(RESEARCH ARTICLE)

# Physical activity is a lifestyle as a factor risk hypertension (study cases in sufferers' hypertension)

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## Abstract

Hypertension is a non-communicable disease, a significant health problem because of its high prevalence and the third cause of premature death. One of the risk factors for hypertension is lifestyle. The study aimed to analyze the effect of lifestyle on hypertension.

The type of research used is an analytic survey with a case-control approach. The population in this study were 96 outpatients clinically diagnosed with hypertension in December 2022, 30 case samples, and 30 control samples. The sampling technique used was purposive sampling, and the data collection methods were interviews. Data analysis is univariate and bivariate analysis.

There is a significant relationship between physical activity (p-0.004), diet (0.039), smoking habits (0.009), and stress (0.018) with the incidence of hypertension. Physical activity is the variable most at risk for suffering from hypertension, with an Odds Ratio (OR) of 5,500. We are increasing the role of health workers in promotive and preventive activities by providing information and education to the public about healthy lifestyles.

**Keywords:** Physical Activity; Diet; Smoking Habits; Stress; Hypertension.

## 1. Introduction

Increased blood pressure that lasts for a long time (persistent) can cause damage to the kidneys, hypertension, and brain if not detected early and received adequate treatment [1]. Hypertension is a non-communicable disease, a significant health problem worldwide due to its high prevalence of 22% in the age group ≥18 years in 2014, and continues to increase. Hypertension is the third most significant risk factor for premature death. The Third National Health and Nutrition Examination Survey revealed that Hypertension can increase the risk of coronary heart disease by 12% and stroke by 24% [2].

According to the results of the 2018 Basic Health Research (Riskesdas), the prevalence rate of Hypertension in people aged > 18 years in Indonesia is 34.1%. This prevalence rate is higher than in 2013 at 25.8% [1]. The Health Profile of West Java Province in 2019 noted the prevalence of Hypertension in West Java in 2019 was 41.6%, while the 2018 Riskesdas results were 39.6%, an increase compared to the 2013 Riskesdas results, which was 29.4% [3].

Based on data from the Majalengka District Health Office, in 2019, the prevalence of Hypertension reached 29.4%; in 2020, the prevalence of hypertension cases reached 34.3%; in 2021, Hypertension rose high enough, reaching 38.8%. Besides, in 2021 hypertension will become a disease with the highest proportion of cases compared with other non-communicable conditions. Hence, illness hypertension is one of the top priorities in minimum service standards in the

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Majalengka Regency. The Rajagaluh Health Center experienced an increase in cases of Hypertension from 347 patients in 2020 to 580 topics in 2021 and 745 points in 2022.

Hypertension risk factors include non -*modifiable risk factors* such as family history, age, and gender. Meanwhile, *modifiable* risk factors can be prevented, such as smoking, high blood sugar (Diabetes Mellitus), dyslipidemia (abnormal fat metabolism), obesity (obesity), lack of physical activity, diet, consumption of alcoholic beverages, and stress [4].

Based on the results of the preliminary study obtained information from 20 respondents of hypertension patients that rarely consume vegetables or fruit less than five times in 1 day, often consume salty food more than ≥1 time in 1 day, often drink fatty food more than ≥1 time in 1 day, seldom do exercise every day, rarely do exercise more than 30 minutes every day, seldom exercise 3 times a week, a smoking habit from 20 respondents obtained > 12 stems per day as many as 11 people, families exposed to cigarette smoke four people, and obtained respondents who experienced moderate stress as many as five people and severe stress as many as five people.

Based on the Research of Ellis Makawekes [5] , Kadir [6], Imelda Erman [7], and Hasbi Taobah Ramdani [8], The results obtained are 1) smoking has a relationship with the incidence of Hypertension, 2) stress has a relationship with Hypertension, 3) physical activity is associated with Hypertension, 4) eating habits are associated with the incidence of Hypertension.

