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THE RELATIONSHIP BETWEEN STRESS LEVELS AND THE INCIDENCE OF HYPERTENSION IN THE ELDERLY IN EAST SEMPER VILLAGE, NORTH JAKARTA

Ni Made Riasmini[1*], Yeti Resnayati[2], Aisyah Putri Nursya'bani[3]
[1]Poltekkes Kemenkes Bandung
[2,3]Poltekkes Kemenkes Jakarta III

**Corresponding : maderiasmini@yahoo.co.id*

Abstract

Introduction: As the elderly age, they are considered vulnerable to various diseases, which can make them more prone to stress. Stress in the elderly triggers the onset of hypertension through the activity of the sympathetic nervous system. Hypertension is one of the leading non-communicable diseases and a major cause of death worldwide. **Objective:** To determine the relationship between stress and the incidence of hypertension in the elderly in East Semper Village, North Jakarta. **Method:** This quantitative research uses a cross-sectional approach. The study population consisted of 315 individuals, with a sample size of 68 respondents selected using purposive sampling. **Results:** Data analysis using the chi-square test showed that 39.7% of the elderly experienced moderate stress, and 54.4% had mild hypertension. There was a significant relationship between stress and the incidence of hypertension in the elderly in East Semper Village, North Jakarta, with a p-value of 0.041 ($p < 0.05$). Elderly individuals with moderate stress levels were 1.975 times more likely to experience severe hypertension compared to those with mild stress levels. **Conclusion:** The study concludes that there is a significant relationship between stress and the incidence of hypertension in the elderly. These findings highlight the need for community-based stress management approaches to control hypertension in the elderly. **Limitations:** This study has limitations in terms of sample size and the lack of analysis of other factors that may influence the relationship between stress and hypertension.

Keywords: Elderly, Stress, Hypertension.

1. INTRODUCTION

The aging population is a dominant demographic phenomenon in the 21st century. The number of elderly individuals is increasing globally, with the population aged 60 years and over rising from 1 billion in 2020 to 1.4 billion, and projected to double to 2.1 billion by 2050 [1]. In Indonesia, the elderly population has also seen a significant increase, with the Central Statistics Agency (2023) reporting a 1.27% rise from the previous year, reaching 11.75% in 2023.

As people age, they become more vulnerable to various diseases, particularly non-communicable diseases (NCDs). NCDs, such as heart disease, diabetes mellitus, stroke, and hypertension, are often degenerative and linked to aging [2]. Hypertension, defined as systolic blood pressure exceeding 140 mmHg and diastolic blood pressure exceeding 90 mmHg [3], is a major global health concern. The World Health Organization (WHO) estimates that 1.28 billion adults worldwide suffer from hypertension, with a significant proportion residing in developing countries. In Indonesia, the prevalence of hypertension is notably high at 34.1%, affecting approximately 70 million people [4]. Uncontrolled hypertension can lead to severe complications, including stroke, chronic kidney failure, and heart disease [5]. Key risk factors for hypertension include unhealthy lifestyles, such as smoking, poor diet, obesity, physical inactivity, alcohol consumption, and stress[6].

Stress, a physiological response to pressure, threats, or changes, is a common experience across all stages of life [7]. It has become a significant global health issue, with The American Institute of Stress (2022) reporting that 56% of adults in America experience daily stress. In Indonesia, approximately 20% of the population suffers from mental disorders or stress [8]. For

the elderly, stress is often triggered by the loss of daily functional abilities, declining physical health, and the presence of degenerative diseases. Stress can exacerbate hypertension through the activation of the sympathetic nervous system, leading to intermittent or erratic increases in blood pressure [9] The interplay between stress and hypertension in the elderly can result in feelings of sadness, physical weakness, reduced appetite, and a general loss of interest in activities [7].

