


Influence Of Genetic Factors, Physical Activity, Dietsmoking Habits And Stress Levels On The Incident Of Hypertension In People Of Productive Age In Seruyan Hilir Timur District, Seruyan Regency

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Article Info	ABSTRACT
<p>Keywords: Physical Activity, genetic, Hypertension, Smoke, Dietary habit, Stress.</p>	<p>Data on deaths due to hypertension in Seruyan Regency in the 2023 period was recorded at 13 people, while services for hypertension sufferers in Seruyan Regency were 16,098 people with a percentage of 32.2% of 49,930 people, while services for hypertension sufferers in Seruyan Hilir Timur District were 2,838 people (64 .9%) from 4,370 people. Then health services in the productive age of Seruyan Hilir Timur District for all diseases amounted to 5,269 people with a percentage of 82.5% of 6,385 people. This study aims to determine the influence of genetic factors, physical activity, diet, smoking habits and stress levels on the incidence of hypertension. This research uses a quantitative approach with a cross sectional method. The sample for the study was taken from 10% of the population, namely 107 people from the people of Seruyan Hilir Timur District, Seruyan Regency using a systematic random sampling technique. The results of the research show that there is an influence between genetic factors and smoking habits, while physical activity, diet and stress levels have no effect on the incidence of hypertension in people of productive age in Seruyan Hilir Timur District, Seruyan Regency, with the most dominant factor being the genetic factor (Exp value (B) or Odds Ratio (OR)=10.474). The Kuala Pembuang II Community Health Center, Seruyan Hilir Timur District, Seruyan Regency is expected to be able to pay more attention and provide education to people of productive age with genetic factors and smoking habits as an effort to prevent early or reduce the risk of complications, and the Seruyan District Health Service is expected to make policies and be able to collaborate with Puskesmas Puskesmas to create classes for people of productive age with a monthly meeting program so they can monitor blood pressure and provide education in keeping their blood pressure stable at every Posyandu activity carried out every month.</p>
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INTRODUCTION

The increasing prevalence of hypertension as a non-communicable disease that can cause death is a current global health challenge throughout the world. Worldwide, hypertension is

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responsible for 9.4 million deaths caused by heart disease and stroke, which is responsible for 51% of deaths. In Indonesia, hypertension causes 427,218 deaths, or 5% of total deaths.(1).

In 2018, Riskesdas recorded 34.1% of hypertension cases in Indonesia, an increase of 8.3% from 2013 to 2018, and most cases have not been detected.(1)WHO estimates that by 2025, around 1.5 billion people worldwide will suffer from hypertension.(2)It is very important to prevent and treat hypertension that occurs in society. This is because hypertension can cause stroke and result in death.(3)

Based on the data, it is known that there is a potential increase in the incidence of hypertension in people of productive age, which is in line with the increased risk of complications from heart disease and kidney failure in the future.(4)In 2018, the prevalence of hypertension was 13.22% in those aged 18-24 years, 20.13% in those aged 25-34 years, and 31.61% in those aged 35-44 years.(5)Factors that cannot be changed in this disease, such as genes, age, and gender; changeable factors such as exercise patterns; diet (fat, sodium, and junk food); and the occurrence of hypertension in males.(6)

Hypertension occurs more often in adults than in older people. Not carrying out prevention and treatment early can become a serious health problem that can interfere with daily activities and cause dangerous complications.(7)There is a relationship between theory and previous research on the causes of hypertension in productive age. Hypertension is often passed down from family to generation, genetics is important in the pathogenesis of hypertension. In addition, the risk factor that cannot be controlled or changed for hypertension is heredity.(8)Genetic factors are potential and unchangeable factors in the occurrence of hypertension because they are inherited from the genes of parents who previously suffered from hypertension.(9)

Studies on parents have found genetic factors that influence the incidence of hypertension.(10)Hypertension results in suppression of the function of the sympathetic nervous system so that blood pressure decreases and to reduce the risk of hypertension you need to do physical activity.(11)Physical activity or exercise is a risk factor for hypertension that can be controlled or changed.(8)Hypertension is a multifactorial disease that results in a person's lack of physical activity.(4)

This study investigated the impact of physical activity on the stability of blood pressure in elderly people suffering from hypertension at UPT Puskesmas Bahagia, which found that physical activity influenced the prevalence of hypertension.(12).(13)Smoking behavior can cause hypertension, but we can still change our behavior to avoid hypertension.(8)(4)Then the results of research entitled the influence of smoking habits on the incidence of hypertension in their research found that there was an influence of smoking habits on the incidence of hypertension.(14)

A person's diet that is high in fat, low in fiber and sodium intake and a large amount of salt intake has an impact on increasing blood pressure.(15)Hypertension is a multifactorial disease that involves a person's diet.(4)Irregular eating patterns and consuming various types of food without paying attention to good nutritional substances can cause an increase

in high blood pressure.(16)Apart from that, research has found that diet is a factor that influences increased blood pressure.(17)