A person's lifestyle can influence Hypertension: physical activity or exercise, diet, smoking, and stress. The Majalengka Regency Office recorded 92,192 people participating in sports activities during 2020. This number decreased by 77%, or as many as 82,453 people from the previous year. As for smokers, according to the National Socio-Economic Survey (Susenas) conducted by the Central Bureau of Statistics (BPS) in March 2020, the number of smokers in Majalengka Regency reached 31.4% for ages 15 and over and spent an average of 72 cigarettes. Cigarettes per week or 10.3 cigarettes per day [5]. Objective study This is For analyzing the effect of lifestyle on the incidence of Hypertension.

## 2. Material and methods

Type research design This is a study analytic with approach *case-control.* Variable free in study This is physical activity, pattern eating, smoking, and stress as well variable *dependent* in study This is incident hypertension. Population in study This is patient take care diagnosed path in a manner clinical suffer disease hypertension as many as 96 people. The sample in the study consists of two sample cases and samples control. As for the sample case, all patients who suffered from Hypertension did control on the moon in December 2022, with as many as 30 points and controls in the study. This is a patient with No sufferer hypertension in January 2022, as many as 30 cases. Criteria included in the study This is diagnosed patient disease hypertension for the first time during the study, and willing patients become respondents with signed *informed consent.* Criteria exclusion in the study This is sufferers with existing Hypertension no can do anything and patients with other similar diseases with Hypertension. The sampling technique used is *purposive sampling*. Method data collection with an interview. Data analysis using an analysis univariate, analysis bivariate through Chi-Square statistical tests, and *Odds Ratio* (OR).

## 3. Results and discussion

### 3.1. Distribution Frequency Case and Control Based on Activity Physical, Diet, Habits Smoking, and Stress Levels

Table 1 shows respondents with style life activity physique not enough Good part big on groups case that is as much 22 respondents (73.3%) and respondents with style life activity physique Good part big on groups control as much 20 respondents (66.7%). Respondents with style life pattern Eat No Healthy part big on groups case that is as much 2 0 respondents (66.7%) and respondents with style life pattern Eat Healthy part big on groups control as many as 19 respondents (63.3%). Respondents with style life smoke tall part big on groups case that is as much 2 3 respondents (76,7%) and respondents with style life smoke low part big on groups control as many as 18 respondents (60.0%). And respondents with style life level stress experience some stress (severe, mild, moderate). Big on groups case that is as much 22 respondents ( 73.3 %) and respondents with style life level stress no experience some stress big on groups control as many as 17 respondents (56.7%).

**Table 1** Frequency Distribution of Cases and Controls Based on physical activity, Diet, Habits of Smoking, and Stress Levels

| Variable | Group | | | | Amount | |
| | Case | | Control | | | |
| | n | % | n | % | n | % |
| --- | --- | --- | --- | --- | --- | --- |
| Activity Physique | | | | | | |
| Not good | 22 | 73.3 | 10 | 33.3 | 32 | 63.3 |
| Good | 8 | 26.7 | 20 | 66.7 | 28 | 36.7 |
| Amount | 30 | 100 | 30 | 100 | 60 | 100 |
| Diet | | | | | | |
| Not healthy | 20 | 66.7 | 11 | 36.7 | 31 | 51.7 |
| Healthy | 10 | 33.3 | 19 | 63.3 | 29 | 48.3 |
| Amount | 30 | 100 | 30 | 100 | 60 | 100 |
| Habit Smoke | | | | | | |
| Tall | 23 | 76.7 | 12 | 40.0 | 35 | 58.3 |
| Low | 7 | 23.3 | 18 | 60.0% | 25 | 41.7 |
| Amount | 30 | 100 | 30 | 100 | 60 | 100 |
| Stress Level | | | | | | |
| stress | 22 | 73.3 | 13 | 43.3 | 35 | 58.3 |
| No Stress | 8 | 26.7 | 17 | 56.7 | 25 | 41.7 |
| Amount | 30 | 100 | 30 | 100 | 60 | 100 |

