GLOBAL TEN PUBLIC HEALTH AND NURSING JOURNAL
Volume 4, No 2, 2026, June, Page 34-42
ISSN: 3025-6283 (Online - Elektronik)

RESEARCH

Overview of Hypertension Risk Factors Among the Elderly at the Posbindu in Semambung Village, Wonoayu

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ABSTRACT

Hypertension is a non-communicable disease with a relatively high prevalence among the elderly population; it remains a public health challenge due to its potential to cause serious complications. This study aimed to describe the risk factors for hypertension among the elderly at the Posbindu Pos 1 in Semambung Village, Wonoayu. A quantitative descriptive design with a cross-sectional approach was employed. The sample consisted of 45 elderly individuals selected via total sampling. Data were collected through questionnaires and measurements of blood pressure, body weight, and height. The results showed that the majority of respondents had stage 1 hypertension (57.8%), normal nutritional status (40.0%), a family history of hypertension (60.0%), frequent salt consumption (48.9%), were non-smokers (68.9%), engaged in light physical activity (48.9%), and had comorbid diabetes mellitus (44.4%). The most frequently identified risk factors were a family history of hypertension, frequent salt consumption, light physical activity, and diabetes mellitus. Early detection, health education, and regular monitoring are necessary to prevent hypertension-related complications in the elderly.

Keywords: hypertension, risk factors, elderly, posbindu

INTRODUCTION

As a type of cardiovascular disease, hypertension remains a health issue with a high incidence rate across various countries. It is often referred to as the "silent killer" because it frequently develops without presenting specific clinical manifestations; consequently, most individuals remain unaware of the condition until it is identified following the onset of various complications.

According to the WHO (2023), nearly 1.4 billion people worldwide aged 30–79 suffered from hypertension in 2024, representing approximately 33% of the population in that age group. Data from the 2023 National Health Survey (SKI) indicate that 59.1% of disability cases among the population aged 15 and older were associated with hypertension; furthermore, hypertension accounted for 22.2% of disabilities resulting from non-communicable diseases. Dr. Eva Susanti, Director of Non-Communicable Disease Prevention and Control, stated that the rising risk of hypertension is linked to unhealthy behaviors, such as smoking, insufficient physical activity, inadequate fruit and vegetable consumption, and the habit of consuming high-salt foods.

Based on 2023 data, the population aged 15 years and older is estimated at 11,702,478; of these, 8,632,039 individuals with hypertension received health services, representing a service coverage rate of 73.69%. Following an update, the estimated number of people with hypertension in East Java Province stands at 6,896,624, comprising 49.2% men and

50.8% women. Of this total estimated population, 6,259,578 individuals or 90.8% have received health service..

Data from the Wonoayu Community Health Center indicates an estimated 14,237 cases of hypertension within its service area. Regarding gender distribution, the patient population comprises 7,114 males and 7,123 females, with a hypertension healthcare coverage rate of 98.72%. Health monitoring conducted through the Integrated Development Post specifically at Post 1 in Semambung Village, Wonoayu District also shows the participation of 45 elderly individuals in health screening activities.

The Indonesian Ministry of Health (2021) states that individuals aged 60 years and older are classified as elderly. The aging process occurs physiologically and is accompanied by a progressive decline in bodily functions. These changes result in a reduced capacity of the body to maintain optimal physiological function and to sustain resilience against various health issues.

Posbindu PTM is a form of community-based health service aimed at enhancing early detection, education, and the control of risk factors for non-communicable diseases, including hypertension. Therefore, this study was conducted to examine the risk factors for hypertension among the elderly at the Posbindu in Semambung Village, Wonoayu.

CLASSIFICATIONOF HYPERTENSION

Table 1 Classification of Hypertension According to the ISH

Category	Systolic (mmHg)	Diastolic (mmHg)
Hypotension	≤89	≤59
Normal	90-129	60-84
High-normal	130-139	85-89
Grade 1 hypertension	140-159	90-99
Grade 2 hypertension	≥160	≥100

(Sumber: *International Society of Hypertension*, 2020)

METODE

This study employs a quantitative design with an observational approach and a cross-sectional design. The research was conducted at Posbindu Post 1 in Semambung Village, Wonoayu.

