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The Relationship Between Lifestyle and Stress Levels in Patients with Hypertension

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ABSTRACT

Introduction: Hypertension is a major non-communicable disease and a leading global cause of morbidity and mortality, often occurring without symptoms while being closely associated with unhealthy lifestyles and psychological stress, making it important to examine these factors as determinants of hypertension incidence.
Objective: This study aims to analyze the relationship between lifestyle and stress levels with the incidence of hypertension among patients in the working area of the Gerunggang Health Center, Pangkalpinang City, in 2025.
Method: This research uses a quantitative method with a correlational design and a cross-sectional approach. The research population is all hypertension patients who visited the Pangkalpinang City Gerunggang Health Center for treatment in July 2025 as many as 260 people, with a sample of 80 respondents taken using the simple random sampling technique. Research instruments in the form of lifestyle questionnaires and DASS. Data analysis is done using chi-square test and Pearson correlation test.
Result: The research results show that the respondents who have a bad lifestyle as many as 60 (75.0%) and 20 (25.0%) have a good lifestyle, with a p-value of 0.031, the stres level obtained a pearson correlation p-value (0.005). Because p-value < α (0.05), it can be concluded that there is a significant relationship between lifestyle and stres level with the incidence of hypertension at the Gerunggang Health Center of Pangkalpinang City in 2025.
Conclusion: The conclusion shows that there is a significant relationship between lifestyle and stres levels with the incidence of hypertension. Poor lifestyle and high stres increase the risk of hypertension, so it is necessary to educate a healthy lifestyle, stres management and routine blood pressure checks for prevention.

Keywords: hypertension, lifestyle, stres level

Introduction

Hypertension, or more commonly known as high blood pressure, is often nicknamed "the silent killer" because it doesn't cause obvious symptoms in its early stages. Many sufferers are unaware of their high blood pressure until serious complications develop. Hypertension is characterized by an increase in systolic blood pressure of 140 mmHg or higher, or a diastolic blood pressure of 90 mmHg or higher (M. Sari et al., 2024).

Hypertension is not only a disorder of the circulatory system, but also a major risk factor for various degenerative diseases such as coronary heart disease, stroke, and chronic kidney failure. Furthermore, uncontrolled high blood pressure over the long term can cause blood vessel damage, impaired nerve function, and decreased function of other vital organs. The higher a person's blood pressure, the greater the likelihood of developing dangerous complications that can threaten quality of life and even lead to sudden death (Butet et al., 2024).

According to 2023 World Health Organization (WHO) data, hypertension is a leading cause of premature death worldwide; most people with hypertension do not experience any symptoms. Globally, an estimated 1.28 billion adults aged 30–79 years live with hypertension, and nearly two-thirds of these live in low- and middle-income countries. Interestingly, nearly half of those with hypertension (46%) are unaware they have the condition. In fact, of all sufferers, only about 42% have been diagnosed and received appropriate treatment. Approximately 1 in 5 adults (21%) with hypertension manages it. The prevalence of hypertension varies across regions and income groups. The African region has the highest prevalence of hypertension (27%), while the Americas region has the lowest (18%). One of the global targets for non-communicable diseases is to reduce the prevalence of hypertension by 33% between 2010 and 2030.

In Indonesia, the problem of hypertension is also increasing. According to a 2024 report from the Indonesian Ministry of Health, hypertension is the leading cause of death worldwide, with 90-95% of cases being caused by hypertension. Nationally, the 2018 Basic Health Research (Riskesdas) showed a population prevalence of 34.11%. The prevalence of hypertension in women was 36.85%, compared to 31.34% in men. According to the 2023 Indonesian Health Survey (SKI), the prevalence of hypertension was 22.2% (Ministry of Health, 2024).

