A Cross Sectional Study of Determinants of Hypertension in Batu City, Indonesia

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ABSTRACT

One of the public health centers (PHC) which has increased hypertension cases was the Sisir PHC. This study aimed to determine the determinants of hypertension at Sisir PHC, Batu City. The study used a cross-sectional design. Consecutive sampling techniques were used, with inclusion criteria was the resident of the Sisir PHC area and understanding Indonesian. The instruments were patient medical record documents and questionnaires. The dependent variable was hypertension. Independent variables were age, gender, education, history of hypertension, work, length of work, and sleep quality. Data analysis using the Chi-square test. 87 samples, 33 (37.9%) of respondents suffered from hypertension, 18 (20.7%) was aged 30-34 years, 58 (66.7%) was female, 31 (35.6%) was senior high school, 22 (25.3%) was Civil servants, 33 (37.9%) was, and 27 (31.0%) have good sleeping quality. Bivariate analysis showed an association between hypertension and gender p = 1,000 (1 PR 95% CI 0.565-1,769), education p = 0.160 (PR 1.474 95% CI 0.870 - 2,497), history of hypertension p = 0.717 (PR 1.111 95%CI 0.632-1.952), occupation p = 0.677 (PR 1,137 95% CI 0.616-2.099), length of work p = 0.003 (PR 2,221 95% CI 1,297- 3,802), and sleep quality p = 0.143 (PR 1,625 95% CI 0.903-2925). There is a significant relationship between age and duration of work with the incidence of hypertension. Researchers suggested doing an effort to control hypertension by improving lifestyle and strengthening regulations about the length of working hours for employees.

Keywords: Hypertension, Cross-sectional, Comb health center.

1. INTRODUCTION

According to the World Health Organization (WHO) in 2011, every year, there was around 8 million people die because of hypertension. In Indonesia hypertension with complications is one of the highest causes of death in all age groups [1]. The Basic Health Research (Riskesdas) in 2018 showed that hypertension has a high prevalence and it increased from 2013 to 2018 (25.8% to 34.1%). One of the provinces in Indonesia which has an increasing prevalence of hypertension and placed in the sixth rank was the East Java Province (13.47% in 2016 to 20.43 in 2017). [2]. Batu city (a city in East Java Province) has an increasing trend of hypertension from 2016 to 2018 (2,504 cases in 2016, 9,843 cases in 2017, and 10,442 cases in 2018). One of the Public health centers (PHC) which has an increasing amount of hypertension was Sisir PHC, it was 449 cases in 2016 increased to 479 cases in 2017 and 498 cases in

2018. This study aims to determine the relationship between work, length of work and quality of sleep with the incidence of hypertension at Sisir Health Center.

2. METHOD

The study was an observational analytic study using a cross-sectional approach. The dependent variable was hypertension. There were six independent variables; sex, education, history of hypertension, working status, duration of work, and sleep quality. Education was categorized into two categories; low (elementary/junior high school) and high (senior high school / higher education). History of hypertension was consists of two categories; yes if the subject has a family history who suffers from hypertension and no if the subject has no family member who suffers from hypertension). Working status consists of two categories; work if the subject has occupation or work to get benefits such as

money and not work. Duration of work was categorized into two; not according to standards if the duration of work is more than 7 or 8 hours a day and or more than 40 hours for a week, and standard if duration of work is equal or less than 7 or 8 hours in a day and or less or equal to 40 hours in a week [9]. Sleeping quality consists of two categories; poor if score> 5 and good if score <5 (Departemen of Psychiatry, 1989). Consecutive sampling was used, with inclusion criteria were resident of Sisir PHC area, age the workforce (15-64 years old) and understanding Indonesian. The exclusion criteria were pregnant women. The study used to register patient documents to know the hypertension status of subjects and questionnaires. The questionnaire for sleeping quality was adopted from the standard Pittsburgh Sleep Quality Index (PSQI) questionnaire. Data analyzed used Chi-square test.

3. RESULTS

Table 1 showed that the majority of respondents were women; 58 (66.7%) women. Most respondents were in a group of 30-34 years old; 18 (20.7%) respondents. Most of the respondents have high education; 58 (66.7%) respondents. The highest education graduated was senior high school; 31 (35.6%) respondents. the majority of respondents did not have a family history of hypertension, it was 60 (69.0%) respondents. Most of the respondents working status 61 (70.1%) with the most work as employees as many as 24 (27.6%) respondents. The most work time is according to the standard that is 39 (44.8%). Whereas the sleep quality of the respondents mostly belongs to the poor category of 48 (55.2%).

