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Original Research

Early Detection of Mental Health in Hypertensive Elderly: Analyzing Depression, Anxiety, and Stress Levels

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ABSTRACT.

Background: *Elderly with hypertension are highly susceptible to psychological disorders, such as depression and anxiety, due to complex physiological and psychosocial changes. However, comprehensive studies examining the interplay of stress, anxiety, and depression within this population remain limited. The purpose of this study is to analyze mental health problems: Depression, Anxiety, Stress in the elderly with hypertension in the Mojosongo Region of Surakarta.*

Methods: *This research method utilised a descriptive analytical survey design with a cross-sectional approach. The sampling technique used purposive sampling with a sample size of 39 elderly people who met the inclusion criteria, namely (1) elderly and (2) having systolic blood pressure ≥140 mmHg. The research instrument used the Depression Anxiety Stress Scale (DASS-21), and data analysis was performed using Pearson's correlation test.*

Results: *Mild depression was dominated by mild hypertension (63.6%), and moderate (76.9%) p=0.571. Mild anxiety was dominated by mild hypertension (54.5%), moderate (76.9%), and severe (75%) p=0.899, mild stress was dominant in mild hypertension (68.2%), moderate (69.2%), and severe (50%) p=0.719.*

Conclusion: *This study found no significant association between the levels of depression, anxiety, or stress and the severity of hypertension. However, given the high prevalence of psychological distress observed in the descriptive findings, healthcare professionals should prioritize mental health screening in elderly patients. Managing these psychological conditions remains crucial for improving overall quality of life, even if it does not directly correlate with blood pressure reduction.*

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INTRODUCTION

Hypertension is a significant health problem among the elderly population (Lukitaningtyas & Cahyono, 2023). This disease is often nicknamed "The Silent Killer", because of its symptoms that are not typical, and often do not appear at all, sometimes

without showing symptoms or without complaints in the sufferer. Hypertension is often referred to as one of the deadly diseases that many suffer from because they are not aware of the symptoms (Nonasri, 2021). Hypertension is the number one cause of death in the world with more than 10 million deaths every year, even 50% of sufferers die because they did not have any symptoms before (Ministry of Health of the Republic of Indonesia, 2022). Studies show that the elderly with hypertension are more prone to experiencing psychological disorders, such as depression and anxiety, due to the physiological and psychosocial changes they experience (Smith et al., 2021).

According to (World Health Organization (WHO), 2023), it shows that around 1.28 billion adults in the age range of 30-79 years worldwide suffer from hypertension and it is worrying that 48% of sufferers are unaware of their condition. Hypertension is most common in China's elderly population (59%), and the rate of control is low (Wang et al., 2024). In Southeast Asia it is in third place with a prevalence of 25% of the total population and continues to increase every year.

Based on Basic Health Research, the prevalence of hypertension in Indonesia is 34.1%, the prevalence of hypertension in Central Java Province is 17.74%. Surakarta City by 22.91%, cases in 2019 were 41.871 (Ministry of Health of the Republic of Indonesia, 2021). Loke and Ching, (2022) showed Age 60.1 years had the highest prevalence of psychological distress, which was 28.8%, followed by anxiety (21.3%), depression (16.2%), and stress symptoms (13.9%). Uncontrolled blood pressure was significantly associated with symptoms of depression, anxiety, and stress. Older hypertensive patients (the elderly) have nearly twice the prevalence of depression compared to younger patients (8.4% vs 4.5%), so comprehensive care that includes psychological support for hypertensive patients is essential for optimal clinical management (Boima et al., 2020).

The impact increases the likelihood of cardiovascular disease. It often shows an association with a variety of psychological disorders, including depression, anxiety, and stress (Tug et al., 2024) . The interaction between chronic health conditions and mental well-being is critical, as untreated mental health problems can exacerbate physical illnesses, leading to a significant decline in quality of life overall in the elderly. Psychological disorders such as depression and anxiety have a significant impact on people with hypertension, affecting blood pressure control and quality of life (Ma et al., 2024).