## 3.2. The connection between Lifestyles with Incident Hypertension

Based on Table 2. obtained that respondents with style life activity physique not well enough, in part, big on groups case that is as much 22 respondents ( 73.3%) and respondents with style life activity physique well, in part big on groups control as much 20 respondents ( 66.7%). Results of statistical tests chi-square obtained mark p-value 0.00 4 (<0.05) and got results with an Odds Ratio (OR) of 5.500, meaning that the risk of Hypertension in respondents with poor physical activity habits is 5.5 times greater than in respondents with good physical activity habits. Respondents with style life pattern Eat No healthy in groups case that is as much as 2 0 respondents ( 66.7%) and respondents with style life pattern Eat beneficial in groups control as much as 1 9 respondents ( 63.3%). Obtained mark p-value 0.039 (<0.05). Results Odds Ratio (OR) of 3.455, meaning that the risk of Hypertension in respondents with unhealthy eating habits is 3.4 times greater than in respondents with healthy eating habits.

Respondents with style life smoked high in the group case, that is as much 23 respondents ( 76.7%), whereas respondents with habit smoking low in the group control as much 18 respondents (60.0 %). Statistical tests obtained a mark p-value of 0.009 (<0.05). Results Odds Ratio (OR) of 4.929, meaning that the risk of Hypertension in respondents with high smoking habits is 4.9 times greater than in respondents with low smoking habits. Respondents with style life Group stress case that is as much 22 respondents (73.3%) and whereas respondent who does not Group stress control as much as 1 7 respondents (56.7%). Results of statistical tests chi-square obtained mark p-value 0.018 (<0.05). Obtained results Odds Ratio (OR) of 3.596, meaning that the risk of Hypertension in respondents with stress habits is 3.5 times greater than in respondents with no stress habits.

The results of this study obtained a significant relationship between physical activity and Hypertension (P value 0.0 0 4 and OR 5.5 00 ). The results of this study are in line with some of the effects of previous studies, including the Research of Ellis Makawekes (2020), which states There is an influence between blood pressure before and after physical activity in older people in the village of Taloarane, with p-value = 0.000 [5]. In line with Rina Andriani Harahap's Research

(2017) states that there is an effect of physical activity on the incidence of Hypertension in early adult males (18-40 years) with a value of p = 0.010 OR = 3.095 (95% CI: 1.292-7.417). It was concluded that early adult males (18-40 years) with light physical activities had an estimated 3 times the risk of developing Hypertension compared to those with moderate and heavy physical activities [5]. The results showed that there was a significant effect between physical activity and the incidence of hypertension (Herawati et al., 2022).

**Table 2** Relationships between Lifestyles _ with Incident Hypertension

| Variable | Hypertension | | | | Amount | | P | OR | 95% CI | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Case | | Control | | | | | | Lower limit | Upper limit |
| | n | % | n | % | n | % | | | | |
| Activity Physique | | | | | | | | | | |
| Not good | 22 | 73.3 | 10 | 33.3 | 32 | 63.3 | 0.004 | 5.500 | 1.813 | 16.681 |
| Good | 8 | 26.7 | 20 | 66.7 | 28 | 36.7 | | | | |
| | 30 | 100 | 30 | 100 | 60 | 100 | | | | |
| Diet _ | | | | | | | | | | |
| Not healthy | 20 | 66.7 | 11 | 36.7 | 31 | 51.7 | 0.039 | 3.455 | 1.195 | 9.99 |
| Healthy | 10 | 33,3 | 19 | 63.3 | 29 | 48.3 | | | | |
| | 30 | 100 | 30 | 100 | 60 | 100 | | | | |
| Habit Smoke | | | | | | | | | | |
| Tall | 23 | 76.7 | 12 | 40.0 | 35 | 58.3 | 0.009 | 4.929 | 1612 | 15.071 |
| Low | 7 | 23.3 | 18 | 60.0 | 25 | 41.7 | | | | |
| | 30 | 100 | 30 | 100 | 60 | 100 | | | | |
| Stress Level | | | | | | | | | | |
| stress | 22 | 73.3 | 13 | 43.3 | 35 | 58.3 | 0.018 | 3.596 | 1.216 | 10.638 |
| No Stress | 8 | 26.7 | 17 | 56.7 | 25 | 41.7 | | | | |
| | 30 | 100 | 30 | 100 | 60 | 100 | | | | |

