

The Relationships between Smoking and Coffee Drinking Habits with Hypertension in Internal Medicine Polyclinic Patients at Malingping Hospital Banten

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Abstract

Background: Hypertension is a disease that is often found in the community and its prevalence continues to increase. One of the modifiable factor related to hypertension is smoking and dietary consumption. This study aimed to identify the relationships between smoking and drinking coffee with the incidence of hypertension in Internal Medicine Polyclinic patients at Malingping Hospital.

Methods: The study used is cross sectional. Data was collected by measuring blood pressure and questionnaires. A sample of 52 respondents was taken by accidental sampling and analyzed using chi-square.

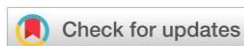
Results: The study showed that there was significant relationship between smoking and hypertension P -value = 0.021 and coffee drinking habits with hypertension P value = 0.001.

Conclusion: Hospitals or health workers are expected to provide counseling in the form of health education about managing smoking habits and coffee consumption as an effort to prevent hypertension in the community.

Keywords: hypertension, smoking, drinking coffee

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INTRODUCTION

In general, a normal or desired blood pressure is systolic blood pressure <130 mmHg and diastolic blood pressure <85 mmHg. Hypertension is abnormally high blood pressure and if it has been measured at least on three different occasions. A person is considered to have hypertension if the blood pressure is higher than 140/90 mmHg.

The World Health Organization (WHO, 2021) revealed that around 1.28 billion people in the world have hypertension. The report showed that one in five people in the world with hypertension have it under control (WHO, 2021). The number of people with hypertension in the world continues to increase every year, it is estimated that in 2025 there will be 1.5 billion people who have hypertension. It is also estimated that every year 9.4 million people die from hypertension and complications (Kemenkes RI, 2019a)

In 2019, 1,857,866 people experienced hypertension with a higher percentage in women and only 50 percent of the total estimated hypertension survivors in Banten Province received health services. In Tangerang City, 100 percent of hypertension sufferers receive health services, while Serang City has the lowest percentage of hypertension survivors receiving health services with 17.8 percent (Kemenkes RI, 2019b).

In 2005, 22% of adults had consumed tobacco. The ratio is 36% of men smoke to 8% of women. The World Health Organization (WHO) states that Indonesia ranks third in the number of smokers, reaching 146,860,000 people (SEATCA, 2018). Caffeine can stimulate the heart to work faster so that it flows more fluid every second. The habit of drinking coffee is obtained from one cup of coffee containing 75-400 mg of caffeine, so drinking more than four cups of coffee a day can increase systolic blood pressure by about 10 mmHg and diastolic blood pressure by about 8 mmHg (Rahmawati & Daniyati, 2016).

Various things are associated with risk factors for hypertension. In general, there are two factors that cause hypertension, namely modifiable risk factors and non-modifiable risk factors. The modifiable risk factors include less consumption of fruits and vegetables, consuming too much salt or salty foods, consuming too much caffeine and alcohol, smoking, lack of exercise, being overweight, and sleeping pattern disorders. Moreover, food selection for daily consumption is very important for patients with chronic disease (Lestari et al., 2018).

A preliminary survey conducted by researchers on five patients with hypertension who went to the Internal Medicine Polyclinic at Malingping Hospital where the results showed that four out five patients had a smoking habit and all of them had a habit of drinking coffee. Coffee consumption may reduce the risk of type 2 diabetes mellitus and hypertension, as well as other conditions associated with cardiovascular risk such as obesity and depression, but can adversely affect lipid profiles depending on how the drink is prepared (O’Keefe et al., 2013). Therefore, this study aimed to identify the relationship between smoking habits and coffee consumption with the incidence of hypertension in Malingping Hospital.

METHODS

The type of study used a descriptive cross-sectional design. The sample in this study were all patients who went to the Internal Medicine Clinic at the Malingping Hospital at the time of the study as many as 52 respondents. Inclusion criteria included hypertensive patients at the Internal Medicine Clinic at Malingping Hospital, at least 21 years old, consuming coffee, being able to read and write. Exclusion criteria included patients with secondary hypertension, benign or malignant hypertension, and uncooperative patients.

