Factors Influencing Hypertension Incidence in Bangun Sari Village: A Cross-Sectional Study

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ABSTRACT

Hypertension is theoretically influenced by several risk factors. The first risk factors are those that cannot be changed such as age, gender, and genetics. Modifiable risk factors include education,knowledge, behavior, and attitude. This study aims to identify factors that contribute to hypertension in Bangun Sari Village, Datuk Tanah Datar Sub-district. This study used a quantitative approach with a cross-sectional analytic design. The study population consisted of all residents of Bangun Sari Village, with a total population of 4,099 people and 1,148 households. The sample was taken using a purposive sampling technique, with the Lameshow formula, resulting in 94 respondents. Data were collected through observation sheets. The results showed a statistically significant relationship between age, knowledge, behavior, attitude, and occupation with the incidence of hypertension (with a p-value of 0.001 for all variables except education). There was a statistically significant association between employment status and the incidence of hypertension (p-value = 0.002). However, no significant association was found between educationlevel and the incidence of hypertension (p-value = 0.501). Therefore, there is a statistically significant relationship between age, knowledge, behavior, attitude, and occupation with the incidence of hypertension, but there is no significant relationship between education level with the incidence of hypertension in Bangun Sari Village.

Keywords: age, attitude, behavior, hypertension, knowledge

INTRODUCTION

Hypertension, or high blood pressure, is a global health problem that is a leading cause of morbidity and mortality. This condition is characterized by a persistent increase in blood pressure, where systolic pressure reaches ≥140 mmHg and/or diastolic pressure ≥90 mmHg. Hypertension is known as the silent killer because it often does not show obvious symptoms until serious complications occur, such as cardiovascular disease, stroke, kidney failure, and other organ damage (Hafni et al., 2021).

Epidemiologically, the prevalence of hypertension continues to increase, especially in developing countries, including Indonesia. Based on data from the Indonesian Ministry of Health, the prevalence of hypertension in Indonesia shows an increasing trend, influenced by changes in lifestyle, unhealthy diet, lack of physical activity, obesity, stress, and consumption of alcohol and cigarettes (Fitriani, 2012).

Risk factors for hypertension include immutable factors, such as age, gender, and family history, and modifiable factors, such as a high-salt, low-fiber diet and lack of exercise. Efforts to prevent and control hypertension are prioritized in the health system to reduce the incidence of complications related to this disease (Nugroho et al., 2019).

Hypertension cannot be explained by its mechanism alone, as it is a manifestation of multifactorial hemodynamic imbalance in the cardiovascular system. According to Kaplan, hypertension is closely related to genetic, environmental, and central hemodynamic regulation factors. Simply put, hypertension is an interaction between cardiac output (CO) and total peripheral resistance (TPR). Hypertension or high blood pressure is a disease in which a person experiences an increase in blood pressure above normal values indicated by systolic and diastolic values when blood pressure is measured with a sphygmomanometer. Increased blood pressure can cause various complications such as stroke, kidney failure, and right ventricular hypertrophy (Rahmadhani, 2021).

According to the World Health Organization (WHO), hypertension and its complications can kill 9.4 million people annually, and this figure is expected to increase by 1.5 billion people, or about 29% of the world's population, by 2025. Recent data on the prevalence of hypertension in Indonesia shows that by 2023, the prevalence rate will be 30.8%, down from 34.1% in 2018. However, figures for 2024 have not been specifically released. In North Sumatra Province, 32,944 people (29.19%) suffer from hypertension. The prevalence of hypertension in Batubara Regency reached 25.06% (Kementerian Kesehatan RI, 2019).

Bangun Sari Village is one of the villages located in Datuk Tanah Datar District, Batu Bara Regency. The total population of Bangun Sari Village is 4,099 people with 1,148 family cards. Based on data on the incidence of hypertension at the Petatal Health Center, there were 278 cases of hypertension in Bangun Sari village in 2024 (Puskesmas Petatal, 2024).

Research conducted Dewati et al., (2023) found that age over 60 years, unhealthy diet, and low physical activity play a significant role in increasing the risk of hypertension. Regular physical activity for at least 30 minutes per day can help reduce this risk. This study provides important insights for designing public health interventions, such as physical activity promotion, nutrition education, and stress management, to reduce the prevalence of hypertension in Indonesia.