According to data obtained from the Bangka Belitung Provincial Health Office, hypertension was among the 10 most prevalent disease categories from 2021 to 2024. Hypertension topped the list of diseases in the Bangka Belitung Islands Province from 2021 to 2024. Hypertension topped the list of diseases from 2021 to 2024. In 2021, the number of hypertension sufferers reached 125,767 people. In 2022, the number decreased to 86,601 people, and in 2023, the number of hypertension sufferers decreased again to 86,307 people. Meanwhile, the number of hypertension sufferers in 2024 experienced a significant decline to 23,536 people (Babel Health Office, 2024).

Researchers conducted a preliminary survey at the Gerunggang Community Health Center to assess the lifestyle and stress levels of hypertension patients. Interviews with healthcare workers and direct observations indicated that many patients had unhealthy lifestyles, including an unbalanced diet, lack of physical activity, high salt and fat consumption, and excessive smoking and coffee consumption. Furthermore, some patients were noncompliant with their medication schedules and blood pressure checks. Stress also appeared to play a role, with several patients reporting frequent anxiety, irritability, or personal burdens, which were suspected of exacerbating hypertension. This indicates a link

between unhealthy lifestyles and stress and the incidence of hypertension in the Gerunggang Community Health Center's work area. Therefore, further research is needed to examine the influence of these two factors as a basis for developing promotive and preventive programs.

Objective

This study aims to analyze the relationship between lifestyle and stress levels with the incidence of hypertension among patients in the working area of the Gerunggang Health Center, Pangkalpinang City, in 2025.

Method

This study employed a quantitative method with a correlational design and a cross-sectional approach. The quantitative method was selected because the study aimed to objectively measure the relationship between variables using numerical data analyzed statistically. A correlational design was used to determine whether there was a relationship between the independent variables, namely lifestyle and stress level, and the dependent variable, namely the incidence of hypertension. The cross-sectional approach means that all research variables were measured simultaneously at one point in time, so the relationships between variables were analyzed based on the respondents' conditions during the data collection period.

This study was conducted in the working area of Gerunggang Public Health Center, Pangkalpinang City, Bangka Belitung Islands Province. Data collection was carried out in July 2025. The population consisted of all hypertensive patients who visited Gerunggang Public Health Center during that month, totaling 260 individuals.

The sample consisted of 80 respondents selected using a simple random sampling technique. This technique provided equal opportunity for each member of the population to be selected as a respondent. The sampling process was conducted by obtaining a list of hypertensive patients from the health center, assigning a number to each patient, and randomly selecting participants until the required sample size was achieved. The inclusion criteria were patients diagnosed with hypertension by healthcare professionals, aged 18 years or older, able to communicate effectively, and willing to participate by signing informed consent. Patients with severe cognitive impairment or in emergency conditions were excluded from the study.

The independent variables in this study were lifestyle and stress level, while the dependent variable was the incidence of hypertension based on blood pressure classification. Data were collected using questionnaires and direct blood pressure measurements. Lifestyle was measured using a questionnaire covering dietary patterns, physical activity, smoking habits, salt and fat consumption, and adherence to routine blood pressure monitoring. The total score obtained was categorized into good lifestyle and poor lifestyle based on predetermined cut-off values. Stress level was measured using the stress subscale of the Depression Anxiety Stress Scale (DASS). The results were categorized into no stress, mild stress, moderate stress, and severe stress according to the DASS scoring guidelines.

Blood pressure was measured using a sphygmomanometer by healthcare personnel at the public health center. The results were classified into stage 1 hypertension (140/90–159/99 mmHg) and stage 2 hypertension (≥160/≥100 mmHg). The data collection procedure began with obtaining research permission from the educational institution and the public health center. After approval was granted, the researcher explained the purpose and procedures of the study to potential respondents. Those who agreed to participate were

asked to sign an informed consent form. Respondents then completed the lifestyle and stress questionnaires, followed by blood pressure measurement. The collected data were checked for completeness before statistical analysis was conducted.