There is a stigma around mental disorders by health professionals and secondly, the need to apply appropriate screening methods for mental disorders in patients and appropriate interventions can help manage these conditions (Dewi & Purnomosidi, 2019). In this regard, prevention efforts are needed by carrying out early detection of mental health problems, so that the results of early detection as a basis for follow-up to design appropriate interventions to overcome this (Turana et al., 2021). Research by Boukhari et al., (2024) examined mental health surveys in people with hypertension, namely depression and the risk factors that affect it, researchers Aldirawi et al., (2024), found high levels of stress, and researchers Kandasamy et al. (2025); Turana et al., (2021) found mental health problems namely anxiety and depression.

However, there are still limited comprehensive studies such as stress, anxiety, and depression. The novelty of this study lies in its comprehensive analysis of three main components of mental health, namely depression, anxiety, and stress, simultaneously in elderly people with hypertension. This differs from previous studies, which focused on only one or two aspects of mental health. The purpose of this study is to analyze mental

health problems: Depression, Anxiety, Stress in the elderly with hypertension in the Mojosongo Region of Surakarta.

MATERIALS AND METHOD

This study uses a descriptive analytical survey design with a cross-sectional design because this design allows to describe the mental health conditions of the elderly with hypertension at a specific point in time. This approach is particularly appropriate for analyzing the relationship between depression, anxiety, and stress and hypertension in the elderly population without the need for long-term observation. The Research Location This research was conducted in the Mojosongo Region of Surakarta and the Research Time was carried out in January – December 2025. The study population included all elderly individuals with hypertension recorded in the Mojosongo regional health service data during the study period. Sampling was conducted using purposive sampling, which is the selection of subjects based on specific criteria in line with the study objectives.

A total of 39 respondents were selected as the research sample. The number 39 was obtained based on the number of elderly people with hypertension who met all the inclusion criteria and were willing to be respondents during the data collection period. In other words, all subjects who met these criteria were included so that the sample reflected the actual conditions of the available population.The sampling technique used purposive sampling of the elderly with hypertension. Inclusion criteria: (1) Elderly; (2) systole blood pressure ≥140 mmHg; and (3) willing to be studied.

In this analysis, blood pressure was set as the dependent variable because it was the main clinical outcome to be evaluated. Meanwhile, depression, anxiety, and stress served as independent variables because they were considered factors that could potentially affect blood pressure. The selection of these variables was adjusted to the focus of the study, which was to understand the relationship between psychological conditions and blood pressure in elderly people with hypertension.

The mental health survey was conducted using detection questions for depression, anxiety, and stress in the elderly with hypertension. Data were collected using the Depression Anxiety Stress Scale (DASS-21) instrument. This instrument has been widely used by previous researchers with the results of validity and reliability tests of Cronbach Alpha score 0.905 for depression, 0.852 for anxiety, and 0.881 for stress. The DASS-21 assesses three core psychological constructs—depression, anxiety, and stress—through 21 items, each of which describes emotional symptoms such as anhedonia, physiological tension, excessive anxiety, difficulty relaxing, and psychological and somatic stress responses (Novitasari, 2015).

Analyzed using Frequency, Mean and Standard Deviation (SD) Distributions To determine the characteristics of respondents based on age, gender, duration of hypertension, stress level, anxiety, and depression Pearson Correlation there was a significant relationship between the hypertension category and the stress or anxiety or depression category. Highlighting the need for early detection of mental health in the elderly with hypertension as an effort to prevent further complications. Ethics approval was obtained from the Health Research Ethics Committee (approval number: 197/EC/KEPK/V/2025), issued on May 7, 2025. Participants have the right to withdraw at any time without consequence. Anonymity and confidentiality were guaranteed by coding data with initials.

The ethical principles of autonomy, beneficence, non-maleficence, and justice were fully applied during the study: participants were provided with clear and comprehensive information before giving their written consent (autonomy); data collection procedures were designed to minimise psychological burden or discomfort (non-maleficence); participation was intended to contribute positively to mental health monitoring efforts among older adults (beneficence); and all eligible participants were treated equally without discrimination (justice).