Sampling collection technique with accidental sampling. Blood pressure data collection by measuring blood pressure directly and using a questionnaire sheet. The study was conducted by considering and using several research ethics, including anonymity, autonomy, and nonmaleficence.

RESULTS

Based on the results of blood pressure measurements and questionnaire collection, the results of the frequency distribution of respondents' characteristics are as follows:

Table 1. Demographic Characteristics (N=52)

Variable	n (%)
Age:	
Mean, ± SD	44,88, ± 10,753,
Min-Max	28-75

Variable	n (%)
Sex:	
Men	29 (55,8%)
Women	23 (44,2%)
Education:	
No School	3 (5,8%)
Primary School	8 (15,4%)
Junior High School	22 (42,3%)
Senior High School	11 (21,1%)
College	8 (15,4%)

The minimum age of the respondent is 28 years and the maximum age of the respondent is 75 years. The majority of respondents are male and have an education at the end of junior high school. While the univariate results in this study included the degree of hypertension, smoking habits, and coffee drinking habits.

Table 2. Hypertension Frequency Distribution (N=52)

Hypertension	Frequency (n)	Persentation (%)
First degree hypertension	5	9,6
Second degree hypertension	25	48,1
Third degree hypertension	22	42,3

Based on table 2, it is known that from 52 respondents, most of the respondents (48.1%) had grade 2 hypertension.

Table 3. Frequency Distribution of Smoking Habits (N=52)

Hypertension	Frequency (n)	Persentation (%)
Smoking	28	53,8
Do not smoking	24	46,2

Based on table 3, it is known that from 52 respondents, most of the respondents (53.8%) have a smoking habit.

Table 4. Frequency Distribution of Coffee Drinking Habits (N=52)

Drinking coffee	Frequency (n)	Persentation (%)
High	27	51,9
Low	25	48,1

Based on table 4, it is known that from 52 respondents, most of the respondents (51.9%) have a high coffee drinking habit.

Table 5. The Relationship between Smoking Habits and Hypertension Incidence

Smoking	Hypertension						Total		<i>p value</i>
	3 rd		2 nd		1 st		n	%	
	n	%	n	%	n	%			
Merokok	3	5,8	18	34,6	7	13,5	28	53,8	0,021
Tidak Merokok	2	3,8	7	13,5	15	28,8	24	46,2	

Based on table 5 it can be concluded that 18 respondents who smoked had grade 2 hypertension. Meanwhile, 15 respondents who did not smoke had grade 1 hypertension.

Table 6. The Relationship between Coffee Drinking Habits and Hypertension Incidence

Drinking coffee	Hypertension						Total		<i>p value</i>
	3 rd		2 nd		1 st		n	%	
	n	%	n	%	n	%			
High	5	9,6	17	32,7	5	9,6	27	51,9	0,001
Low	0	0,0	8	15,4	17	32,7	25	48,1	

Based on table 6 it can be concluded that 17 respondents who have a high habit of drinking coffee have grade 2 hypertension and 17 respondents who have a low coffee drinking habit have grade 1 hypertension.

DISCUSSION

Characteristics of respondents

The average age of the respondents in this study was 45 years with the highest age being 75 years. With increasing age, various systems in the body experience a decline in function. Blood vessels stiffen with age, triggering an increase in blood pressure. With increasing age, it can increase the risk of increasing blood pressure (Whitney & Rolfes, 2008). The majority of the sexes in this study were male. The habit of smoking and drinking coffee is identical to the habits carried out by men. According to infodatin most women smoke less than 1 cigarette per day while men smoke 1 cigarette per day (Kementerian Kesehatan RI, 2015). Meanwhile, according to Sirait et al., (2002) half of male smokers consume 11-20 cigarettes/day.

The results of data analysis show that the majority of respondents' education is junior high school. This is in line with the survey conducted by Sirait et al., (2002) which shows that respondents who smoke more than 20 cigarettes per day with a high school and college education are more than respondents with higher education. This can be because respondents with higher education have better knowledge and awareness about the dangers of smoking to health.

