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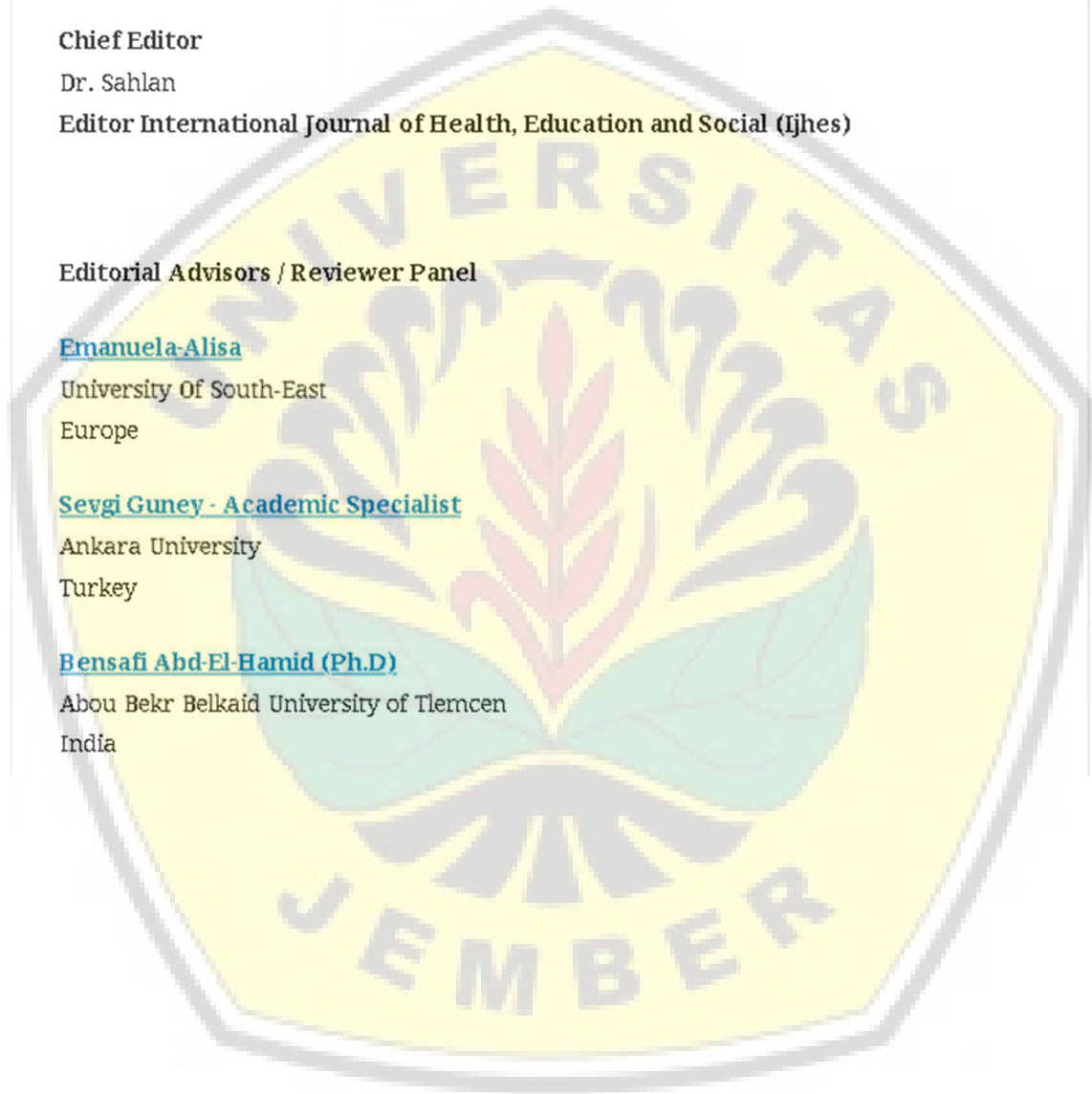
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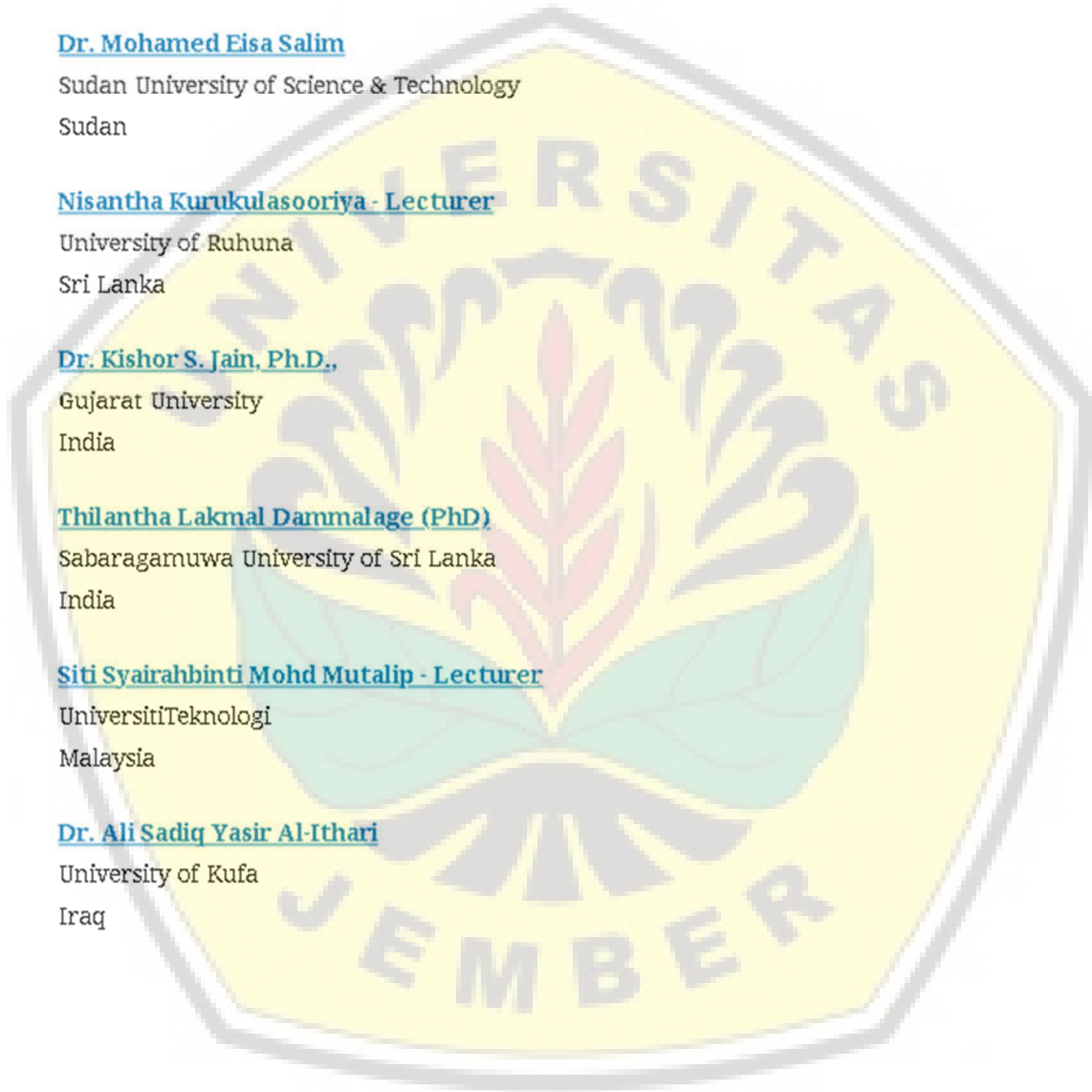
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## Correlation Between Habits Of Physical Activity With Blood Pressure Of Hypertensive Patients