The study population consisted of all elderly individuals registered and active in Posbindu activities. The study sample comprised 45 respondents, selected using the total sampling technique.

The independent variables in this study were family history, salt intake, physical activity, nutritional status, smoking habits, and medical history, while the dependent variable was the occurrence of hypertension. The research instruments consisted of a questionnaire, measurements of body weight and height, and blood pressure measurements.

Univariate data analysis was conducted to describe respondent characteristics, the severity of hypertension, and the distribution of hypertension risk factors including nutritional status, family history of hypertension, salt consumption patterns, smoking habits, physical activity levels, and history of comorbidities. The analysis results are presented in frequency distribution and percentage tables to provide an overview of respondent characteristics and the study variables.

RESULTS

Table 1 Distribution of General Characteristics of Respondents at the Posbindu in Semambung Village, Wonoayu, February 2026

General Data	Frequency	Percentage
A. Age (Years)		
60-65	24	53,3%
66-70	13	28,9%
70-75	5	11,1%
>75	3	6,7%

B. Gender		
Man	14	31,1%
Woman	31	68,9%
Total	45	100%

The table shows that the 60–65 age group is the largest group, with 24 respondents (53.3%). The 66–70 age group is next with 13 respondents (28.9%), followed by the 71–75 age group with 5 respondents (11.1%), and the over 75 age group with the smallest number, with 3 respondents (6.7%).

Based on gender distribution, the majority of respondents were female, numbering 31 people (68.9%), man respondents numbered 14 people (31.1%).

Table 2 Frequency Distribution of Hypertension Severity among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
High-normal	9	20,0%
Grade 1 hypertension	26	57,8%
Grade 2 hypertension	10	22,2%
Total	45	100%

The table showing the distribution of hypertension grades indicates that the majority of the 45 respondents fell into the grade 1 hypertension category, comprising 26 individuals (57.8%). Additionally, 10 respondents (22.2%) were in the grade 2 hypertension category, while 9 respondents (20.0%) fell into the high-normal blood pressure category.

Table 3 Frequency Distribution of Body Mass Index among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
underweight	3	6,7%
Normal	18	40,0%
Overweight	6	13,3%
Obesity I	15	33,3%
Obesity II	3	6,7%
Total	45	100%

The table shows that the "normal" category was the most common nutritional status among respondents, accounting for 18 individuals (40.0%). The Obesity I category followed with 15 individuals (33.3%), followed by the overweight category with 6 individuals (13.3%). Meanwhile, the underweight and Obesity II categories each comprised 3 respondents (6.7%).

Table 4 Frequency Distribution of Family History of Hypertension among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
Have	27	60,0%
No	18	40,0%
Total	45	100%

As shown in the table, the majority of respondents 27 individuals (60.0%) had a family history of hypertension, representing a hereditary factor. Meanwhile, 18 respondents (40.0%) did not have a family history of hypertension.

Table 5 Frequency Distribution of Salt Consumption Habits Among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
Rarely	16	35,6%
Sometimes	7	15,6%
Often	22	48,9%
Total	45	100%

The table shows the distribution of respondents, with the "frequent" category accounting for the highest proportion 22 individuals (48.9%). This is followed by the "infrequent" category, comprising 16

respondents (35.6%), while the "occasional" category consists of 7 respondents (15.6%).

Table 6 Frequency Distribution of Smoking Habits Among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
Do not smoke	31	68,9%
Light smokers	4	8,9%
Moderate smokers	6	13,3%
Heavy smokers	4	8,9%
Total	45	100%

The table shows that the majority of respondents 31 individuals (68.9%) do not smoke. Respondents who do smoke are categorized as follows: light smokers 4 individuals (8.9%), moderate smokers 6 individuals (13.3%), and heavy smokers 4 individuals (8.9%).

