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Job Stress on Air Traffic Controllerat Sultan Hasanuddin International Airport Makassar

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Abstract

The Purpose of this research is to discover the relationship between age, genderworking period, work shift and workload to job stress and to ensure factors that most influential job stress on Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport Makassar.This research is an analytic observational study using a cross sectional study design which aims to analyze factors related to job stress on the Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport, Makassar. This study also utilizes a regression analysis model to observe which variables have the most influence on job stress on the Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport, Makassar.The significance value of age with job stress (0.210>0.05), the significance value of gender with job stress (0.410 > 0.05) the significance value of working period with job stress (0.382>0.05),the significance value of work shift with job stress (0.001 < 0.05), and the significance value of workload with job stress (0.000<0.05). Through the logistic regression test, the OR value of age (.772), value of working period (1.473), value of gender (1.855), value of work shift (4.719), and value of workload (9.100).There is no a significant relationship between age, gender, and working period with job stress. There is a significant relationshipbetween shift work with job stress and workload with job stress on Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport Makassar, the factor that most influences job stress is workload.

Keywords: *Job stress, workload, work shift, working period, gender, age, Air Traffic Controller (ATC)*

1. Introduction

Aviation is a means of transportation that is already in an unsafe condition (unsafe condition). Safety is a priority in the world of aviation. On the one hand, economic growth is a significant factor in increasing the growth of air transport services. Based on data released by the Aviation Safety Council (ASC) in 2010.Jouetal (2013) there were 1.82 accidents per 1 million flights per hour in Taiwan and 1.08 accidents per 1 million flights per hour worldwide.To create flight safety, an air traffic guidance service called Air Traffic Control (ATC) was formed. ATC is considered as one of the most demanding jobs (Costa, 1996).

Stress will increase if things happen such as bad weather for flights and navigation and communication equipment that is not functioning properly, the shift rotation system is not suitable or does not work properly(Budiman, 2013).

One of the human errors that often occurs is the interaction which includes communication and misunderstanding between the pilot and the Air Traffic Controller. In the safety aspect, the take-off and landing processes are the most critical situations of aviation that require ATC to be even better because they play a central role in this (Fathimahhayatietal., 2018). Therefore, IATCA asks aviation

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stakeholders in Indonesia to plan all top priorities, including security, capacity and regulations (Saleh, 2018).

ATC is aware of the responsibility for the lives of people in the aircraft which appear as only small dots on the radar screen. Extremely demanding on the ATC psyche are lost aircraft, accident, collision, dangerous, rapprochement, and failure of aircraft in flight, high jacking, dangerous substances, bomb scar onboard and other misfortunes(Rozenberg&Begera, 2011; Regulaetal., 2014;Sochaetal., 2015).In busy traffic conditions the air traffic controller must be still in suspense and anticipation of the new situation. A large degree of responsibility and the hundreds of lives flying in aircraft, leads to stress experience. The greater or lesser stress exists as a daily part of the workday in this profession (Čekanováetal.,2016).

Stress is a common problem that occurs in human life, whether in school, work, family, or anywhere else, stress can be experienced by someone. Stress can also happen to anyone, including children, adolescents, adults, or the elderly (Kupriyanovetal., 2014). In other words, stress must happen to anyone, anywhere. The problem is when the amount of stress is experienced by a person so much. The impact is that stress endangers his physical and mental condition (Gaol, 2016).

Currently, stress is defined as an immediate biological, physiological and psychological response to an alarm, mobilization and defence of an individual organism in the form of aggression or threat. It is obviously useful and leads to the choice and implementation of adaptive solutions. It evokes the atmosphere of extraordinary tension. Psychological stress finishes with the release and mental relaxation and exhaustion. Stress is not a pathological phenomenon, but if it is too strong, it may become pathological when acting adversely (Čekanová et al., 2016).

2. Methods

This type of research used is quantitative. The research design used was an analytic observational study with a cross-sectional study approach. The number of population in this study amounted to 184 Air Traffic Control Branch of Makssar Air Traffic Service Center Sultan Hasanuddin International Airport, the number of samples studied was taken using purposive sampling technique totaling 65 controllers. The data source used is secondary data. The measuring instruments used are the questionnaire to measure the stress level and NASA-TLX to measure workload,The data analysis used was the chi-square test and logistic regression using the SPSS program.

