

Received: June, 8 2026
 Revised: June, 13 2026
 Accepted: July, 9 2026
 Published: July, 29 2026

The Relationship Between Lifestyle and the Incidence of Hypertension Complications in the Elderly

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ABSTRACT

Background: Hypertension is a common health problem in the elderly. Symptoms of hypertension are only discovered after complications affect all organs of the body, known as multi-organ dysfunction, including the heart, kidneys, brain, and eyes. Lifestyle plays a significant role in the health of the elderly. An unhealthy lifestyle can increase the risk of hypertension in the elderly. **Objective:** The purpose of this study was to determine the relationship between lifestyle and the incidence of hypertension complications in the elderly at the Kebomas Gresik Community Health Center. **Methods:** This study used a cross-sectional design. The population was all elderly at the Kebomas Gresik Community Health Center, with a sample size of 75 respondents. Sampling was conducted using purposive random sampling. The research instrument was a questionnaire. Data analysis used univariate and bivariate analyses. **Results:** There is a relationship between lifestyle and the incidence of hypertension complications, with a strength of 0.660 within the range of 0.60–0.79. There is a strong relationship between the variables studied. **Conclusion:** Health education for people with hypertension is needed.

Keywords: cardiovascular, elderly, hypertension complications, Lifestyle, health behavior

Background

Hypertension is a condition where a person's blood pressure exceeds the normal limit, which is indicated by an increase in systolic blood pressure of more than 140 mmHg and diastolic pressure of more than 90 mmHg, measured at least twice in a state of sufficient rest (1). Hypertension is a disease and risk factor for cardiovascular disease, stroke, heart failure, kidney disease and myocardial infarction associated with increased blood pressure (2) According to the World Health Organization (WHO), hypertension or high blood pressure remains one of the leading causes of premature death and disability globally. In 2023, WHO released the first global report on hypertension which revealed that approximately 1 in 3 adults worldwide suffer from hypertension, but only 1 in 5 are successfully controlling it, the number of adults with hypertension increased from 650 million in 1990 to 1.3 billion in 2019 if countries can increase treatment coverage, an estimated 76 million deaths can be prevented between 2023 and 2050. Symptoms of hypertension are only known after complications occur that attack all organs of the body called multi-organ dysfunction including the heart, kidneys, eyes, brain so that treatment does not respond which results in disability or even death (3). Hypertension is a common disease in the elderly. Elderly individuals are individuals over the age of 60. The WHO defines the elderly as those aged 60-74, those aged 75-90, and those aged 90. The aging process in the elderly is accompanied by a decline in physical endurance, which makes them susceptible to various diseases (4).

Research has shown that age influences blood pressure levels. However, age is not the primary determinant of blood pressure levels and is not considered the sole risk factor for cardiovascular disease. Factors such as medical history and lifestyle can be considered as other factors influencing blood pressure levels and the risk of cardiovascular disease. Blood pressure monitoring and appropriate preventive measures are crucial, especially in the elderly (5). Hypertension sufferers should adopt a healthy lifestyle to reduce the risk of complications. A healthy lifestyle encompasses daily activities, including diet, physical activity, and maintaining a stress-free mental state. Regulating diet can be challenging at first, both in terms of meal timings and what to eat and what not to eat and should avoid. Reducing consumption of fatty and salty foods is crucial for hypertension sufferers (6).

Methods

This study is a study with a cross-sectional approach. This study aims to analyze the relationship between lifestyle and the incidence of hypertension in the elderly. This study was conducted at the Kebomas Gresik Health Center. The population in this study was all elderly people at the Kebomas Gresik Health Center. The research sample was taken using purposive random sampling of 100 respondents. Data were collected using a questionnaire that had been tested for validity and reliability. The results of the calculated r ($0.702 - 0.763$) > r table (0.361), and the reliability test showed the results of r alpha (0.729) > 0.6 (constant). Data analysis used bivariate with chi-square.