Table 7 Frequency Distribution of Physical Activity among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
Light	22	48,9%
Moderate	16	35,6%
Heavy	7	15,6%
Total	45	100%

The table showing the distribution of respondents' physical activity levels indicates that the light physical activity category accounts for the highest proportion, comprising 22 individuals (48.9%). This is followed by the moderate physical activity category, which includes 16 respondents (35.6%), while the vigorous physical activity category comprises 7 respondents (15.6%).

Table 8 Frequency Distribution of Comorbidities among the Elderly at the Posbindu in Semambung Village, Wonoayu, February 2026

Category	Frequency	Percentage
Diabetes mellitus	20	44,4%
Heart disease	4	8,9%
Hypercholesterolemia	11	24,4%
None	10	22,2%
Total	45	100%

The table showing the distribution of comorbid conditions indicates that diabetes mellitus was the most common condition among respondents, affecting 20 individuals (44.4%). This was followed by a history of hypercholesterolemia in 11 respondents (24.4%), while 10 respondents (22.2%) had no history of comorbidities. A history of heart disease was recorded in 4 respondents (8.9%).

DISCUSSION

Severity of Hypertension among the Elderly at Posbindu Post 1, Semambung Village, Wonoayu

The study results indicate that the majority of respondents (26 or 57.8%) had stage 1 hypertension, followed by 10 respondents (22.2%) with stage 2 hypertension, while 9 respondents (20.0%) fell into the high-normal blood pressure category. These findings demonstrate that the majority of elderly individuals at the Semambung Wonoayu Village Posbindu exhibited elevated blood pressure falling within the hypertension category, although most were still at stage 1.

Hypertension is a condition characterized by systolic blood pressure of ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg. This condition generally develops gradually due to physiological changes associated with aging, such as reduced blood vessel elasticity, increased peripheral resistance, and declining cardiovascular system function. If left uncontrolled, hypertension can progress to a more severe stage and

increase the risk of target-organ complications.

The results of Langingi's (2021) study show that the largest proportion of respondents fell into the grade 1 hypertension category specifically 23 individuals (71.9%) while grade 2 hypertension was found in 9 respondents (28.1%). These findings align with the results of the present study, which indicate that grade 1 hypertension is the most dominant category among the respondents.

Based on these findings, researchers posit that the high proportion of elderly individuals with Grade 1 hypertension remains a condition requiring early attention and management. Although classified as an early stage of hypertension, the condition can worsen without optimal control, thereby posing a risk of progression to more severe hypertension and increasing the likelihood of complications.

Nutritional status of the elderly at Posbindu Post 1, Semambung Village, Wonoayu.

The study results indicate that the majority of respondents (18 individuals or 40.0%) had normal nutritional status, followed by 15 respondents (33.3%) with Class I obesity and 6 respondents (13.3%) who were overweight; meanwhile, 3 respondents (6.7%) fell into the underweight category and another 3 (6.7%) into the Class II obesity category. These findings demonstrate that the majority of the elderly maintain a nutritional status within the normal range, although cases of overweight and obesity were still observed among the respondents.

Nutritional status is a factor contributing to the development of hypertension. Individuals with excess body weight are at higher risk of elevated blood pressure because increased adipose tissue can raise the heart's workload and peripheral vascular resistance.

The study by Cahyaningrum (2022) showed that the majority of respondents fell into the normal BMI category, with a percentage of 46.6%. These findings align with the results of the present study, which also revealed that the majority of respondents specifically 18 individuals (40.0%) were in the normal BMI category. This indicates that the majority of the elderly have an appropriate nutritional status based on BMI measurements.

Based on these findings, the researchers infer that although the majority of respondents fall within the normal BMI range, a significant proportion of the elderly are overweight or obese; this warrants attention when managing hypertension risk factors. Therefore, the elderly need to be educated on the importance of maintaining an ideal body weight by adopting a balanced, nutritious diet and engaging in physical activity suited to their capabilities.

Family History of Hypertension Among the Elderly at Posbindu Post 1, Semambung Village, Wonoayu

The study results indicate that 27 respondents (60.0%) had a family history of hypertension, whereas 18 respondents (40.0%) did not. These findings suggest that the majority of the elderly possess a genetic risk factor that may increase the likelihood of developing hypertension.

