



**Risk Factors With The Occurrence Of Hypertension In Ground Handling Officers Of  
PT. Gapura Angkasa Minangkabau International Airport**

Afdal Hardiyanto<sup>1</sup>, Onny Setiani<sup>2</sup>, Nikie Astorina Yunita Dewanti<sup>3</sup>

<sup>1</sup> Diponegoro University Public Health Students

<sup>2,3</sup> Lecturer of Diponegoro University Community Health Program

Email: [afdal.sughol@gmail.com](mailto:afdal.sughol@gmail.com)

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**ABSTRACT**

Hypertension was an important health problem throughout the world, this is due to hypertension also known as the silent killer because it was often without complaints, so patients did not know that they have hypertension and only know after complications occur. This study aims to determine the risk factors for hypertension in Ground Handling officers.

This study was an observational analytic study with a cross sectional design in February 2020. Samples in this study was taken from

populations that met the inclusion criteria of 50. Sampling with simple random sampling technique. Data analysis used chi square test, and the alternative test was fisher exact test.

Statistical test results found that there was a significant relationship between age ( $p = 0.006$ ; OR = 9,000; 95% CI = 1,693 - 47,837), years of service ( $p = 0.028$ ; OR = 7,200; 95% CI = 1,363 - 37,960), continuity of use Ear Protection Equipment ( $p = 0.041$ ; OR = 6.469; 95% CI = 1,230 - 34,012), and noise intensity ( $p = 0.042$ ; OR = 4,762; 95% CI = 1,085 - 20,907) to the incidence of hypertension in the ground handling officer of PT. Gapura Angkasa Minangkabau International Airport in 2020.

Conclusion, the risk of hypertension was 9 times greater for ground handling officers with age over 35 years ( $p = 0.006$ ; OR = 9,000; 95% CI = 1,693 - 47,837).

**Keywords:** Risk Factors, Hypertension, Ground Handling

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## INTRODUCTION

Hypertension is an important health problem throughout the world, this is due to hypertension also known as the silent killer because it is often without complaints, so patients do not know that they have hypertension and only known after complications occur, the prevalence is high and continues to increase and its relationship with cardiovascular disease, stroke, retinopathy, and kidney disease. Data from the World Health Organization (WHO) in 2015 showed that around 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world is diagnosed with hypertension. The number of people with hypertension continues to increase every year, it is estimated that in 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 9.4 million people die from hypertension and its complications (WHO. World Health Statistics 2015).

The Institute for Health Metrics and Evaluation (IHME) in 2017, states that from a total of 1.7 million deaths in Indonesia, the risk factor that causes death is hypertension of 23.7%. According to Indonesia's 2014 Sample Registration System (SRS) data, hypertension with complications (5.3%) is the number 5 cause of death at all ages (RI BK dan PMKK.. 2017).

Basic health research data in 2018 the prevalence of hypertension is the main rank in cases of non-communicable diseases with a total of 185,857 cases. Research was conducted in the population group aged  $\geq 18$  years in Indonesia with a result of 34.1%, hypertension occurred in the age group 31-44 years (31.6%), age 45-54 years (45.3%), age 55 -64 years (55.2%), with the highest prevalence occurring in South Kalimantan province (44.1%) and the lowest in Papua province (22.2%), while West Sumatra has a hypertension prevalence of 25.1% (Riskesmas. 2018).

In 2016, the National Health Indicators Survey (Sirkesnas) mentioned an increase in the percentage of people suffering from hypertension to 32.4% in the population aged  $\geq 18$  years (Kesehatan BK. Laporan Survei Indikator Kesehatan Nasional. 2016).

Data on screening for non-communicable diseases in 2017 by Padang Port Health Office officers in the context of controlling non-communicable diseases in the working area of the Minangkabau International Airport is known that of the 20 airport officials whose blood pressure was measured 4 people (20%) experienced hypertension (Padang K. Posbindu Non-Communicable Disease Activity Report Padang Class II Port Health Office. 2017).

The airport is one of the workplaces that has a risk of hypertension, especially ground handling officers who work most of the time in the apron area. The ground handling task at the apron is the service of baggage, cargo, postal, auxiliary equipment for aircraft movements on land and as long as the aircraft is at the airport, for departure (departure) and for arrival (arrival).

