JPH RECODE March 2022; 5 (2): 80-89
http://e-journal.unair.ac.id/JPHRECODE
http://dx.doi.org/10.20473/jphrecode.v5i2.27923

THE RISK FACTORS OF HYPERTENSION IN INDONESIA (DATA STUDY OF INDONESIAN FAMILY LIFE SURVEY 5)

Faktor Yang Mempengaruhi Kejadian Hipertensi Di Indonesia (Studi Data Indonesian Family Life Survey 5)

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ARTICLE INFO

Article History:
Received:
1st, July 2021

Review:
16th, September 2021

Accepted:
22nd, September 2021

ABSTRACT

Background: Hypertension is a worrying disease, as it often does not cause symptoms. According to the WHO, this disease affects 22% of the world's population, and hypertension has affected 25% of the population in Southeast Asia. In Indonesia, the prevalence of hypertensive disease is increasing year on year. The suspected risk factors for hypertension are gender, age, genetics, smoking, obesity, physical activity, and stress. **Purpose**: To analyze the factors that affect the prevalence of hypertension in Indonesia based on *Indonesian Family Life Survey* (IFLS) 5 data. **Method**: This study uses secondary data from Indonesia Family Life Survey (IFLS) 5 through analytical observational research with a cross-sectional design. There were 4790 total respondents sampled from a 34,239 total sample of the population. The analyses used were bivariate and multivariate. **Results**: Bivariate analysis using the chi-square test determined the factors related to hypertension incidence to be gender (p=0,000), age (p=0.000), employment status (p=0.003), physical activity (p=0.011), and obesity (p=0.000). Through logistic regression, the factors that affect hypertension include gender (p=0,000), age (p=0.000), physical activity (p=0.015), and obesity (p=0.000). **Conclusion**: The factors that affect the incidence of hypertension are gender, age, physical activity, and obesity.
Keywords: risk factors, hypertension, indonesia

ABSTRAK

Latar Belakang: Hipertensi merupakan penyakit yang menghawatirkan, karena penyakit ini sering tidak menimbulkan gejala. Menurut WHO penyakit ini menyerang 22% penduduk di seluruh dunia, sedangkan penyakit hipertensi telah menyerang 25% penduduk wilayah Asia Tenggara. Di Indonesia, prevalensi penyakit hipertensi meningkat dari tahun ke tahun. Adapun yang diduga menjadi faktor risiko hipertensi yaitu jenis kelamin, umur, genetik, obesitas merokok, aktifitas fisik, dan stress. **Tujuan:** menganalisis faktor yang mempengaruhi kejadian hipertensi di Indonesia berdasarkan data *Indonesian Family Life Survey* (IFLS) 5. **Metode:** penelitian ini menggunakan data sekunder dari Indonesia Family Life *Survey* (IFLS) 5 dengan jenis penelitian observasional analitik dengan desain cross sectional. Terdapat 4790 responden yang menjadi sampel penelitian dari 34.239 populasi. Analisis yang digunakan adalah bivariat dan multivariat. **Hasil:** analisis bivariat yang menggunakan uji chi-square didapatkan faktor yang berhubungan dengan kejadian hipertensi adalah jenis kelamin (*p*=0,000); umur (*p*=0,000); status pekerjaan (*p*=0,003); aktifitas fisik (*p*=0,011); dan obesitas (*p*=0,000). Sedangkan melalui uji regresi logistik faktor yang berpengaruh terhadap hipertensi adalah jenis kelamin (*p*=0,000), umur (*p*=0,000), aktifitas fisik (*p*=0,015), dan obesitas(*p*=0,000). **Kesimpulan:** faktor yang berpengaruh terhadap kejadian hipertensi adalah jenis kelamin, umur, aktifitas fisik, dan obesitas.
Kata kunci: faktor risiko, hipertensi, indonesia

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INTRODUCTION

Hypertension is defined as an increase in systolic and diastolic pulses from normal blood pressure to 140/90 mmHg in two estimates with a span of five minutes in a completely fresh / calm state (Kemenkes RI, 2014). Systolic blood pressure is the main measurement that is the basis for determining the diagnosis of hypertension (Perhimpunan Dokter Spesialis Kardiovaskular Indonesia, 2015). Hypertension often does not cause symptoms, which is why it is called the silent killer.