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### ABSTRACT

Hypertension is an asymptomatic disorder, and condition which blood pressure is increase in diastolic pressure  $\geq 90$  mmHg and systolic pressure  $\geq 140$  mmHg. Factors of hypertension are obesity (overweight), low physical activity, lifestyle (consumption alcohol and smoking). Design the research was used descriptive analytic type with correlation study and cross sectional method. The sample was 84 respondents from hypertensive patients recruited by using consecutive sampling technique. Data were

collected from respondents by employing Baecke Questionnaire and observation sheet for degree of hypertension. This research used spearman correlation and results revealed that there was correlation between habits of physical activity and blood pressure hypertensive patients (p value 0,008) and (r value 0,287) and the strength of the correlation in the two variables is statistically weak with the direction of the positive correlation. People with low physical activity were tended has higher blood pressure than people with active physical activity. The result showed gender and age could influence habits of physical activity and smoking history and hypertension history in the family affect blood pressure. One solution to overcome these problems is exercising routinely like doing aerobics or walking in the morning.

**Keyword :** Hypertension, Habits of physical activity, Blood pressure

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## Introduction

Physical activity is the movement produced by skeletal muscles and their supporting systems, which require energy to move and metabolism in carrying out activities (World Health Organization, 2016). Lack of physical activity increases the risk of hypertension because people with less physical activity tend to have a higher heart rate so that the heart muscle will work harder in each contraction, the harder and more frequent the heart muscle has to pump blood, the greater the pressure placed on the arteries causing increased blood pressure (Sheps, 2005).

Hypertension is an asymptomatic disorder, with signs of increasing blood pressure (Potter and Perry, 2010). Hypertension or often called high blood pressure occurs because of an increase in systolic blood of more than 140 mmHg (exceeding the normal limit) and for diastolic blood pressure exceeding 90 mmHg, which has been measured twice measurements with an interval of five minutes in adequate rest conditions (Potter and Perry, 2010). Hypertension is a non-communicable disease (PTM) with very serious health problems both in the world and Indonesia (Anggraini, 2014).

In the world as many as 1.13 billion people have hypertension, which means that of 3 people 1 of them have been diagnosed with hypertension (World Health Organization, 2015). The increase in the number of people with hypertension is estimated to increase by 1.56 billion annually in the next 2025. While the Riskesdas data (2018), amounting to 34.1% of the total prevalence of hypertension in Indonesia with South Kalimantan being the city with the highest prevalence (44.1%) and Papua (22.2%). In Indonesia, the average person with hypertension is 8.4% and during 2013 to 2018 there was an increase of 6.6% the prevalence of people with hypertension.

East Java Provincial Health Service (2016) stated that 13.47% prevalence of hypertension or population around 935,736, for the proportion of women with 547,823 residents or (13.25%) and male population of 387,913 or 13.78%. In East Java, hypertension is the most prevalent in the city of Surabaya with 137,337 patients or 20%. And for Jember Regency, based on data from the Jember District Health Office during January to December 2018 a total of 76,224 visits. Baladhika Husada Hospital Level III Jember in 2018 as many as 1200 visits of patients with hypertension. The prevalence of hypertension in Jember Regency must be a particular concern because it can increase the incidence of hypertension if he does not pay attention to the factors causing hypertension.

According to research by Karim, et al (2018) informs that respondents with moderate physical activity suffer more hypertension, 28 people (70%) with the most stage II hypertension, 25 people (78%) and 3 people (37.5%) stage I while 12 people or as many as (30%) with heavy physical activity with stage II hypertension at most were 7 people (22%) and stage I as many as 5 people (62.5%) and there were no respondents belonging to the light activity category.

Based on research by Hasanudin, et al (2018) most hypertensive respondents with physical activity sometimes are as many as 31 people (60.78%) of 51 respondents and 20 people (39.22%) fall into the category of rarely active. One solution to overcome these problems, among others, by doing aerobic exercise carried out for 30 to 45 minutes every day can reduce blood vessel resistance and suppress the sympathetic nervous system which is the cause of the risk of hypertension.





## Research methods

This research uses correlation design and cross sectional approach. Data collection using the Baecke questionnaire which contained questions about physical activity habits consisting of work index, exercise index and leisure time index and for blood pressure measurements using a sphygmomanometer and tension. Data collection was carried out starting in June 2019 on respondents with hypertension in accordance with the inclusion and exclusion criteria set by 84 respondents.

Sampling was based on inclusion criteria, namely patients with hypertension at the Internal Medicine Polyclinic of Baladhika Husada Level III Hospital, Jember, patients who were willing to become research respondents and had full, cooperative awareness, and were willing to become respondents and provided informed consent sheets.

Measuring instruments in this study used the Baecke questionnaire with the results of a previous research test conducted by (Supeni, 2007) the results of the validity test of the Baecke questionnaire which was  $r = 0.8$  which means it was valid for measuring physical activity.

