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A Descriptive Study of Hypertension Characteristics Among the Elderly

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A B S T R A C T

This descriptive study aimed to provide a detailed analysis of hypertension characteristics among the elderly population in Kebun Jeruk, Jakarta, in light of the high global incidence and the minimal availability of specific local community data. Hypertension is a significant global health concern, often compounded by degenerative processes and physiological changes such as arterial stiffness in older adullts. The research imployed a descriptive design with a cross-sectional approach, involving 30 elderly individuals (≥ 60 years) who met the inclusion criteria. Descriptive analysis results revelaed that the dominant age group was 65–69 years (30%). Respondents were predominantly female (63.3%), a finding consistent with the elevated hypertension risk observed in postmenopausal women. Regarding the severity of hypertension, the majority of respondents were categorized into Hypertension Stage 1 (46.7%) and Hypertension Stage 2 (33.3%). This substantion proportion suggest that a high percentage of the elderly population is at considerable risk of experiencing severe cardiovascular complications, including stroke and heart disease.

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INTRODUCTION

Hypertension is a significant global health problem with an incidence rate that continues to increase every year. According to the World Health Organization (WHO, 2021), approximately 1.28 billion adults worldwide suffer from hypertension, with two-thirds of them living in low and middle-income countries. In Indonesia, hypertension is a major cause of non-communicable deaths, contributing significantly to the community's economic and health burden. Data from the 2018 Basic Health Risearch (Riskesdas) reported a hypertension prevalence of 34.1%, with the figure notably increasing in the elderly age group.

The rise in blood pressure among the elderly is an unavoidable condition accompanying degenerative processes. Older adults experience physiological changes that cause artery walls to become stiffer, a decrease in baroreceptor sensitivity, and a decline in kidney function in regulating body fluid balance. These changes increase peripheral vascular resistance, resulting in higher blood pressure compared to younger ages. Gender also influences the prevalence of hypertension. Research indicates that postmenopaus have a higher risk of hypertension due to a decrease in estrogen, a hormone that maintains blood vessel elasticity (Merz & Wenger, 2017). This condition leads to a high incidence of hypertension in elderly women, especially after the age of 55.

Despite macro-level data from national surveys underscoring this high prevalence, a substantial research gap exists. The available epidemiological data often remains generalize and fails to capture the intricate variablily of the desease's clinical profile at the granular, hyperlocal level, particularly within densely population urban sub-districts like Kebun Jeruk, Jakarta. Prior studies have extensively explored general risk factors or medication adherence, but detailed data specifically classifying the demographic characteristic of hypertensive elderly based on clinical severity (Stage 1 and Stage 2) within this specific locality is currently lacking (Setyawan & Haryanto, 2021).

Therefore, the novelty of this research lies in providing accurate, hyperlocal and severity-based profile data set. By mapping the elderly population based on their hypertension classification, this study establishes a crucial foundation for a precision public health approach that tergets interventions toward the most vulnerable groups. Besides biological factors, an increasingly inactive modern lifestyle also contributes to the rising incidence of hypertension. High-salt, low-fiber consumption patterns, smoking habits, alcohol consumption, psychological stress, and lack of daily physical activity are risk factors frequently found in the elderly (Setyanda et al., 2020). Ignorance of the dangers of hypertension causes many elderly individuals to be unaware of the initial symptoms, leading to a lack of routine check-ups.

Regular blood pressure monitoring is essential for the elderly group. Uncontrolled hypertension can cause various serious complications such as stroke, coronary heart disease, chronic kidney failure, and hypertensive retinopathy (Kario, 2018). Therefore, community-level blood pressure screening is an important strategy for early case detection. Community-based interventions have proven effective in managing hypertension. Health education, elderly

exercise, and routine screening can increase awareness and influence lifestyle modification in the elderly (Rahajeng & Tuminah, 2019). Programs like this are more easily accepted because they are carried out within a social environment close to the daily life of the elderly.

The research contribution is highly significant for primary public health policy. The descriptive data generated is expected to provide robust information for: (1) Identifying high-priority elderly subgroups (e.g., those with Stage 2 Hypertension) who required intensive resource allocation, and (2) Designing more targeted, effective, and evidence-based promotive and preventive programs (such as nutritional education and geriatric exercise) at the loval Community Health Center (Puskesmas) level. The finding serve as a critical basis for formulating more efficient and integrated hypertension management strategies.