Stress experienced by a person can increase heart rate and increase the sympathetic nervous system, which can increase blood pressure. Hypertension is a multifactorial disease that involves a person's stress level.(4)A person's stress causes their blood pressure to increase.(18)Then the results of research entitled The Effect of Psychosocial Stress on the Incident of Hypertension in Rural and Urban Communities, which in the research found that psychosocial stress increases the risk of hypertension.(19). In Indonesia, people aged 18 years and over have hypertension, amounting to 25.8%. Bangka Belitung Province has the highest prevalence of hypertension, at 30.9 percent, and Papua the lowest, at 16.8 percent. The provinces of South Kalimantan, East Kalimantan and West Java have the highest rates of hypertension in the entire country.(20)

Data shows that in 2021, there will be 10,567 cases of hypertension in the population aged 25-60 years, with an increase of 1,124 new cases per year.(20)Data on deaths due to hypertension in Seruyan Regency in the 2023 period were recorded at 13 people, while services for hypertension sufferers in Seruyan Regency were 16,098 people with a percentage of 32.2% of 49,930 people, while services for hypertension sufferers in Seruyan Hilir Timur District were 2,838 people (64.9%) of 4,370 people. Then health services in the productive age of Seruyan Hilir Timur District for all diseases amounted to 5,269 people with a percentage of 82.5% of 6,385 people(21).

This shows that the service for hypertension sufferers in health services at productive age in Seruyan Hilir Timur District has not yet reached 100%. Based on data from the Seruyan District Health Service in 2023, it shows that hypertension is one of the first highest cases of the disease in Seruyan Hilir Timur District, Seruyan Regency at 4,370, this is because 66% of people smoke, 79% have poor eating patterns, 52% lack of physical activity and The level of stress experienced by the community is 61%, so this has an impact on the high number of hypertension cases that occur in the community in Seruyan Hilir Timur District.(21)This high number of cases of hypertension, if not treated immediately, can of course result in death and will increase cases of death in productive age due to hypertension in Seruyan Hilir Timur District.

A preliminary study on 10 people of productive age in Seruyan Hilir Timur District revealed that 7 of them had a genetic history of hypertension from their parents and 3 people had no history of hypertension. Based on physical activities such as sports activities and morning walks, it is known that only 6 people have regular activity habits by doing gymnastics and jogging 3 times a week and 4 other people do not do regular physical activity because they are busy working at the office. Then regarding eating patterns such as regular consumption of food ingredients, 8 people do not have a regular eating pattern because they do not pay attention to the 3 J's, namely: Irregular eating schedules, and the amount of food or portions of food consumed at each meal as well as the right type of food ingredients and 2 people have regular eating patterns. Then for smoking habits, 9 people said they smoked cigarettes every day, especially after eating, and 1 person did not smoke

cigarettes and when stressed, such as loss of appetite and digestive disorders, 6 people experienced stress and 4 people did not experience stress.

The research aims to determine the influence of genetic factors, physical activity, diet, smoking habits and stress levels on the incidence of hypertension and determine the most dominant factors influencing hypertension as well as produce recommendations for input in order to increase efforts to reduce the incidence of hypertension in people of productive age, Seruyan Hilir Timur District. In 2023. This research found the incidence of hypertension in the productive age population in Seruyan Hilir Timur District and provided recommendations.

METHOD

This study uses a quantitative approach cross-sectional method. The population of all people of productive age (age range 20-59 years) who visited the Kuala Pembuang II Health Center in September-November 2023 was 1,597 people. The sample in the study was taken as much as 10% of the population. (8) In this study, 20% of the sample was taken, resulting in a sample of 107 people. Samples were taken by making direct visits to the community using systematic random sampling techniques with intervals of 5. Interval 5 was obtained from the total population divided by the sample. So the researchers determined respondents at intervals of 5, based on data on the number of patient visits to the Kuala Pembuang II Health Center. The data collection method is through primary data by distributing questionnaires to public productive age. Research analysis was carried out using univariate analysis, bivariate analysis and multivariate analysis using the SPSS 24.00 application.