Hypertension is an event that has various causes. Several studies have shown risk factors that influence the onset of hypertension.

Age is a risk factor for hypertension that cannot be modified. Blood vessels narrow and become stiff with age (Aging. 2014). Another risk factor that cannot be changed is gender, because the plasma activity of male renin (prorenin and renin levels) is usually higher than that



of women which will affect the synthesis of AT II in the angiotensin renin system (Oktaviarini, 2019).

Risk factors for hypertension that can be modified are years of service. The work period is more than 5 years and does not rotate the work so that they experience hypertension (Marisdayana. 2012). The next risk factor for hypertension that can be modified is smoking. Smoking for a long time can cause blood vessels to become stiff (Alshaarawy. 2012). Another risk factor for hypertension is noise. Noise that exceeds NAV causes the heart muscle to work harder and increases pressure on the walls of the arteries causing peripheral resistance to increase and blood pressure to increase (Puspa Dewi. 2018).

Therefore, researchers want to conduct research on the risk factors for hypertension in ground handling officers because this has resulted in a description that hypertension is a potential health problem. If left untreated, this condition will cause various kinds of complications in the form of damage to target organs and in fatal cases can lead to heart disease, kidney failure or stroke which often leads to death.

Knowledge of the factors that have the most important role in the occurrence of hypertension will be very helpful in the early detection of high-risk patients and the immediate treatment of patients with hypertension that can later prevent complications and problems that arise due to late diagnosis of hypertension. This study aims to analyze the risk factors for hypertension.

## **RESEARCH METHODOLOGY**

This study uses an observational analytic study with a cross-sectional design, the population of this study is all officers of PT. Space Archway. Samples obtained from populations that meet the inclusion criteria include people who are willing to become respondents, officers who work in the apron, respondent's working period  $\geq 2$  years, ages 20-45 years. The sample size was calculated using the Lemeshow formula and obtained a sample of 50 respondents. The selection of sample members is done by simple random sampling technique.

Determination of respondents is done with the help of a random number table. So as many as 50 respondents were obtained. If the respondent is absent or refuses to be examined, then the respondent is replaced with another sample with the same technique. The study was conducted at the Minangkabau International Airport in February 2020. The independent variables observed in this study were age, working period, drinking water consumption, sleep duration, continuity of use of Ear Protection Equipment, smoking habits, salt consumption habits, and noise intensity, while the dependent variable was incidence of hypertension.

Data collection techniques with primary data through questionnaires, interviews, and direct measurement at the study site. Data collection begins with the measurement of noise intensity carried out in the apron of the airport. One time measurement with a time of 10 minutes at a predetermined place. The blood pressure check begins with giving informed consent to the respondent about the aims, benefits and procedures of the study. Respondents who are willing to participate sign an informed consent sheet and fill out a questionnaire to find out the



characteristics of the respondents. Respondents then measured their blood pressure after 15 minutes of rest.

Blood pressure checks were carried out by nurses at the Padang Class II Port Health Office. The criteria for determining blood pressure for the incidence of hypertension in this study are guided by the Joint National Committee VII of 2003 with provisions for hypertension sufferers, systolic blood pressure  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg. Data analysis was carried out in stages including univariate analysis, bivariate analysis using the Chi-square test, and the alternative test was the fisher exact test.

## RESULTS AND DISCUSSION

Characteristics of respondents in this study include: age, years of service, drinking water consumption, sleep duration, continuity of use of Ear Protection Equipment, smoking habits, and salt consumption, as shown in the following table.

Table 1. Frequency Distribution of Respondent Characteristics

Research variable	f (person)	%
Age		
$\geq 35$ years	22	44
$< 35$ years	28	56
Years of service		
$\geq 5$ years	27	54
$< 5$ years	23	46
Drinking Water Consumption		
$< 1,5$ liter	8	16
$\geq 1,5$ liter	42	84
Sleep Duration		
$\leq 5-6$ hours	33	66
$\geq 7-8$ hours	17	34
Use of Ear Protection Equipment		
Not often	25	50
Often	25	50
Smoking habit		
Smoke	30	60
Do not smoke	20	40
Salt consumption		
$\geq 1.500$ mg/day	8	16
$< 1.500$ mg/day	42	84
Noise intensity		
High	22	44
low	28	56



Table 1 shows that out of 50 ground handling officers 56% have 35 years of age, 56% work period  $\geq 5$  years, 16% drinking water consumption  $< 1.5$  liter, 66% sleep duration  $\leq 5$  hours, 50% do not use ear protectors often, 60% smoked, 16% consumed salt  $\geq 1,500$  mg / day, and 44% worked at high noise intensity.