Table 1. Characteristics of respondents

Variable	n	%
Sex		
Male	29	33.3
Female	58	66.7
Age		
15-19	2	2.3
20-24	7	8.0
25-29	9	10.3
30-34	18	20.7
35-39	12	13.8
40-44	6	6.9
45-49	5	5.7
50-54	11	12.6
55-59	11	12.6
≥60	6	6.9
Education		

Variable	n	%
Low	29	33.3
High	58	66.7
Education level		
Elementary	19	21.8
Junior High school	10	11.5
Senior High school	31	35.6
Higher education	27	31.0
History of hypertension		
None	60	69.0
Yes	27	31.0
Working status		
Not work	26	29.9
Work	61	70.1
Occupation		
Housewife	25	28.7
Labor	21	24.1
Seller	17	19.5
Employee	24	27.6
Duration of work		
Nonstandard	33	37.9
Standard	54	62.1
Sleeping quality		
Bad	48	55.2
Good	39	44.8

Table 2 showed, the p-value of sex is 1.000 with prevalence risk (PR) is 1 (95% CI 0.565-1.769) it means there is no association between sex with hypertension. The p-value of education is 0.160 with PR 1.474 (95% CI 0.870 -2.497) it means there is no association between education with hypertension. Respondents with low education have a risk of hypertension 1.474 times more than respondents with higher education. History of hypertension has a p-value of 0.717 with PR 1.111 (95% CI 0.632-1.952) which means there is no relationship between the history of hypertension and hypertension, but respondents who have a history of hypertension have 1.111 times more to get hypertension then respondent who hasn't the history of hypertension. Working status has p-value 0.677 with PR 1.137 (95% CI 0.616-2.099) which means there is no relationship between working status and hypertension. Respondents with working status have risk 1,137 times more than respondents who do not work. P-value of the duration of work 0.003 with PR 2.221 (95% CI 1.297-3802) which means there is a relationship between duration of work and hypertension. The risk of hypertension among respondents with not according to the standard of a

duration of work is 2,221 times. Sleeping quality has p-value 0.143 PR 1.625 (95% CI 0.903-2925) which means there is no relationship between sleeping quality and hypertension. Poor sleep quality has the risk to get hypertension 1.625 times compared to good sleep quality.

Table 2. Analysis Results

Variabel	*p-value*	PR (95% CI)
Sex	1,000	1 (0.565-1,769)
Education	0.160	1.474 (0.870 -2,497)
History of hypertension	0.717	1.111 (0.632-1.952)
Working status	0.677	1,137 (0.616-2.099)
Duration of work	0.003	2,221 (1,297- 3,802)
Sleeping quality	0.143	1,625 (0.903-2925)

4. DISCUSSION

4.1. Relationship among Sex with Hypertension

The study found that there is no relationship between sex and hypertension. It has a similar result with Sulistiyowati (2010) study, there was no significant relationship between sex and hypertension (p-value 0.479). In general, men reported having a higher risk of hypertension compared to a woman at a productive age [11]. It because men have predisposing factors that encourage hypertension such as, work, and uncontrolled eating [3]. Men have an unwell lifestyle that can increase blood pressure than women, such as alcohol consumption, smoke cigarettes and refuse hypertension treatment. [12], [13]. The prevalence of hypertension in men will increase at the age of 45-55 years old. While women at 55 years old or more. [10]. This is due to the influence of the hormone estrogen which protects women from cardiovascular disease, it decreases at the menopause period. In the premenopausal period, women will lose little by little the hormone estrogen which protecting blood vessels from damage [12]

4.2. Relationship among Education with Hypertension

The study found there is a relationship between education and hypertension, p-value 0,160. It similar to Indrawan's (2014) study result, found that there was no significant relationship among education level with hypertension p-value >0.05. The study also resembles with Novitaningtyas (2014) study result, p-value 0,346.

Education is an indicator of the level of human ability in terms of access to health information related to awareness to examine oneself and knowledge of further complications [14]. The level of education related to health information obtained can affect health status [10].