Family history is a non-modifiable risk factor. Individuals with a family history of hypertension are more likely to experience elevated blood pressure compared to those without such a history. This is linked to genetic factors that influence the body's blood pressure regulation mechanisms.

Research conducted by Sari (2023) indicates that the majority of respondents had a family history of hypertension, specifically 44 individuals (51.8%). These

findings align with the results of the present study, which also show that the majority of respondents 27 individuals (60.0%) had a family history of hypertension. The consistency between the two studies suggests that hereditary factors play a role in the development of hypertension.

Based on these results, researchers hypothesize that elderly individuals with a family history of hypertension are at higher risk of experiencing elevated blood pressure; therefore, early detection through regular blood pressure monitoring is necessary.

Salt Consumption Patterns Among the Elderly at Posbindu Post 1, Semambung Village, Wonoayu

The study results indicate that the majority of the elderly 22 individuals (48.9%) fall into the "frequent" category regarding their consumption of salt and flavor enhancers. Meanwhile, 16 individuals (35.6%) fall into the "rare" category, and 7 individuals (15.6%) fall into the "occasional" category. These findings suggest that a large proportion of the elderly at Posbindu Post 1, Semambung Village, maintain dietary habits that pose health risks, particularly concerning the excessive use of salt and flavor enhancers in their daily meals.

Excessive sodium intake can increase fluid retention in the body, thereby raising blood volume and leading to higher blood pressure. Therefore, limiting salt consumption is a crucial measure in controlling hypertension.

Research conducted by Janu Purwono et al. (2020) reveals that the majority of respondents—28 individuals (54.9%)—had a habit of high salt consumption, whereas 23 individuals (45.1%) had a low salt consumption pattern. The analysis indicates that salt consumption patterns are significantly associated with the incidence of hypertension among the elderly, as evidenced by a p-value of 0.001.

Based on these findings, the researchers argue that the high proportion of elderly individuals with salt consumption patterns falling into the "at-risk" category highlights the importance of increasing education regarding the adoption of a low-salt diet. It is essential to inform the elderly that excessive sodium intake stems not only from the use of table salt but also from various high-sodium foods such as instant foods, salted fish, and crackers as well as the excessive use of flavor enhancers.

Smoking Habits Among the Elderly at Posbindu Post 1, Semambung Village, Wonoayu

Based on the research findings, the majority of respondents 31 individuals (68.9%) do not smoke. Meanwhile, the respondents classified as light smokers numbered 4 (8.9%), moderate smokers numbered 6 (13.3%), and heavy smokers numbered 4 (8.9%). These results indicate that the majority of the elderly at Posbindu Post 1, Semambung Village, Wonoayu, do not have a smoking habit.

The high proportion of respondents in the non-smoking category was likely influenced by the fact that the majority of respondents were female. Conversely, all male respondents in this study were reported to be smokers. This situation indicates that smoking behavior among the elderly is more prevalent among men.

The study by Lapodi et al. (2024) reveals that the majority of hypertensive respondents fell into the non-smoking category specifically 43 individuals (57.3%) while 32 individuals (42.7%) were smokers. The researchers suggest that the predominance of non-smoking respondents is likely linked to gender characteristics, given that the majority of participants in the study were women.

Based on these findings, the researchers suggest that the predominance of non-

smoking elderly individuals in this study creates a favorable environment for hypertension prevention and control efforts. Nevertheless, elderly individuals who continue to smoke particularly moderate and heavy smokers still require attention through education regarding the negative impact of smoking on cardiovascular health.

Physical Activity Levels Among the Elderly at Posbindu Post 1, Semambung Village, Wonoayu

Based on the study results, the distribution of respondents' physical activity was dominated by the light physical activity category, comprising 22 individuals (48.9%). Furthermore, 16 individuals (35.6%) fell into the moderate physical activity category, while 7 individuals (15.6%) were in the vigorous physical activity category. These findings indicate that the majority of the elderly at Posbindu Post 1, Semambung Village, do not yet engage in high-intensity physical activity.

Regular physical activity contributes to maintaining an ideal body weight and cardiovascular health. To achieve optimal health benefits, it is recommended to engage in physical activity regularly for 30–45 minutes daily, or at least three to four times a week.