In theory, high blood pressure is caused by several risk factors. The first set of risk factors are those that cannot be changed or modified. These factors include gender, age, and genetics. Modifiable risk factors include education, knowledge, behavior, and attitude. Based on this

background, this study aims to determine the factors that influence the occurrence of hypertension in Bangun Sari Village, Datuk Tanah Datar District.

METHODS

This research is a quantitative study using a cross-sectional design analytic approach that looks at comparisons between variables where data concerning respondents is taken at the same time but the dependent variable and the independent variable are only assessed once. The target population of this research is Bangun Sari Village, Datuk Tanah Datar District, totaling 4,099 people with a total of 1,148 families. Sampling using the Lameshow formula obtained 94 samples with the sampling technique using purposive sampling. This research instrument uses a questionnaire in which the questionnaire used has been tested for validity which has been used in previous studies related to the criteria of this study.

Data collection techniques by asking questions online through interviews, as for the questions given in the form of questions related to what factors affect the incidence of hypertension. Data analysis uses univariate analysis to determine frequency and bivariate to determine the relationship between factors that influence the incidence of hypertension. The data analysis technique uses the chi-square test, which is used because it is able to analyze relationships or differences between categorical variables by testing the suitability of the distribution of observed data to the expected distribution, and determining the independence between variables, without requiring the assumption of normal distribution, making it suitable for nonparametric data in various fields of research. The significance limit (confidence level) of 95% or 0.05 is used to signify the results of statistical calculations. If the P-value is <0.05, it means that there is a significant relationship (ho is rejected), while if the P-value is >0.05, it means that there is no significant relationship (ho is not rejected).

RESULTS

This study examines the indicators of respondent characteristics, level of knowledge, behavior, and attitude. The research methodology employed combines univariate analysis to describe the characteristics of respondents, their knowledge level, behavior, and attitude. Subsequently, bivariate analysis is used to investigate the relationships between age, education level, knowledge, behavior, attitude, occupation, and occupational variables with the incidence of hypertension in Bangun Sari village.

Table 1. Characteristics of Respondents

Characteristics	Frequency (f)	Percentage (%)
Age		
30 - 40 year	64	68.1
40 - 50 year	30	34.9
Gender		
Male	49	52.1
Women	45	47.9
Jobs		
Working	31	33.0
Not working	63	67.0
Education		
Not In School	33	35.1
Primary School	23	24.5
Junior Secondary School	20	21.3
Upper Secondary School	15	16.0
Bachelor's Degree	3	3.2

Based on data on the characteristics of respondents based on age, most of the respondents were aged 30-40 years with a total of 64 people (68.1%) and above 40 years as many as 30 people (34.9%). Based on gender, most of the respondents were male with a total of 49 people (52.1%) and 45 people (47.9%) were female. Based on occupation, 31 people (33.0%) worked and 63 people (67.0%) did not work. Based on the level of education, respondents who have no school education are 33 people (35.1%), elementary school as many as 23 people (24.5%), junior high school as many as 20 people (21.3%), upper secondary school as many as 15 people (16.0%) and Bachelor degree equivalent as many as 3 people (3.2%).

Table 2. Frequency Distribution of Respondents According to The Incidence of Hypertension, Level of Knowledge, Behavior and Attitudes

Variabel	Frequency (f)	Percentage (%)
Incidence of Hypertension		
Suffered	38	40.4
Not Suffering	56	59.6
Knowledge Level		
Good	41	43.0
Less Good	53	56.4
Behavior		
Good	38	40.4
Less Good	56	59.6
Attitude		
Good	51	54.3
Not Good	43	45.7

Based on univariate data, it was found that in the variable of hypertension incidence, respondentswho suffered from hypertension were 38 people (40.4%) and did not suffer from

hypertension as many as 56 people (56.4%). Based on the variable level of knowledge, respondents who have a good level of knowledge are 41 people (43.0%) and less good as many as 53 people (56.4%). Based on behaviour variables, 38 people (40.4%) have good behaviour and 56 people (59.6%) arenot good. Based on attitude variables, 51 people (54.3%) had good attitudes and 43 people (45.7%) had poor attitudes.