RESULTS

Univariate Analysis

The relationship between genetic factors, physical activity, eating patterns, smoking habits and stress levels as well as the incidence of hypertension in people of productive age in Seruyan Hilir Timur District, Seruyan Regency in 2023, is as follows:

Table 1 Genetic Factors, Physical Activity, Diet, Smoking Habits and Stress Levels and the Occurrence of Hypertension

Variable	Frequency (F)	Percentage (100%)
Hypertension		
- High blood pressure	68Person	63.6%
- Low blood pressure	39Person	36.4%
Genetic Factors		
- There's Genetics	55Person	51.4%
- No Genetics	52Person	48.6%
Smoking Habit		
- Smoke	31Person	29.0%
- Do not smoke	76Person	71.0%
Physical Activity		

Variable	Frequency (F)	Percentage (100%)
- Not a routine	61Person	57.0%
- Routine	46Person	43.0%
Dietary habit		
- Irregular	55Person	51.4%
- Regular	52Person	48.6%
Stress Level		
- Light	29Person	27.1%
- Normal	78Person	72.9%
Total	107Person	100.0%

Source: Research results, processed, 2024

Table 1 shows that there were 107 respondents 63.6% experiencing high blood pressure, as much as 51.4% have genetic factors, as many as 29.0% have a smoking habit, as much as 57.0% engage in irregular physical activity, as much as 51.4% have irregular eating patterns, and as many as 27.1% experienced mild levels of stress.

Bivariate Analysis

Bivariate analysis for looking at the influence of genetic factors, physical activity, diet, smoking habits and stress levels on the incidence of hypertension in people of productive age in Seruyan Hilir Timur District, Seruyan Regency in 2023, as follows:

Table 2 The Influence of Genetic Factors, Physical Activity, Diet, Smoking Habits and Stress Levels on the Incident of Hypertension

Genetic	Hypertension				Total	χ^2	P
	High blood pressure		Low blood pressure				
	F	%	F	%			
There's Genetics	48	70.6%	7	17.9%	55	51.4%	25,4260,000
No Genetics	20	29.4%	32	82.1%	52	48.6%	
Smoking habit	F	%	F	%	F	%	
Smoke	25	36.8%	6	15.4%	31	29.0%	4,516 0.034
Do not smoke	43	63.2%	33	84.6%	76	71.0%	
Physical Activity	F	%	F	%	F	%	
Not a routine	40	58.8%	21	53.8%	61	57.0%	,089 0.766
Routine	28	41.2%	18	46.2%	46	43.0%	
Dietary habit	F	%	F	%	F	%	
Irregular	39	57.4%	16	41.0%	55	51.4%	2,032 0.154
Regular	29	42.6%	23	59.0%	52	48.6%	
Stress Level	F	%	F	%	F	%	
Light	18	26.5%	11	28.2%	29	27.1%	,000 1,000
Normal	50	73.5%	28	71.8%	78	72.9%	
Total	68	100.0%	39	100.0%	107	100.0%	

Source: Research results, processed, 2024

Table 2 shows that there is a significant influence between genetic factors and smoking habits and the incidence of hypertension because the P values obtained are 0.000 and $0.034 \leq 0.05$. Meanwhile, physical activity, diet and stress levels had no effect on the incidence of hypertension because the P values obtained were 0.766, 0.154 and $1.000 > 0.05$.

Multivariate Analysis

The results of the multivariate analysis of the factors that have the most dominant influence on the incidence of hypertension are as follows:

Table 3 The Most Dominant Factors Influencing the Incident of Hypertension

Variable	Exp(B)	95% CI for EXP(B)	
		Lower	Upper
Genetic	10,474	3,865	28,383
Smoking habit	2,343	,719	7,631
Physical Activity	1,312	,503	3,417
Dietary habit	1,852	,693	4,948
Stress Level	,989	,333	2,932

Source: Research results, processed, 2024

Table 3 shows that the most dominant factor influencing hypertension is genetic factors because an Exp (B) value or also called an Odds Ratio (OR) is obtained.10,474 which is the highest compared to the Exp (B) value for physical activity, diet, smoking habits and stress levels.

Discussion

The Influence of Genetic Factors on Hypertension in People of Productive Age in Seruyan Hilir Timur District, Seruyan Regency in 2023

This study found that there was an influence between genetic factors and smoking habits and the incidence of hypertension because the P values obtained were 0.000 and $0.034 \leq 0.05$. Meanwhile, physical activity, diet and stress levels had no effect on the incidence of hypertension because the P values obtained were 0.766, 0.154 and $1.000 < 0.05$. Genetic factors are the factors that have the most influence on the incidence of hypertension in people of productive age and from 107 respondents 51.4% have genetic factors. Genetic factors or family history also contribute to the etiology of hypertension and hypertension is often passed down from genes to the next generation in a family as a risk factor that cannot be controlled or changed so that it becomes a potential factor inherited from the genes of parents who previously suffered from hypertension.(22)(8)(9).

Research findings found the influence of genetic factors on the incidence of hypertension.(10)The research results are also in line with research findings in 2020 showing genetic factors influence hypertension(23). Efforts to reduce the risk of hypertension need to be made so that people of productive age can maintain their diet, can do physical activity, so that their blood pressure can remain stable.

