]. Cataract patients similarly reported low utility (0.347) due to mobility limitations and visual impairment, which increase the risk of falls and limit independence [17].

Comparative analysis using the Post Hoc LSD test revealed significant differences in utility values between hypertensive patients without comorbidities and those with comorbid diabetes mellitus ($p = 0.006$) and other serious conditions, such as kidney disease, stroke, and cataracts ($p < 0.001$). The mean utility score of hypertensive patients without comorbidities was 0.669, in contrast to 0.578 for those with diabetes mellitus and 0.148 for those with other conditions. These findings indicate that comorbid conditions,

particularly degenerative diseases, significantly lower the utility scores of hypertensive patients, impacting their physical, psychological, and social functioning [18].

A limitation of this study was the difficulty in communicating with elderly patients, which affected the clarity of questionnaire responses. Improved communication methods tailored to elderly participants could enhance data accuracy in future studies.

Conclusion

This study concludes that hypertensive patients without comorbidities generally exhibit better utility, or quality of life, compared to those with additional health conditions. Using the EQ-5D-5L instrument, it was found that comorbidities, particularly severe conditions like stroke, kidney disease, and cataracts, significantly reduce utility values, affecting patients' physical, psychological, and social functioning. While gender and occupation showed no significant relationship with utility, age did, as older patients had lower utility scores likely due to age-related health complications. This research highlights the importance of managing comorbid conditions alongside hypertension to improve overall patient quality of life.

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Declaration of interest

The authors declare no conflicts of interest, personal or organizational, and have no financial conflicts.

Author contributions

MP: investigation, data curation, writing – original draft preparation. PSM: formal analysis, visualization, writing – review & editing, validation. IA: conceptualization, methodology, supervision, project administration, resources, writing – review & editing.

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