

COMORBIDITIES AND QUALITY OF LIFE IN PEOPLE WITH STAGE 2 HYPERTENSION: A STUDY IN YOGYAKARTA, INDONESIA

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Abstract: Hypertension is a major public health issue throughout the world, including in Indonesia. Quality of life has been assessed in patients with hypertension, but few data have been reported from community settings. This study assessed the relationships between comorbidities and quality of life in people with stage 2 hypertension in an Indonesian rural community. This questionnaire-based study included 108 people (aged 45 years or older) living in a rural community who was diagnosed with stage 2 hypertension >6 months before the study began. The abbreviated version of the World Health Organization Quality of Life Instrument was applied to measure the quality of life. This instrument comprises four domains of quality life: physical health, psychological health, social relationships, and environmental health. Among the 108 participants, 73 (67%) self-reported having the comorbid disease; cardiovascular diseases, endocrine disorders, and musculoskeletal disorders were the most common. Only 31 (29%) reported having a good quality of life in the physical health domain (score ≥ 60 on the quality-of-life instrument). The percentages of participants reporting good quality of life were 37 (35%), 50 (47%), and 48 (44%) for the domain's psychological health, social relationships, and environmental health domains, respectively. A higher score for the comorbidities index was associated with lower quality of life ($p < 0.05$). These findings suggest that the quality of life among rural people with stage 2 hypertension worsens with increasing comorbidities. Health and social support should be strengthened to help these people.

Keywords: hypertension, quality of life, comorbidity, rural community

Introduction

Hypertension is a chronic, frequently asymptomatic condition affecting 34% of Indonesian adults; in the elderly, the prevalence reaches more than 60% (Ministry of Health Republic of Indonesia, 2019). People with hypertension often report a poorer quality of life than healthy individuals (Trevisol *et al.*, 2011; Ye *et al.*, 2018). Health-related quality of life is one focus of therapy in hypertensive patients and is an aim of effective treatment. In elderly patients, quality of life is an important indicator of active aging (Sekeon *et al.*, 2017; Zygmuntowicz *et al.*, 2012) and an important parameter of general health.

Comorbid diseases are common in hypertensive patients and require special attention. In developing countries, more than 50% of the elderly population have three or more chronic conditions and more than 20% of patients have more than one comorbid disease (Noh *et al.*, 2016; Peter *et al.*, 2017). A study in China reported that the highest incidence rates of comorbidities among hypertensive patients were diabetes, hyperlipidaemia, and coronary heart diseases (Wang *et al.*, 2017). Studies have shown

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that few patients with hypertension reach the recommended blood pressure target (Hussain *et al.*, 2016; Mills *et al.*, 2020). Comorbidities are known to influence therapeutic outcomes in hypertensive patients; the presence of comorbidities is a risk factor for not achieving the blood pressure target (Rowan *et al.*, 2015). The presence of comorbidities also affects the increasing complexity of hypertension management in patients and can then influence patient adherence to hypertension therapy (Perwitasari *et al.*, 2015). More complex management therapies will influence the choice of therapy and increase the treatment cost. For example, hypertension accompanying heart disease might involve changes in proinflammatory cytokines, which activate the microvascular endothelium, induce oxidative stress and an abnormal myocardial cycle, and eventually lead to chronic ischemia, fibrosis, and progression of heart failure with low ejection fraction. The presence of these conditions will influence the choice of medications prescribed to treat such patients and will increase the treatment cost (Ventura & Lavie, 2016).

A recent hospital-based study of Bangladeshi patients with hypertension found that comorbidities are associated with declining quality of life (Mannan *et al.*, 2022). Previous studies of the quality of life among Indonesians have reported poor quality of life in a substantial proportion of people with hypertension treated in primary health care (Husain, 2019; Khairunisa & Akhmad, 2019; Sekeon *et al.*, 2017). Another study reported a poorer quality of a life in elderly people compared with the general population (Sekeon *et al.*, 2017). The number of complications and medicines taken are associated with the mental domain of quality of life (Khairunisa & Akhmad, 2019). However, the quality of life in patients with stage 2 hypertension has not been addressed in detail.

