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**Yosef Pandai Lolan**  
Bachelor Programme Public  
Health, Bhakti Kencana  
University, Bandung,  
Indonesia

**Supriyatni Kartadarma**  
Bachelor Programme Public  
Health, Bhakti Kencana  
University, Bandung,  
Indonesia

**Corresponding Author:**  
**Yosef Pandai Lolan**  
Bachelor Programme Public  
Health, Bhakti Kencana  
University, Bandung,  
Indonesia

## Relationship between physical activity and smoking with hypertension incidence in productive age

**Yosef Pandai Lolan and Supriyatni Kartadarma**

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### Abstract

**Background:** This hypertension problem is a health challenge in Indonesia. The tendency to increase the prevalence of hypertension in the productive age group is one of them caused by the level of busyness and an unhealthy lifestyle, thus increasing the risk of hypertension in the productive age group.

**Aim:** The purpose of this study was to analyze the relationship between physical activity and smoking with hypertension incidence in productive age.

**Method:** The type of research used is quantitative with case control research design. The population in this study is all patients who visit and treat to the general poly recorded in the report register at the Neglasari Health Center. The sample in this study was 400 respondents. The sample was taken using a simple random technique. The instruments used are check sheets and questionnaires. Data analyzed using chi square test.

**Results:** The results of the study showed that factors that were proven to be related to the incidence of hypertension were physical activity ( $p=0.000$ ), smoking ( $p=0.000$ ).

**Conclusion:** A factor that has been shown to be associated with the incidence of hypertension is physical activity and smoking. It is recommended to health workers to provide education to the community, especially the productive age about hypertension prevention.

**Keywords:** Hypertension, physical activity, smoking

### Introduction

This hypertension problem is a health challenge not only in Indonesia but almost all over the world. An estimated 1.28% of adults aged 30-79 years worldwide suffer from hypertension, two-thirds of whom live in low- and middle-income countries [1]. Based on WHO data related to the prevalence of hypertension, globally the prevalence of hypertension is 22% of the total world population, while for the prevalence of hypertension based on WHO region, Africa is the region with the highest prevalence of hypertension with a percentage of 27%, then followed by the Eastern Mediterranean with the prevalence of hypertension at 26% and Southeast Asia is third with a percentage of 25% (Kemenkes RI, 2019a).

Based on basic health research data in 2018, the prevalence of hypertension based on the results of blood pressure measurements in the  $\geq 18$ -year-old population in Indonesia, which amounted to 34.11% the prevalence of hypertension in 2013 which was 25.8%. The first highest prevalence of hypertension in Indonesia is in South Kalimantan Province with a prevalence of 44.13% then ranked second with the highest prevalence of hypertension, namely West Java Province with a prevalence of hypertension of 39.6% and for the lowest prevalence of hypertension in Papua Province which is 22.2%. The highest prevalence of hypertension in West Java is in Ciamis Regency with a prevalence of 49.6%, Bandung City itself with a prevalence of 36.79% [3].

The prevalence of hypertension in Indonesia is more prevalent in the age group of  $\geq 75$  years with a prevalence of 69.5%, it is because physiologically the higher a person's age, the greater the risk to suffer from hypertension, it is caused by a decrease in organ function in the body (Kemenkes RI, 2019b). While the prevalence of hypertension in the 18-24 year old age group is 13.2% and in the 25-34 age group of 20.1% where the group is a productive age group, the prevalence of the productive age group tends to increase, compared to 2013 where the prevalence of hypertension in the 15-24 year old age group is 8.7% and in the age group 25-34 by 14.7% [4].

The tendency to increase the prevalence of hypertension in the productive age group is one of them caused by the level of busyness and an unhealthy lifestyle, thus increasing the risk of hypertension in the productive age group [5]. Low healthy living behaviors such as lack of physical activity, lack of fruit and vegetable consumption, smoking habits, drinking alcohol habits, poor diet such as high salt and fat is one of the many lifestyles that cause hypertension including in the productive age group [1].

