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Research Article

Stress level, Blood Pressure, and Pulse of Makassar Air Traffic Controller Employees

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Abstract: This research aims to determine the description of blood pressure, stress level, the pulse of Air Traffic Control employees. This research was conducted at Airnav Sultan Hasanuddin International Airport Makassar. The research method is analytic observational with a cross-sectional study approach by looking at a picture of stress level, blood pressure, and pulse of an air traffic controller. Sampling was carried out on ATC employees. Stress level measurement was carried out using a questionnaire, blood pressure using blood pressure gauges, while the pulse rate used palpation. Data were analyzed using SPSS 16. The results showed that after measuring blood pressure, stress level, and pulse of the Air Traffic Controller, it showed that the average Air Traffic Controller employee had a history of high hypertension, as well as at stress level. Whereas the pulse of an ATC is normal. This can happen because an ATC does not do much physical exertion during work but rather expends a lot of thought energy during controlling the aircraft.

Keywords: Stress, Blood Pressure, Air Traffic Controller.

INTRODUCTION

According to 2014 World Health Organization (WHO) data, in many countries or 8% of occupational diseases. The results of the Labor Force Survey in 2014 found 440,000 cases of work-related stress in the UK with an incidence of 1,380 cases per 100,000 workers experiencing work-related stress. 35% of work-related stress is fatal and it is estimated that working days are lost by 43%. Based on a survey of West Australian health statistics it was stated that male workers lost approximately 50.8 working days and female workers lost approximately 58.5 working days (Sari, 2016).

According to statistics reported by the Health and Safety Executive (2016), the number of cases of work stress, depression or anxiety of workers in the UK in 2015 to 2016 amounted to 488,000 cases with a prevalence of 1510 per 100,000 workers. Stress accounts for 37% of all health-related health cases and 45% of all workdays lost due to workers' health problems (Health and Safety Executive, 2016). In addition, the factors that cause work stress, depression or anxiety are mental stresses, including tight deadlines, too many responsibilities and lack of managerial support (Marcatto, *et al.*, 2016; Shea *et al.*, 2016).

WHO (World Health Organization) in 2012 showed that around the world around 982 million people or 26.4% of the earth's inhabitants suffered from hypertension with a ratio of 26.6% of men and 26.1% of women. This number is likely to increase to 29.2% in 2025. High blood pressure or hypertension kills 9.4 million people worldwide every year (WHO, 2012). Hypertension is a cause of death worldwide, which is about 13% of total deaths (Muhammad, 2017).

Survey conducted by The American Institute of Stress (AIS) 2017, the workers in the United States reported 40% of workers stated their work was very stressful, then 29% of workers felt sufficiently or very stressed at work, and 26% of workers said that they often or very often burned out or stressed out from work (Saleh, 2019).

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Based on data in Indonesia, there are around 10% of the total population of Indonesia experiencing stress. Basic Health Research Data (Riskesdas), in 2013 stated that around 1.33 million residents of DKI Jakarta experienced stress where the figure reached 14% of the total population with acute stress levels reaching 1-3% and severe stress reaching 7-10% (Perwitasari, et al. 2015).

Air Traffic Controller or commonly referred to as Air Traffic Controller is a job that has an important role in controlling aircraft travel activities, starting from taking off (taking off) travel route arrangements that are traversed, weather information obtained through the Meteorology and Geophysics Agency (BMKG), visibility, wind direction, temperature, air pressure, information on the presence of airplanes that are monitored via radar, control of landing aircraft (landing via giving signals to pilots, to setting aircraft parkers or aprons). The importance of communication related to information related to flight makes officers Air Traffic Controller is considered as the closest pilot partner in smooth flight (Saleh, 2019).

The sources of stress for the controllers include: (1) Work demands such as the number of planes controlled, the peak period of air traffic density, unscheduled foreign aircraft, the occurrence of unexpected events; (2) Operational procedures, such as time pressure, violation of rules, feeling of loss of control, fear of the consequences of mistakes; (3) Working hours, such as work periods with no breaks, night shifts; (4) work equipment, such as equipment limitations and reliability, quality of communication equipment, telephone lines, and equipment layout; (5) Work environment, such as lighting, optical reflection, sound level, microclimate, non-ergonomic body posture, number of breaks, relaxation facilities and canteen, elevator or stairs; (6) Work organizations, such as role ambiguity, work relationships with supervisors and coworkers, lack of control over work processes, salaries and rewards, public opinion (Setiaji & Wajdi, 2017).

According to Hewitt (1986) in the journal (Mustikawati, 2015), progressive muscle relaxation therapy exercises can release tension in the body and mind and open awareness (improve health and protect against illness, maintain and combine energy, achieve psychophysical expertise and improve the state of psychophysical balance), so that by achieving a balance between body and soul can help a person be more efficient in his life. This study aims to describe the blood pressure, stress level, pulse of Air Traffic Control employees.

METHODOLOGY

The method used in this research is analytic observational with cross sectional study approach by looking at a picture of the level of stress, blood pressure and pulse of an air traffic controller. This research was conducted at Makassar Air Traffic Center. The choice of location is based on a preliminary study that has been carried out in which the work environment at Makassar Air Traffic Center can be said to have a high stress level. This research will be carried out in September 2019.