Table 3. Distribution of The Relationship Between Levels of Knowledge, Behavior and Attitudes Towards The Incidence of Hypertension

Variabel/ Subvariabel	Incidence of Hypertensi						P-Value
	Hypertension		Not Hypertension		Total		
	f	%	f	%	N	%	
Age							
30-40 Year	18	47.4	46	82.1	64	100	0.001
>30 Year	20	52.6	10	17.9	30	100	
Knowledge Level							
Good	7	18.4	34	60.7	41	100	0.001
Less Good	31	81.6	22	39.3	53	100	
Behaviour							
Good	1	2.6	37	66.1	38	100	0.001
Less Good	37	97.4	19	33.9	56	100	
Attitude							
Good	9	76.3	42	25.0	51	100	0.001
Less Good	29	23.7	14	75.0	43	100	
Education Level							
Not in School Primary	12	31.6	21	37.5	33	100	0.501
School Junior High	10	26.3	13	23.3	23	100	
School	11	28.9	9	16.1	20	100	
Senior High School	4	10.5	11	19.6	15	100	
Bachelor's Degree	1	2.6	2	3.6	3	100	
Jobs							
Working	20	52.6	11	19.6	31	100	0.002
Not Working	18	47.4	45	80.4	63	100	

The table analysis shows the association between the incidence of hypertension and seven differentvariables, namely age, level of knowledge, behaviour, attitude, level of education and occupation.The table provides an overview of the number of respondents who experience Hypertension withthe number of respondents who do not experience Hypertension, depending on whether they havea good level of knowledge, behaviour, attitude, education level, and occupation.

Analysis on the age variable shows that out of a total of 64 respondents who have the age of 30- 40 years, 18 of them have hypertension (47.4%), while out of 30 respondents who have the age above 40 years, 20 of them have hypertension (52.6%). The p-value is 0.001, indicating

that there is a statistically significant relationship between age and the incidence of hypertension.

Analysis on different knowledge level variables showed that out of 41 respondents who had a goodlevel of knowledge, 7 people (18.4%) suffered from hypertension. While 31 out of 53 respondents(81.6%) had low knowledge. The p-value was 0.001, indicating a statistically significant relationship between knowledge level and prevalence of hypertension.

Analysis on behavioral variables showed that out of a total of 38 respondents who had good behavior, 1 person (2.6%) suffered from hypertension. In contrast, 37 (97.4%) of the total 56 respondents who had poor behavior had hypertension. The p-value was 0.001, indicating a statistically significant association between behavior and the incidence of hypertension.

Analysis on the attitude variable showed that out of 51 respondents who had a good attitude, 9 people (76.3%) suffered from hypertension. While 29 (23.7%) out of a total of 43 respondents who had poor behaviour had hypertension. The p-value of 0.001 indicates a statistically significant relationship between attitude and the occurrence of hypertension.

Analysis on the education level variable showed that 12 (31.6%) out of 33 respondents with no education level suffered from hypertension. Of the total 23 respondents with primary education (SD), 10 (26.3%) suffered from hypertension. Of the 20 respondents with secondary education, 11(28.9%) had hypertension. Out of a total of 15 respondents with high school education, 4 people (10.5%) had hypertension. Out of a total of 3 respondents who had a bachelor's degree or equivalent, 1 person (2.6%) had hypertension. The p-value was 0.501, indicating that there was no statistically significant relationship between education level and the incidence of hypertension.

Analysis on the occupational variable showed that out of a total of 31 respondents who worked, 20 of them had hypertension (52.6%). While out of a total of 63 respondents who did not work, 18of them had hypertension (47.4%). The p-value is 0.002, indicating that there is a statistically significant relationship between employment status and the incidence of hypertension.

DISCUSSION

Relationship between Age and Hypertension

Relationship between age and the development of hypertension as age increases, blood pressure also increases. After the age of 40, natural degenerative processes occur more frequently with age,causing the artery walls to thicken due to the accumulation of collagen substances in the

muscle layer, so that the blood vessels narrow and harden Podungge, (2020). When viewed from the age variable, out of a total of 64 respondents aged 30-40 years, there were 18 people (47.4%) who suffered from hypertension, while 20 out of 30 respondents aged 40 years and over suffered from hypertension. Hypertension blood pressure (52.6%). The incidence of hypertension in the 30s, and 40s age groups was lower in respondents aged over 40 years.

which means there is a statistically significant relationship between age and the incidence of hypertension. This shows that respondents who have an age below 40 years, tend to have a lower risk of developing hypertension compared to respondents who have an age above 40 years.

In line with research conducted by Nurhayati, et al. (2023) showed a significant relationship between age and the incidence of hypertension , where hypertension is more common in older age groups than young adults. This study underscores the importance of early detection and management of hypertension in the elderly through regular check-ups and lifestyle interventions.