Previous research conducted the tendency to the incidence of hypertension occurs in those who have an unhealthy lifestyle, such as lack of physical activity, smoking, excessive salt consumption, alcohol consumption, in addition there are other factors such as genetics, obesity, stress, using oil [6, 7]. Other studies say that the incidence of hypertension is caused by a family history of hypertension, stress levels, and lifestyle [5].

From the data of the annual report of up Puskesmas Neglasari Bandung City regarding the top 10 highest diseases, with the most non-specific ISPA disease in the puskesmas. High cases of degenerative diseases such as hypertension caused by behavior. In 2018, the number of cases was 6,031 people with hypertension, almost 50% of visitors at the Neglasari health center were diagnosed with hypertension. Efforts in overcoming cases of hypertension in the Neglasari health center have been widely carried out, ranging from prevention and treatment, namely home visits, socialization and counseling. However, cases of hypertension are still increasing because there are still many people who do not know that they suffer from hypertension and people who have been diagnosed with hypertension do not routinely do health checks and supported by several other factors such as people's lifestyle that is not good such as lack of physical activity, diet that likes to consume hypertension-inducing foods excessively and smoking habits that cannot be stopped properly. The purpose of this study was to analyze the relationship between physical activity and smoking with hypertension incidence in productive age.

**Method**

The type of research used is quantitative with case control research design [8]. This design is used to analyze the relationship of physical activity and smoking habits with the incidence of hypertension. This research was conducted in the working area of the Neglasari Health Center. The population in this study is all patients who visit and treat to the general poly recorded in the report register at the Neglasari Health Center. The sample in this study was 400 respondents, consisting of 200 case groups (people with hypertension) and 200 control groups (not suffering from hypertension). Samples were taken using a simple random technique with criteria for people aged 15-64 years.

The study used skunder data and primary data. Skunder data is the data of hypertensive patients and the characteristics of respondents seen from the general poly register book. Primary data is data on physical activity and smoking habits. The instruments used are check sheets and questionnaires.

The analysis of the data used is a univariate analysis that is to determine the distribution of age, gender, history of hypertension, physical activity and smoking habits. To find out the relationship between physical activity and smoking habits with the incidence of hypertension, the Chi Square

(X2) test was used.

**Result**

**Table 1:** Characteristics of Respondents

Characteristics of Respondents	N	%
Age		
≥ 45 Years	255	63,7
< 45 Years	145	36,3
Gender		
Man	153	38,3
Woman	247	61,8
History of Hypertension		
Yes	195	48,8
Not	205	51,2
Total	400	100

Table 1 explains that the vast majority of respondents were ≥ 45 years old (63.7%), female (61.8%), and more than half of respondents had no history of hypertension (51.2%).

**Table 2:** Overview of Physical Activity, Smoking Habits, Excess Salt Consumption and Alcohol Consumption

Variable	N	%
<b>Physical activity</b>		
Less	221	55,3
Enough	179	44,7
<b>Smoking habits</b>		
Smoke	177	44,3
No smoking	223	55,7
Total	400	100

Table 2 explained that more than half of respondents were less physical activity (55.3%), and smoking (55.7%)

**Table 3:** Relationship between Physical Activity and Smoking with Hypertension Incidence In Productive Age

Factors	Incidence of Hypertension				P-Value	OR (95% CI)
	Case		Control			
	N	%	N	%		
<b>Physical activity</b>						
Less	151	75,5	70	35,0	0,000	5,723 (3,708-8,832)
Enough	49	24,5	130	65,0		
<b>Smoking habits</b>						
Smoke	106	53,0	71	35,5	0,000	2,049 (1,372-3,060)
No smoking	94	47,0	129	64,5		

Table 3 shows that factors found to be significantly associated with the incidence of hypertension are physical activity (p=0.000), smoking (p=0.000).

**Discussion**

This study proves physical activity is significantly associated with the incidence of hypertension. A person who lacks physical activity has a 5.7 chance of suffering from hypertension. These results are consistent with other studies in the city of Bandung which stated that less physical activity can cause hypertension [9]. In line with several other studies that state that one of the risk factors that cause hypertension is due to lack of physical activity [10].