The relationship between smoking habits and the incidence of hypertension

Based on the Chi-Square statistical test on the relationship between smoking and hypertension, p value = $0.021 < (0.05)$ indicates that there is a significant relationship between smoking habits and the incidence of hypertension in Malingping Hospital. Based on table 5 shows that smoking habits can also increase a person's hypertension degree. Meanwhile, respondents who do not smoke but have grade 1 hypertension can be caused by other risk factors such as age, gender, and obesity.

Substances contained in cigarettes can damage the lining of the artery walls causing the blood vessels to become stiff. This causes narrowing of the arteries which can increase blood pressure. In addition, the nicotine content in cigarettes can increase the hormone epinephrine which can constrict arteries. Carbon monoxide gas produced by burning cigarettes can be inhaled and causes the heart to work harder to replace the supply of oxygen to body tissues. Heavier heart work can increase blood pressure.

The influence of chemicals contained in cigarettes such as nicotine, carbon monoxide and tar will stimulate the work of the central nervous system and the sympathetic nervous system, resulting in increased blood pressure and faster heart rate. The results of this study are in line with the research conducted by (Kartikasari, 2015) in Kabongan Kidul Village which found that smoking has been proven to be a risk factor for hypertension. The study showed that people with smoking habits had a 9.537 times greater risk of developing hypertension than people who did not smoke.

One of the chemicals contained in cigarettes is carbon monoxide (CO) gas which is toxic which is contrary to oxygen in its transport and use. Cigarettes contain 2-6% CO when smoking, while the lowest CO inhaled by smokers is 400 ppm (parts per million) and can increase carboxy hemoglobin levels in the blood by 2-16% (Sitepoe, 2000). CO gas can also cause hemoglobin desaturation, reduce direct oxygen circulation to tissues throughout the body including the myocardium. CO replaces oxygen in hemoglobin, interferes with the release of

oxygen, and accelerates atherosclerosis (calcification or thickening of blood vessel walls. Carbon monoxide in cigarette smoke will replace oxygen binding in the blood vessels). This causes blood pressure to increase as the heart is forced to pump to get enough oxygen into other organs and tissues of the body.

The relationship between coffee drinking habits and the incidence of hypertension

Based on the Chi-Square statistical test to see the relationship between coffee consumption and hypertension, p value = $0.001 < (0.05)$ indicates that there is a significant relationship between coffee drinking habits and the incidence of hypertension in Malingping Hospital. Based on table 6, it can also be seen that there is an increase in the number of respondents who have grade 1 hypertension to grade 2 hypertension along with high coffee drinking habits. This is in line with previous study conducted by (Martiani & Lelyana, 2012) which showed that respondents who consumed 1-2 cups of coffee per day increased the risk of hypertension 4.11 times higher ($p = 0.017$; OR = 4.11; 95% CI: 1,22-13,93) compared to subjects who do not drink coffee. The results of Rahmawati & Daniyati, (2016) also show that there is a relationship and has a very strong degree of relationship between coffee drinking habits and hypertension levels. In contrast to the results of research conducted by (Bistara & Kartini, 2018) which showed there was no relationship between coffee drinking habits and hypertension. This can be due to the higher level of coffee consumption in respondents where in one day the majority of respondents usually consume coffee above 5 cups per day. Based on the results of this study, those who have a habit of consuming high coffee are those who spend a lot of time at home and have little activity outside the home, so they have more opportunities to consume coffee.

Coffee can affect blood pressure because it contains polyphenols, potassium, and caffeine (Bistara & Kartini, 2018). Caffeine has a competitive antagonistic effect on adenosine receptors. Adenosine is a neuromodulator that affects a number of functions in the central nervous system. This has an impact on vasoconstriction and increases total peripheral resistance, which will cause high blood pressure. This proves that the increase in blood occurs through biological mechanisms, including caffeine binding to adenosine, activating the sympathetic nervous system by increasing the concentration of catecholamines in plasma, and stimulating the adrenal glands and increasing cortisol production so that it has an impact on vasoconstriction and increases total peripheral resistance so that blood pressure rises (Martiani & Lelyana, 2012).

