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Hypertension in Urban Areas: Hypertension Risk Factors in the Community of Banjar Pengiasan, Dauh Puri Kauh Village, West Denpasar Municipality, Bali

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ABSTRACT

Hypertension is a serious medical condition that increases the risk of other diseases such as heart, kidney and brain disease and is a leading cause of premature death worldwide. Differences in the demographics, customs and habits of the people in an area result in differences in the main risk factor for hypertension.

Keywords: Hypertension, Risk

CASE STUDY

Hypertension is a serious medical condition that increases the risk of other diseases such as heart, kidney and brain disease and is a leading cause of premature death worldwide. Differences in the demographics, customs and habits of the people in an area result in differences in the main risk factor for hypertension. Bali has the highest prevalence of hypertension among the southeastern islands of the Indonesia country, which is 18.7% [1]. Denpasar municipality has the second highest prevalence of hypertension in Bali, which is 16.7% [2]. West Denpasar Primary Health Care Center II has the highest cases of hypertension in Denpasar Municipality. Banjar Pengiasan has the most cases of hypertension in the service area of West Denpasar with 286 cases. This study aimed to determine the risk factors for hypertension among the people in the Banjar Pengiasan community. We used a community based cross-sectional study with a sample of 125 people selected using simple random sampling was conducted among adults 30 years and older living in Banjar Pengiasan in July until October 2019. The study collected data on sociodemographic, stress, food and physical activity using questionnaire. The questionnaires used were the Depression Anxiety Stress Scale, 24 Hour Food Recall, and International Physical Activity Questionnaire. Anthropometric, blood pressure, and total blood cholesterol measurements were performed following standard procedures. Multiple logistic regression was used for analysis and odds ratios (OR) with 95% confidence intervals were calculated to identify risk factors associated with hypertension. From Table 1, the majority of respondents: female and prevalence of hypertension was 67.2%.

Table 1. Respondent characteristic.

Characteristic	Frequency	Percentage
Age (years)		
>60	68	54,4%
<60	37	45,6%
Sex		
Male	59	47.2%
Female	66	52.8%
Blood pressure		
Hypertension	84	67,2%
Not hypertension	41	32.8%
Smoking		
Yes	34	27.2%
No	91	72.8%

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Body mass index		
Obesity	81	64.8%
Not obese	44	35.2%
Total cholesterol levels		
High	84	67.2%
Normal	41	32.8%
Positive family history		
Yes	48	38.4%
No	77	61.6%
Coffee consumption		
Yes	100	80.0%
No	25	20.0%
Physical activity		
Low	66	52.8%
High	59	47.2%
Stress		
Yes	72	57.6%
No	53	42.4%
Salt consumption		
High	86	68.8%
Normal	39	31.2%

From Table 2 shows age, family history, total cholesterol, obesity, salt consumption, physical activity and coffee consumption significantly associated with hypertension. Non-risk factors for hypertension include smoking, sex, and stress.

Table 2. Logistic regression analysis results.

Variable	p	OR	95% CI
Age > 60 years	0,002	18,576	2,955-116,782
Family history	0,041	10,480	1,106-99,288
High total cholesterol levels	0,003	12,628	2,406-66,279
High salt consumption	0,032	6,069	1,162-31,689
Obesity	0,034	4,750	1,240-20,060
Coffee consumption	0,046	5,833	1,031-33,009
Low physical activity	0,023	9,191	1,360-62,108

In this study, age is a risk factor for hypertension. The result of this study is consistent with that of a previous research by Akilew et al. This risk increased to 20% at the age above 55 years as evidenced by a $p<0.05$ [3]. Advancing age is also associated with the thickening of arterial walls and will reduce the diameter of blood vessels, causing a decrease in the elasticity of blood vessels which leads to a hypertension [4]. Sex is not proven to be a risk factor for hypertension. The result of this analysis is consistent with that of a previous research by Sugiharto [5]. Men are more likely to be influenced by unhealthy behaviors. Meanwhile, women have estrogen hormone which increase the level of high-density lipoprotein to protect them from hypertension [6]. Family history is proven to be a risk factor for hypertension. This result is consistent with that of a previous study conducted by Kartikasari [7]. The presence of genetic factors in hypertension is associated with mutations in the simeric gene (11 β -hydroxylase) that cause an increase in renin-aldosterone activity and an increase in intracellular sodium levels with influence the reabsorption of sodium in the kidneys [8-10]. Total cholesterol is a risk factor for hypertension. The result of this study is consistent with that of a previous study conducted by Akuyam et al which stated there was a significant positive relationship (r=0.994) between total cholesterol and hypertension which caused blood vessels to become narrowed and less elastic [11-13]. Salt consumption was a risk factor for hypertension. This result is consistent with that of a research conducted by Irza [14]. High intake of sodium causes the adrenal glands to release digitalis-like factor and results in sodium retention. With the occurrence of sodium retention, will occur increase in blood pressure [15,16]. Obesity was a risk factor for hypertension. This result is also consistent with a previous study by Estiningsih [17]. The greater the body mass the more blood supply is needed to supply oxygen and this condition results in an hypertension [18,19]. Smoking habit not proven as a risk factor for hypertension was not accordance in the result of a previous study by Ambarish Pandey et al in an adult male, which indicated that smoking habit was a risk factor for hypertension [20]. Smoking habit not proven as a risk factor in this study could be influenced by a number of things. The sample in this study consisted of mostly women, while the habit of smoking is usually had by men. The majority smokers (32 out of 34 smokers) in this study used filter cigarettes. Therefore, even though smoking habit was not proven to be a risk factor in this study it does not mean that smoking does not increase the risk of hypertension, because in theory smoking can increase the risk of hypertension and is a dangerous habit and harmful to health. The nicotine in cigarettes regulate mitochondria to form

oxidative stress and will increase blood pressure. The filter on the cigarette serves as a filter for cigarette smoke so that it does not much into the lungs [21,22]. Coffee consumption was a risk factor for hypertension. Coffee contains caffeine. The way caffeine works in the body is by produces the CYP1A2 enzyme and taking over the adenosine receptors in the nerve cells which will trigger excessive production of the adrenaline hormone and will eventually increase blood pressure [23-25]. Physical activity was a risk factor for hypertension. Regular physical activity causes the body to produce nitric oxide (NO). NO stimulates the formation of endothelium-derived relaxing factor to maintain blood pressure at normal levels [26-28]. Stress is not proven to be a risk factor for hypertension. The result in this study is consistent with a previous research conducted by Sugiharto [5]. Stress activates sympathetic nerves and renin angiotensin aldosterone system (RAAS). Sympathetic nerves and RAAS play a role in influencing the hypertension [29,30]. Stress is not risk factors because all variables were analyzed simultaneously. In this study, >60 years age, high total cholesterol, family history, low physical activity, high salt consumption, coffee consumption, and obesity are risk factors for hypertension. With these hypertension risk factors having been identified, it is expected that preventive efforts can be made to reduce the prevalence of hypertension.

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