## Results And Discussion

Table 1 Characteristic Data (Gender of Respondents, Smoking History and Family History of Hypertension)

Variable	Total	Percentage (%)
<b>Gender:</b>		
Girl	58	69,0
Man	26	31,0
<b>Family History of Hypertension:</b>		
- Has no family history of hypertension	24	28,6
- Have a family history of hypertension	60	71,4
<b>Smoking History:</b>		
- Do not smoke	58	69,00
- Smoking	26	31,00

Based on table 1 shows that as many as 58 people (69.0%) were female and as many as 60 people (71.4%) had a family history of hypertension and based on these data it was explained that 58 non-smoking respondents (69%).



Table 2. Habits of Physical Activity Habits

Variable	Total	Percentage (%)
<b>Habits of Physical Activity</b>		
<b>Light</b>	43	51,2
<b>Remains</b>	34	40,5
<b>Weigh</b>	7	8,3

Based on table 2 explains that the habits of light physical activity as many as 43 people (51.2%), and based on these data it is known that respondents with mild physical activity habits are more than respondents with moderate and severe physical activity.

Table 3. Blood Pressure Values

Variable	Total	Percentage (%)
<b>Tekanan Darah</b>		
Normal	0	0
Pre-Hipertensi	19	22,6
Hypertension Grades I	46	54,8
Hypertension Grades II	19	22,6

Table 3 explains the blood pressure values of 46 people (54.8%) having hypertension grade I.

Table 4. Analysis of the Relationship between Physical Activity Habits and Blood Pressure

Variable	r	p-value
<b>Physical Activity Blood pressure</b>	0,287	0,008

In the table can be seen the relationship between physical activity with blood pressure based on the Spearman correlation test which shows that the value (P value = 0.008). From the Spearman correlation test the value of r is ( $r = 0.287$ ), these results illustrate that there is a relationship between physical activity and blood pressure. The strength of correlation on both variables is statistically weak with positive correlation direction.

## DISCUSSION



## **Habits of Physical Activity**

From the results of the study in table 2 shows that as many as 43 people (51.2%) are respondents with mild physical activity habits. The habit of physical activity in this study is physical activity in hypertensive patients as measured using the Baecke questionnaire, which consists of 16 questions with 8 work index questions, 4 exercise index questions and 4 leisure time questions. In the work index question, 68 people answered that their activity in working was relatively light, namely as a housewife, teaching (teacher and lecturer), pensioner, shopkeeper.

This is supported by the theory of Potter and Perry (2005), which states that if a person's age shows a sign of ability and will, or also the habit of physical activity, because of the increasing age of a person, the transition also faces more and more, such as changes in health and functional abilities. This causes the emergence of disturbances in terms of meeting the necessities of life, so the high dependence to ask for help from others (Tamher and Noorkasiani, 2009). According to Sihombing's research (2010), lack of physical activity in addition to the risk of increasing blood pressure and causing hypertension patients can also be at risk for diseases such as heart disease, stroke, DM, and cancer.

In this study it was found that the female respondents in this study had the most hypertension compared to male respondents. A total of 58 people (69.0%) were female hypertensive patients, these results were supported by research from Kozier et al. (2010) which explained that women with old age experienced a decrease in muscle strength, mass, bone mineralization which was experienced by many women, and the system musculoskeletal associated with the ability to habitual physical activity in general, and in elderly women with osteoporosis muscle tone and decreased bone density.

It can be concluded that physical activity is a broader concept which involves other activities such as body movements at work, exercise time and leisure time. Lack of physical activity causes blood pressure in arteries to increase when the heart pumps blood and an increase in cardiac output causes hypertension. The age factor influences how a person performs his physical activities, so as a person ages, the risk of hypertension will increase due to changes in the structure of large blood vessels, so that the blood vessels will become narrower and the walls of blood vessels become stiff and then an increase in systolic blood pressure.

### **Blood pressure**

Based on table 3 it is known that the respondent's blood pressure is categorized as normal, hypertension, first degree hypertension and second degree hypertension (JNC 8 of 2015-2018), which is then known from the data on blood pressure results. In the table, it is known that the majority are respondents in the category of hypertension, first-degree hypertension, as many as 46 people (54.8%).