However, epidemiological studies show that drinking coffee can reduce the risk of death from cardiovascular disease. Potential benefits also include protection against neurodegenerative diseases, improved asthma control, and a lower risk of gastrointestinal disease (O’Keefe et al., 2013). Based on study results, daily intake of 2 to 3 cups of coffee is safe and has a neutral to beneficial effect (O’Keefe et al., 2013). However, it is necessary to consider other effects of the caffeine contained in coffee. In addition, people also need to pay attention to the composition of the coffee they consume to get a good effect and avoid the bad effects of coffee consumption.

CONCLUSION

Based on the results of the study, it is known that from 52 respondents, most of the respondents had grade 2 of hypertension, most of the respondents had a smoking habit and most of the respondents had a high coffee drinking habit. There is a relationship between smoking and drinking coffee with the incidence of hypertension in Malingping Hospital. Moreover, the health workers are suggested to provide counseling about managing smoking and coffee drinking habits as an effort to prevent hypertension. In addition, it is necessary to have the closest cross-sectoral collaboration with the community and health cadres in counseling the risk factors and dangers of hypertension.

REFERENCES

- Bistara, D. N., & Kartini, Y. (2018). Hubungan Kebiasaan Mengkonsumsi Kopi dengan Tekanan Darah Pada Dewasa Muda. *Jurnal Kesehatan Vokasional*, 3(1), 23. <https://doi.org/10.22146/jkesvo.34079>
- Kartikasari, A. N. (2015). Faktor risiko hipertensi pada masyarakat di Desa Kabongan Kidul, Kabupaten Rembang.
- Kemkes RI. (2019a). Hipertensi Penyakit Paling Banyak Diidap Masyarakat. Retrieved June 15, 2022, from <https://kemkes.go.id/article/view/19051700002/hipertensi-penyakit-paling-banyak-diidap-masyarakat.html>
- Kemkes RI. (2019b). Laporan Provinsi Banten RISKESDAS 2018. *Badan Penelitian Dan Pengembangan Kesehatan*, 575.
- Kementerian Kesehatan RI. (2015). Infodatin: Perilaku merokok masyarakat Indonesia berdasarkan riskesdas 2007 dan 2013. *Pusat Data Dan Informasi Kementerian Kesehatan RI*, pp. 2–12.

- Lestari, D., Winahyu, K., & Anwar, S. (2018). Kepatuhan Diet pada Klien Diabetes Melitus Tipe 2 Ditinjau dari Dukungan Keluarga di Puskesmas Cipondoh Tangerang. *Jurnal Ilmiah Keperawatan Indonesia*, 2(1), 83-94.
- Martiani, A., & Lelyana, R. (2012). Faktor Risiko Hipertensi Ditinjau dari Kebiasaan Minum Kopi (Studi Kasus di Wilayah Kerja Puskesmas Ungaran pada Bulan Januari-Februari 2012). *Journal of Nutrition College*, 1(1), 78–85.
<https://doi.org/10.14710/jnc.v1i1.678>
- O’Keefe, J. H., Bhatti, S. K., Patil, H. R., Dinicolantonio, J. J., Lucan, S. C., & Lavie, C. J. (2013). Effects of habitual coffee consumption on cardiometabolic disease, cardiovascular health, and all-cause mortality. *Journal of the American College of Cardiology*, 62(12), 1043–1051. <https://doi.org/10.1016/j.jacc.2013.06.035>
- Rahmawati, R., & Daniyati, D. (2016). Hubungan Kebiasaan Minum Kopi Terhadap Tingkat Hipertensi. *Journal of Ners Community*, 7(2), 149–161.
- SEATCA. (2018). Indonesia: Number of Smokers. Retrieved from <https://timonitor.seatca.org/indonesia/>
- Sirait, A. M., Pradono, Y., & Toruan, I. L. (2002). Perilaku Merokok di Indonesia. *Buletin Penelitian Kesehatan*, 30(3), 139–152.
- Sitepoe, M. (2000). *No Title Kekhususan rokok di Indonesia*. Jakarta: Gramedia Widiasarana Indonesia.
- Whitney, E., & Rolfes, S. R. (2008). *Hypertension: Understanding Nutrition 1th Edition*. Belmont: Wadsworth.
- WHO. (2021). Hypertension. Retrieved February 28, 2021, from <https://www.who.int/news-room/fact-sheets/detail/hypertension>