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THE RELATIONSHIP BETWEEN STRESS LEVEL, PHYSICAL ACTIVITY LEVEL AND DIETERY HABIT WITH HYPERTENSION INCIDENCE

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ABSTRACT
Hypertension is a major risk factor for death in the world. Hypertension is strongly influenced by the way and habits of a person's life which is often referred to as the killer disease because people with hypertension do not know if they have hypertension There are many risk factors for the incidence of hypertension, including consuming foods that contain a lot of salt and fat, not eating enough fruits and vegetables, consuming excessive alcohol, lack of physical activity, and poor stress management. researchers are interested in conducting research on the relationship between stress levels, physical activity and dietery habits with hypertension Incidence. The research design used quantitative analytic with a cross-sectional approach. Instruments for measuring blood pressure using a digital sphygmomanometer, measuring stress levels using the standard DASS (Depression Anxiety Stress Scale), measuring activity levels using the standard IPAQ (International Physical Activity Questionnaire), and measuring Dietery Habits or eating pattern using a diet questionnaire that has been modified and has been tested for validity, reliability, and normality. Data analysis using the Chi-square test. The Result Showed that there was a relationship between Stress level, Phsycal Activity, and dietery habit with hypertension Incidence.

Keywords: dietery habit; hypertension; phsycal activity level; stress level

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INTRODUCTION

Hypertension is one of the main risk factors that dominates the severity of cardiovascular non-communicable diseases such as coronary heart disease, kidney failure, and stroke (Kemenkes, 2019). Hypertension is a disease in which the blood vessels are disturbed, which causes the body's tissues to lack oxygen and nutrients. This makes the heart muscle pump blood stronger so that the body's needs are met (Trisnawan, 2019). In general, hypertension is defined as a blood pressure condition that exceeds the normal limit of 140/90 mmHg (Chobanian et al., 2003; Pikir et al., 2015).

The World Health Organization (WHO) states that hypertension is the main cause of premature death in the world. At least 1.28 billion adults worldwide suffer from hypertension and most of them live in middle-to low-income countries (World Health Organization 2021). In Indonesia, as a developing country, the prevalence of hypertension is quite high. The results of the 2018 Riskesdas measurement, the prevalence of hypertension sufferers in Indonesia has increased in the number of sufferers. In 2013, patients with hypertension reached 26.5%, and increased in 2018 to reach 34.11%, with an estimated number of cases of 63,309,620 people, and 427,218 of them died due to hypertension (Kemenkes, 2018). In East

Kalimantan Province, based on the results of measurements on residents aged 18 years, there are 36.10% cases of hypertension (Riskesdas, 2018). The results of the recapitulation of health data obtained by researchers from services carried out by the Sidomulyo Health Center, Samarinda City, in 2019 showed 297 cases of hypertension, in 2020 it reached 593 cases of hypertension, and in 2021 it reached 1,329 cases of hypertension. This shows that people with hypertension at the Sidomulyo Health Center Samarinda experienced a significant increase.

There are many risk factors for the incidence of hypertension, including consuming foods that contain a lot of salt and fat, not eating enough fruits and vegetables, consuming excessive alcohol, lack of physical activity, smoking, and poor stress management (WHO, 2015 in Saragih, 2021). People who experience stress will cause an increase in blood pressure by triggering an increase in adrenaline levels. Stress can activate the sympathetic nerves, triggering an increase in blood pressure and cardiac output. The prevalence of stress in the world is quite high. In America, there are approximately 75% of adults who experience severe stress and the number tends to increase in the past year (American Psychological Association, 2013; Legiran et al., 2015). In Indonesia alone, the prevalence of emotional and mental disorders in the population aged 15–24 years is 9.8%, and in East Kalimantan it is 9.6% (Riskesdas, 2018). In Samarinda City, the prevalence of emotional and mental disorders in residents aged 15–24 years is around 9.58% (Riskesdas, 2018). The results of interviews conducted on residents of RT 08 found 9 people (36%) experienced mild stress, 4 people (16%) experienced moderate stress, and 3 people (12%) experienced severe stress. Existing technological advances have a very significant impact on changing a person's lifestyle, one of which is providing convenience in activities. Thus, forming bad habits that cause a lack of interest in physical activity (Cristanto et al., 2021). Lack of physical activity will have an effect on increasing the frequency of a higher heart rate. so that the heart pumps harder, which results in an increase in blood pressure (Sihotang & Elon, 2020).