A higher blood pressure requires more intensive pharmacological management therapy, which will be more complex for patients with coexisting diseases (Weber *et al.*, 2014). This community-based study aimed to describe the quality of life in older adult patients with stage 2 hypertension in Yogyakarta, Indonesia, and to determine whether the quality of life is associated with comorbidities. The specific objectives of this study were to assess the quality of level in older adult patients with stage 2 hypertension, to identify the presence and types of comorbidities reported by patients with stage 2 hypertension, and to determine whether the quality of life is associated with comorbidities in these patients.

Materials and Methods

Study design, setting, and participants

This was a cross-sectional study involving members of the Integrated Health Service Post for the Elderly (IHSP-Elderly, *posyandu* lansia) in Dlingo subdistrict, Yogyakarta Province, Indonesia, between July and September 2019. The eligibility criteria included age of ≥ 45 years, diagnosed with stage 2 hypertension (systolic blood pressure ≥ 160 mmHg or diastolic blood pressure ≥ 100 mmHg) at least 6 months before the study began, and the absence of cognitive impairment. A complete informed consent form was provided to all patients before they participated in this study, and the researchers then interviewed eligible participants to complete the questionnaire. We received ethical approval to conduct this study from the Health Research Committee Faculty of Medicine Universitas Islam Indonesia (No:56/Ka.Kom/70/KE/VII/2019).

Data collection and analysis

Coexisting diseases were identified according to the International Classification of Disease (ICD)-10 (World Health Organization, 2016). Patients self-reported by answering the question, “Have you been diagnosed with [a specific disease]?” Subsequently, the Charlson Comorbidity Index (CCI) was used to define the comorbidities level. This index was originally developed by Charlson *et al.* in 1987 and is standard research and clinical tool for assessing comorbidity. Based on the CCI list of clinical conditions, the score was calculated for each patient by adding the weights assigned to each disease (Charlson *et al.*, 1987; Huang *et al.*, 2014). For example, congestive heart failure has a score of 1. In our study, a high CCI index was defined as a CCI score ≥ 3 . The patient’s age is also part of the CCI and is scored as 1 for age 50–59 years, 2 for age 60–69 years, 3 for age 70–79 years, and 4 for age ≥ 80 years (Charlson *et al.*, 1987).

The abbreviated version of the World Health Organization Quality of Life questionnaire (WHOQOL-BREF) was used to assess patients’ perceptions about their quality of life. An Indonesian version of this questionnaire has been tested for validity and reliability (Salim *et al.*, 2007). The WHOQOL-BREF questionnaire comprises two questions to assess general health and four domains of quality life: physical health (seven items), psychological health (six items), social relationships (three items), and environmental health (eight items) (Skevington *et al.*, 2004). Each question is given a score of 1–5. The score was calculated by adding the point values for the questions about each domain and then converting the scores to a 0–100-point interval (World Health Organization, 1998). Patients were categorized having as good quality of life when the score was ≥ 60 (Silva *et al.*, 2014). The mean score of items within each domain was used to calculate the domain score, for which a higher score represents better quality of life.

Data analysis was performed using IBM SPSS Statistics (version 23). Relationships between comorbidities and quality of life were assessed using the chi-square test. A p-value < 0.05 was considered to be significant. Cronbach’s alpha > 0.70 was considered to indicate good reliability of WHOQOL-BREF.

Results and Discussion

One hundred eight participants completed this study. The mean age was 67.2 years (SD = 9.0 years) Most were women (87%), and more than half had no schooling or did not graduate from primary school (Table 1). Seventy-eight patients reported taking at least one antihypertensive medication in the preceding 30 days. Medications related to comorbid diseases were self-reportedly taken by 41 (38%) participants.

Table 1. Characteristics of the study participants (n = 108)

Characteristics	n (%)
Age, range	
<50 years	5 (5%)
50–59 years	11 (10%)
60–69 years	42 (39%)
70–79 years	39 (36%)
≥80 years	11 (10%)
Sex, female	94 (87%)
Education, no schooling or less than primary school	61 (56%)
Having health insurance	91 (84%)
Taking hypertension medication in the preceding 30 days	78 (72%)
Taking any medications for their comorbid diseases	41 (38%)
Having 1 comorbid disease	38 (35%)
Having >1 comorbid disease	35 (32%)
Self-reportedly diagnosed with:	
The disease of the circulatory system	29 (27%)
Disease of the respiratory system	6 (5%)
Disease of the nervous system	13 (12%)
Endocrine, nutritional, or metabolic disease	26 (24%)
Disease of the digestive system	8 (7%)
Disease of the musculoskeletal system or connective tissue	21 (19%)

