The Correlation Between Smoking Behavior and Hypertension in the Productive Age Population at Banjar Ubung Kaja, North Denpasar

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Abstract: Hypertension is an asymptomatic condition in which abnormally high pressure in the arteries causes an increased risk of stroke, aneurysm, heart failure, and heart attack among other conditions. One of the causes of hypertension is smoking, which is an activity many people engage in, including teenagers or people in the productive age. This study aimed to determine the correlation between smoking behavior and hypertension of people in the productive age at Banjar Ubung Kaja, North Denpasar. This study employed a correlational analytic design with a cross-sectional approach. There were 183 respondents recruited as the sample through probability sampling with the random sampling technique. The data were collected using observation sheets, sphygmomanometer tools, and a questionnaire. Furthermore, the data were processed through the bivariate data analysis with Spearman's Rho test. This study found that based on the statistical analysis test, the p-value (sig) was 0.000 (<0.05), which meant that there was a correlation between smoking behavior and hypertension in productive age people at Banjar Ubung Kaja, North Denpasar. There was a correlation between smoking behavior and the incidence of hypertension with a significant correlation value of -.397. This indicates that the higher the smoking behavior, the higher the incidence of hypertension.

1 INTRODUCTION

Hypertension is a blood circulation system disorder that results in an increase in blood pressure above the normal value or blood pressure of 140/90 mmHg (KEMENKES, 2019). Hypertension is an asymptomatic condition, where abnormally high pressure in the arteries causes an increased risk of stroke, aneurysm, heart failure, heart attack, and damage (Umam et al., 2020). Hypertension is a silent killer where symptoms can vary in each individual and are almost the same as the symptoms of other diseases. Hypertension symptoms include headache/a heavy feeling in the neck, nausea (vertigo), heart palpitations, being easily fatigued, blurred vision, ringing in the ears (tinnitus), and nosebleeds (KEMENKES, 2019).

According to data from the World Health Organization (WHO) in 2015, hypertension is defined as having a systolic blood pressure of 140 mmHg and/or diastolic blood pressure of 90 mmHg. The WHO has predicted that by 2025, 1.5 billion people in the world will suffer from hypertension every year (Umam et al., 2020). The high hypertension incidence in the world is influenced by two types of factors, namely modifiable and non-modifiable. Non-modifiable factors are those that cannot be changed such as age, gender, and race. Modifiable factors include obesity, alcohol consumption, lack of exercise, excessive salt consumption, and smoking habits.

Smoking is a problem that continues to grow, and a solution has not been found in Indonesia until now. According to WHO data from 2011, in 2007, Indonesia was in the 5th position with the highest number of smokers in the world (Suhadi & Pratiwi, 2020). Smoking can cause hypertension due to chemicals contained in tobacco that can damage the inner lining of the artery walls, making the arteries more susceptible to plaque buildup (atherosclerosis).

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This is mainly due to nicotine which can stimulate the sympathetic nerves, which triggers the heart to work harder and causes blood vessel constriction. This also triggers the carbon monoxide function, which can replace oxygen in the blood and force the heart to meet the body's oxygen needs. Today, smoking is not taboo for most people. Smoking behavior has been entrenched in the global community, especially among teenagers.

The chemicals contained in cigarettes are addictive, which means they can cause dependence, and if they are dependent, people will continue to smoke cigarettes. Smoking behavior, especially in adolescents, if carried out continuously, will cause various diseases, one of which is hypertension. This study was carried out in Banjar Ubung Kaja, North Denpasar on adults and adolescents. The stages of development can be characterized by an increased smoking frequency and intensity. This often results in them becoming addicted to nicotine. Nicotine can cause addiction, both in active smokers and passive smokers.

Nicotine is a stimulant alkaloid (Dwi, 2013). Smoking behavior refers to sucking tobacco smoke from a lit cigar or cigarette. Smoking can cause hypertension due to the chemicals contained in tobacco, especially nicotine, which can stimulate the sympathetic nerves to trigger the heart to work faster. This results in quicker blood circulation and blood vessel constriction. This also impacts carbon monoxide's role in replacing oxygen in the blood and forcing the heart to meet the body's oxygen needs (Rachmat et al., 2013).

2 METHODS

This study used a correlative analytic research design with a cross sectional approach. It was conducted from February to March 2022. The population in this study was the productive age community in Banjar Ubung Kaja, North Denpasar with a total of 350 people. The sampling technique used was probability sampling. Data collection was carried out using Google Forms and tension measuring devices. The inclusion criteria in this study were people who were willing to participate, agreed to sign the study's informed consent form, had a mobile phone with the WhatsApp (WA) application and were able to use it, and people of productive age (15-64 years) who smoked.