Research on the characteristics of the elderly with hypertension is crucial as a basis for mapping health issues in the community. By knowing the profile of age, gender, and hypertension severity, healthcare providers can develop more targeted and effective intervention strategies, including determining priority groups. Additionally, hypertension distribution data can be used to design structured health promotion programs, such as increasing knowledge about nutrition, stress management, and physical exercise. This is important because most elderly individuals still lack understanding of non-pharmacological hypertension management (Aryani et al., 2021). This study is relevant given the high rate of hypertension and the minimal local data related to the characteristics of the elderly at the community level. Epidemiological data is needed so that prevention efforts can be properly directed, especially to prevent long-term complications. Thus, this study aims to describe the age, gender, and hypertension severity in the elderly in Kebun Jeruk, Jakarta. The results are expected to contribute to the development of more comprehensive and effective elderly health policies.

THEORETICAL REVIEW

Accurate classification of hypertension severity encompassing Stage 1, Stage 2, and Prehypertension is fundamental to modern clinical guidelines. This categorization aims for optimal risk stratification, which serves as the primary basis for crucial therapeutic decision-making. Global guidelines emphasize that effective management must be proportionate to the diagnosed severity (Whelton et al., 2018). Furthermore, in the context of public health, there is a paradigm shift toward the Concept of Precision Public Health. This approach mandates granular and hyperlocal data to enable efficient resource allocation and targeted interventions (Utami & Prabandari, 2022; Burlacu et al., 2024). Thus, collecting specific hypertension characteristic data at the community level is essential for precisely identifying high-risk groups, which is key to improving overall hypertension control rates.

The pathophysiology of hypertension in the elderly is profoundly influenced by complex vascular degenerative processes. Beyond the established Arterial Stiffness Theory (Williams et al., 2018), this mechanism is exacerbated by

increased systemic oxidative stress and low-grade chronic inflammation, which significantly impairs endothelial function (Pacholko & Ladecola, 2025). Hypertension complications in the older population are not solely limited to cardiovascular events like heart disease and stroke. Strong evidence links sustained high blood pressure to the risk of cognitive decline and vascular dementia (WHO, 2025). Moreover, recent studies suggest that damage to cerebral blood vessels and brain cells can commence in the early phases of hypertension, even before blood pressure reaches critically high clinical thresholds (Medicine, Weill Cornell, 2025). Therefore, strict blood pressure control must be viewed as an essential dual strategy for vascular and neurocognitive protection.

Gender remains a significant determinant of risk in hypertension. The higher incidence observed in older women is often attributed to the loss of protective estrogen hormones post-menopause (Merz & Wenger, 2017). This complexity necessitates personalized blood pressure management. Researchers suggest that treatment targets should be tailored by gender, particularly given the unique link observed between rapid systolic blood pressure decline and accelerated cognitive decline specifically in older women (Isaacs-Thomas, 2024). Additionally, the etiology of hypertension increasingly involves the gut-heart axis. Disturbance in gut microbiota composition (*dysbiosis*) in the elderly can trigger systemic inflammation and generate pro-hypertensive metabolites (TMAO), which offers a promising avenue for non-pharmacological intervention through diet adjustment and probiotic supplements (Ge et al., 2024; Valdez-Palomares et al., 2025).

While pharmacological therapy is crucial for severe hypertension, holistic management demands a robust integration of non-pharmacological interventions. Structured health education has proven effective in enhancing understanding and adherence among the elderly (Hidayati & Lestari, 2020). Furthermore, routine physical activity, such as targeted exercise programs for the elderly, can help reduce vascular resistance and improve cardiac function (Aryani et al., 2021). The key to long-term success lies in the presence of strong family support, which actively ensures medication adherence and necessary lifestyle modification (Sari et al., 2019). This integrated strategy, combining pharmacotherapy with community-based health promotion, represents the most effective model for achieving sustained blood pressure control rates (Rahajeng & Tuminah, 2019).

METHODOLOGY

This study employed a descriptive design with a cross-sectional approach. It aimed to describe the characteristics of the elderly based on age, gender, and hypertension severity. The research was conducted in Kebun Jeruk on July 2020. It involved 30 elderly individuals as respondents with inclusion criteria: aged ≥ 60 years, willing to undergo blood pressure examination, and able to communicate well. Blood pressure measurement was performed after the respondents had rested for at least 5 minutes. Blood pressure was measured on the right arm in a sitting position. Hypertension severity was categorized into normal, prehypertension, hypertension stage 1, and hypertension stage 2. Data

were analyzed descriptively and presented in the form of frequency distribution tables and percentages

RESULTS AND DISCUSSION

Tabel 1. Distribution of Respondent by Gender, Age, and Hypertension Severity

Characteristics	n	Presentation (%)
1. Gender		
Male	11	36.7
Female	19	63.3
2. Age		
60 – 64 years	7	23.3
65 – 69 years	9	30
70 – 74 years	8	26,7
≥ 75 years	6	20
3. Hypertension Severity		
Normal	1	3.3
Prehypertension	5	16.7
HT Stage 1	14	46.7
HT Stage 2	10	33.3

Table 1 indicates that the respondents were predominantly female (63.3%), with the 65–69 age group being the largest (30.0%). The most critical finding is the distribution of hypertension severity: the vast majority of respondents were categorized as having Hypertension Stage 1 (46.7%) and Hypertension Stage 2 (33.3%). This highlights that a collective 80% of the elderly population in the study area presented with hypertension requiring clinical intervention, while only 3.3% were in the normal category.