3. ResultsandDiscussion

The results show that of the 65 Air Traffic Controllers of Sultan Hasanuddin International Airport Makassar, there are 49 (75.3%) young controllers and 16 (24.7%) old controllers, there are 48 (73.8%) male controller and there are 17 (26.2%) female controller, there are 40 (61.5%) controllers that having new working period (≤ 6 years) and 25 (38.5%) controllers that having long new working period, there are 41 (80%) controllers that working on day shift and there are 24 (20%) controller that working on night shift, and there are 38 (58.5%) controllers that having heavy workload. Meanwhile, the results of measuring job stres using quetionarries showed that there were more controllers with high stress, amounting 38 (58.5%) controllers, than controllers had a low stress amounting 27 (41.5%) controllers. The distribution of respondents based on the independent and dependent variables can be seen in table 1.

Table 1. Distribution of Respondents based on Independent and Dependent Variable

Variable	n	%
Age		
Young	49	75.3
Old	16	24.7
Gender		
Male	48	73.8
Female	17	26.2
Working Period		
New	40	61.5
Long	25	38.5

ISSN: 2005-4238 IJAST

Work Shift		
Day	41	80
Night	24	20
Workload		
Heavy	38	58.5
Mild	27	41.5
Job Stress		
High	38	58.5
Low	27	41.5

Based on the cross tabulation table between age and job stress variable, it shows that the percentage of respondents who have a high stress are more on the controller with the young age category amounting 26 controllers (53.1%) than the old age amounting 12 controllers (75%). While the percentage of respondents who have a low stress are more on the controller with the young age category amounting 23 controllers (46.9%) compared to the old age amounting 4 controllers (25%). Based on data analysis using the Chi Square test, the value of $p > 0.05$ ($p = 0.210$) was obtained (Table 2).

Based on the cross tabulation table between gender and job stress variable, it shows that the percentage of respondents who have a high stress are more on the male controller category amounting 30 controllers (62.5%) than the female controller amounting 8 controllers (47.1%). While the percentage of respondents who have a low stress are more on the male controller categoryamounting 18 controllers (37.5%) compared to the old age amounting 9 controllers (52.9%). Based on data analysis using the Chi Square test, the value of $p > 0.05$ ($p = 0.410$) was obtained (Table 2).

Based on the cross tabulation table between working periodvariable and job stress variable, it shows that the percentage of respondents who have a high stress are lesstothe controller with new working period amounting 13 (50%) controllers and long working period amounting 25 controllers (64.1%). While the percentage of respondents who have a low stress are less on the controllers with new working period category, amounting 13 controllers (50%) than to long working period amounting 14 controllers (35.9%). Based on data analysis using the chi square test, the value of $p < 0.05$ ($p = 0.382$) was obtained (Table 2).

Based on the cross tabulation table between work shift variable and job stress variable, it shows that the percentage of respondents who have a high stress is more on the controllers who working on day shift amounting 31 (75.6%) controllers than 7 (25.9%) controllers who working on night shift. While the percentage of respondents who have a low stress are more on controller who working on day shift amounting 10 (24.4%) controllers than 17 (70.8%) controllers who working on night shift. Based on data analysis using the chi-square test, the value of $p < 0.05$ ($p = 0.001$) was obtained (Table 2).

Based on the cross tabulation table between workload variable and job stress variable, it shows that the percentage of respondents who have a high stress is more on the controllers who have heavy workload amounting 31 (81.6%) controllers than 7 (25.9%) controllers who have mild workload. While the percentage of respondents who have a low stress are more on controller who have mild workload amounting 20 (74.1%) controllers than 7 (18.4%) controllers who have heavy workload. Based on data analysis using the chi-square test, the value of $p<0.05$ ($p = 0.000$) was obtained (Table 2).