Distribution of hypertension events at PT. Gapura Angkasa Minangkabau International Airport 2020 is shown in table 1 below:

Table 2. Distribution of Frequency of Occurrence of Hypertension

Occurrence of hypertension	f (person)	%
Hypertension	11	22
Normal	39	78
Total	50	100

Table 2 shows that, of the 50 respondents whose blood pressure was examined there were 22% of respondents experiencing hypertension.

Hypertension is a degenerative process of the sirkulasi system that begins with atherosclerosis, which is a disturbance in the anatomical structure of peripheral blood vessels that continues with the occurrence of stiffness in blood vessels / arteries. Blood vessel stiffness is accompanied by narrowing and possible enlargement of the plaque that can inhibit peripheral blood circulation (Bustan. 2015).

Stiffness and small blood flow will cause the heart load to grow heavier which will ultimately be compensated by an increase in heart pumping efforts which will result in an increase in blood pressure in the blood circulation system.

The occurrence of a strong pumping in the heart muscle results in thickening of the heart muscle so that the heart has difficulty pumping blood throughout the body. Therefore, the pathological process of hypertension is characterized by an increase in peripheral resistance that continues so that it is chronically compensated by the heart in the form of hypertension (Bustan. 2015).

This result is in line with research conducted by Sartik, et al., In 2017 which states that the percentage of cases of finding people who have hypertension is less than people who do not have hypertension. The percentage of people who had hypertension was 22.9% while the percentage of people who did not have hypertension was 77.1% (Sartik. 2008).

The few new cases of hypertension were found due to limited research time. Hypertension is a disease that can be caused by multifactors. The longer a person is exposed to risk factors, then it is possible that the person is also at increased risk for experiencing hypertension. Hypertension can be prevented if controlled. Therefore, to prevent hypertension, employees need to adopt healthy behaviors and lifestyles such as not smoking, exercising diligently, eating nutritious and varied foods, and others.

Table 3. Relationship between Individual Risk Factors and the Occurrence of Hypertension

Occurrence of hypertension	Occurrence of hypertension		P value	OR ((95 % CI)
	Hypertensio	No hypertension		
		amount		



	n		n		n			
	n	%	n	%	n	%		
Age								
≥ 35 year	9	40,9	13	59,1	22	100	0,006	9,000 (1,693 – 47,837)
< 35 year	2	7,1	26	92,9	28	100		
Drinking Water								
Consumption	4	50,0	4	50,0	8	100	0,059	5,000 (1,003 – 24,914)
< 1,5 liter/day	7	16,7	35	83,3	42	100		
Sleep Duration								
≤ 5-6 hours	7	21,2	26	78,8	33	100	1,000	0,875 (0,216 – 3,539)
≥ 7-8 hours	4	23,5	13	76,5	17	100		
Smoking habit								
Smoking	7	23,3	23	76,7	30	100	1,000	1,217 (0,305 – 4,860)
Do not smoke	4	20,0	16	80,0	20	100		
Salt consumption								
≥1.500 mg/day	3	33,3	4	66,7	9	100	0,392	2,063 (0,422 – 10,080)
<1.500mg/day	8	19,5	31	80,5	41	100		

Table 4. Relationship between Occupational Risk Factors and the Occurrence of Hypertension

Occurrence of hypertension	Occurrence of hypertension				amount		p value	OR ((95 % CI)
	Hypertensio		No hypertension		n	%		
	n	%	n	%				
Years of service								
≥ 5 years	9	37,5	15	62,5	24	100	0,028	7,200 (1,366 – 37,960)
< 5 years	2	7,7	24	92,3	26	100		
Use of Ear								
Protection	9	36,0	16	64,0	25	100	0,041	6,469 (1,230 – 34,012)
Equipment	12	8,0	23	92,0	25	100		
Not often								
Often								
Noise at Apron								
≥ 85 dBa	8	36,4	14	63,6	22	100	0,042	4,762 (1,085 – 20,907)
< 85 dBa	3	10,7	25	89,3	28	100		