Severity Levels and the Urgency of Clinical Risk Stratification

The finding that a combined 46.7% of respondents had Stage 1 Hypertension and 33.3% had Stage 2 Hypertension, totaling 80% underscores a significant and high-risk health burden in the Kebun Jeruk. This severity level strongly supports the emphasis in accurate risk stratification in global clinical guidelines (Whelton et al. (2018). The substantioal presence of 33.3% of the elderly in Stage 2 represents a major clinical alarm, as this classification indicates a high absolute risk of major adverse cardiovascular events (MACE), mandating immediate and intensive therapeutic and disease management actions. This hyperlocal data set provided a strong empirical basis for implementing a precision public health strategy.

The clinical urgency posed by the high prevalence of Stage 2 Hypertension necessitates immediate screening for Target Organ Damage (TOD). Stage 2 Hypertension is frequently associated with subclinical TOD, such as left ventricular hypertrophy (LVH) detected via electrocardiogram (EKG) or microalbuminuria, indicating incipient renal damage (Burlacu et al., 2024). Therefore, for this 33% subgroup, intervention must be initiated immediately and

accompanied by TOD examinations to mitigate the risk of irreversible complications.

Dominant Age and The Consequences of Vascular Pathophysiology

The dominance of the 65–69 age group (30%) in this study aligns with the pattern of increasing hypertension prevalence that characterizes degenerative aging. Pathophysiologically, this age bracket is marked by the acceleration of the Arterial Stiffness Theory, where the degradation of elastin and accumulation of collagen in the arterial walls increases pulse wave velocity and Peripheral Vascular Resistance (Williams et al., 2018). This dominance is also consistent with the hypothesis of accelerated systemic oxidative stress (Pacholko & Ladecola, 2025), which exacerbates endothelial dysfunction and culminates in the significant clinical manifestation of Stage 1 and Stage 2 hypertension within this early-to-mid elderly age range.

The high prevalence of Stage 1 and 2 Hypertension in this age group directly implies an elevated Pulse Pressure (PP). In the elderly, PP (the difference between systolic and diastolic pressure) is often considered a stronger predictor of cardiovascular risk than diastolic pressure, as it more accurately reflects arterial stiffness (Mancia et al., 2019). The elevated PP signifies a substantial vascular burden, reinforcing the need for interventions that target adherence to anti-hypertensive medication to effectively reduce the systolic pressure load.

Geder Proportion, Post-Menopausal Risk, and Personalized Management

The finding that female respondents dominated (63.3%) reinforces global epidemiological trends. This phenomenon is strongly associated with the loss of the protective effect of the estrogen hormone post-menopause on vascular function (Merz & Wenger, 2017). This gender dynamic holds critical implications for treatment strategy, underscoring the necessity for personalized blood pressure management. Target blood pressures in elderly women must be determined cautiously to balance cardiovascular risk with neurocognitive risk, given evidence linking a rapid decline in systolic blood pressure to accelerated cognitive function decline in older women (Isaacs-Thomas, 2024).

The implications of female dominance also extend to Health-Related Quality of Life (HRQoL). Studies indicate that women with hypertension, particularly at Stage 2, tend to report a lower HRQoL and experience a higher psychosocial burden, such as anxiety or depression, compared to men with the same condition (Messerli et al., 2017). Therefore, interventions in Kebun Jeruk must incorporate a psychosocial support and stress management component for this female subgroup, extending beyond a purely pharmacological focus.

Hypertension Severity and the Thread of Neurocognitive Complications

The significant proportion of respondents in Stage 2 Hypertension (33.3%) raises concerns that extend beyond cardiovascular risk to include potential brain damage. Uncontrolled hypertension is a leading modifiable risk factor for vascular cognitive impairment and dementia (WHO, 2025). The severity found here increased the risk of serious complications such as stroke up to four times, as explained by Kairo (2018), emphasizing the need for strict blood pressure

control. Moreover, studies suggest that cerebral vascular damage can be initiated in the early phases of hypertension (Medicine, Weill Cornell, 2025). The magnitude of the Stage 2 burden found in Kebun Jeruk confirms that aggressive blood pressure management is required as a primary, multiorgan intervention to preserve long-term cognitive function.