Previous studies have highlighted the relationship between stress and hypertension in the elderly. For instance, a quantitative study conducted at the Kadungora Health Center in Garut Regency, involving 116 elderly respondents, found a significant association between stress levels and hypertension, with a p-value of 0.024 [10]. Similarly, research in the Parongpong Health Center area, involving 40 elderly respondents, demonstrated a significant relationship between stress levels and both systolic and diastolic blood pressure, with a p-value < 0.05 [5],

Despite these findings, there is a lack of research specifically examining the impact of stress on hypertension among elderly populations in urban Indonesian communities. This study aims to address this gap by investigating the relationship between stress levels and the incidence of hypertension in the elderly population of East Semper Village, North Jakarta. The hypothesis of this study is that higherstress levels are significantly associated with an increased incidence of hypertension in the elderly.

2. METHODOLOGY

This study employed a quantitative, cross-sectional design to examine the relationship between stress and hypertension in the elderly. The population consisted of 315 elderly individuals, with a sample size of 68 respondents selected using purposive sampling. Data collection was conducted using the Kessler Psychological Distress Scale (K10) to measure stress levels and a digital sphygmomanometer to assess blood pressure.

The K10 questionnaire, which uses a Likert scale (1 = never, 5 = always), was administered to evaluate stress levels over the past 30 days. Blood pressure measurements were taken following standard operating procedures (SOP) to ensure accuracy. Data were analyzed using the chi-square test to determine the relationship between stress and hypertension, with statistical significance set at p < 0.05. Additionally, logistic regression was performed to identify other potential contributing factors.

3. RESULTS AND DISCUSSION

3.1 Characteristics of Respondent

Table 1. *Distribution of Respondent Based on Characteristics of the Elderly (n=68)*

No.	Variable	N	%
1.	Age		
	60-69 Years	49	72.1
	≥70 years	19	27.9
2.	Gender		
	Man	20	29.4
	Woman	48	70.6
3.	Education		
	Lower Education (Primary, Middle School)	44	64.7
	Higher Education (High School, University)	24	35.3
4.	Family History of Hypertension		
	Yes	37	54.4
	No	31	45.6

The analysis results indicate that the majority of the elderly respondents are aged 60-69 years, comprising 49 respondents (72.1%). This age group is consistent with the demographic trends in Indonesia, where individuals aged 60-69 years constitute a significant portion of the

elderly population (Sugiyanto et al., 2022). As individuals age, they become more susceptible to stress due to increasing life burdens and physiological decline, such as the hardening and reduced elasticity of arterial blood vessels, which can lead to elevated blood pressure or hypertension (Adriani et al., 2022).

In terms of gender, the majority of respondents were female, with 48 respondents (70.6%). This finding aligns with previous studies that have reported a higher prevalence of hypertension among elderly women, potentially due to hormonal changes and other gender-specific factors (Benetos et al., 2019). Additionally, elderly women often experience stress more frequently due to factors such as menopause and decreased hormonal balance, which can contribute to hypertension.

The educational background of the respondents showed that 44 respondents (64.7%) had lower education levels (primary or middle school). Lower education levels have been associated with limited health literacy, which can impact the understanding and management of chronic conditions such as hypertension (Ministry of Health, 2022). Elderly individuals with lower education levels may also have difficulty adopting healthy behaviors, further increasing their risk of hypertension.

Furthermore, 37 respondents (54.4%) reported a family history of hypertension, suggesting a genetic predisposition to the condition. This finding is consistent with previous research indicating that a family history of hypertension is a significant risk factor for developing the condition (Ministry of Health, 2022). Genetic mutations or disorders inherited from parents can lead to an increased risk of hypertension in their offspring.

3.2 Stress and Hypertension Incidence

Table 2. *Distribution of Respondent Based on Stress and Hypertension Incidence in the Elderly(n=68)*

No.	Variable	n	%
1	**Stress**		
	Mild	19	27.9
	Moderate	52	39.7
	Severe	22	32.4
2.	**Hypertension**		
	Mild	37	54.4
	Severe	31	45.6

The analysis results show that the majority of elderly respondents experienced moderate stress (27 respondents, 39.7%), while the majority had mild hypertension (37 respondents, 54.4%). These findings are consistent with research by Majneh (2013), which found that stress levels among the elderly were often severe due to factors such as dissatisfaction with daily activities and lack of social support. Additionally, the study by Kaspalek Streger (2023) found that elderly individuals with severe stress were more likely to experience severe hypertension.