Comorbid diseases were reported by 73 (67%) participants (Table 2). Diseases of the circulatory system, endocrine system, or musculoskeletal system were the most common. Most participants (n = 86, 80%) had a high level of comorbidities (CCI score >3) (Table 3). The prevalence of multimorbidity increases with aging (Agborsangaya *et al.*, 2012; Fortin *et al.*, 2012), and deterioration of quality of life is also associated with aging (Nurbasari *et al.*, 2019). A high prevalence of coexisting diseases among patients with hypertension has also been reported in previous studies in Indonesia (Hussain *et al.*, 2015; Sulistiawati *et al.*, 2020) and other countries (Mannan *et al.*, 2022; Shrestha *et al.*, 2016). Data from a national survey found that one-third of Indonesian adults are living with multiple comorbidities and that hypertension and comorbid diseases such as cardiac disease, arthritis, and hypercholesterolemia were the most common pairing (Hussain *et al.*, 2015). Even though two-thirds of the participants in this study had comorbidities, 32 (44%) did not take any medication for their disease(s).

The internal consistency of the Indonesian version WHOQOL-BREF used in this study was measured using Cronbach's alpha. The range of alpha values for each item was satisfactory (0.90–0.92). Overall, the mean scores for the four domains of quality of life ranged from 52 ± 14 to 60 ± 21 (Table 2). Previously, Salim *et al.* (2007) also reported high reliability of the Indonesian version of the WHOQOL-BREF when used to assess the quality of life in elderly people.

Table 2. Scores of each item and domain of WHO quality of life

No	Domains	Item	Mean \pm SD	
			Raw score*	Transformed score**
1		How would you rate your quality of life?	3.4 \pm 1	
2		How satisfied are you with your health?	2.8 \pm 1	
3		To what extent do you feel that physical pain prevents you from doing what you need to do?		
4		How much do you need any medical treatment to function in your daily life?		
5		Do you have enough energy for everyday life?		
6	Physical health	How well are you able to get around?	21.5 \pm 4	52 \pm 14
7		How satisfied are you with your sleep?		
8		How satisfied are you with your ability to perform your daily living activities?		
9		How satisfied are you with your capacity for work?		
10		How much do you enjoy life?		
11		To what extent do you feel your life to be meaningful?		
12	Psychological health	How well are you able to concentrate?		
13		Are you able to accept your physical appearance?	19.6 \pm 3	56 \pm 11
14		How satisfied are you with yourself?		
15		How often do you have negative feelings such as blue mood, despair, anxiety, depression?		
16		How satisfied are you with your personal relationships?		
17	Social relationship	How satisfied are you with your sex life?	10.2 \pm 2	59 \pm 21
18		How satisfied are you with the support you get from your friends?		
19		How safe do you feel in your daily life?		
20		How healthy is your physical environment?		
21		Have you enough money to meet your needs?		
22	Environmental health	How available in the information that you need in your day-to-day life?		
23		To what extent do you have the opportunity for leisure activities?	26.5 \pm 5	60 \pm 21
24		How satisfied are you with the conditions of your living place?		
25		How satisfied are you with your access to health services?		
26		How satisfied are you with your transport?		

* Each question is given a score of 1–5

** The total score for each domain was transformed into a 0–100 score (World Health Organization, 1998)

Table 3 shows that poor quality of life was self-reportedly dominant in four domains of the WHOQOL. More than two-thirds of patients reported poor quality of life in the physical and psychological health domains. The score for quality of life was 60 or less (out of 100) across the four domains. The lowest mean score was in the physical domain (52), which reflects the poor quality of life in terms of their physical pain, energy for everyday life, ability to get around and perform daily activities, satisfaction with their sleep, and capacity to work. Patients' overall satisfaction score for their health condition was 2.8 out of 5. Taken together, these findings reflect poor quality of life among a substantial proportion of patients with stage 2 hypertension living in rural areas in Indonesia. The range of scores in this study (52–60) was similar to that reported in studies from Vietnam (Ha et al., 2014). In our study, 71%, 66%, 54%, and 56% of participants reported poor quality of life for the physical, psychological, social relationship, and environmental domains, respectively. These percentages are much higher than those in a previous Indonesian study involving patients in primary health care who joined a chronic disease management program namely *prolanis* (Anwar et al., 2020). That study found that 38%, 33%, 30%, and 26% of patients reported poor quality of life for the physical, psychological, social relationship, and environmental domains, respectively. *Prolanis* was launched in Indonesia's primary health care in 2010, and its focus is to improve the management of chronic diseases, particularly hypertension and diabetes mellitus. Despite the positive impact of *prolanis*, the implementation should be strengthened to provide optimal healthcare services for patients (Rachmawati et al., 2019).