Effect of Smoking Habits on Hypertension

The findings show that there is an influence of smoking habits on the incidence of hypertension in people of productive age in and among 107 respondents 29.0% have a smoking habit. Smoking can increase heart rate and blood pressure. (13) Smoking behavior can cause hypertension, but we can still change our behavior to avoid hypertension. (8) (4)

The research findings are in line with research findings that there is an influence of smoking habits on the incidence of hypertension. (14) Research findings show that smoking is one of the factors influencing hypertension. (23) Based on theoretical concepts and previous research findings, everything shows that smoking is one of the factors that influences the incidence of hypertension.

Effect of Physical Activity on Hypertension

The research found that physical activity had no influence on the incidence of hypertension in people of productive age from 107 respondents 57.0% do irregular physical activity. Physical activity reduces the risk of hypertension because it suppresses the sympathetic nervous system. (11) Physical activity or exercise is a risk factor for hypertension that can be controlled or changed. (8) Hypertension is a multifactorial disease that results in a person's lack of physical activity. (4)

Research finds that physical activity influences the incidence of hypertension. (12) Research findings that the factor that influences the incidence of hypertension is physical activity. (24) Likewise, other research supports these findings, where the research found that physical activity (exercise) had an effect on the incidence of hypertension. (25). Based on research findings, it shows that physical activity has no effect on the incidence of hypertension. This finding contradicts theoretical concepts and previous research which explains that physical activity is one of the factors that influences the incidence of hypertension.

Influence of Diet on Hypertension

The research found that diet had no influence on the incidence of hypertension in people of productive age and among 107 respondents as much as 51.4% have irregular eating patterns. A person's diet that is high in fat, low in fiber and sodium intake and a large intake of packaged salt or other ingredients containing sodium, and fast food have an impact on increasing blood pressure. (15) Hypertension is a multifactorial disease that involves a person's diet. (4) Irregular eating patterns and consuming various types of food without paying attention to good nutritional substances can cause an increase in high blood pressure. (16)

Apart from that, the research contradicts research findings which explain the influence of diet on the incidence of hypertension. (17) This finding is also not in line with research findings that diet influences the incidence of hypertension. (25) Based on research findings, it shows that diet has no effect on the incidence of hypertension. This finding contradicts theoretical concepts and previous research which explains that diet is one of the factors that influences the incidence of hypertension.

Effect of Stress Level on Hypertension

The research found that stress levels had no influence on the incidence of hypertension in people of productive age from 107 respondents. 27.1% experienced mild levels of stress. Stress experienced by a person can increase heart rate and increase the sympathetic nervous system, which can increase blood pressure. Hypertension is a multifactorial disease that involves a person's stress level. (4) Someone who is stressed causes their blood pressure to increase. (18)

The findings of this study are not in line with research findings that found psychosocial stress increased the risk of hypertension. (19) This finding is also not in line with research findings that stress status influences the incidence of hypertension. (25) Based on research findings, it shows that stress levels have no effect on the incidence of hypertension. This finding contradicts theoretical concepts and previous research which explains that stress levels are one of the factors that influence the incidence of hypertension.

The Most Dominant Influence Affecting Hypertension

The findings show that the most dominant factor influencing hypertension in people of productive age is genetic factors and of the 107 respondents there were as many as 63.6% experiencing hypertension. Factors that depend on the origin and development of organisms or living creatures or their relationship to hereditary traits are known as genetic factors. A family genealogy consists of parents, siblings, children, and grandchildren, as well as a description or diagram of the age, health, or cause of death of each of the closest family members. (26)

Hypertension and coronary heart disease are also caused by genetic factors. (8) A history of hypertension in the immediate family, or hereditary factors, also increases the risk of developing hypertension, especially primary (essential) hypertension. (27) Hypertension is a condition where blood vessels experience pressure. It can attack a person suddenly and can result in death. (8) Research has found that genetic factors influence the incidence of hypertension. (10) Based on theoretical concepts and previous research findings, the explanation shows that genetic factors are one of the factors that influence the incidence of hypertension.

CONCLUSIONS

Based on the research results, it can be concluded that in Seruyan Hilir Timur District in 2023: Genetic factors have an influence on the incidence of hypertension in people of productive age. Physical activity, diet and stress levels have no effect on the incidence of hypertension in people of productive age. Genetic factors are the most dominant factors influencing hypertension in people of productive age. Suggestions to the Kuala Pembuang II Community Health Center to pay more attention and provide education to people of productive age (age range 20-59 years) who have genetic factors and smoking habits, because these two factors were found to be the causes of hypertension. Suggestion; Seruyan District Health Service to be able to make policies and be able to collaborate with the Community Health Center to create classes for people of productive age with a monthly

meeting program involving doctors to monitor blood pressure and provide education to the community at every Posyandu activity carried out every month.

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