Data analysis was performed using statistical software through univariate and bivariate analyses. Univariate analysis was used to describe the frequency distribution and percentages of each research variable. Bivariate analysis was conducted to examine the relationships between variables. The Chi-square test was used to analyze the relationship between lifestyle and the incidence of hypertension. In addition, the Prevalence Odds Ratio (POR) and 95% Confidence Interval (CI) were calculated to determine the magnitude of risk. The relationship between stress level and hypertension incidence was analyzed using the Pearson correlation test. A p-value of less than 0.05 was considered statistically significant. The correlation coefficient (r) indicated the strength of the relationship, while the coefficient of determination (r^2) showed the contribution of stress level to the incidence of hypertension.
This study adhered to research ethical principles, including confidentiality, voluntary participation, and the right of respondents to withdraw at any time without consequences. The ethical approval number and the name of the approving ethics committee should be stated according to the official approval from the health research ethics committee.

Result

Table 1. The Relationship between Lifestyle and Hypertension Incidence

Lifestyle	Hypertension Incidence				Total		*p-value*	POR (95%CI)
	Hypertension Stage 1		Hypertension Stage 2					
	n	%	n	%	n	%		
Good	8	40.0	12	60.0	20	100.0	0.031	0.286
Poor	42	70.0	18	30.0	60	100.0		
Total	50	62.5	30	37.5	80	100.0		

Table 1 shows that respondents with a poor lifestyle were more likely to experience stage 1 hypertension. (140/90–159/99 mmHg) in 42 people (70.0%) and stage 2 hypertension (≥160/≥100 mmHg) in 18 people (30.0%) compared to respondents with a healthy lifestyle. Based on the Chi-square test, the p-value (0.031) <α (0.05) was obtained, thus H0 was rejected. It can be concluded that there is a relationship between lifestyle and the incidence of hypertension at the Gerunggang Community Health Center in Pangkalpinang City. Further analysis obtained a POR value of 0.286 (95%CI= 0.10-0.82), indicating that respondents with a healthy lifestyle had a 0.286 times lower chance of experiencing hypertension than respondents with an unhealthy lifestyle.

Table 2. Relationship between Stress Levels and Hypertension Incidence

Stress Level	Hypertension Incidence				Total		*p-value*	*r*	*r^2 square*
	Hypertension Stage 1		Hypertension Stage 2						
	N	%	n	%	n	%			
Not Stressed	18	69.2	8	30.8	26	100	0.005	0.309	0.096
Mild Stressed	29	74.4	10	25.6	39	100			
Moderate Stressed	3	21.4	11	78.6	14	100			
Severe Stressed	0	0.0	1	100	1	100			
Total	50	62.5	30	37.5	80	100			

Table shows that respondents in the mild stress category experienced stage 1 hypertension (140/90–159/99 mmHg) more often, with 29 people (74.4%) compared to those in the no-stress, moderate-stress, and severe-stress categories. Meanwhile, respondents in the moderate stress category experienced stage 2 hypertension (≥160/≥100 mmHg) more often, with 11 people (78.6%) compared to those in the no-stress, mild-stress, and severe-stress categories.

The Pearson correlation test results showed a p-value (0.005) < α (0.05), indicating that stress levels were significantly associated with hypertension. The r-square value of 0.096 indicates that stress levels only explained 9.6% of the hypertension risk, with the remainder being influenced by other factors. The correlation coefficient value (r) of 0.309 shows that the closeness of the relationship between stress levels and the incidence of hypertension is classified as weak.

Discussion

Lifestyle is a daily behavior frequently practiced by an individual, becoming a habit (Yulandari & Saputra, 2022). According to the Big Indonesian Dictionary (KBBI), lifestyle is the daily behavioral patterns of a group of people in society. Lifestyle is a crucial factor influencing human life, particularly in those with hypertension (Aryzki et al., 2022). A healthy lifestyle, encompassing diet, mental well-being, exercise, and a supportive environment, can improve health (Angelita et al., 2025).