Relationship between Knowledge Level and Hypertension Incidence

Education is an activity or learning process that aims to develop or improve certain skills, so that educational goals can be independent. Your level of education also determines how easy it is. Whether a person absorbs and understands the knowledge. The advantage is generally higher. The better the education of a person, the better his knowledge. The higher your educational background, the easier it is to acquire information. With higher education, one tends to receive information not only from mass media, but also from other people. The more information you receive, the more knowledge you have about your health. Knowledge is closely related to the education expected of a person. Higher education means a person's knowledge is broader (Suaib et al., 2019).

Analysis of different knowledge levels showed that who had a sufficient level of knowledge, (18.4%) suffered from hypertension (81.6%) had low knowledge. The incidence of hypertension was much lower among respondentswith sufficient knowledge than among those with poor knowledge. Relationship between the level of knowledge and the incidence of hypertension. This shows that respondents with sufficient knowledge are less likely to suffer from high blood pressurethan those with less knowledge.

This is in line with research conducted by Suaib et al. (2019), there is a relationship between knowledge and the incidence of hypertension in the elderly. This is because elderly people with

a good level of knowledge are more likely to adopt a healthy lifestyle, such as a low-salt diet and regular exercise, which has an impact on controlling blood pressure.

Education that focuses on the prevention and management of hypertension, such as diet control, physical activity and stress management, has been shown to be effective in reducing the prevalence of hypertension in various age groups. This approach not only increases public awareness about risk factors, but also encourages healthy living behaviors to reduce the risk of hypertension-related complications (Dinita & Maliya, 2024).

Relationship between Behaviour and Hypertension

Although hypertension is a non-communicable disease, its development is one of the causes of death. The causes of high blood pressure are related to healthy lifestyles such as stress, obesity, lack of exercise, smoking, alcohol, and eating high-fat foods. Risk factors for hypertension also exist, namely age, family or genetic history of hypertension, gender, and lack of fruit and vegetable intake (Setiandari, 2022).

Analysis of behavioral variables showed that out who behaved well,(2.6%) suffered from hypertension. In contrast, 37 (97.4%) of the total 56 respondents who cheated had high blood pressure. The incidence of hypertension in respondents who behavedwell was much lower than that of respondents who behaved badly. Which indicates that there is a statistically significant relationship between behavior and the incidence of hypertension. This suggests that respondents who behave well tend to have a lower risk of developing hypertension than respondents who behave badly**.**

In line with research conducted by Putra and Susilawati (2022), which showed a systematic review in Indonesia highlighted that a combination of unhealthy lifestyles, such as an unbalanced diet, lack of exercise, alcohol consumption, and smoking, has a strong association with the prevalence of hypertension, especially in the productive to elderly age group. This study suggests that behavioral changes towards a healthy lifestyle, such as quitting smoking, managing stress, and increasing physical activity, can help prevent or reduce the risk of hypertension.

Relationship between Attitude and Hypertension

Knowledge, beliefs, beliefs, values, and habits are predisposing factors that influence a person's perspective. External and internal aspects influence the behavior of hypertensive patients. External aspects include the impact of learning and health, the relationship between patients and health professionals, and social and family support. Internal aspects include age,

background, behavior and emotions due to the disease experienced, and the nature of the sufferer. Hypertensive patients' knowledge and behavior regarding blood pressure control influence theirviews. Attitude is a collection of comments, beliefs, and relatively unchanging states that can affecta person's behavior. If a person acts well towards something, then his knowledge of the object isalso good (Darmayanti Widya, 2022).

Analysis of attitude variables showed that who had a good attitude (76.3%) suffered from hypertension. While 23.7% of the total 43 respondents who cheated had high blood pressure. The incidence of hypertension was significantly lower among respondents who had a good attitude compared to respondents who had a bad attitude. Which indicates that there is a statistically significant relationship between attitude and the incidence of hypertension. This shows that respondents with good posture tend to have a lower risk of developing hypertension compared torespondents who do not have good posture.

In line with research conducted by Wibowo et al. (2023) it shows that attitude has a significant relationship with the incidence of hypertension. Most respon dents with a positive attitude tend to have normal blood pressure compared to those with a negative attitude. Public attitudes towards the prevention of hypertension are considered important in preventing this condition.