The research instrument consisted of four parts, the first part being informed consent, the second part demographic data, the third part a smoking behavior questionnaire, and the fourth part a hypertension observation sheet. The smoking behavior questionnaire was a standardized questionnaire, and there were changes made according to a validity test. The hyperthesis observation sheet was a non-standard observation sheet on which the validity test had been carried out. The normality test in this study had the value of sig < 0.05. Data were analyzed using Spearman's Rho test.

3 RESULTS

Table 1: Respondents' Characteristics.

Characteristic	Frequency (n)	Percentage (%)
Productive Age (17-60)	183	(100%)
Gender		
Male	177	(98%)
Female	6	(2%)
Occupation		
Student	38	923%)
Government employee	19	(5%)
Farmer	48	(30%)
Private employee	11	(9%)
Laborer	26	(14%)
Businessman	38	(25)
Unemployed	3	(2%)
Marital Status		
Married	111	(85%)
Single	72	(15%)

Table 1 shows respondents' characteristics in this study, namely age, gender, occupation, and marital status (n = 183). Based on the results of data collection, it is evident that the majority of respondents were 56. Based on occupation, the largest proportion of respondents were farmers with as many as 48 with that occupation (26.2%). Based on marital status, the majority were married, with as many as 111 respondents (60.7%). Based on the results of data collection, it was found that the majority of respondents engaged in light smoking behavior at as many as 150 respondents (82%), and heavy smoking behavior was identified in as many as 33 respondents (18%).

Table 2: Hypertension History.

Hypertension History	Characteristics	Frequency (n)	Percentage (%)
History of HT	Yes	160	87.4%
	No	23	12.6%
Diagnosed with HT	Yes	160	87.4%
	No	23	12.6%
History of genetic HT	Yes	163	89.1%
	No	20	10.9%

On the distribution of hypertension frequency and percentage (n = 183) (31.7%), stage 1 hypertension category was found in as many as 28 respondents (15.3%), and stage 2 hypertension in as many as six respondents (3.3%). Table 2 consists of the correlation coefficient (r), p-value, and the number of respondents. Spearman's Rho was used to analyze the relationship between smoking behavior and hypertension in the productive age population in Banjar Ubung Kaja, North Denpasar (n = 183). Other variables and data were not normally distributed with a p-value of 0.000 (p <0.05), which means Ha was accepted and H0 was rejected. This study found that there was a relationship between the smoking behavior and hypertension variables. The correlation coefficient was calculated to be -.397, which means indicates a negative direction and sufficient relationship strength where the higher the smoking behavior, the higher the hypertension incidence.

4 DISCUSSION

According to (Astuti, 2012) smoking behavior refers to burning tobacco which is then smoked, either using cigarettes or pipes. In this study, smoking behavior was divided into two categories, namely light smokers with less than 10 cigarettes per day, moderate smokers with 10-20 cigarettes per day, and heavy smokers with more than 20 cigarettes per day. The results obtained from the 183 respondents were that as many as 150 respondents (82.0%) were in the mild category and as many as 33 respondents (18.0%) were in the severe category. In regards to the statement "I still smoke even though I have family or friends around me who do not smoke", 35% of respondents answered "never".

Based on these results, smoking behavior is thought to be closely related to the surrounding environment's influence and conditions. The questionnaire results showed that out of 183 respondents, 21.9% answered "always" to the question about smoking 1-9 cigarettes a day, 12.6% answered "always" to the question about smoking 10-20 cigarettes in a day, and 11.5% answered "always" to the question about smoking 20-30 cigarettes per day. It is assumed that the smoking behavior in the Ubung Kaja village among those within the productive age mostly falls into the mild category. This is because even though the respondents smoke, it is still within reasonable limits, which is an average of 1-9 cigarettes per day. Light smoking behavior is caused by people knowing that smoking behavior is influenced by peers, parents, the work environment, as well as the environment at home. In this study, smoking behavior was mostly found to be light due to the respondents still being in the productive age, implying they spent more time at work and did not have time to smoke in short intervals. The productive age is the age where the activities carried out are quite dense, such as work.

Workplace rules that prohibit employees from smoking contribute to reducing smoking behavior, resulting in lighter smoking behavior in Banjar Ubung Kaja. Although most respondents had light smoking behavior, 18% still engaged in heavy smoking behavior. This is due to other factors such as environmental influences, social influences, family environment, and self-will to smoke. Smoking is one of the risk factors for hypertension. Nicotine in cigarettes causes an increase in blood pressure immediately after the first puff. Like other chemicals in cigarette smoke, nicotine is absorbed by the tiny blood vessels in the lungs and circulated into the bloodstream. In just a few seconds, nicotine will reach the brain.

Behavior is the action or activity of the organism concerned, which can be observed directly or indirectly (Hartanto, 2012). Behavior is defined as an action reaction of organisms to their environment. New behavior occurs when something is needed to cause a reaction, which is called a stimulus. This means that the stimulus will produce a certain reaction or behavior (Daud, 2020).