### Relationship between Age and Hypertension

The analysis showed that, of the 22 respondents aged ≥35 years there were 9 respondents (40.9%) had hypertension, while respondents aged <35 years there were 2 respondents (7.1%) had hypertension. Statistical test results prove that there is a significant relationship between age



and the incidence of hypertension ( $p = 0.006$ ;  $OR = 9,000$ ;  $95\% CI = 1,693 - 47,837$ ) which means that ground handling officers aged greater than or equal to 35 years have 9 times more risk of experiencing the incidence of hypertension compared to officers aged less than 35 years.

As you get older, your blood pressure will also increase. After the age of 40 years, the arterial wall will experience thickening due to the accumulation of collagen in the muscle layer, so that the blood vessels will gradually narrow and become stiff, Decreased blood vessel elasticity causes an increase in peripheral vascular resistance resulting in an increase in blood pressure (Aster. 2005 ).

In line with the research of Kembuan et al. in 2016 which showed that there was a relationship between age and the incidence of hypertension in the Touluan General Health Clinic of the South Minahasa District Health Center due to sensitivity to hypertension as a person ages (Kandou. 2018).

The older the respondent's age, the greater the risk of hypertension. This is caused by changes in the anatomical structure of peripheral blood pembuluh which continues with the occurrence of stiffness in the arteries / arteries along with the age of the respondent. It is better to minimize the incidence of hypertension in officers over the age of 35 years, it takes sufficient rest and not too long in the airport environment when it has finished work. Officers in general, when they have finished work, will chat and gather together with other officers and do not immediately go home to rest from their work activities all day. Age 35 years and over requires 7-9 hours of rest every day for the body to get back to normal and normal due to the day's activities. Way that can be done to provide enough time for the ground handling provides work shift arrangements for officers older than 35 years so that more picket on the morning shift and do not provide overtime schedules, while for officers aged less than 35 years so that more pickets on afternoon shift.

### **Relationship of Work Period with Hypertension**

The analysis showed that, of the 24 respondents with a working period of  $\geq 5$  years, there were 9 respondents (37.5%) suffering from hypertension. Meanwhile, respondents with a working period of less than 5 years only 2 respondents (7.7%) suffered from hypertension. Statistical test results prove that there is a significant relationship between work period and the incidence of hypertension ( $p = 0.028$ ;  $OR = 7,200$ ;  $95\% CI = 1,363 - 37,960$ ), which means that ground handling officers with a service life greater than or equal to 5 years have a 7 times chance more at risk of experiencing hypertension compared with officers with a working period of less than 5 years.

Work period is the period of time or length of time an officer works in a place. The longer a person works, the more exposed to the dangers posed by the work environment. Noise due to noise at the airport will be easily experienced by officers who work with a longer work period, because the longer the officer works in parts with high noise levels, the higher the risk of hypertension (Nawawinetu, 2007).

In line with Rara's research in 2016 which stated that there was a relationship between work period and hypertension among workers in PLTD / G Payo Selincah Jambi City in 2016



and obtained  $p$ -value = 0,000 ( $p < 0.05$ ). This incident is caused by a work environment that has a noise intensity above the Threshold Value (NAV) and during work the worker does not use Personal Protective Equipment (PPE), and in the work process the company does not rotate work on its workers so that the worker experiences a noise hyperstimulus (Marisdayana. 2016).

Officers who work more than 5 years at the airport will be more exposed to hypertension risk factors, one of which is noise due to aircraft activities and ground handling activities. To reduce the incidence of hypertension, it is better to do a job rotation process. Rotation can be used to find out the potential of each employee, get new knowledge in accordance with their potential and minimize the level of saturation that exists. Implementation of work rotation can provide new freshness for employees, and reduce the sense of boredom and suppress the sense of depression caused by being too long in charge of a particular job.