The study confirmed that positive attitude change towards the prevention and management of hypertension is an effective strategic step in reducing the prevalence of hypertension. Attitudes that support the adoption of healthy lifestyles, such as medication adherence, dietary control, and physical activity, play an important role in preventing the incidence of hypertension and reducing the risk of complications. This effort is also an integral part of public health education programs oriented towards health promotion and disease prevention.

The Relationship between Education Level and Hypertension Incidence.

Analysis of education level variables showed that out of 33 respondents who had no education level, (31.6%) suffered from hypertension. The total 23 respondents who had Primary Education, and suffered from hypertension (26.3%). Of the 20 respondents with secondary education, and suffered from hypertension (28.9%). The total 15 respondents with tertiary education, and suffered from hypertension (10.5%). Answers from 3 total respondents with S1 or equivalent education level, 1 of them suffered from hypertension (2.6%). The incidence of hypertension was higher among respondents who did not go to school or had primary school education compared to respondents who had university or undergraduate education.

Indicating that there was no statistically significant relationship between education level and

the incidence of hypertension. This suggest is respondents with higher education are less likely to suffer from hypertension. Even without a statistical association, personal knowledge influences awareness of actions to prevent hypertension. In other words, the more you know about the causes, triggers, signs and symptoms,as well as normal and abnormal high blood pressure, the more likely you are to avoid potential triggers of high blood pressure, such as smoking, drinking coffee, obesity. People with a low levelof education have a higher risk of developing hypertension because they do not have information about health and it is difficult or difficult to accept information (advice) given by the authorities. affect healthy behaviour/lifestyle (Taiso et al., 2021).

Previous studies have shown that there is not always a significant relationship between education level and the incidence of hypertension. For example, some studies found that although there is a presumption that lower education levels are associated with an increased risk of hypertension, the results are not always consistent. Other factors such as lifestyle, environment and genetic predisposition often play a role. Some studies have even suggested that in some cases, education level does not significantly affect a person's risk of developing hypertension, demonstrating the complexity of the relationship between education and cardiovascular health.

Occupational Associations with Hypertension

Analysis of occupational respondents who worked (52.6%) suffered from hypertension. Of the total 63 respondents who were not employed (47.4%) of them suffered from hypertension., indicating a statistically significant relationship between employment status and the incidence of hypertension. The incidence of hypertension was higher among respondents who were employed than those who were unemployed.

The p-value was 0.002, indicating a statistically significant relationship between employment status and the incidence of hypertension. Light physical activity can lead to overnutrition and obesity. Physical activity increases energy expenditure, and being overweight also increases heartrate and insulin levels in the blood. This study found that occupation was associated with the development of hypertension, as many respondents were not working. People who do not do that. If you work, you may experience high blood pressure due to lack of exercise or light exercise. Thisresearch is in line with the research findings (Maulidina et al., 2019).

In line with research conducted by Kholifah et al., (2020) showed that among various types of occupations, housewives were the most likely to suffer from hypertension, followed by self-

employed workers and fishermen farmers. This study indicated a significant relationship between occupational status and the prevalence of hypertension, where workload and associated stress can affect cardiovascular health.

Another study focusing on teaching staff found that those who worked more than 6 hours per day had a higher tendency to develop hypertension. This was attributed to the work stress and mental load acquired due to daily tasks. Excessive workload and long working hours can increase blood pressure, potentially leading to hypertension in the long run. These studies emphasize the importance of understanding the impact of work on health, as well as the need for workload and stress management strategies to prevent hypertension across different occupational groups.

CONCLUSION

This study showed that there was a statistically significant association between age, knowledge, behaviour, attitude, and occupation with the incidence of hypertension with a p-value of 0.001 < 0.05 however, no statistically significant association was found between education level and the incidence of hypertension, indicated by a p-value of. Therefore, factors such as age, knowledge, behaviour, attitude, and occupation have an influence on hypertension, while education level does not show a significant relationship with the incidence of hypertension.
It is hoped that health workers can be more active in providing education to the community on how to control and prevent hypertension. In addition, the community needs to further increase their awareness and understanding of the importance of maintaining blood pressure as well as various methods to control hypertension**.**

LIMITATION

The present study's sample selection is limited to respondents residing in Bangun Sari village, which restricts the generalizability of the findings to a broader population. Specifically, the study's sample may not be representative of individuals with hypertension who are not residents of Bangun Sari village, thereby limiting the scope of the conclusions that can be drawn. This sampling limitation may result in the findings being specific to the context of Bangun Sari village, and caution is advised when attempting to generalize the results to other populations or settings.

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