Physical activity in Indonesia, according to Basic Health Research data (2018), shows that 50%, or approximately (33.5%) of the Indonesian population is doing physical activity. This number has increased by 26.1% (Riskesdas, 2013; Ministry of Health, 2018). The proportion of physical activity based on measurements carried out by Riskesdas (2018) in East Kalimantan Province of the population aged >10 years who did physical activity was only around 58.9%, and 41.1% of the other population still lacked physical activity. Based on the data from the 2018 Riskesdas measurement, the proportion of people in Samarinda City who do physical activity in the population aged > 10 years is only 47.44%. So it is necessary to make effective efforts to increase the level of adequate physical activity, which can be done to prevent hypertension by doing physical activity for 30–40 minutes per day (Suryani et al., 2020). Dietery Habits in Indonesia, especially for the poor, tends to be high consumption of high carbohydrate foods and low in protein, fiber, and vitamins. This is because carbohydrates are still a cheap source of energy. Some people eat food in much larger portions than they should, and vice versa. (Indrawati, L., Werdhasari, A., 2009). Based on the data from the Riskesdas measurement (2018), the proportion of people in Indonesia who consume salty food habits in the population aged >3 years is 43.0%. Of 962,045 residents, the percentage of 1-6 times/week consumption of salty food in the whole province is 43.0%. Of Kalimantan, there are 46, 9% of 13,195. The proportion of people in Indonesia who have the habit of consuming fatty foods, cholesterol, and fried foods in the population > 3 years by province. The percentage is 1-6 times per week, 45.0% from various provinces the habit of consuming fatty foods, cholesterol, and fried foods, and in East Kalimantan there are 49.0% of the weighted 13,195 inhabitants.

Based on the phenomenon in RT 08, the working area of the Sidomulyo Public Health Center, Samarinda, from the survey results, 70% of residents who often consume fried food, 60% sometimes consume salt or salty food. Based on the data above, researchers are interested in conducting research on the relationship between stress levels, physical activity and dietery habits with hypertension Incidence.

METHOD

The research design used quantitative analytic with a cross-sectional approach. The population in this study were RT 8 residents in the working area of the Sidomulyo Public Health Center, Samarinda. Purposive sampling was used to select 81 respondents for the research sample. Instruments for measuring blood pressure using a digital sphygmomanometer, measuring stress levels using the standard DASS (Depression Anxiety Stress Scale) questionnaire from Nursalam's book (2016), measuring activity levels using the standard IPAQ (International Physical Activity Questionnaire) questionnaire, and measuring eating patterns using a diet questionnaire that has been modified and has been tested for validity, reliability, and normality. This research was conducted in March-April 2022. The inclusion criteria in this study were respondents aged 18–65 years, willing to become respondents, and able to read and write. While the exclusion criteria were mental disorders, suffering from serious illness, communication disorders, and emergency conditions, Data analysis using the Chi-square test

RESULTS

Table 1.
Analysis of the Relationship Between Stress Levels With Hypertension Incidence

Stress Level	Hypertension Incidence				Total		P Value
	No Hypertension		Hypertension				
	f	%	f	%	f	%	
Normal	49	74.2%	17	25.8%	66	100,0	0,01
Moderate	6	40.0%	9	60.0%	15	100,0	

Table 2.
Analysis of the Relationship Between Physical Activity Levels With Hypertension Incidence

Physical Activity Level	Hypertension Incidence						P Value
	No Hypertension		Hypertension		Total		
	f	%	f	%	f	%	
Low	18	56,3%	14	43,8%	32	100%	0,021
Moderate	26	86,7%	4	13,3%	30	100%	
High	11	57,9%	8	42,1%	19	100%	