The complexity of managing severe Stage 2 Hypertension is further compounded by potential comorbidities often present in the elderly, such as Diabetes Mellitus (DM). For hypertensive patients with DM, the recommended blood pressure targets are often more stringent (Carey et al., 2018). Therefore, the high Stage 2 rate in Kebun Jeruk suggests that local health center protocols must include routine screening for comorbidities, as the presence of DM would further elevate the MACE risk and necessitate a higher, more immediate intensity of pharmacological treatment.

Prehypertension and the Role of Gut Microbiome Etiology

The presence of a Prehypertension group (16.7%) provides a critical signal for primary prevention programs. This condition is the initial phase before hypertension progresses to become more severe. If lifestyle interventions such as reducing sodium consumtion, increasing physical activity, and stress management are not carried out, this condition can progress to hypertension in a relatively short time (Whelton et al., 2018). The overall high severity also underscores the importance of a holistic approach that includes novel etiologies, such as the Gut-Heart Axis. Hypertension has been linked to gut microbiota dysbiosis, which causes increased systemic inflammation in the elderly and triggers the production of pro-hypertensive compounds like Trimethylamine N-oxide (TMAO) (Valdez-Palomares et al., 2025).

Given the role of the microbiome, non-pharmacological interventions for the Prehypertension and Stage 1 groups can be targeted through dietary modulation. Hypertension-related dysbiosis is characterized by a reduction in the production of Short-Chain Fatty Acids (SCFAs), which are anti-inflammatory and aid in blood pressure regulation. Therefore, dietary education promoting prebiotic (fiber) intake for the elderly in Kebun Jeruk can serve as an effective, evidence-based adjunct intervention to mitigate systemic inflammation and support blood pressure control.

The high prevalence of Stage 1 and Stage 2 Hypertension among the elderly demonstrates the urgency of implementing a holistic and stratified community program (Rahajeng & Tuminah, 2019). Based on severity, the **s**tage 2 must be prioritized for intensive pharmacological management and clinical monitoring. Hypertension control does not only focus on pharmacotherapy but also on a holistic approach that includes stress management, a low-salt diet, and limiting alcohol consumption (James et al., 2014). Elderly individuals who undertake a combination of these interventions have a greater chance of lowering blood pressure compared to those who rely only on medication.

This aggressive strategy requires specific, evidence-based interventions. Health education is a core strategy to enhance the elderly's understanding of hypertension management. Hidayati & Lestari's (2020) research proved that

health education can significantly improve hypertension prevention behavior. Community-based programs like counseling and intensive assistance have proven effective in changing the lifestyle habits of the elderly. Furthermore, physical activities such as elderly exercise also contribute to lowering blood pressure. Aryani et al. (2021) found that elderly exercise can improve blood circulation, reduce vascular resistance, and enhance heart function; light movements with low to moderate intensity are recommended to maintain fitness without causing a risk of injury. Additionally, family support also influences the effectiveness of hypertension management. Sari et al.'s (2019) research showed that elderly individuals with high family support are more disciplined in taking medication and following health programs. This affirms that hypertension intervention must involve the family as the main supporter.

CONCLUSIONS AND RECOMMENDATIONS

This descriptive study presents community-specific data confirming that Hypertension remains a significant public health crisis among the elderly population in Kebun Jeruk, Jakarta. A highly critical risk profile is revealed by the fact that the majority of respondents, totaling 80%, fall into the high-risk categories (Stage 1 and Stage 2 Hypertension). This condition indicates a heavy disease burden and a high potential for serious cardiovascular complications and target organ damage. Furthermore, the analysis shows that the 65–69 age group and elderly women are the most vulnerable subgroups. The presence of a Prehypertension group (16.7%) provides an important signal for primary prevention programs. These data highlight the necessity of shifting from general health programs to a precision public health model where interventions must be targeted and stratified based on the severity and specific characteristics of the high-risk subgroups.

Based on the conclusion above, an integrated intervention strategy is recommended that must target various stakeholders to achieve stable blood pressure control. The Kebun Jeruk Primary Health Center (Puskesmas) and local health authorities must prioritize the group with Stage 2 Hypertension through intensive clinical protocols, including mandatory screening and the implementation of a Home Blood Pressure Monitoring (HBPM) program for continuous follow-up.

FURTHER STUDY

For health promoters and volunteers, the actionable steps include regularly conducting targeted health education on medication adherence, stress management, and the importance of a low-sodium diet. Additionally, structured physical activity, such as low-to-moderate intensity elderly exercise, must be actively promoted as a non-pharmacological intervention. Families and caregivers hold a critical role as the main supporters for the Prehypertension and Stage 1 groups, they must be included through family support training, focusing on supervising medication discipline, providing healthy food, and creating a supportive environment to improve medication adherence and the quality of life of the elderly.

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