### **The Relationship of Drinking Water Consumption and the Occurrence of Hypertension**

The analysis showed that, of 8 respondents consuming  $< 1.5$  liter drinking water there were 4 respondents (50.0%) suffering from hypertension. While respondents with drinking water consumption  $\geq 1.5$  liters only 7 respondents (16.7%) who suffer from hypertension. Statistical test results obtained  $p$  value (0.059), because  $p$  value (0.059)  $> \alpha$  (0.05), meaning there is no relationship between drinking water consumption and the incidence of hypertension in the Ground Handling officer of PT. Garuda Indonesia Minangkabau International Airport in 2020.

Drinking water is an element of nutrition that is as important as carbohydrates, protein. The body needs mineral water to consume as much as 1 to 2.5 liters or the equivalent of 6-8 glasses every day. Consuming good and sufficient mineral water for the body can help the digestive process, regulate metabolism, regulate food substances in the body and regulate body balance, and reduce dehydration (Sari. 2014).

In line with Indah's 2012 study conducted on hypertension patients in the Technical Implementation Unit of Lawang Public Health Center Malang Regency as many as 34 patients found there was a decrease in systolic blood pressure in patients before and after consuming water ( $p = 0,000$ ) and there was a decrease in diastolic blood pressure in patients before and after consuming water ( $p = 0.001$ ).

Hypertension often occurs when the body detects a reduction in blood volume. A common cause of decreased blood volume is dehydration. As a reaction the body will direct most of the blood flow to the active organs and close the blood supply to less important areas. Adjustment of the body will cause hypertension throughout the blood circulation system. Therefore, officers can bring their own drinking water or the ground handling party provides water for officers 'needs by always providing gallons of water in the resting area, so that the officers' drinking water consumption is fulfilled. When the officer is short of drinking water consumption, he will become dehydrated, the volume of blood in the body will decrease. To avoid this, every time officers begin to feel symptoms of hypertension, it is expected to drink 1-2 glasses of water. This will help the officer to restore adequate blood volume in the body and reduce blood pressure so that hypertension does not occur.



#### The Relationship Between Sleep Duration and the Occurrence of Hypertension

The analysis showed that, of 33 respondents with short sleep duration, there were 7 respondents (21.2%) suffering from hypertension. While respondents with normal sleep duration were only 4 people (23.5%) suffering from hypertension. Statistical test results obtained p value (1,000), because p value (1,000) >  $\alpha$  (0.05), meaning there is no relationship between sleep duration and the incidence of hypertension in the Ground Handling officer of PT. Garuda Indonesia Minangkabau International Airport in 2020.

The relationship between sleep and hypertension occurs due to sympathetic activity in blood vessels, a person will experience a change in cardiac output that is not significant in nature today. A decrease in peripheral vascular resistance causes a normal nocturnal decrease in arterial pressure. Sympathetic sleep activity increases significantly and varies greatly during rapid eye movements compared to when you wake up. Blood pressure approaches the awake level during the phasic component of the Rapid Eye Movement, and new sensitivity increases during sleep. This is related to sleep patterns. Abnormal sleep is involved in the pathogenesis of non-dipping pre-hypertension and later in hypertensive disorders in sleep quality causing hypertension (Liu and Qian. 2015).

In line with Santi's study in 2018, stated that sleep patterns have the highest influence on the incidence of hypertension. The risk of suffering from hypertension in people who have bad sleep patterns is 9,022 times greater than people who have good sleep patterns (Mastini. 2018).

Sleep can give effect to the nervous system and other organs of the body physiologically. Some components in the body including the nervous system that has been used during various activities, to recover it is necessary to sleep as a means of rest with  $\pm$  8 hours / day. Sleep is also important because officers who have insufficient hours of sleep will tend to become emotionally irritable. It is better still to take the time to rest and not fend for themselves staying up late. Because the less sleep, the more the work performance of officers.

#### **The Relationship between Continuity of Ear Protective Equipment and the Occurrence of Hypertension**

The analysis showed that, of the 25 respondents who did not often wear ear protection equipment, there were 9 respondents (36.0%) suffering from hypertension. While only 2 respondents (8.0%) often used hypertension. Statistical test results prove that there is a significant relationship between the continuity of Ear Protection Equipment and the incidence of hypertension ( $p = 0.041$ ; OR = 6.469; 95% CI = 1.230 - 34.012), meaning that ground handling officers who do not often wear Ear Protection Equipment have 6 times more chance the risk of experiencing hypertension compared to the staff who often use ear protection equipment.