The study found that respondents with a poor lifestyle were more likely to experience stage 1 hypertension (140/90–159/99 mmHg), with 42 (70.0%) and stage 2 hypertension (≥160/≥100 mmHg), with 18 (30.0%) compared to respondents with a healthy lifestyle. Based on the Chi-square test, the p-value (0.031) < α (0.05) was obtained, thus rejecting H0. Therefore, it can be concluded that there is a relationship between lifestyle and hypertension incidence at the Gerunggang Community Health Center in Pangkalpinang City. Further analysis yielded a POR value of 0.286 (95% CI = 0.10-0.82), indicating that respondents with a good lifestyle were 0.286 times less likely to develop hypertension than respondents with a poor lifestyle.

According to the researchers, lifestyle plays a crucial role in the development of hypertension in the community. Unhealthy lifestyle patterns, such as lack of physical activity, an unbalanced diet, poor sleep quality, and smoking, can contribute to increased blood pressure. If these conditions persist over a long period, they can disrupt the balance of the

cardiovascular system, increase blood vessel resistance, and increase the workload of the heart, thus increasing the risk of hypertension. Therefore, changing to a healthier lifestyle is an important effort to reduce the risk of hypertension.

Stress is defined as fear and anxiety experienced by the body and one's emotions in response to changes in the environment. Physiologically, this causes the hypothalamus to release hormones that induce the adrenal glands to produce stress hormones, particularly cortisol. Sympathetic nervous system activity can also be induced by hypothalamic activators. Direct stimulation of the sympathetic nervous system causes blood vessels to constrict, increasing the workload of the heart and increasing blood pressure (Lingga, 2023).

The study found that respondents in the mild stress category experienced a higher rate of stage 1 hypertension (140/90–159/99 mmHg), with 29 individuals (74.4%) compared to those in the no-stress, moderate-stress, and severe-stress categories. Meanwhile, respondents in the moderate stress category experienced a higher rate of stage 2 hypertension (≥160/≥100 mmHg), with 11 individuals (78.6%) compared to those in the no-stress, mild-stress, and severe-stress categories. The Pearson correlation test yielded a p-value of 0.005 $<\alpha$ (0.05), indicating a significant relationship between stress levels and hypertension. These findings indicate that the higher the level of stress an individual experiences, the greater the likelihood of developing hypertension. The r2-square value of 0.096 indicates that stress levels only explain 9.6% of the influence on hypertension incidence, with the remainder being influenced by other factors. The correlation coefficient (r) of 0.309 indicates that the relationship between stress levels and hypertension incidence is relatively weak.

Stress is defined as fear and anxiety experienced by the body and feelings of a person in response to environmental changes. Physiologically, this causes the hypothalamus to release hormones that cause the adrenal glands to produce stress hormones, primarily cortisol. Sympathetic nervous system activity can also be induced by hypothalamic activators. Direct stimulation of the sympathetic nervous system causes blood vessels to constrict, increasing the workload of the heart and increasing blood pressure (Lingga, 2023).

The study revealed that respondents in the mild stress category were more likely to experience stage 1 hypertension (140/90–159/99 mmHg), at 29 individuals (74.4%), compared to those in the no-stress, moderate-stress, and severe-stress categories. Meanwhile, respondents with moderate stress category experienced more stage 2 hypertension (≥160/≥100 mmHg) namely 11 people (78.6%) compared to no stress, mild stress, and severe stress. The results of the Pearson correlation test obtained a p-value of 0.005 $<\alpha$ (0.05) indicating that stress level has a significant relationship with the incidence of hypertension. This finding indicates that the higher the level of stress experienced by an individual, the greater the tendency to develop hypertension.

Conclusion

There is a significant relationship between lifestyle and stress levels and the incidence of hypertension among patients at the Gerunggang Community Health Center, Pangkalpinang City, in 2025.

Conflict of Interest

No declare.

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Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper. This research was conducted independently without any financial, commercial, or personal relationships that could be construed as a potential conflict of interest. All processes, including study design, data collection, analysis, and manuscript preparation, were carried out objectively and without external influence.

Ethical consideration

Not applicable.

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