As indicated by the World Health Organization (WHO), hypertension is a major problem that affects 22% of the world's population. In Southeast Asia in particular, hypertension affects 25% of the total population. The WHO estimates that worldwide, 1 in 4 men and 1 in 5 women suffer from hypertension. When comparing the number of patients with hypertension, there are more men than women.

In Indonesia, by 2013, hypertension reached 25.8% and is the third most common cause of death (Riskesdas, 2013). The prevalence of hypertension in Indonesia is increasing and this is very worrying, reaching 34.11% of adults over the age of 18 years (Riskesdas, 2018). The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,210 people. In 2018, it was found that 41% of the population did not regularly check their blood pressure.

Hypertension can be influenced by several factors. The risk factors for hypertension are divided into 2 groups, namely factors that cannot be changed (age, gender, and heredity) and factors that can be changed (overweight, smoking, lack of physical activity, and stress) (Kemenkes RI, 2013). In 2018, hypertension in Indonesia mostly affected the female population at a rate of 36.85% compared to the male population, which reached 28.80%. Furthermore, hypertension increases with age. In 2018, hypertension generally affected the 75+ age group at a rate of 69.5%. Judging from the level of education, hypertension attacks the least educated in the population who have not/never been promoted, at 51.6%. Meanwhile, in terms of occupation, people who do not work have a hypertension rate of 39.73%. Obesity caused by unbalanced nutrition and a lack of activity can increase the risk of hypertension. The smoking tendency of the population in Indonesia in 2016 reached 46.16%, and smoking is one of the causes of hypertension.

Based on research by Anggara and Prayitno (2013), the factors related to hypertension are age, schooling, occupation, BMI, smoking tendency, exercise habits, use of liquor (alcohol), sodium intake, and potassium consumption. This is in accordance with the research of Puspita and Haskas (2014), which stated that the factors that influence the incidence of hypertension are age, smoking, and obesity. Sartik et al., (2017) mentioned that education and work have no effect on the incidence of hypertension. Putra and Ulfah (2016) stated that gender has an effect on the incidence of hypertension while according to Arum (2019), gender has no effect on hypertension. According to Rahmayani (2019), stress factors affect the incidence of hypertension, while Putra and Ulfah (2016) found that stress has no effect on hypertension.

Based on the descriptions above, hypertension is increasingly becoming a challenge for Indonesia. Understanding the factors behind it, especially preventable behavioural factors using a nation-wide data, is key to halting the rise of hypertension in Indonesia. This study therefore aims to analyze the factors of the incidence of hypertension in Indonesia based on data from the Indonesian Family Life Survey (IFLS) 5.

METHOD

This research used an observational analytical approach via across-sectional IFLS survey using secondary data from the Indonesia Family Life Survey (IFLS) cycle 5. This survey was conducted continuously starting from IFLS 1 in 1993 to IFLS 5 in 2015 in 13 of the 27 provinces in Indonesia, with a representative rate of 83%. The provinces include North Sumatra, West Sumatra, South Sumatra, Lampung, DKI Jakarta, West Java, Central Java, East Java, DI Yogyakarta, Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi. The sample selection in this survey used the stratified random sampling method.

The population of this study was the entire population of Indonesia, amounting to

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34,239 individuals recorded in the data of the Indonesia Family Life Survey (IFLS) 5. The sample in this study consisted of those in the Indonesian population aged 18 years and older. The sample size was obtained through the data cleaning process, which resulted in a total of 4,790 residents. The process of collecting the data was done by selecting the research variables first. The variables included gender, age, last education, employment status, smoking, physical activity, obesity, and stress. After collecting the data, data cleaning was carried out in accordance with the research variables. The data were analyzed using bivariate and multivariate analysis. Bivariate analysis used the chi-square test. This test was used to select the variables to be included in the multivariate analysis. The multivariate analysis used logistic regression to determine the factors that influence the incidence of hypertension.

RESULT

Based on data from IFLS cycle 5, the sample population was 4,790 Indonesian residents aged 18 years and older. The following is the distribution of the frequency of occurrence of hypertension.

Table 1. Distribution of Hypertension.