A good Ear Protection Tool is an ear plug that can hold only certain frequencies, while the frequency of speech is not interrupted. Ear plugs can reduce noise intensity by 25 dB (A) to 30 dB (A). Whereas ear muff can be used for high intensity (> 95 dB), can protect the whole ear, its size can be adjusted for various ear sizes, easily monitored and although infection occurs in the ear the tool can still be used (Buntarto. 2015).



The results of this study are in line with research conducted by Ramadhani in 2017, the results showed that respondents who did not wear Ear Protection Equipment had a risk of experiencing hearing loss by 11,600 times compared to respondents who used Ear Protection Equipment (OR = 11,600; 95% CI = 3,121 - 43,120). Another impact felt by workers besides hearing loss is an increase in blood pressure which results in workers becoming more irritable and easily stressed (Ramadhani. 2017).

Workers who did not use ear protectors only looked for reasons not to use ear protectors, because researchers felt for 1 week in the airport apron using Ear Protection Devices, researchers felt very comfortable when using these ear protectors. Therefore, strict supervision from the avsec of officers going to the apron must be strictly supervised and if there are officers who do not use ear protection equipment, strict sanctions can be given. The reason for choosing sanctions is because the ground handling has provided ear protection equipment and procurement every 2 times during the year in accordance with the criteria of work carried out by officers, so there is no more reason for officers not to use Ear Protection Devices again for their own health. Another way that can be done is social support from coworkers to always use Ear Protection Equipment. Coworkers can also influence someone's behavior because a colleague is one of the closest friends who can be an example in the continuity of the use of Ear Protection Equipment that is good and right ..



### **The Relationship between Smoking Habits and the Occurrence of Hypertension**

The analysis showed that, of 30 respondents with smoking habits there were 7 respondents (23.3%) experiencing hypertension. While respondents who did not smoke only 4 respondents (20.0%) had hypertension. Statistical test results obtained p value (1,000), because p value (1,000) >  $\alpha$  (0.05), meaning there is no relationship between smoking habits and the incidence of hypertension in Ground Handling officers.

Cigarette smoke contains about 0.5% to 3% nicotine, and if inhaled the nicotine levels in the blood will range between 40-50 mg / ml. Nicotine can irritate the heart, make the heart rhythm become irregular, accelerate blood flow, cause damage to the inner lining of blood vessels and cause blood clots. The nicotine in tobacco causes a rise in blood pressure after the first puff (Aditama. 2011).

The results of this study are in line with research conducted by Erlyna in 2012 on risk factors for primary hypertension at the Tlogosari Kulon Health Center in Semarang City with the results of 80 respondents (52 people (65%)) did not smoke. After analyzing the data, it was concluded that there was no relationship between smoking and the incidence of hypertension (p = 0.655) (Syahrini. 2012).

Cigarette smoke will narrow the blood vessels and force the heart to work harder. Tar content that enters the blood can force the heart to work and pump blood more strongly, so that it can increase blood pressure in the body. While carbon monoxide can bind to hemoglobin in the blood while thickening the blood, making it easy to stick to the walls of blood vessels. The blood vessels will narrow and eventually force the heart to pump blood faster. Therefore, the habit of



smoking at rest should be reduced and the AVSEC must frequently monitor officers at the rest area if the plane has taken off and will wait for the arrival of the next plane.

#### **The Relationship of Salt Consumption Habits with the Occurrence of Hypertension**

The analysis showed that, from 9 respondents who were high in consuming salt there were 3 respondents (33.3%) who had hypertension. While respondents who are low in consuming salt there are 8 people (19.5%) who have hypertension. Statistical test results obtained p value (0, 392), because the p value (0, 392) >  $\alpha$  (0.05), meaning there is no relationship between salt consumption and the incidence of hypertension in the Ground Handling officer of PT. Garuda Indonesia International Airport in 2020.

Salt serves as an important nutrient in the body and helps nerves and muscles function properly. Salt is also involved in automatic water regulation and fluid balance in the body. High dietary salt intake is a big challenge for the kidneys to excrete large amounts of salt given. One of the major organ systems that is susceptible to the adverse effects of excessive salt in the diet is the cardiovascular system. Excess salt in the diet predisposes to high blood pressure (Kyu Ha. 2014).