Based on the results study, This obtained part considerable activity physique is not enough in cases (Hypertension) as many 22 respondents (73.3 %) with OR 5.500 results. This is in line with the theory, according to Patryani (2016), lack of physical activity will increase the risk of developing Hypertension by 2.2 times. Regular physical activity or regular exercise can have the effect of increasing blood flow and helping to break down fat metabolism and cholesterol [5]. According to Fajar (2015), based on an analysis of 2013 Basic Health Research data which states that physical activity can substantially reduce the risk of Hypertension because regular physical activity can help control risks caused by other risk factors for Hypertension such as Hypertension, high blood sugar levels, cholesterol erol and obesity [10].

On Research This obtained part big on control own activity physique Good that is as much 20 respondents (66.7 %), results in This state that at the Health Center Rajagaluh found physical activity case not Good enough compared to physical activity properties located in control. Factor activity not enough. This is related to the era of the Covid-19 pandemic, which has become a barrier for people to exercise or other activities outside the home (Cucu Herawati et al., 2022).

Study proves that physical activity affects a person's occurrence of Hypertension. Suppose a person does light physical activity or doesn't do physical exercise regularly. In that case, the risk for someone suffering from Hypertension will be very high because risk factors play a role in causing Hypertension, which is interrelated with the influence of a person's physical activity on Hypertension.

This study found a significant relationship between diet and Hypertension (p-*value* 0.039 and *OR* 3.455 ). This study's results align with some of the effects of previous studies, including the Research of Sunarto Kadir (2019). The study's results showed that diet affected the incidence of Hypertension in the working area of the Dungaliyo Health Center, Gorontalo Regency [12]. In line with Ogis Mega Pratiwi's Research (2018), which states that the results of this study are *a value* of P = 0.000 <0.05%. This study concludes a significant relationship between diet patterns and the incidence of Hypertension in the elderly [13]. The results of this study found that there was a significant effect between diet and the incidence of Hypertension (Herawati et al., 2022).

Based on the results study, This obtained part big on the case own pattern Eat No Healthy, as many as 2 0 respondents (66.7 %), It is known that diet is strongly related to the incidence of coronary Hypertension. Someone who often consumes foods high in fat will result in fat and cholesterol deposits, narrowing or blockage in the walls of the coronary arteries resulting in disrupted blood supply to Hypertension. An increase in cholesterol levels always characterizes patients with coronary Hypertension. Cholesterol levels of this roller are due to a lifestyle that is not good, such as not maintaining a diet, smoking, drinking alcohol, and lack of activity. Physical (Marlinda et al., 2020).

On Research This obtained part big on control own pattern Eat Healthy as much as 1 9 respondents (63.3%), results in This state that at the Health Center Rajagaluh found design Eat more good at control compared to pattern eat in cases where the diet is healthy on case only obtained ten respondents (33.3%). Food and drink consumed become essential for the able body to change energy so that food and drink contain contents. No healthy consumption keeps going continuously and frequently triggers Hypertension [12] Health workers are advised to counsel hypertensive patients to implement a hypertensive diet, such as not consuming foods that contain excess salt, avoiding foods that contain fat and high cholesterol, diligently consuming fruits and vegetables, and routinely checking blood pressure to health services.