Hypertension is an increase of more than 140 mmHg in systolic blood pressure and an increase of more than 90 mmHg in diastolic blood pressure on two measurements with an interval of five minutes in a state of sufficient rest/quiet (Indonesian Ministry of Health, 2014). Table 5.5 shows that 91 respondents had normal blood pressure (49.7%). These results are supported by the questionnaire results, namely that 87.4% of respondents answered that they did not have a history of hypertension, 88.9% had never been diagnosed with hypertension, and 89.1% did not have

a hereditary history of hypertension. However, although most respondents' blood pressure was normal, there were still respondents who got results in the categories of pre-hypertension, stage 1 hypertension, and stage 2 hypertension. The respondents in this study were still of productive age and it is possible that the respondents will experience hypertension as they get older.

Respondents who did not have normal blood pressure may place the blame on several factors that play a role in hypertension incidence. Risk factors for hypertension include obesity, lack of exercise, smoking, and consuming alcohol. Other factors that influence hypertension prevalence include obesity, high salt intake, and a family history of hypertension. Emotional disturbances, excessive alcohol consumption, excessive coffee stimulation, smoking habits, and stimulating drugs can also play a role in hypertension development. However, this disease is strongly influenced by heredity. This disease also affects more women than men (Handayani et al., 2022).

Spearman's Rho yielded results where if the p-value was 0.000 (p < 0.05), then Ha is accepted and H0 is rejected. This indicates that there was a significant relationship between the smoking behavior and hypertension variables with a correlation strength of -.397. This means the relationship between the variables was negative (-) because the results were that the lighter the smoking behavior, the lower the hypertension incidence in the productive age population in Banjar Ubung Kaja. The productive age is a period where the body's organs and physical strength are in good condition, meaning their immunity is stronger than the elderly's. Unhealthy lifestyle behaviors such as smoking have no visible impact at the productive age. However, with time and increasing age, it is feared that smoking can make health conditions worse, such as experiencing hypertension in old age due to smoking behavior in one's younger years. Although respondents' current smoking behavior tended to be mild and most did not have hypertension, it is better to maintain a healthy lifestyle because smoking causes hypertension, whether the impact can be seen now or at later stage in life.

Smoking is a modifiable factor. The relationship between cigarettes and hypertension stems from nicotine, which causes an increase in blood pressure when absorbed by small blood vessels and circulated in the lungs and to the brain. The brain reacts to nicotine by signaling the adrenal glands to release epinephrine (adrenaline). This powerful hormone constricts blood vessels, forcing the heart to work harder and causing higher blood pressure. The carbon monoxide in cigarette smoke replaces oxygen in the blood. This results in higher blood pressure because the heart is forced to pump to transfer sufficient oxygen into the body's organs and tissue (Ishwari Adhikari & Santosh, 2021). Toxic chemicals in cigarettes can cause high blood pressure or hypertension. One of these toxic substances is nicotine, which can increase adrenaline which makes the heart beat faster and work harder; the heart rate and contractions increase, causing increased blood pressure (Abedini et al., 2020).

Differences in hypertension levels can be attributed to differences in cigarette consumption, basically meaning smoking affects hypertension incidence. Toxic chemicals, such as nicotine and carbon monoxide, that are inhaled through cigarettes and enter the bloodstream can damage the arteries' endothelial lining, resulting in atherosclerosis and high blood pressure. An autopsy found a close relationship between smoking habits and the presence of atherosclerosis in all blood vessels. Smoking in patients with high blood pressure further increases the risk of damage to the heart. This study is similar to the research of Irene, Josef, and Nurmansyah in 2019 entitled "The Relationship Between Smoking and Hypertension at the Kawangkoa Health Center". In this study, it was found that smoking behavior was mostly moderate, with the majority having normal blood pressure. However, this study differs from the research of Eric Untario (2017) with the title "The Relationship of Smoking to the Incidence of Hypertension". The study stated that there was no relationship between smoking habits and hypertension incidence because the sample size used was insufficient to show the significance in this study.

5 CONCLUSION

From the results of research conducted in Banjar Ubung Kaja, North Denpasar regarding the relationship between smoking behavior and hypertension in the productive age population with 183 respondents, the results were: 13 respondents were 56 years old (7.1%), 177 were male (96%), 48 were farmers (26.2%), and 111 were married (60.7%). The study found that as many as 150 respondents were light smokers (82%). The study found that most respondents with normal hypertension were in their productive age with as many as 91 people (49.7%). Based on Spearman's Rho correlation test, there was a relationship between smoking behavior and the hypertension incidence in

the productive age population in Banjar Ubung Kaja, North Denpasar.

6 SUGGESTION

Further researchers can examine similar topics by reviewing various factors from this study that have not been disclosed such as age, occupation, and stress.

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