The percentages of patients with a poor quality of life in the physical, psychological, and environmental domains were significantly higher in patients with a higher CCI score than in those with a lower CCI score (having mild comorbidities). In agreement with previous studies (Chantakeeree et al., 2021; Garin et al., 2014; Mannan et al., 2022; Zygmuntowicz et al., 2012), patients with multimorbidity were more like to have a lower quality of life. A study from Vietnam reported that the presence of comorbidity in hypertensive patients was associated with a lower quality of life in the physical health domain. In our study, quality of life was significantly associated with the physical health, psychological, and environmental domains.

Table 3. Association between comorbidities and quality of life (n=108)

Score of comorbidities	Domains of WHOQOL-BREF							
	Physical health		Psychological health		Social relationship		Environmental health	
	Poor* (n)	Good (n)	Poor (n)	Good (n)	Poor (n)	Good (n)	Poor (n)	Good (n)
Low CCI score (<3)	11	11	10	12	8	14	5	17
High CCI score (≥3)	66	20	61	25	50	36	55	31
Total	77	31	71	37	58	50	60	48
Chi-square test, p value	0.01**		0.02**		0.06		<0.001**	

WHOQOL-BREF: World Health Organization Quality of Life-abbreviated version, CCI: Charlson Comorbidity Index (a higher score represents more comorbidities)

* WHOQOL score <60, **p < 0.05

The present study highlights some important findings related to the quality of life in patients with hypertension. This study involved members of the community based-health program, the IHSP-Elderly, living in rural areas. A study among the Thai and Chinese older adults showed that rural people with hypertension have a lower quality of life compared with those living in urban areas (Chantakeeree *et al.*, 2021; You *et al.*, 2019). Findings from this study reveal a complex burden faced by some study participants: being elderly, having stage 2 hypertension and comorbid diseases, being a rural resident, and having a poor perception of their quality of life. These findings indicate a strong need to improve the quality of life and focus more on the optimal treatment of hypertension as well as other comorbidities in people with hypertension. Lower quality of life in patients with stage 2 hypertension and coexisting diseases indicates the need for early diagnosis and comprehensive treatment. In the community setting, family members and community health workers can work with healthcare professionals to facilitate better hypertension management for patients. Interventions aimed at improving the quality of life of disadvantaged patients are required.

To our knowledge, this study is one of the first in Indonesia to assess the quality of life in older adults with stage 2 hypertension living in rural areas. Lack of access to healthcare facilities is a common problem in developing countries, particularly among those living in rural or remote areas. This study obtained information from hypertensive patients living in a rural community that is unlikely to be found in studies conducted in a healthcare setting. However, this study relied on patients' self-reports on the presence of their comorbidities and their perception of their quality of life, and the possibility of a recall bias is unavoidable. In addition, this study did not measure other factors that can affect the quality of life such as sex, duration of hypertension, and educational and occupational status.

Conclusion

This study reported a high prevalence of self-reported multimorbidity in rural people with stage 2 hypertension. A substantial percentage of these people reported poor quality of life in the physical health, psychological health, social relationships, and environmental health domains. Quality of life worsened with an increasing score of comorbidities. Good quality of life is an important indicator of effective hypertension management. The findings from this study indicate the need to strengthen health and social support to help improve these patients' quality of life. Further studies should explore whether other factors also contribute to poor quality of life and should focus on developing tailored hypertension management programs for patients with stage 2 hypertension who have coexisting diseases.

Acknowledgments

We thank the community health workers in the study area who helped the researchers conduct this study. We also thank the Head of Community Health Centre in Dlingo II and the Dean of the Faculty of Medicine Universitas Islam Indonesia for supporting this study.

Declaration of Interest Statement

The authors declare that they have no conflicts of interest.

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