Hypertension	Amount	
	n	%
Hypertension	441	9,2
No Hypertension	4.349	90,8
Total	4.790	100

Source: *Indonesian Family Life Survey* Data, 2015

The characteristics of the respondents in this study include gender, age, education, employment status, smoking, physical activity, obesity, and stress. The distribution of these characteristics is shown in Table 2.

Table 2. Distribution of Respondent Characteristics and Research Variables

Characteristic	**n**	**%**
Sex		
Male	4.625	96,6
Female	165	3,4
Age		
≥40	1.836	38,4
<40	2.954	61,7
Education		
Low (TK-SMP)	2.317	48,4
High (SMA-Sarjana)	2.473	51,6
Employment Status		
Work	4.544	94,9
Unemployment	2.46	5,1
Smoke		
Yes	4.671	97,5
No	119	2,5
Physical Activity		
Yes	3.240	67,6
No	1.550	32,4
Characteristic	**n**	**%**
Obesity		
Obesity	223	4,7
No Obesity	4.567	95,3
Stress		
Yes	280	5,8
No	4510	94,2

Source: *Indonesian Family Life Survey* Data, 2015

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Table 2 shows that there are more male respondents (96.6%) than female respondents (3.4%), while there are more in the <40 age group (51.6%) than the 40+ age group (38.4%). The percentage of respondents with a higher education was over half (51.6%), while those with a low education made up (48.4%). The average respondent had a job (94.9%). Respondents who smoked made up more of the sample (97.5%) than those who did not smoke. Respondents who were obese made up 4.7% less than those who were not obese, and there were less respondents who were stressed (5.8%) than those who were not stressed.

Table 3. Relationship between the Risk Factors (Gender, Age, Education, Occupational Status, Smoking, Physical Activity, Obesity, and Stress) and Hypertension.

Risk Factor	Incidence of Hypertension				Total		*p* Value	OR (95% CI)
	Hypertension		Not Hypertension					
	n	%	n	%	n	%		
Sex								0,331 (0,226-0,484)
Male	404	8,7	4221	91,3	4625	100	0,000	
Female	37	22,4	128	77,6	165	100		
Total	441	9,2	4349	90,8	4790	100		
Age								2,897 (2,367-3,545)
≥40	273	14,9	1563	85,1	1836	100	0,000	
<40	168	5,7	2786	94,3	2954	100		
Total	441	9,2	4349	90,8	4790	100		
Education								
Low								0,977 (0,803-1,189)
High	211	9,1	2106	90,9	2317	100	0,817	
	230	9,3	2243	90,7	2473	100		
Total	441	9,2	4349	90,8	4790	100		
Employment Status								0,571 (0,395-0,825)
Work	405	8,9	4139	91,1	4544	100	0,003	
Unemployed	36	14,6	210	85,4	246	100		
Total	441	9,2	4349	90,8	4790	100		
Smoke								0,755 (0,428-1,330)
Yes	427	9,1	4244	90,9	4671	100	0,328	
No	14	11,8	105	88,2	119	100		
Total	441	9,2	4349	90,8	4790	100		
Physical Activity								1,327 (1,065-1,653)
Yes	322	9,9	2918	90,1	3240	100	0,011	
No	119	7,7	1431	92,3	1550	100		
Total	441	9,2	4349	90,8	4790	100		
Obesity								2,913 (2,082-4,075)
Obesity	48	21,5	175	78,5	223	100	0,000	
No Obesity	393	8,6	4174	91,4	4567	100		
Total	441	9,2	4349	90,8	4790	100		
Stress								1,102 (0,736-1,650)
Yes	28	10	252	90	280	100	0,636	
No	413	9,2	4097	90,8	4510	100		
Total	441	9,2	4349	90,8	4790	100		

Source: *Indonesian Family Life Survey Data*, 2015

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Table 3 shows the results of the bivariate analysis using the chi square test, where 5 variables have a significant relationship with the incidence of hypertension, namely gender (p = 0.000; OR = 0.331; 95% CI = 0.226-0.484), age (p=0.000; OR=2.897; 95% CI=2.367-3.545), employment status (p=0.003; OR=0.571; 95% CI=0.395-0.825), physical activity (p=0.011; OR=1.327; 95% CI=1.065-1.653), and obesity (p=0.000; OR=2.913; 95% CI=2.082-4.075). The variables found not to have a significant relationship with the incidence of hypertension are education (*p*=0,817), smoking (p=0,328), and stress (p=0,636).