RESULTS

Characteristics Overview

Table 1. Distribution of Hypertension Levels by Sex, Occupation, and Duration of Illness (n = 39)

Variable	Category	Mild (n=22)	Moderate (n=13)	Severe (n=4)
Sex	Male	14 (63.6%)	8 (61.5%)	1 (25.0%)
	Female	8 (36.4%)	5 (38.5%)	3 (75.0%)
Occupation	Not working	15 (68.2%)	9 (69.2%)	3 (75.0%)
	Laborer	2 (9.1%)	0 (0.0%)	0 (0.0%)
	Pension	0 (0.0%)	2 (15.4%)	0 (0.0%)
	Self-employed	5 (22.7%)	2 (15.4%)	1 (25.0%)
Duration of Hypertension (years)	0	1 (4.5%)	0 (0.0%)	0 (0.0%)
	1	14 (63.6%)	6 (46.2%)	3 (75.0%)
	1–2	3 (13.6%)	0 (0.0%)	0 (0.0%)
	>2–5	1 (4.5%)	1 (7.7%)	1 (25.0%)
	>5–10	1 (4.5%)	4 (30.8%)	0 (0.0%)
	>10	2 (9.1%)	2 (15.4%)	0 (0.0%)

Based on table 1, the results were obtained from 39 respondents, the majority were respondents suffering from mild hypertension (56.4%). Male sex is more (59.0%) than female (41.0%), mild hypertension (63.6%) is more commonly found in men while severe hypertension tends to be more experienced by women (75.0%). Most of the respondents in the mild (68.2%) and severe hypertension categories were not working, with the highest percentage in the severe hypertension group (75.0%). Related to long-term suffering, the majority of respondents (59.0%) only suffered from hypertension for 1 year.

Table 2. Distribution of Hypertension Incidence, Age, Long Suffering in Advanced Usia (n = 39)

Variables	Mean ± SD	Min–Max
Hypertension	156.38 ± 13.49	140–187
Age	67.54 ± 8.34	49–89
Duration of Illness	3.77 ± 5.40	0–23

Table 2 shows that the average blood pressure result in the elderly is 156.39 then rounded up to 157 with a minimum value of 140 and a maximum of 187. The age in the elderly is 67.54 then rounded up to 68 with a minimum score of 49 and a maximum of

89. The duration of suffering from hypertension in the elderly is 3.77 then rounded up to 4 years. with a minimum value of 0 years and a maximum of 23 years.

Overview of Mental Health Status and Correlation with Hypertension

Before conducting the correlation analysis, the Shapiro–Wilk normality test was first performed, given the relatively small sample size (n = 39). The normality test results showed that all psychological variables (stress, anxiety, and depression) had p-values > 0.05, indicating that the data were normally distributed. Thus, Pearson Correlation analysis could be performed to assess the relationship between variables.

Table 3. Mental Health Indicators and Their Correlation with Blood Pressure in Hypertensive Elderly (n = 39)

Variables	Mean ± SD	*p-value**	r
Depression	5.38 ± 3.98	0.571	–0.094
Anxiety	5.56 ± 3.87	0.899	–0.021
Stress	4.90 ± 3.73	0.719	–0.059

Note: *Pearson Correlation

The results of the analysis show that the average depression score among elderly people with hypertension is 5.38, anxiety is 5.56, and stress is 4.90. Pearson's correlation test showed that these three mental health indicators had no significant relationship with blood pressure, with p-values of 0.571 for depression, 0.899 for anxiety, and 0.719 for stress. Thus, no statistical correlation was found between psychological conditions and blood pressure in the elderly hypertensive group in this study.

DISCUSSION

In this study, it was found that the dominance of the male sex with mild hypertension while severe hypertension was dominated by women. It is supported (Leszczak et al., 2024), hypertension is more found in women than men. This phenomenon can be explained by the unique social and biological stressors experienced by women mainly after menopause, such as hormonal changes that can make them susceptible to severe hypertension (Cho & Shin, 2025):(Fakhri et al., 2020).

Decreased estrogen levels during menopause are a significant factor contributing to increased blood pressure. Estrogen decline has a vasodilator effect, triggering vasoconstriction through renin-angiotensin-aldosterone (RAA) sensitive pathways and sodium-sensitive pathways. These hormonal changes accelerate arterial aging and increase arterial stiffness, which is a key factor in the development of hypertension (Vallée, 2025), metabolic syndrome, which includes hypertension, increases during perimenopause and early menopause.