Blood pressure in humans is always changing because heart rate affects the high and low blood pressure of a person, for systolic blood pressure will be higher than diastolic blood pressure



(Gunawan, 2012). Genetic factors influence the risk of hypertension, meaning that in the family (parents) or one of them has a history of hypertension can increase the high risk of hypertension to their children. If parents or family members have high blood pressure, children have the same risk even greater than those inherited from their parents' genes.

In addition to a family history of hypertension, the results of research on hypertension respondents at Baladhika Husada Jember Level III Hospital showed that gender affected respondents' blood pressure. In the Internal Medicine Clinic as many as 58 people (69.0%) were female with high blood pressure or hypertension. Other studies indicate that women have a greater prevalence of 51.2% compared to men (Sulistyowati, 2018). Based on the results of several studies, hypertension in the female sex mostly occurs due to the loss of the hormone estrogen when entering the period of menopause. Women who experience hormonal changes that cause weight gain and blood pressure will become more reactive to the consumption of sodium and cause increased blood pressure (Kartikasari, 2012).

In this study, smoking history was one of the factors that influenced a person's blood pressure. A total of 26 people (31%) had a history of smoking. This study was supported by previous research by Kartikasari (2012), namely that smoking is one of the risk factors for hypertension with a p value of 0.001 with 21 respondents (36.9%) smoking respondents, the presence of chronic cigarette smoke exposure due to smoking can continuously cause atherosclerosis which is a cause of increased blood pressure (Hakim, 2015).

Research shows that smoking every day is a risk factor for hypertension, smoking can increase blood pressure, heart rate, arterial strength and disruption of nitric oxide synthesis (Situmorang, 2015). The effect of smoking in increasing blood pressure lasts for 15 to 30 minutes for each cigarette. Cigarettes contain nicotine, which can stimulate the release of catecholamines. Increased catecholamines cause, increased heart rate, myocardial irritability, and vasoconstriction which also increases blood pressure (Potter & Perry, 2010).

Increased malignant hypertension by heavy smokers can cause renal artery stenosis, which experiences atherosclerosis (Nuraini, 2015). Narrowing of the arteries is caused by heavy heart work, and the stimulation of sympathetic nerves from the nicotine content in cigarettes (WHO, 2011). Smoking is a factor in increasing blood pressure and at risk of hypertension due to the presence of nicotine in cigarettes which increases the frequency of heart rate (Rahmawati, 2019). The entry of nicotine in the body will give a signal to the brain to release the hormone adrenaline which then shrinks the diameter of blood vessels and high risk of increased blood pressure.

### **Relationship between Physical Activity Habits and Blood Pressure**





The analysis test results based on table 4 found that there is a relationship between physical activity habits with blood pressure in hypertensive patients at Level III Baladhika Husada Hospital in Jember with  $p$  value = 0.008 in blood pressure which means that  $H_0$  is accepted so there is a significant relationship. In this study has a weak correlation strength of 0.287 which means that the more frequent moderate or strenuous physical activity, the blood pressure will get better and normal, conversely if the more frequent physical activity is less or lighter the blood pressure of the person is getting worse which can be interpreted that the person who have less active physical activity habits are at risk of high blood pressure and cause hypertension.

This research shows that physical activity affects one's blood pressure, if physical activity is less then blood pressure will increase, due to an increase in the arteries when the heart pumps blood so that cardiac output increases and then causes hypertension. Besides physical activity that is less triggering a person's body weight to rise and will affect the rise in blood pressure because the heart rate works faster and the heart muscle works harder each time the contraction. Respondents who have mild physical activity habits are at increased risk of blood pressure compared to respondents who have moderate and severe physical activity habits.

## **CONCLUSION**

The habit of physical activity in hypertensive patients at Level III Baladhika Husada Hospital in Jember is mild physical activity. Blood pressure in hypertensive patients at Level III Baladhika Husada Hospital Jember is blood pressure hypertension degree I. There is a positive relationship between physical activity and blood pressure in hypertensive patients with weak correlation strength, which means the better the physical activity of a person, the better blood pressure will be and normal, on the contrary if the worse the physical activity of a person, the blood pressure of the person is getting worse which can be interpreted that people who have less active physical activity habits will be at risk of high blood pressure and cause hypertension.



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