RESULTS

Table 1. Distribution of Water Traffic Controller Age Characteristics At AirNav Makassar

Variable	ATC employees	
Age	**n**	**%**
Young (20-35 years)	22	55
Old (36-50 years)	18	45
Total	**40**	**100**

Source: Primary Data, 2019

Based on data from Table 1, the age of Air Traffic Control employees, which on average has an age of 20-35 years, is 22 people (55%) and 36-50 years is 18 people (45%).

Table 2. Distribution of Gender Air Traffic Controller Characteristics Airnav Makassar

Variable	Intervention Group	
Gender	**n**	**%**
Male	28	70
Female	12	30
Total	**40**	**100**

Source: Primary Data, 2019

Based on the data table 2 Gender Air Traffic Control employees on average are 28 people (70%) and 12 people (30%).

Table 3. Distribution of Characteristics Length of Work of Air Traffic Controller in AirNav Makassar

Variable	Intervention Group	
Length of Work	**n**	**%**
Qualify	40	100
Not eligible	0	0
Total	**40**	**100**

Source: Primary Data, 2019

Based on data from table 3, the duration of work of Air Traffic Control employees on average all have met the working requirements (100%) for <6 hours per day.

Table 4. Distribution of Characteristics Working Duration of Air Traffic Controller Employees at AirNav Makassar

Variable	Intervention Group	
Working Duration	**N**	**%**
Old	31	77,5
New	9	22,5
Total	**40**	**100**

Source: Primary Data, 2019

Based on the data in table 4, the highest number of years of service is that ATC employees have years of service with 77.5% and 22.5% in the new category.

Table 5. Changes in Blood Pressure Air Traffic Controller at AirNav Makassar

Group	ATC employees				Category
	Sistol		Diastole		
	N	%	n	%	
ATC Employees	11	*13,3*	11	*20*	Hypertension
	17	33,3	15	20	Prehypertension
	12	20	14	26,7	Normal
Total	40	66,7	40	66,7	

Source: Primary Data, 2019

Based on data from table 5, the characteristics of blood pressure systole air traffic controller on average have a history of prehypertension as much as 33.3% then normal as much as 20% and a history of hypertension as much as 13.3%. While diastole blood pressure with a history of prehypertension is 20%, normal is 26.7% and hypertension is 20%.

Table 6. Characteristics of Air Traffic Controller Stress Levels at AirNav Makassar

Group	Stress Level		Category
	n	%	
ATC employees	24	*35,8*	Low
	16	23,9	Moderate
	6	8,8	High
Total	40	66,7	

Source: Primary Data, 2019

Results of analysis of table 6 characteristics the average stress level has a Low stress level of 35.8% and a moderate stress level of 23.9% and a high stress level of 8%.

Table 7. Characteristics of Air Traffic Controller Pulse Rate at AirNav Makassar

Group	Pulse		Category
	n	%	
ATC employees	0	*0*	Low
	39	*58,4*	Moderate
	1	1,5	High
Total	40	66,7	

Source: Primary Data, 2019

The results of Table 7 analysis of the average pulse characteristics have a normal of 58.4% and a height of 1.5%.

DISCUSSION

Air Traffic Control (ATC) is a regulator of air traffic from before the aircraft takes off until the aircraft reaches its destination. Before the aircraft took off, the ATC has provided services to the pilot in the form of checking the flight plan submitted by the pilot to the ATC (Loura, 2013).

The ATC Organization Work System focuses on air traffic control. dimensions that affect the high or

low mental load carried by the controllers in the ATC include external dimensions and internal dimensions. Controllers have authority over airspace and ground control (Iqbal & Waseem, 2012; Tiara, *et al.*, 2019).

Based on data from table 5, the characteristics of blood pressure systole air traffic controller on average have a history of prehypertension as much as 33.3% then normal as much as 20% and a history of hypertension as much as 13.3%. While diastole blood pressure with a history of prehypertension is 20%, normal is 26.7% and hypertension is 20%.

This is caused by the factor of adult age which tends to have high stress levels in the medium category. Stress results in sympathetic stimulation which can increase the frequency of blood pressure, cardiac output and vascular resistance as well as the effect of sympathetic stimulation on increasing blood pressure (Perry & Potter, 2005). Stress can trigger an increase in systolic and diastolic blood pressure in people who have a sensitivity to it. Besides stress tends to cause a rise in blood pressure that is repeated, but, if the stress has passed then the blood pressure will usually return within normal limits. The results of the analysis of table 6 characteristics The average stress level has a Low stress level of 35.8% and a moderate stress level of 23.9% and a high stress level of 8%. The results of Table 7 analysis of the average pulse characteristics have a normal of 58.4% and a height of 1.5%.

While the pulse does not change because the heart rhythm of an air traffic controller is always in a stable state because the activity during work is always in a static state such as sitting for long, so it does not cause significant changes in the pulse rhythm.

CONCLUSION

Overall the results of this study showed that of 40 respondents there were 16 respondents who were at moderate stress levels while 6 of them were at high stress levels. Next, from 40 respondents as many as 17 respondents who had a history of prehypertension in systolic blood pressure, while in diastole as many as 15 respondents. A total of 39 respondents had normal pulses and 1 of them had high pulses. It is recommended for Makassar General Air Traffic Controller Managers to always supervise the health of their workers.

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