The syndrome is characterized by weight gain, increased belly fat, and decreased energy expenditure, all of which contribute to high blood pressure (Oh et al., 2018). In this study, it was found that the majority of the elderly had an average age of 68 years, this was supported by a study that found that the final sample consisted of 109 participants aged 60 to 85 years (mean age 67.3 years; 70.4% female) (Leszczak et al., 2024). The majority of unemployed or retired people experience mild, moderate, and severe hypertension, because lack of physical activity can contribute to an increase in the prevalence of hypertension among the elderly (Mistry et al., 2022).

Long suffering from hypertension both mild, moderate and severe majority 1 year. In this study, it was found that depression was more common in respondents with mild and moderate hypertension, this result is in line with research showing that although depression may play a role in increasing the risk of hypertension (Li et al., 2025), chronic diseases increase the incidence rate of depression (Chao et al., 2024), however, the study found no significant association between the incidence of depression and hypertension in the elderly due to several other factors, such as loneliness (Hauger et al., 2025) or age, gender, monthly personal income (Du et al., 2025) and quality of life in the elderly (Delli Zotti et al., 2022). It is important to evaluate other factors that influence the development of hypertension in old age.

The majority of mild, moderate, and severe hypertension experienced mild anxiety and mild stress. However, no significant association was found between stress and moderate anxiety and blood pressure in this study due to limited measurement approaches, such as one-time measurements or the inability to evaluate the long-term effects of psychological factors on hypertension. This strengthens the argument that hypertension is influenced by other physiological factors that are more dominant than psychological, one of which is fatigue. This is supported by studies (Känel et al., 2020); (Knoop et al., 2021) hypertension occurs due to physical fatigue.

In the new article, although many have shown that psychological factors have an influence on the development of hypertension (Cheon et al., 2020); (Carola et al., 2024); (Park et al., 2023), however more diverse results also show that not all individuals with hypertension experience the same psychological problems (Schaare et al., 2023), it was found that higher systolic blood pressure (SBP) is associated with fewer depressive symptoms, better well-being, and lower emotion-related brain activity. The negative association between SBP and emotion-related amygdala activity was reduced in participants with hypertension. This was discovered by another researcher who found that extremely high levels of anxiety, depression, and stress, most likely reflect the profound impact of recent political, social, and economic changes, not of hypertension (Neyazi et al., 2024).

The findings of this study have important implications for healthcare professionals, particularly in the management of hypertension in the elderly. Although the relationship between depression, anxiety, stress, and blood pressure was not significant, psychological screening is still necessary to maintain quality of life and treatment adherence. Healthcare professionals need to apply a holistic approach that combines physiological and socio-psychological aspects, considering that postmenopausal hormonal factors, physical fatigue, and lack of activity have been shown to have a greater impact on hypertension in older adults. Education on healthy behaviours, increased physical activity, and monitoring of comorbid conditions are important steps in daily clinical practice.

However, this study has several limitations that need to be considered. The small sample size (n = 39) and single-time measurement of blood pressure and psychological factors may limit the statistical power and sensitivity in detecting the actual relationship between variables. Additionally, the lack of control for confounding factors such as sleep quality, physical activity, medication use, and socioeconomic status may have influenced the study results. Therefore, future research is recommended to use a longitudinal design, a larger and more diverse sample, and consider a broader range of physiological and psychosocial variables.

CONCLUSION

In the absence of a significant association between mental health (depression-anxiety-stress) and blood pressure, these findings suggest that mental health factors are not the main predictors of influencing blood pressure levels. It prompts the need for further research that explores other factors such as physiological and lifestyle. Although no direct correlation was found, efforts to manage stress and anxiety are still crucial for the overall well-being of the elderly. The findings also contribute to increasing understanding of the complexity of hypertension, which a variety of variables may influence in addition to psychological factors. Addressing these psychological conditions remains important for improving overall quality of life, even if it does not directly correlate with lower blood pressure.

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