Table 3.
Analysis of the Relationship Between Dietery Habits With Hypertension Incidence

Dietery Habit	Hypertension Incidence						P Value
	No Hypertension		Hypertension		Total		
	f	%	f	%	f	%	
Good	36	78.3%	10	21,.7%	46	100.0%	0,040
Bad	19	54.3%	16	45.7%	35	100.0%	

DISCUSSION

The Relationship Between Stress Level with Hypertension

Based on research on table 1., 81 respondents in RT 08 working area of Sidomulyo Public Health Center, Samarinda, it was found that from a total of 66 respondents who experienced normal or not stressed conditions with hypertension (25.8%) and no hypertension (74.2%). The results of this study are in line with research by Gunawan & Adriani (2020) that a low stress level means lower blood pressure, but on the contrary, the higher the stress level, the higher the blood pressure. Individuals who are not stressed due to the ability to access mental support and manage stress. Different types of stress can be caused by several factors and the perceived effect of the stressor is not the same for each individual. Risk factors for hypertension are not only caused by stress, but there are several other factors such as obesity, lack of physical activity, genetics, age, smoking, consuming excessive sodium and gender (Azizah, 2016).

The total 15 respondents who experienced moderate stress with hypertension incidence as many as 9 respondents (60%) and no hypertension incidence as many as 6 respondents (40%). The results of this study are in line with research by Delavera et al., (2021) that respondents who experience stress have a higher chance of developing hypertension than respondents who do not experience stress. Everyone has a different strategy for dealing with stress. Some are avoiding and some are looking for solutions to solve the problems they face (Andriyani, 2020). Stress is very influential on health, including blood pressure. When a person experiences stress, the mechanism of stress will affect an increase in blood pressure (Bhelkar et al., 2018).

Based on the Chi-square test, there are 1 cells (25.0%) which have an expected count of < 5, so the test used is the Fisher's Exact Test. Statistical test results obtained a value of 0.01 ($p < 0.05$) H0 is rejected and Ha is accepted, which means that there is a relationship between stress levels and the incidence of hypertension in RT 08 working area of Sidomulyo Public Health Center Samarinda. The results of this study are in line with Setyawan's research (2017) that there is a significant relationship between stress and blood pressure. When experiencing stress, the hormones adrenaline, thyroxine and cortisol increase and affect the body's homeostatic system. Then, the hormone adrenaline activates the sympathetic nerves, causing vasoconstriction which makes more blood pumped. This affects the increase in cardiac output and blood pressure.

When experiencing stress, the body will secrete epinephrine as much as 300 times the normal level. Activation of epinephrine is influenced by the hormone cortisol in the body. The hormone cortisol will increase the activity of epinephrine, so that blood vessels narrow (vasoconstriction). Vasoconstriction in renal afferent arterioles which is the effect of increased epinephrine activity, will stimulate the renin-angiotensin aldosterone system (RAAS) as a cause of lack of oxygen delivered to the kidneys. RAAS activity will result in an increase in peripheral resistance, sodium and water reabsorption, increased heart rate and cardiac output and increased blood pressure (Usman et al., 2021).

Based on the description above, the researcher assumes that respondents who experience stress are because the respondents cannot manage stress properly so they experience hypertension. This is indicated at the time of the interview, the respondent admits that one of his family members suffers from a chronic illness, so that the respondent always thinks about treatment for the recovery of his family members. There are also those who admit that the workload is excessive and always think about the problem, causing stress. And there are also those who admit that they feel lost because their husband has died. Always think about

memories when you are with your partner who ultimately feel lonely and sad, causing a sense of stress and affecting blood pressure.