ISSN: 2005-4238 IJAST

Table 2. Relationship between Independent Variables and Dependent Variable on Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport, Makassar

Variable	Job Stress Category				Total		Statistic Test Results
	High Stress		Low Stress				
	n	%	n	%	N	%	
Age							
Young	26	53.1	23	46.9	49	100	p=0,210
Old	12	75	4	25	16	100	
Gender							
Male	30	62.5	18	37.5	48	100	p=0,410
Female	18	47.1	9	52.9	17	100	
Working Period							
New	13	50	13	50	26	100	p=0,382
Long	25	64.1	14	35.9	39	100	
Work Shift							
Day	31	75.6	10	24.4	41	100	p=0,001
Night	7	28.2	17	70.8	24	100	
Workload							
Heavy	31	81.6	7	18.4	38	100	p=0,000
Mild	7	25.9	20	74.1	27	100	

Based on the multivariate results, it shows that age, gender, and working period did not have a sig value <0.05. Age has a sig value of 0.210 > 0.05, gender has a sig value of 0.410 > 0.05 and working period has a sig value of 0.382>0.05. Only two variable that have a sig value which are work shift with a sig value of 0.001 < 0.05 and workload with a sig value of 0.000 < 0.05.The multivariate analysis of variable that affecting job stress on Air Traffic Controller at Sultan Hasanuddin International Airport, Makassar can be observed in table 3.

Table 3. Multivariate Analysis of Variables thataffect Job Stress on the Air Traffic Controller (ATC) at Sultan Hasanuddin Airport, Makassar

Variable / Step	B	S.E	Wald	Sig.	Exp(B)
Step 1					
Work Shift	1.727	.804	4.618	.032	5.623
Working Period	.418	.763	.300	.584	1.519
Workload	2.159	.650	11.039	.001	8.663
Age	-.258	.807	.103	.749	.772
Gender	.619	.753	.677	.411	1.858
Constant	-7.000	2.805	6.226	.013	.001
Step 2					
Work Shift	1.807	.767	5.557	.018	6.092
Working Period	.388	.756	.263	.608	1.473
Workload	2.148	.646	11.049	.001	8.566
Gender	.650	.741	.771	.380	1.916
Constant	-7.413	2.519	8.662	.003	.001
Step 3					
Work shift	1.625	.668	5.910	.015	5.076
Workload	2.146	.645	11.086	.001	8.555
Gender	.618	.734	.708	.400	1.855
Constant	-6.493	1.681	14.915	.000	.002
Step 4					

ISSN: 2005-4238 IJAST

Work Shift	1.552	.654	5.629	.018	4.719
Workload	2.208	.639	11.928	.001	9.100
Constant	-5.700	1.315	18.779	.000	.003

The results of the research on the relationship between age and job stress using the Chi-Square test obtained p-value = 0.210, because the p-value <α = 0.210 >0.05, there is no a relationship between age and job stress on Air Traffic Controller (ATC) at the Sultan Hasanuddin International Airport Makassar. In this study, the most controllers who have high stress are 26 controllers (53.1%) on young officers this is due to the night shift which has an impact on the performance of the controller body. This research is in line with research conducted by Yuliani& Putri (2020) which shows to employees of the Jagakarsa urban village office, South Jakarta, who concluded that age is not related to work stress because the work at the Jagakarsa Village office is work that can be done by workers both old and young because the work does not require high concentration like in a laboratory. Likewise, research on surgical room nurses at the Central Surgical Installation of K.R.M.T Regional Hospital,Wongsonegoro Semarang concluded that there was no relationship between age and job stress in operating room nurses From the two journals above, it is the reason why age does not affect work stress on workers, because the responsibilities and workload that must be carried out are not influenced by age (Fuadaetal.,2017).

The results of the research on the relationship between gender and job stress using the Chi-Square test obtained p-value = 0.410, because the p-value <α = 0.410 >0.05, there is no a relationship between gender and job stress on Air Traffic Controller (ATC) at the Sultan Hasanuddin International Airport Makassar. This is in line with research Sarietal., (2017) which states there is no relationship between gender and work stress (P value = 0.175) nurses at Bhakti Kartini Hospital Bekasi. This is also in line with the research entitled "Gender differences in psychological morbidity, burnout, job stress and job satisfaction among Chinese neurologists: a national cross-sectional study", which reveals that there is no relationship between age and work stress in neurologists, one of which is due to because there is one other psychological factor that disturbs them more, namely the low level of job satisfaction (Puetal., 2017).