Results

Respondent Characteristics

Table 1 Frequency distribution based on respondent characteristics

	Number	Presentase
Age		
60-65	33	44,0
66-75	42	56,0
Gender		
Laki-laki	34	45,3
perempuan	41	54,7
Last Education		
Elementary School	13	17,3
Middle School	21	28,0
High School	25	33,3
College	13	17,3
Not attending school	3	4,0
Daily Activities		
Farmer	8	10,7
Trader	8	10,7
Retiree	20	26,7
Housewife	29	38,7
Self-Employed	10	13,7
Number	75	100

Based on Table 1 above, 42 (56.0%) respondents were aged 66-75 years, 41 (54.7%) respondents were female, 25 (33.3%) respondents had a high school education and 3 (4.0%) respondents did not attend school. 29 respondents (38.7%) were housewives and 8 (10.7%) were farmers.

Special Data

Table 2. Lifestyle and the Incidence of Hypertension Complications in the Elderly

Kategori Gaya Hidup		Cardi ovasc ular Comp licatio ns	Cerebral Complica tions	Kidney Compli cations	Eyes Compli cations	No complicati ons	Total	Total complic ations
Healthy	Coun t	8	12	6	16	3	45	42
	%	17.8%	26.7%	13.3%	35.6%	6.7%	100.0 %	93,33 %

Unhealthy	Coun	0	0	5	7	18	30	12
	t							
	%	0.0%	0.0%	16.7%	23.3%	60.0%	100.0	40%
Total	Coun	8	12	11	23	21	75	54
	t							
	%	10.7%	16.0%	14.7%	30.7%	28.0%	100.0	72%
								%
Correlation Coefficient				0,660				
Sig (2-tailed)				0,001				
N				75				

Based on the cross table 2 above, it can be seen that respondents who have a healthy lifestyle are 45 (60.0%) respondents, while respondents who have an unhealthy lifestyle experienced complications 42 respondents and those who did not experience complications 3 respondents. Respondents who have a good lifestyle 30 (40.0%) respondents experienced complications 12 respondents did not have complications 18 (60.0%) respondents, the total respondents with a healthy lifestyle and unhealthy lifestyle who experienced complications 54 (72.0%) respondents, the total who did not experience complications 21 (28.0%) respondents did not experience complications. Based on the results of the chi-square test analysis, a correlation coefficient value of 0.660 was obtained with a significant value of <0.001 , this indicates that there is a significant relationship between lifestyle and the incidence of hypertension complications in the elderly.

Discussion

Based on the data analysis for each respondent, the study found that the majority of the 54 respondents experienced complications of hypertension: 8 heart failure, 12 strokes, 11 kidney failure, 23 eye problems, and 21 no complications. Based on the data tabulation, 24 respondents aged 60-65 experienced complications, while 30 respondents aged 66-75 experienced complications. It can be concluded that the older the elderly, the greater the risk of developing hypertension complications. More elderly people suffer from hypertension compared to other age groups due to changes in blood vessel elasticity, thickening and stiffening of the heart valves, and reduced blood pumping ability of the heart, which can increase blood pressure in the elderly, which puts them at risk of diseases such as heart failure, stroke/brain damage, kidney failure, and eye problems.

Based on the study results, 22 male respondents and 32 female respondents experienced complications, with women suffering more from hypertension complications. Gender is one of the risk factors that cannot be changed, the high prevalence of hypertension in women occurs because it increases after entering menopause due to hormonal changes experienced by women, which cause women to experience increased sensitivity to salt and weight gain, both of which have the potential to trigger higher blood pressure (7).

Based on the respondents' last education, 9 respondents were elementary school graduates, 4 respondents were junior high school graduates, 17 respondents were high school graduates, and 11 respondents were college graduates, with 3 respondents not attending school. These results indicate that high school students experience more complications. Based on the results of other studies, there was a relationship between education level (p value 0.010; OR 2.883) and age (p value 0.006; OR 13.000) with hypertension (8). Education is closely related to a person's ability to understand information (9). Kurangnya pemahaman terhadap risiko hipertensi sebagai silent killer dan deteksi dini Complications can also affect unhealthy lifestyles such as consuming instant foods, fatty foods, smoking, and lack of physical activity. The results of other studies concluded that education can be associated with a person's insight and knowledge, elderly people who have less knowledge and insight because when receiving information about hypertension from various sources, for example health counseling delivered by health workers, it will be difficult to understand and accept health information about hypertension so that the level of education becomes a factor in increasing blood pressure (7). To increase knowledge and enhance health education, modular media is considered highly effective in providing health education to improve

adherence to antihypertensive medication and healthy lifestyle behaviors. This approach is used as an effective community-based nursing strategy to prevent stroke complications in hypertensive patients (10).