While respondents who experience stress but do not have hypertension because respondents are able to manage stress well so that it does not affect their blood pressure. This is marked at the time of the interview, the respondent admits that if he faces a problem that makes him feel burdened, the respondent chooses not to think about it too much, some also choose to go out of the house, shop and some choose to play cellphones so that the problems they face can be diverted so that the perceived stress is reduced and has no effect on blood pressure.
And respondents who experience conditions are not stressed or normal with the incidence of hypertension. This was marked at the time of the interview, the respondent admitted that he had a family history of hypertension, lack of exercise and likes salty food.

The Relationship Between Phsycal Activity With Hypertension

Based on the results of the Chi-square statistical test, p value = 0.021 < (0.05) so it can be concluded that Ha is accepted and H0 is rejected, which means that there is a relationship between the level of physical activity and the incidence of hypertension in RT 08 the working area of the Sidomulyo Public Health Center Samarinda. This study is in line with research conducted by (Lestari et al., 2020) that based on the results of statistical tests obtained p = 0.001 < = 0.05 so that there is a significant relationship. Inadequate physical activity can be influenced by an unhealthy diet, such as consuming high levels of saturated fat, salt, and sodium, which can lead to irregular eating patterns and overweight or obesity. So that it can cause a person to be more at risk of suffering from hypertension.

In this study, of 81 respondents who did light physical activity, 32 people with hypertension did not have hypertension, as many as 18 people (56.3%), and hypertension as many as 14 people (43.8%). The results of this study are supported by research (Tindangen et al., 2020) that age has a relationship with the incidence of hypertension. Researchers wrote that age is the main factor that affects hypertension through natural processes that cause changes in the heart system, blood vessels, and hormones. Not entirely people with light physical activity levels will experience hypertension. Generally this is influenced by the age factor. At a relatively young age, a person's physical fitness is still in an increasing condition to a maximum age of 25-30 years, then there will be a decrease in the body's functional capacity of 0.8-1% every year. However, if you routinely carry out activities, the body's functional decline can be reduced by half (Wildan Welis, 2013).

In addition, light physical activity can increase the risk of hypertension. This is reinforced by the results of research conducted (Marleni, 2020) which states that physical activity affects the incidence of hypertension. At least someone who has light physical activity 30-50% of people can develop hypertension. The results of this study are also supported by research (Iswahyuni, 2017) that the lighter the physical activity, the more likely it is to increase the chance of developing hypertension. Modern lifestyle conditions result in a person rarely exercising and doing enough physical activity because of the time used to continue pursuing a career, so they tend to experience stress and release tension by smoking, drinking coffee, and drinking alcohol so that it can cause obesity which is a risk factor. hypertension (Widharto, 2018).

Another similar study was conducted by (Karim et al., 2018) that the results of statistical tests using the chi-square test with a 95% confidence level obtained p value = 0.039 < = 0.05 so that there is a relationship between physical activity and hypertension. In this study, there

were 30 people who did moderate physical activity with the incidence of hypertension without hypertension, namely 26 people (86.7%), and hypertension as many as 4 people (13.3%). Moderate physical activity is usually influenced by individual factors such as liking for physical activity, and expectations about the benefits of doing physical activity so that it affects a person to do physical activity (Kusumo, 2020). In addition, the microenvironment affects the level of moderate physical activity. People's habits of spending free time by traveling outside the home have begun to be abandoned and replaced with modern habits such as playing cellphones (Wicaksono & Handoko, 2020).

In this study, there were 19 levels of strenuous physical activity with the incidence of hypertension without hypertension as many as 11 people (57.9%), and hypertension as many as 8 people (42.1%). Another factor that is closely related to the occurrence of hypertension in heavy physical activity is heredity. The results of this study are supported by research (Tindangen et al., 2020) which states that the family has a major role in the emergence of hypertension. If both parents suffer from hypertension, then 45% will pass to their children, and if one of the parents suffers from hypertension, then 30% will pass to their children (Kemenkes, 2013). Based on the description above, the researcher assumes that a lack of physical activity can cause a potential occurrence of hypertension in RT 08 the working area of the Sidomulyo Public Health Center Samarinda, but hypertension can be suffered not only based on the intensity of a person's activity level, besides that a modern lifestyle that is used only to pursue a career can be the cause occurrence of hypertension.