Multivariate analysis was carried out, in which the variables included were the variables that had significant value in the bivariate analysis, with a p value of less than 0.05 (p < 0.25). The variables with a p value <0.25 were gender, age, work status, physical activity, and obesity. The multivariate analysis results using logistic regression are shown in Table 4.

Table 4. Logistic Regression Analysis of the Factors Affecting the Incidence of Hypertension

Category	B	Wald	Sig	Exp(B)	95%C.I for EXP(B) Lower	Upper
Sex						
Male	0,826	16,939	0,000	2,284	1,541	3,386
Female (reference)						
Age						
≥40	-1,021	96,373	0,000	0,360	0,294	0,442
<40(reference)						
Physical Activity						
Yes	-0,274	5,767	0,016	0,760	0,608	0,951
No (reference)						
Obesity						
Obesity	-0,962	29,561	0,000	0,382	0,270	0,541
No Obesity (reference)	2,263	101,813	0,000	9,612		
Constant						

Source: *Indonesian Family Life Survey* Data, 2015

The results of the multivariate analysis in Table 4 show that the variables were analyzed together using logistic regression, which resulted in 4 variables that had significant values related to the incidence of hypertension. The variables were gender, age, physical activity, and obesity.

DISCUSSION

The Effect of Gender on Hypertension

Based on the results of the cross-tabulation in Table 3, there were 4790 respondents tested. From the 4625 (96.6%) male respondents, 404 (8.7%) suffered from hypertension and 4221 (91.3%) did not. hypertension. Meanwhile, from the 165 (3.4%) female respondents, 37 (22.4%) suffered from hypertension and 128 (77.6%) did not.

Based on the results of the bivariate analysis using the chi square test, the p value (p = 0.000; OR = 0.331) was less than (0.05), which means that there is a relationship between gender and the incidence of hypertension. In the multivariate analysis, the logistic regression produced a p value (p = 0.000; OR = 2,284) of less than (0.05) meaning that the gender variable has an effect on the incidence of hypertension. The risk of the influence of sex on hypertension is indicated by the Odd Ratio (OR) value of 2.284, meaning that the male respondents have a 2.284 times greater risk of experiencing hypertension than the female respondents.

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The results of this study are in accordance with the results of the research conducted by Wahyuni and Eksanoto (2013), who stated that there is a relationship between gender and the incidence of hypertension with a p value = 0.000. In addition, the research conducted by Arifin et al., (2016) is also in accordance with this recent study, which proved that there is a significant relationship between gender and the incidence of hypertension with a value of (p = 0.015; OR = 0.980).

A man can experience indications of hypertension in his late thirties, while women often experience hypertension during menopause. The spread of hypertension in men is almost the same as in women, but women who have not experienced menopause will be protected by the hormone estrogen, which plays a role by increasing the level of High Density Lipoprotein (HDL). For women who have entered menopause or old age, the level of estrogen in women decreases, meaning that women go on to become susceptible to hypertension. Cases of hypertension in men are often associated with high activity which causes other factors to appear, such as fatigue, smoking, and unhealthy eating patterns (Amanda and Martini, 2018).

It can be concluded that gender has a significant effect on the incidence of hypertension. It can be seen that female respondents suffer from hypertension more than men, because women are more susceptible to hypertension, especially in old age.

The Effect of Age on Hypertension.

Based on the results of the cross-tabulation in Table 3, there were 4790 respondents who were tested, from which 1836 (38.3%) respondents were aged 40 and older. From this population, 273 (14.9%) suffered from hypertension and 1563 (85.1%) did not. Meanwhile, of the 2954 (61.7%) respondents aged <40, 168 (5.7%) had hypertension and 2786 (90.8%) did not.

It can be seen from the results of the bivariate analysis that the p value (p = 0.000; OR = 2.897) is less than (0.05), which means that the age variable has a relationship with the incidence of hypertension. The multivariate analysis resulted in a value (p = 0.000; OR = 0.360), the p value was less than (0.05), which means that the age variable has an effect on the incidence of hypertension. The risk of the age of the respondent related to hypertension is shown in the Odd Ratio (OR) value of 0.360, which means that respondents aged 40 and over have a 0.360 times more serious risk of developing hypertension compared to respondents aged <40.