The results in the field showed that in the group of cases most of them did less physical activity, which was 75.5%. Based on the statements of some respondents they do not do olahraga because of laziness, busy work, so they do not have

enough time to do olahraga. Some respondents stated that they do olahraga if they have time, and most respondents only do olahraga once a week, namely on holidays only. Exercise is widely associated with the management of non-communicable diseases, because isotonic and regular exercise can lower peripheral resistance that will lower blood pressure (for hypertension) and train the heart muscle so that it becomes accustomed if the heart has to do more strenuous work due to certain conditions <sup>[11]</sup>.

In addition, in this study also examined physical activity that is categorized as being less and enough. Most of the physical activity that respondents did was less physical activity, such as just doing homework, walking in the office environment. Lack of physical activity increased the risk of high blood pressure due to the increased risk of becoming obese. Inactive people tend to have faster heart rates and their heart muscle has to work harder on each contraction, the harder and more often the heart has to pump the greater the force that urges the arteries <sup>[12]</sup>. Therefore, to avoid the occurrence of hypertension must do enough physical activity by doing olahraga for 30 minutes or more continuously and done a week 3 times a week <sup>[9]</sup>.

This study proves that smoking is significantly associated with the incidence of hypertension. A person who smokes has a 2-time chance of suffering from hypertension. These results are consistent with research conducted in the city of Bandung, which stated that the incidence of hypertension is more work in people who are active smokers <sup>[13]</sup>. Other studies also mention that smoking habits can increase a person's risk of suffering from hypertension <sup>[14]</sup>.

The results on the field showed that more than half of the group of cases had a smoking habit of 53%. Researchers are trying to dig deeper into information to avoid information bias in smoking habits. Some respondents stated that they had had a smoking habit for more than 15 years. So it can be ascertained that smoking habits do not precede the occurrence of hypertension. Smoking has a huge role in increasing blood pressure, this is caused by nicotine contained in cigarettes that triggers the hormone adrenaline which causes blood pressure to increase <sup>[15]</sup>.

Nicotine is absorbed by the blood vessels in the lungs and circulated throughout the other bloodstream so that there is a narrowing of the blood vessels. This causes the work of the heart to increase to pump blood throughout the body through narrow blood vessels <sup>[16]</sup>. In addition, smoking can increase the heart rate of blood vessel damage is also caused by depositing cholesterol in blood vessels, so that the heart works faster <sup>[17]</sup>.

This study proves that excess salt consumption is significantly associated with the incidence of hypertension. A person who consumes excess salt every day has a 2-time chance of suffering from hypertension. These results are consequential with previous studies stating that the incidence of hypertension can be caused by excessive salt consumption <sup>[18]</sup>. In line with other studies conducted at the productive age, which stated that salt consumption is significantly associated with the incidence of hypertension at productive age <sup>[19]</sup>.

## Conclusion

A factor that has been shown to be significantly associated with the incidence of hypertension is physical activity. A person who lacks physical activity has a 5.7 chance of suffering from hypertension. Smoking habits, a person who

smokes has a 2-time chance of suffering from hypertension. Excessive salt consumption, A person who consumes excess salt every day has a 2-time chance of suffering from hypertension. And onsumsi alcohol, a person who consumes alcohol has a 2-time chance of suffering from hypertension. It is recommended to health workers to provide education to the community, especially the productive age about hypertension prevention.