The Relationship Between Diet With The Incidence Of Hypertension

Based on the results of the study, out of 46 respondents who experienced a good diet with the incidence of hypertension, 10 respondents (21.7%) had a good diet with no hypertension as many as 36 respondents (78.3%). This is in line with the theory (Apriyani, 2019) good diet with hypertension occurs due to other factors that can affect hypertension such as genetics or heredity, rest patterns, stress management and there is also a hormone balance factor that can change at any time according to the system in the body. Respondents who have a bad diet with hypertension as many as 16 respondents (45.7%) respondents who have a bad diet with no hypertension as many as 19 (54.3%) respondents, this is in accordance with Manuntung theory (2019), Respondents whose diet is not good will tend to have hypertension because high sodium intake can cause an increase in cardiac output, plasma volume, and blood pressure.

The results of statistical tests using the Chi-Square test obtained p value of 0.040 < (0.05) so it can be stated that H0 is rejected and Ha is accepted which says there is a significant relationship between diet and the incidence of hypertension with the value of the correlation coefficient (r) equal to - 0.254 Which means that the closeness of the relationship in the weak category. The direction of the correlation shows a negative value (-) which means the opposite direction. That is, the better the respondent's diet, the hypertension will be lower or in the mild category, and the worse the eating pattern is, the more likely it is that hypertension will occur

Sodium causes the body to retain water by exceeding the body's normal limits, which can increase blood volume and high blood pressure. High sodium intake can cause adipocyte hypertrophy due to lipogenic processes in white fat tissue, if continuously it can cause constriction of blood vessels caused by fat and will result in an increase in blood pressure.

Respondents whose diet is not good but do not have hypertension can be caused by other factors not included in this study, for example respondents taking blood pressure-lowering drugs, or respondents diligently doing sports so that blood flow is smoother and prevents hypertension. (Sholichah, 2021)

In line with the research (Aprillia, 2020) The results from the bivariate test were also obtained that there were 16 respondents 22.5% from the control group or the group with hypertension had a bad diet which can be seen from the results of the questionnaire filled out by respondents more often eating foods that are healthy. can trigger hypertension such as beef, chicken meat and skin, shrimp, bread, pindang. While respondents rarely eat foods that can prevent hypertension such as spinach, mustard greens, tomatoes, carrots, bananas, tempeh and tofu. This can happen because hypertension is also caused by other triggering factors besides diet.

From the explanation given, it can be seen that hypertension is not only caused by diet, but there are other factors, namely genetics or heredity, hypertension can be passed down from parents who have a history of hypertension to their children, there is also a hormonal balance factor that can change at any time. changes according to the system in the body. Supported by research (Wahdah, 2021) that the Chi Square test results obtained p value of p-0,000 < = 0.05 so that H0 was rejected and Ha was accepted, which means there is a significant relationship between diet and the incidence of hypertension in the area around the coast. in the Cepiring sub-district in the villages of Korowelang Anyar and Margorejo.

Respondents who have a bad diet will have the potential to experience hypertension with an OR of 0.33 times compared to respondents who have a good diet, respondents who have a good diet have the opportunity to have hypertension, the RR results are 0.47 times compared to respondents who have a good diet. not good, respondents who have a bad diet have the opportunity to have hypertension, the RR result is 1.44 times compared to respondents who have a bad diet. According to the researcher's assumption that the majority of respondents have a good diet, they do not suffer from hypertension because they have a healthy diet, although there are 26 respondents who have a bad diet that have the opportunity to develop hypertension, a bad diet can be influenced by self-awareness of health, a poor economic environment. Lack of and lack of a person's respect for health will affect a person's diet so that it has the potential for hypertension.

CONCLUSION

The Result Showed that there was a relationship between Stress level, Phsycal Activity, and dietery habit with hypertension Incidence. Stress control, healthy activity pattern and healthy diet could prevent and control hypertension

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