The results of the research on the relationship between working period and job stress using the Chi-Square test obtained p-value = 0.382, because the value of p <α = 0.0382 >0.05, there is no a relationship between working period and job stress on the Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport Makassar. The result is in accordance toUlum (2018) that working period does not have a significant effect on job stress on the Bus Rapid Transit (BRT) corridor II Semarang City driver (P-value = 0.505). The work period has a positive and negative impact on workers. Positive effects, for example, such as the longer a person works, the more work experience increases, but the negative effect itself is that the longer a person works, the more bored and tired workers are due to monotonous work. Likewise, a study entitled "Prevalence of Stress a Coping Mechanism Among Staff Nurses of Intensive Care Unit in a Selected Hospital" reveals that there is no relationship between job stress and working period(Kibria,2018). Other results were also found in research in Iran on nurses showing no significant relationship between working period and work stress. This is due to increased clinical competence over time and through the acquisition of various work experiences in the field of patient care (Farajietal., 2019).

When observed from the ATC side, why could this happen because companies that provide aviation services, in this case AIRNAV, have been able to implement a rating assessment system to measure the ability of ATC employees every 6 months, not only that the employees have also passed the same level of education. DII and DIII are equipped with job training so that they become more proficient in accordance with the job description and are worthy of the position they occupy (Saleh, 2020).

The results of the research on the relationship between work shift and job stress using the chi-square test obtained p-value = 0.001, because the p-value <α = 0.001 <0.05, there is a relationship between work shift and job stress on the Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport Makassar. This is in line with research (Tomic& Liu, 2017), Which reveals that of the 5 markers of stress in Air Traffic Controller employees, namely, pressure, deadlines, work

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relationships, fatigue, work shifts, the most influential on the incidence of work stress is work shift (M = 0.7671). Research in Brazil also Freitasetal., (2017) revealed that 25% of Air Traffic Controller employees experience excessive sleepiness during day shifts and this can certainly interfere with their productivity in doing work. In line with the research entitled "Brazilian Air Traffic Controllers Exhibit Excessive Sleepiness" reveals that air traffic controllers in Brazil show excessive sleepiness, this habit is related to sleep quality, for example, such as not wearing sunglasses when leaving work in the morning after working all night, sleeping with the lights on, and the use of stimulants before bed / sedatives to sleep (Ribaetal., 2011).

The results of the research on the relationship between workload and job stress using the chi-square test obtained value = 0.000, because the p-value <α = 0.000<0.05, there is a relationship between workload and job stress on the Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport Makassar. This is also in line with the research conducted by Setiadji which found that there was a significant influence between workload and ATC stress level (P-value = 0,000), if the workload level of the average ATC was at a very heavy level, then this automatically means that make work stress levels increase (Setiaji, 2017). This will have a bad impact on ATC as in Roa's research on ATC which concluded that in the work environment of ATCs, workload and stress make their working memory more vulnerable to loss of information. If the operating procedure is inconsistent due to the workload, ATC's unpreparedness will appear in service (Roa, 2018).

Each variable has been tested logistic regression, it is found that age has no a sig value of 0.210 >0.05, EXP (B) .772, gender has no a sig value 0.410 > 0.05 EXP (B) 1.855 working period has no a sig value 0.382> 0.05, EXP (B) 1.473, work shift has a sig value 0.001 < 0.05 EXP (B) 4.719 and Workload has a sig value 0.000< 0.05, EXP (B) 9.100. There aretwo variables that had sig value obtained is <0.05 which are work shift and workload. But the most influential variable on the job stress on Air Traffic Controller (ATC) at Sultan Hasanuddin International Airport Makassar is workload. This is in line with research Susanti, (2017) which reveals that workload has a significant effect on work stress on Air Traffic Controller employees. Likewise, the research entitled "Factors Affecting Work Stress in Air Traffic Controller Workers" which was researched by Susanti(2017)stated that the factors that most influence work stress on ATC are workload and work routine. The workload itself will increase even more for Air Traffic Controller employees if something happens, including bad weather for flights, navigation and communication equipment that is not functioning properly (Ismail, 2019).

Conclusion

There is no a significant relationship between age, gender, and working period with job stress. There is a significant relationship between work shift with job stress and workload with job stress on Air Traffic Controller at Sultan Hasanuddin International Airport Makassar, the factor that most influential to the job stress is workload.

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