Based on the research results, the daily activities of 6 respondents were farmers, 6 were traders, 12 were retired government employees, and 21 were housewives. Housewives did not experience many complications from hypertension. Occupation is linked to a person's economic status because a job that aligns with expectations will have a positive impact on income and health behaviors. Someone with a job that provides sufficient income will adopt healthy behaviors, such as regularly monitoring their blood pressure, compared to those with low-income jobs who pay less attention to their health because they have to meet daily needs (7). Risk factors for increased blood pressure experienced by workers include sleep duration, alcohol consumption, work stress, hot environment and duration of working hours (11). These risk factors were not present in the respondents' work or daily activities. Almost all housewives in this study did not experience complications of hypertension. Housewives have flexible hours and no formal work demands, allowing them to manage their activities according to their wishes, thus reducing stress. Other research suggests a link between stress levels and blood pressure levels in the elderly. Stress is a condition in which the body's condition is disturbed by psychological pressure, and stress can trigger hormones in the body that control a person's thoughts. Experiencing stress can increase blood pressure even further (12). If blood pressure increases, there is a risk of hypertension complications.

Respondents who experienced complications had a good lifestyle (12 respondents) and a bad lifestyle (42 respondents). Hypertension is a condition where a person's blood pressure exceeds the normal limit, which is characterized by an increase in systolic blood pressure of more than 140 mmHg and diastolic pressure of more than 90 mmHg, measured at least twice in a state of sufficient rest (1). Complications of hypertension occur because uncontrolled high blood pressure consistently damages the walls of arteries and vital organs over the long term. This damage deprives major organs of adequate blood and oxygen supply. Some of the major organs susceptible to complications include stroke/brain damage, heart failure, kidney failure, and eye disorders, all of which are associated with high blood pressure (2). The WHO defines hypertension as high blood pressure (140/90 mmHg or higher), which can become even higher if left untreated. Hypertension is a disease without symptoms but can suddenly take life, hence the name "silent killer" (13). Complications of hypertension are a condition known as congestive heart failure (CHF) or heart failure is a mismatch in the function and structure of the heart along with the failure of the heart to distribute oxygen needed by the tissues for metabolism despite appropriate filling and increasing pressures. Heart failure occurs when the heart cannot pump enough blood and oxygen to other vital organs of the body, and an irregular heartbeat that can cause sudden death (14). Hypertension is also a major cause of stroke, both ischemic and hemorrhagic, because it increases peripheral blood pressure and disrupts the hemodynamic system, causing thickening of the blood vessels and heart muscle hypotrophy. Other risk factors for hypertension include smoking and a high-fat and high-salt diet, which can lead to atherosclerosis, which in turn can lead to stroke (15). In cases of uncontrolled hypertension, the kidneys can also develop nephrosclerosis, which in turn can lead to chronic kidney failure. In the early stages of hypertension, the kidneys appear normal, but over time, they can undergo diffuse cortical atrophy and fibrosis, causing a gradual decrease in size. This is due to progressive damage to the renal blood vessels (16). Uncontrolled hypertension can affect other parts of the body, including the eyes. Hypertension can cause blood vessels in the eye to rupture, resulting in blurred vision or blindness. Bleeding in the retina can cause blurred vision, and damage to the eye organs can be detected by examining the fundus of the eye to identify changes related to hypertension, such as hypertensive retinopathy, choroidopathy, optic neuropathy, and retinopathy. These are examples of target organ damage to the eye caused by hypertension (14). Therefore, a healthy lifestyle is necessary to lower blood pressure by limiting salt intake, not smoking, avoiding fatty foods, limiting caffeine, and getting regular rest. By adopting positive habits, hypertension can be gradually prevented. High rates of hypertension can be prevented by adopting a healthy lifestyle. Adopting a healthy lifestyle can lower high blood pressure, preventing or delaying the onset of hypertension (17).