The results of this study are in line with research conducted by Rivanli in 2016 which stated that there was no relationship between sodium levels and high blood pressure in adolescents in Bolangitang Barat District, North Bolaang Mongondow District ( $p = 0.514$ ) (Polii. 2016).

Hypertension is not always due to excessive sodium intake. Many factors can cause an increase in blood pressure such as alcohol drinking habits, age, smoking habits, gene factors, obesity, hydration / fluid intake. High sodium intake influences the onset of hypertension through the mechanism of increasing plasma volume, cardiac output, and blood pressure. Excessive intake will increase fluid from cells, where water will move towards electrolyte solutions that have higher concentrations. This results in an increase in blood plasma volume and will increase cardiac output, thereby increasing blood pressure. In addition, high sodium intake can reduce the diameter of the arteries, so that the heart pumps harder to push the increased blood volume through narrow spaces. Therefore, although the officers consume a little salt, it is important to watch out for processed foods that also contain salt and the officers can control salt consumption every day so as to minimize the occurrence of hypertension.

#### **Relationship of Noise Intensity with the Occurrence of Hypertension**

The analysis showed that out of 22 officers exposed to high noise intensity there were 8 respondents (36.0%) who suffered from hypertension. While officers who were exposed to low noise intensity were only 2 people (8.0%) who suffered from hypertension. Statistical test results prove that there is a significant relationship between noise and the incidence of hypertension ( $p = 0.042$ ; OR = 4.762; 95% CI = 1.085 - 20.907).

The brain will respond due to sound waves from outside, so that it can hear sounds, the brain will also respond to unwanted sounds or noise as a threat. As a result the body releases stress hormones epineprin, norepineprin, and cortisol. This hormone affects the metabolism of



glucose, protein, fat and nervous system which is manifested as stress. The nervous system immediately responds to stress by increasing blood pressure during the fight-or-flight response (the body's physical reaction to external threats). Eventually an increase in heart rate and narrowed blood vessels and reduced blood flow. Then the heart works harder to pump blood resulting in an increase in blood pressure (Larasanti, 2013).

This is in line with Jarup's research in 2008 which showed a correlation between noise intensity from aircraft or road traffic near airports with the risk of hypertension, which has an Odds Ratio (OR) of 1.14 with 95% CI (1.01 - 1.29) (Needle. 2008). Pershagen in 2007 also got the result that there was a relationship between long-term aircraft noise exposure so as to increase the risk of hypertension, which has an Odds Ratio (OR) of 1.20 with 95% CI (1.03 - 1.40) (Erikson. 2007) .

Noise received repeatedly in the long run, will result in a permanent rise in blood pressure. A continuous increase in blood and the absence of prevention and control will cause hypertension. High noise at the airport can be overcome by the way officers more often wear ear protection devices such as ear muffs or ear plugs during work so that noise is not a source of danger to officers and does not experience noise hyperstimulus. The reason for choosing the use of ear protection devices is because the use of earplugs can reduce noise by  $\pm 30$  dBA, while earmuffs can reduce noise slightly greater, ie between 40 -50 dBA. The use of Ear Protection Equipment, the noise level received by the ground handling officer can be reduced and is in a safe condition.

### **Conclusion**

The risk of hypertension was 9 times greater for ground handling officers with age over 35 years ( $p = 0.006$ ; OR = 9,000; 95% CI = 1,693 - 47,837). As respondent's age increases, there is a change in the anatomical structure of peripheral blood vessels, which continues with the occurrence of stiffness in the arteries / arteries and results in a small blood flow that triggers hypertension. To minimize this incident, it is necessary to have sufficient rest and not be too long in the airport work environment when it has finished serving, and always use the APT when on duty at the apron.

It is better if the ground handling officer has high motivation to prioritize his work safety and health. For PT. Garuda Angkasa to conduct an initial health check before receiving ground handling workers as a comparison to periodic health inspection data to determine the presence of occupational diseases. For Garuda Pura II to make sanctions and rewards aimed at ground handling of the completeness of Personal Protective Equipment.



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