The results of Angel's (2025) study demonstrate a significant relationship between physical activity and blood pressure in elderly individuals with hypertension (p-value = 0.001; $p < 0.05$). These findings align with the results of the present study, which show that the majority of respondents fall into the light physical activity category.

Based on this, the researchers argue that physical activity among the elderly needs to be maintained and increased in accordance with their respective functional capacities. Engaging in regular physical activity at an appropriate intensity plays a role in keeping blood pressure under control and improving the quality of life for the elderly population.

History of Comorbidities Among the Elderly at Posbindu Post 1, Semambung Village, Wonoayu

The study results indicate that the majority of respondents had a history of comorbidities in the form of diabetes mellitus, specifically 20 individuals (44.4%). Additionally, 11 respondents (24.4%) had a history of hypercholesterolemia, 10 respondents (22.2%) had no comorbidities, and 4 respondents (8.9%) had a history of heart disease. These findings demonstrate that the majority of the elderly at Posbindu Post 1, Semambung Village, Wonoayu, present with comorbidities that could potentially affect their overall health status, including blood pressure control.

Chronic hyperglycemia can lead to endothelial dysfunction, increase vascular stiffness, and impair renal function in regulating fluid and electrolyte balance. These changes increase peripheral resistance and facilitate a rise in blood pressure.

The results of the study by Lairi et al. (2026) indicate that all respondents comprising 30 elderly individuals with hypertension had diabetes mellitus as a co-existing condition. These findings suggest that diabetes mellitus is a frequently encountered comorbidity among the elderly population with hypertension.

Based on these findings, the researchers argue that the presence of comorbidities in elderly patients with hypertension highlights the need for comprehensive and continuous health management. Health management for elderly patients with hypertension should not focus solely on blood pressure control but must also include the monitoring and management of blood sugar levels.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Based on the results of the data analysis, several conclusions can be drawn as follows:

1. The results of the blood pressure assessment in the elderly at Posbindu Post 1, Semambung Wonoayu Village showed that the majority of respondents were in the grade 1 hypertension category.
2. The distribution of nutritional status among the elderly based on Body Mass Index values shows that the majority of respondents fall into the normal category.
3. The majority of elderly individuals at Posbindu Post 1, Semambung Wonoayu Village, were found to have a family history of hypertension.
4. Research findings regarding salt consumption patterns indicate that the majority of the elderly fall into the category of frequently consuming high-salt foods.
5. The majority of the elderly at Posbindu Post 1, Semambung Wonoayu Village, do not have a smoking habit.
6. Regarding the physical activity level of the elderly, the majority of respondents fell into the light activity category.
7. Diabetes mellitus is the most frequently encountered comorbidity among the elderly at Posbindu Post 1, Semambung Wonoayu Village.

RECOMMENDATIONS

1. For future researchers

It is hoped that further development using an analytical method will be possible to determine the relationship between specific risk factors and the incidence of hypertension among the elderly. Additionally, other variables not examined in this study such as age, gender, stress levels, alcohol consumption habits, sleep quality, and adherence to medication therapy could be included.

2. For Healthcare Workers

It is expected that health promotion and prevention activities will be enhanced through the continuous provision of health education regarding hypertension control. This education should focus on the importance of limiting salt intake, undergoing routine blood pressure checks, and increasing physical activity such as through exercise classes for the elderly as a means to prevent hypertension-related complications.

3. For families

They are expected to play an active role in supporting the elderly to maintain and improve their health status. This support can be provided by helping to manage dietary habits particularly by limiting salt intake reminding the elderly to undergo regular health check-ups, and assisting in the management of any co-existing medical conditions.

4. For the elderly

it is recommended to adopt a healthy lifestyle by managing dietary intake—specifically by limiting the consumption of high-salt foods—engaging in regular physical activity suited to their physical condition and capabilities, and routinely monitoring blood pressure at community-based integrated health posts or healthcare facilities. Furthermore, adherence to prescribed treatments and the management of co-existing medical conditions must be maintained to reduce the risk of complications arising from hypertension.

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