Based on the data analysis of the respondents, the study found that the majority (45 respondents) had a poor lifestyle, while 30 respondents had a good lifestyle. An unhealthy lifestyle in the elderly can trigger hypertension, as can stress, which can reduce their health. Lack of sleep, minimal physical activity, and a diet that does not follow a daily diet can contribute to increased stress hormones, especially cortisol (18). Hypertension can be prevented by maintaining an ideal body weight, reducing

salt consumption, not smoking, exercising regularly, living a healthy lifestyle, reducing stress, and avoiding fatty foods. Hypertension is a disease that can affect people of all ages, especially the elderly, indicated by high systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg. Lifestyle is a pattern of life for each person expressed in daily activities, interests, and opinions in spending their money in the time they have. Lifestyle can also be formed through social interactions in everyday life. Lifestyle is a way that a person can live their life, which includes physical activity, interests, attitudes, consumption, and expectations. Lifestyle also drives a person's needs and attitudes and influences activities and product use. As a driver that can influence a person's decision-making process in purchasing a product, lifestyle can be grouped into several lifestyle classifications (19).

Based on the results of the study, 45 (60.0%) respondents had a bad lifestyle, 42 (93.33%) respondents had a bad lifestyle and 3 (6.7%) respondents did not experience complications. Respondents who had a good lifestyle were 30 (40.0%) respondents and 12 (40.0%) respondents experienced complications, 18 (60.0%) respondents did not experience complications, a total of 54 (72.0%) respondents had a good lifestyle and a bad lifestyle who experienced complications, and 21 (28.0%) respondents did not experience complications. The results of the analysis using the chi-square test obtained a value of 0.001 so that the research hypothesis (H1) was accepted because the p-value (0.001) < 0.05, which means there is a relationship between lifestyle and the incidence of hypertension complications in the elderly. Based on the results of the Symmetric Measures table, the Cramer's V and Phi coefficient values were obtained at 0.660. When adjusted to the correlation interval criteria, the value of 0.660 falls within the range of 0.60-0.79, indicating a strong relationship between the variables studied. The value indicates a significant < 0.001 (less than $\alpha = 0.05$). This demonstrates a strong and statistically significant relationship and is not a coincidence in the study sample.

The relationship between lifestyle and the incidence of hypertension complications can be influenced by: Increasing age increases the risk of high blood pressure. Both men and women are at equal risk of hypertension, especially the elderly. If hypertension is not promptly and properly managed, it increases the risk of serious complications. A person's lifestyle can influence their likelihood of developing hypertension. Individuals who adopt a healthy lifestyle through diligent and regular exercise can reduce fat accumulation in their bodies, which is a risk factor for hypertension. Lack of physical activity can result in restricted blood and oxygen flow, leading to increased blood pressure (20). Other research suggests a link between lifestyle and the incidence of hypertension in the elderly. A poor lifestyle in the elderly can trigger stress, which can reduce their quality of health. Lack of sleep, minimal physical activity, and a diet that doesn't follow a daily diet can contribute to increased levels of cortisol, especially cortisol. Hypertension can be prevented by maintaining a healthy weight, reducing salt intake, not smoking, exercising regularly, living a balanced lifestyle, reducing stress, avoiding fatty foods, and adopting a healthy lifestyle for at least 4-6 months, which has been shown to reduce the risk of cardiovascular problems (21).

Conclusions and Recommendations

There is a relationship between Lifestyle and the incidence of Hypertension Complications with a strength of relationship with a value of 0.660 in the range 0.60 – 0.79, there is a strong relationship between the variables studied. So the elderly are expected to always follow the correct lifestyle recommendations, and reduce consuming foods high in salt, reduce fatty foods, reduce smoking, get enough rest/sleep and do regular exercise. Health workers can provide health education about healthy lifestyles to prevent complications of hypertension in the elderly.

Ethical Consideration and Competing Interest

In conducting a research, researchers must obtain recommendations from institutions or other parties by submitting a research permit application to the Health Research Ethics Commission of the Ngudia Husada Madura Foundation, NHU University (UNHM) No: 3303/KEPK/UNIV-NHM/EC/IV/2026. There is no conflict of interest in the research process or publication of this article.

Acknowledgment

Thank you to the University of Gresik Institution and the Kebomas Gresik Community Health Center for assisting in this research process..

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