## Conflict of Interest

Not available

## Financial Support

Not available

## Reference

1. WHO. Hypertension, World Health Organization. 2021 Aug 25. <https://www.who.int/news-room/fact-sheets/detail/hypertension> (accessed Mar. 11, 2022).
2. Kemenkes RI. Hipertensi Sih Pembunuh Senyap, Jakarta; c2019. Accessed: Mar. 11, 2022. [Online]. Available: <https://pusdatin.kemkes.go.id/resources/download/pusdatin/infodatin/infodatin-hipertensi-si-pembunuh-senyap.pdf>
3. Kemenkes RI. Hasil Utama Riset Kesehatan Dasar (RISKESDAS), J Phys A Math Theor. 2018;44(8):1-200.
4. Kemenkes RI. Riset kesehatan dasar, Jakarta: Badan Penelitian dan Pengembangan Kesehatan; c2013.
5. Kasumayanti E, Maharani M. Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Usia Produktif Di Desa Pulau Jambu Wilayah Kerja UPTD Puskesmas Kuok, Jurnal Ners. 2021;5(1):1-7.
6. Agustina R, Raharjo BB. Faktor risiko yang berhubungan dengan kejadian hipertensi usia produktif (25-54 tahun), Unnes Journal of Public Health; c2015, 4(4).
7. Sutriyawan A, Endah Y, Miranda TG. Relationship between Physical Activity and Routine Health Checks with Incidence of Hypertension, Hypertension. 2021;44(57):9.
8. Sutriyawan A. Metodologi Penelitian Kedokteran dan Kesehatan: Dilengkapi Tuntunan Membuat Proposal Penelitian, Bandung: PT Refika Aditama; c2021.
9. Sutriyawan A, Apriyani R, Miranda TG. The Relationship between Lifestyle and Hypertension Cases at UPT Cibiru Public Health Center Bandung City, Disease Prevention and Public Health Journal. 2021;15(1):50-56.
10. Garwahasada E, Wirjatmadi RB. Hubungan Jenis Kelamin, Perilaku Merokok, Aktivitas Fisik Dengan Hipertensi Pada Pegawai Kantor [Correlation of Sex, Smoking Habit, Physical Activity and Hypertension among Office Employee], Media Gizi Indonesia. 2020;15(1):60-65.
11. Ladyani F, Febriyani A, Prasetya T, Berliana I. Hubungan antara Olahraga dan Stres dengan Tingkat Hipertensi Pada Lansia, Jurnal Ilmiah Kesehatan Sandi Husada. 2021;10(1)82-87.
12. Nasution LK, Rambe NY. Penyakit Hipertensi Pada Lansia Di Desa Huraba Kecamatan Batang Angkola Kabupaten Tapanuli Selatan Tahun 2020. Jurnal Pengabdian Masyarakat Aupa (JPMA). 2020;2(3):49-

- 53.
13. Sutriyawan A. Relationship of Smoking Behavior With Hypertension Events In Neglasari Health Center Bandung City, Afiasi: Jurnal Kesehatan Masyarakat. 2019;4(3):97-104.
  14. Dismiantoni N, Anggunan A, Triswanti N, Kriswiastiny R. Hubungan Merokok Dan Riwayat Keturunan Dengan Kejadian Hipertensi, Jurnal Ilmiah Kesehatan Sandi Husada. 2020;9(1):30-36. DOI: <https://doi.org/10.35816/jiskh.v11i1.214>.
  15. Tanjung DNH, Meilianingsih L, Suheti T, Husni A. Gambaran Gaya Hidup Sehat pada Klien Hipertensi (Study Literatur Review), Jurnal Keperawatan Indonesia Florence Nightingale. 2021;1(1):24-33.
  16. Suharno S. Faktor-Faktor Individu Yang Berhubungan Dengan Hipertensi Di Wilayah Kerja UPTD Puskesmas Cigasong Kabupaten Majalengka Tahun 2017, Jurnal Kampus STIKES YPIB Majalengka. 2018;6(1):1-10.
  17. Oktaviani E, Prastia TN, Dwimawati E. Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Pada Pra Lansia Di Puskesmas Bojonggede Tahun 2021,” Promotor. 2022;5(2):135-147.
  18. Purwono J, Sari R, Ratnasari A, Budianto A. Pola Konsumsi Garam Dengan Kejadian Hipertensi Pada Lansia, Jurnal Wacana Kesehatan. 2020;5(1):531-542.
  19. Agustina R, Raharjo BB. Faktor risiko yang berhubungan dengan kejadian hipertensi usia produktif (25-54 tahun), Unnes Journal of Public Health; c2015, 4(4).

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