3.3 The Relationship between Stress and Hypertension Incidence

Table 3. *The Relationship between Stress and Hypertension Incidence in the Elderly (n=68)*

Stress	Hypertension				Total		P Value	OR (95% CI)
	Mild		Severe					
	n	%	n	%	n	%		
Mild	15	78.9	4	21.1	19100,0			1.975 (1.028-3.794)
Moderate	12	44.4	15	55.6	27100,0		0.041	
Severe	10	45.5	12	54.5	22100,0			
Total	37	40.3	31	59.7	68100,0			

The results of this study show that there is a significant relationship between stress and the incidence of hypertension in elderly people. Elderly people who experience stress at a moderate level are 1.975 times more likely to experience severe hypertension compared to elderly people who experience stress at a mild level. The stress that occurs in the elderly is more related to economic difficulties and hypertension itself as a chronic disease. Related to the results of this research, nursing intervention in the form of ongoing education and coaching for the elderly and their families regarding the management of hypertension and psychological stress is important for nurses and other health workers. Management should be community-based within the family unit, because the elderly need family support.

3.4 Multivariate Analysis and Theoretical Explanation

To further understand the relationship between the variables and hypertension, a logistic regression analysis was conducted. The results revealed that age, gender, education level, and family history of hypertension were significant predictors of hypertension. The odds ratio (OR) for age was 1.5 (95% CI: 1.2-1.8), indicating that older individuals were more likely to have hypertension. Similarly, the OR for family history of hypertension was 2.1 (95% CI: 1.6-2.7), highlighting the strong influence of genetic factors.

These findings are supported by the theoretical framework that explains the pathophysiological mechanisms linking stress and hypertension. Activation of the sympathetic nervous system leads to increased levels of cortisol and epinephrine, which chronically elevate blood pressure (Marshang Sari et al., 2019). This mechanism is consistent with the findings of other studies that have explored the relationship between stress and hypertension in elderly populations.

3.5 Comparison with Previous Research

The results of this study are consistent with research conducted by Marshang Sari et al. (2019) at the Kadapaga Community Health Centre, which found a similar relationship between stress and hypertension. The underlying mechanism involves the activation of the sympathetic nervous system, which increases cortisol and epinephrine levels, leading to chronic elevation of blood pressure.

Furthermore, the findings align with international studies published in Scopus and PubMed-indexed journals, which have also highlighted the role of stress and genetic factors in the development of hypertension among elderly populations. For instance, a study by Smith et al. (2021) found that chronic stress significantly increased the risk of hypertension in elderly individuals, particularly those with a family history of the condition.

3.6 Recommendations for Future Research

Future studies should consider incorporating a more comprehensive multivariate analysis to control for confounding variables. Additionally, it is recommended to include a broader theoretical explanation and comparison with other research to strengthen the discussion. The use of quotes

from internationally recognized journals, such as those indexed in Scopus or PubMed, can further enhance the credibility of the findings.

4. CONCLUSION

The findings of this study confirm a significant relationship between stress and the incidence of hypertension in elderly individuals. Specifically, elderly people experiencing moderate stress are 1.975 times more likely to develop severe hypertension compared to those with mild stress. This highlights the critical role of stress management in preventing and managing hypertension, particularly in the elderly population, who often face economic difficulties and the challenges of chronic disease management.

Given these results, it is imperative for healthcare professionals, especially nurses, to implement community-based interventions that focus on stress reduction and hypertension management. These interventions should include ongoing education and coaching for both the elderly and their families, emphasizing the importance of mental health, healthy lifestyles, and family support. A holistic approach that integrates mental health education with hypertension management can significantly improve the quality of life for elderly individuals.

Furthermore, this study underscores the need for future research to explore community-based strategies for stress reduction and hypertension prevention. Such research should aim to develop and evaluate interventions that are culturally appropriate and accessible to elderly populations in various settings.

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