This study showed a significant relationship between smoking and hypertension (p-*value* 0.009 and *OR* 4.929. This study's results align with Imelda Erman's Research (2021). The study's results found a relationship between smoking habits (p-value = 0.005) and the incidence of Hypertension at the Palembang Campus Health Center [7]. In line with the Research of Irene Megawati Umbas (2019), which stated that most of the 74 respondents studied were smokers, the results of the *chi-square test* found that the *p-value* was 0.016, which was smaller than the significant value of 0.05, that there was a relationship between smoking and Hypertension in Kawangkoan Health Center [15] There is a relationship between smoking habits (0.035) with Hypertension (Herawati et al., 2022).

Based on the results of this study, it was found that the majority of cases had a high smoking lifestyle, with as many as 23 respondents (76.7%); according to Ardiansyah M (2012), the nicotine contained in cigarettes can stimulate the release of catecholamines where catecholamines have increased so that it can cause an increase in hypertension pulse, myocardial irritability, and vasoconstriction that can increase Hypertension [16]. This study also found that most of the controls had a low smoking lifestyle, with as many as 18 respondents (60.0%), so it was found that the smoking lifestyle at the Rajagaluh Health Center in cases was higher than the smoking lifestyle in the controls.

Research results This obtained a *p-value of* 0.018 (<0.05 and *OR* 3,596 ). This shows a significant relationship between stress and the disease of Hypertension. Study This is in line with study Hasbi Taobah Ramdani (2017), which offers a connection between stress levels and the incidence of Hypertension in hypertensive patients with p-value 0.001 [17] . In line with Septiana Ayu Cahyaning Tyas's Research (2021), the results obtained with a p-value = 0.027 (p <0.05) means that there is a relationship between stress levels and blood pressure levels in older people in Krajan Hamlet, Kromengan Village, Kromengan District, Malang Regency (Ayu et al., 2021).

Based on the results study, This obtained part big on the case own style life stress as many as 22 respondents (73.3%), while in the control who did not stress as much as 17 respondents (56,7%). The relationship between stress and primary Hypertension is suspected by sympathetic nerve activity, which can increase intermittent blood pressure. If the focus worsens, it can result in persistently high blood pressure (Erman et al., 2021; Mellisa, 2013).

This study concluded that there is a relationship between stress and the incidence of Hypertension. This may be because high levels of stress not only have an impact on causing Hypertension but also cause various other diseases that are found in the long term. Stress level is a condition where the state of the body is disrupted due to psychological pressure, and stress can trigger hormones in the body that control one's mind. Experiencing anxiety can increase blood pressure even more. Therefore, the patient's efforts are to avoid stress triggers as much as possible and open communication with family and psychologists if there are severe problems because they can trigger stress.

## 4. Conclusion

Based on the results study obtained conclusion exists a connection meaningful between activity physique and disease hypertension obtained mark *p-value of* 0.004, with an *Odds Ratio* (OR) of 5.500, meaning that the risk of suffering from Hypertension in respondents who have poor physical activity habits is 5.5 times greater than in respondents who have good physical activity habits. There is a meaningful connection between the pattern eat with disease hypertension obtained mark p-value 0.039 result Odds Ratio (OR) of 3.455, meaning that the risk of suffering from Hypertension in respondents with unhealthy eating habits is 3.4 times greater than in respondents who have healthy eating habits.

There is a connection meaning between the habit smoke and incident hypertension obtained mark *p-value of* 0.009, resulting in an *Odds Ratio* (OR) of 4.929. And there is a relationship meaning between the level of stress and disease hypertension obtained mark *p-value* 0.018 (<0.05) with a results *Odds Ratio* (OR) of 3.596.

Should the public do activity physique in a manner routine or exercise, organized pattern. Eat Healthy with food and drink healthy or nutritious No consume cigarettes and always do inspection health routinely for early detection and appropriate treatment. We are increasing the role of health workers To prioritize activity promotive by giving information and education to the public about the importance of guarding health by applying a healthy lifestyle.

## Compliance with ethical standards

*Disclosure of Conflict of interest*

No conflict of interest.

*Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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