The results of this study are in accordance with the research conducted by Puspita and Haskas (2014), which stated that there was a relationship between age and the incidence of hypertension with a value of (p = 0.009; OR = 3.6). The research conducted by Sartik et al., (2017) also proved that there was an influence due to age on the incidence of hypertension with a value of (p = 0.000; OR = 6,138).

The likelihood of hypertension increases with age (Kemenkes RI, 2019). Physiologically, the older a person's age, the higher the risk of them developing hypertension. At the age of 30-65 years, systolic pressure increases normally by 20 mmHg and continues to increase after the age of 70 years. As the person ages, the blood vessel pressure in their body will increase, and there are degenerative diseases that often occur in old age.

It can be concluded that there is an influence due to age on the incidence of hypertension. This is because respondents who are older are more likely to suffer from hypertension, once they are 40 years and over. It can be seen that the older a person is, the more susceptible they are to hypertension, because when a person is old, their organ functions will decrease and they will become more sensitive to disease, including hypertension. This is in contrast to someone who is still young, who has a strong immune system and good level of organ function that can prevent diseases from entering the body. However, someone who is young can still get hypertension. This is evidenced in the Indonesian population segment for those aged over 20 years old who already have the risk factors for hypertension (Azhari, 2017).

The Effect of Employment Status on Hypertension

Based on the results of the cross-tabulation in Table 3, there were 4790 respondents tested. From the 4544 respondents

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who had jobs, 405 (8.9%) people suffered from hypertension and 4139 (91.1%) did not. From the 246 respondents who did not have a job, 36 (14.6%) suffered from hypertension and 210 (85.4%) people did not.

Based on the results of the bivariate analysis using the chi square test in Table 3, it shows that the p value = 0.003, where the p value <α (0.05) means that there is a relationship between employment status and the incidence of hypertension. The results of the analysis also obtained an Odd Ratio (OR) value of 0.571, which means that respondents who have a job have a risk that is 0.571 times greater than the respondents who do not have a job. It is known that the value of OR is <1, meaning that the respondents who do not have a job have a risk that is 1.75 times greater than the respondents who do have a job. However, in the multivariate analysis, employment status had no effect on the incidence of hypertension.

The results of this analysis are in line with the research by Anggara and Prayitno (2013), which showed that there is a significant relationship between employment status and the incidence of hypertension with a p value of (p = 0.000; OR = 8.95). The results of the research conducted by Azhari (2017) are also in line with the results of the analysis of this study, which states that there is a significant relationship between work status and the incidence of hypertension with a value of (p = 0.006 ; OR = 3.208).

In general, people do at least some physical activities that expend energy during work. This can be compared with people who do not work, where they do not engage in activities that cause the body to be active. A lack of physical activity is one of the factors of hypertension. This is in line with research by Arda, Ali, and Mustapa (2018), which stated that someone who does not work has a 2.71 times greater risk of suffering from hypertension than someone who does work.

It can be concluded that there is a relationship between work status and the incidence of hypertension. It can be seen in the results of the research that respondents who do not work suffer from hypertension more than those who do work. This is because someone who works engages in physical activity more, which has an effect on hypertension.

The Effect of Physical Activity on Hypertension

Based on the results of the cross-tabulation in Table 3, 4790 respondents who were tested, from which 3240 (67.6%) respondents did physical activity. From this group, there were 322 (9.9%) people who suffered from hypertension and 2918 (90.1%) who did not. Meanwhile, out of the 1550 (32.4%) respondents who did not do physical activity, 119 (7.7%) who suffered from hypertension and 1413 (92.3%) people who did not.

Based on the results of the bivariate analysis using the chi square test, the p value (p = 0.011; OR = 1.327), which is p <α (0.05), which means that there is a relationship between physical activity and the incidence of hypertension. In the multivariate analysis which using logistic regression produces a value (p = 0.016; OR = 0.730), the p value shows p <α (0.05), which means that physical activity affects the incidence of hypertension. The risk factors for physical activity with hypertension are evidenced by the results of the multivariate analysis which resulted in an OR value of 0.751. It is known that the value of OR <1, meaning that the respondents who do not do physical activity have a risk that is a 1.33 times greater chance of getting hypertension.