Kharisyanti & Farapti (2018) study found that more high education level decreases the risk of suffering from hypertension [17].

Increasing individual knowledge about health information, encouraging someone to behave better to be able to control their blood pressure, and be able to adopt a healthy lifestyle such as reducing fatty foods, reducing salty, do not smoking, non-alcoholic foods, and engaging in physical activities [18]. Healthy lifestyle able to decrease the risk of hypertension [17].

4.3. The Relationship between the History of Hypertension with Hypertension

This study found that there is no relationship between the history of hypertension with hypertension. This study is similar to Yeni, et al., (2016) study result, it found a relationship history of hypertension in the family with hypertension (p 0.158).

History of hypertension in the family is one factor that has strong to increase the risk of hypertension to their descendants [20]. 70-80% of cases of primary (essential) hypertension occur on people who have a family member with hypertension. [21]. Someone with a parent and or grandparent with hypertension has a risk amount two times more than someone who hasn't a record of hypertension in the family. [20],[22]. History of hypertension in the family can affect the lifestyle of individuals who have become a habit in the family [23]. Based on the results of the study found that the majority of respondents did not have a family history of hypertension as much as 69.0%.

4.4. The Relationship among Working Status with Hypertension

This study found, there isn't a relationship between working status. It resembles the study result of Sulistiyowati (2010) and Kharisyanti & Farapti (2018), the significancies of each relationship was more than 0.05 (0.703 and 0.084).

Each type of work has a potential risk to health problems. Physical and mental fatigue resulting from several types of work that require physical and mental work can cause symptoms such as stress, depression, and lack of sleep resulting in blood disorders such as anemia and hemochromatosis [24]. Workable to prevent hypertension due to physical activity due to good work for blood circulation [25]. The physical activity carried out at work help to strengthen the heart so that it pumps blood better without expending great energy [26].

The workload can cause changes in the cardiovascular system such as increased heart rate, cardiac output and blood pressure [24]. Physical workload, busy work schedule, work rhythm too fast, full of time pressure, constantly racing against deadlines

at risk of increasing blood pressure which refers to the incidence of hypertension [27]–[29].

4.5. The Relationship among Duration of Work with Hypertension

This study found people who have a duration of work more than standard have 2.22 times more to have a risk of hypertension. The study of Basit, et al., (2016) found a relationship between the duration of work and hypertension (p 0.016). Deischa, et al., (2016) study also, there was a relationship among duration of work with hypertension (p 0.000).

The addition of working hours, work demands, and fewer rest periods result in workplace fatigue. Overwork and lack of rest can increase blood pressure from the heart throughout the body when blood pressure raises the hormone epinephrine or adrenaline is released, thus increasing blood pressure and heart rate [6].

Long working hours can increase the incidence of mortality and have an impact on poor health. Working hours affect hypertension through two things. First, long working hours will reduce the body's recovery time which serves to help the immune system in the body that functions in protecting the body when stressed or exposed to pollution and bacteria [33] and reduce sleep time which is considered to affect the disruption of physiological processes. Second, long working hours can influence lifestyles and behaviors such as smoking, unhealthy diets and lack of physical activity [5].

4.6. The Relationship between Sleeping Quality with Hypertension

This study found that sleeping quality has no relationship with hypertension, risk of hypertension among people with poor quality of sleeping is 1.63 times. A study from Tebo (2016) showed the significance of quality of sleeping and hypertension was p 0.912, it means no relationship. Pitaloka, et al., (2015) found that there is no relationship among sleeping quality and hypertension, it reflected on significance value 0.418 (> 0.05).

Sleep can prevent and manage fatigue that affects health. Sleep is good and healthy that is about 7 hours a day [24], [33]. One of causing poor quality of sleep is due to the short duration of sleep. Normally, the duration of sleep is 7 hours a day. Short sleep duration able to increase average heart blood pressure and heart rate [36]. Sleep duration of fewer than 5 hours every night has a relationship with increased blood pressure [37], [38]. This study showed the mean of a sleeping duration of the respondent was 5 to 7 hours per night for the last month.

5. CONCLUSION

Base on the study, the researcher suggest to workers to manage the working hour effectively to work, rest, and stress management. In the time to rest or during work, workers able to do simple physical activities and or listening to the relaxing song.

ACKNOWLEDGMENTS

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