The results of this study are in accordance with the research of Nelli Safitri and Suyanto (2016), which showed that there was a significant relationship between physical activity and the incidence of hypertension with a value of (p = 0.000; OR = 14,479). In addition, the results of the research conducted by (Arifin et al., 2016) are also in line with the results of the analysis of this study which states that there is a relationship between physical activity and the incidence of hypertension with a value of (p = 0.017; OR = 1.424).

People who are less mobile will tend to have a higher heart rate, meaning that the heart muscle has to work harder with each contraction. The harder the heart muscle works to ensure blood flow, the greater the blood pressure imposed on the arteries (Harahap et al., 2017). Therefore, physical activity greatly affects blood pressure stability. Physical activity can decrease the risk of being overweight, because when the body does not move, it will cause fat to accumulate.

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It can be concluded that there is an influence due to physical activity on the incidence of hypertension. The number of respondents who did not do physical activity is smaller, and this is evidenced by the number of respondents who did do physical activity suffering from hypertension being more than those who did not do physical activity. It is possible that people who have been engaging physical activity do not suffer from hypertension because doing so can affect the factors that cause hypertension.

The Effect of Obesity on Hypertension

Based on the results of the cross-tabulation in Table 3, there were 4790 respondents tested. Out of 223 (4.7%) respondents who were obese, there were 48 (21.5%) people who suffered from hypertension and 175 (78.5%) who did not. Meanwhile, of the 4567 (95.3%) respondents who were not obese, 393 (8.6%) had hypertension and 4174 (91.4%) did not.

Based on the results of the bivariate analysis using the chi square test, the p value (p = 0.000; OR = 1.102) showed that p was less than (0.05), which means that there is a relationship between obesity and the incidence of hypertension. In the multivariate analysis using logistic regression, the p value (p = 0.000; OR = 0.382) was less than (0.05), which means that obesity has an effect on the incidence of hypertension. The risk factors for obesity with hypertension are shown by the results of multivariate analysis which produced an OR value of 0.382. This means that respondents who are obese are 0.382 times more at risk of developing hypertension than respondents who are not obese.

The results of this analysis are in line with the research by Agustina and Raharjo (2015), which stated that there is a relationship between obesity and the incidence of hypertension with a p value of (p = 0.038; OR = 3.5). In addition, the results of the research conducted by Rahmayani (2019) are also in line with the results of the analysis of this study, which stated that there is a relationship between obesity and the incidence of hypertension with a value of (p = 0.007; OR = 5.573).

Obesity is one of the risk factors for hypertension. When a person is overweight, that person will need a lot of blood to supply oxygen and food to the body's tissues. This causes the volume of blood to increase, which puts greater pressure on the artery walls. In the study by (Puspita, 2014), it is stated that the risk for obese people is 8.4 times greater for hypertension than it is for people who are not obese.

It can be concluded that there is an interaction between obesity and the incidence of hypertension. From the results of the analysis, respondents who are obese have a large risk. There are a number of respondents who are not obese who suffer from hypertension, and the results of the analysis show this to be a significant value. However, obesity has a significant effect on blood pressure because, in general, obese people will find it difficult to move and when they want to move, they will need to exert more energy, which causes a person’s blood pressure to continue to rise.

Analysing large-scale data from different parts of Indonesia is the strength of this study. However, the cross-sectional design prohibits causal inference.

CONCLUSION

Based on the results of the research analysis on the risk factors for hypertension in Indonesia, it can be concluded through the logistic regression test that the factors that influence hypertension are gender, age, physical activity, and obesity.

SUGGESTIONS

Patients with hypertension in Indonesia are more likely to be men than women. It is expected for men to pay more attention to their health by checking their blood pressure regularly, so then they can detect hypertension early. Patients with hypertension are more likely to be over the age of 40 than aged <40. It is expected for people to engage in a healthy and clean lifestyle to avoid hypertension.

Patients with hypertension who engage in physical activity have a greater risk. So it is expected for them to continue to do physical activities such as exercise and to take hypertension medication regularly. Hypertension often occurs in the group of respondents who are obese, so it is hoped that they will be more aware of the other causal factors of hypertension as well. Hopefully, this research can be used as an evaluation and

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http://dx.doi.org/10.20473/jphrecode.v5i2.27923

comparison material for future research in more detail.

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