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FACTORS INFLUENCING WORK FATIGUE IN TRAIN DISPATCHER AT BANDUNG STATION

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ABSTRACT

Train dispatcher who is absent it causes an overhaul of the service pattern; there are nine to eleven times the SPV Perka replaces Train Dispatcher in one month. This high intensity of replacement was caused by the absence of the relevant train dispatcher, as a result of the fatigue factor experienced by the officers. It can be interpreted that it is important to minimize the level of work fatigue in Train Dispatcher by paying attention to the factors that affect work fatigue, both internal and external factors. Based on these problems, the researchers seek to analyze the factors that influence work fatigue in Train Dispatcherat Bandung Station. This research uses quantitative methods with primary and secondary data sources. The data collected through a questionnaire to all relevant train dispatcher, on the Bandung station, for January-March 2022. Data processing techniques were carried out on Microsoft Excel and SPSS version 25 applications with multiple linear regression analysis and to measure the level of officer fatigue, the Subjective Self Rating Test method was used. The results of this research were 18 officers get low fatigue and 6 people moderate fatigue. Factors that affect work fatigue are age and nutritional status, with a percentage of 52.9% while the rest is influenced by other factors.

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1. INTRODUCTION

Railways as a unified system of infrastructure, facilities and human resources for implementation rail transportation (Law No. 23, 2007) and train stations are places of departure and stopping of trains, crossing, overtaking or overtaking, and shunting, as well as a place for boarding and unloading passengers or loading and unloading of goods (PD 19 Volume I, 2011) . In guaranteeing safety and order, including everything related to the affairs of train travel and shunting affairs within its station boundaries, officer train trips namely Train Travel Arrangers (PPKA), Platform Supervisors (PAP) and Langsir Officers (PLR) coordinate with each other with a number of other officers depending on the class and type. These stations are: small stations, medium stations, and large stations.

Bandung Station is one of the major stations located in Operational Area 2 (DAOP 2) and as a station major in the city of Bandung which serves several train trips both local, economy, business and executive. In ensuring safety and order, there are 24 train dispatcher, namely 4 PPKA people, 4 PAP people, and 16 PLR people with the pattern of service of Train Dispatcher divided into 3 shifts a day. So that in a day there are 1 PPKA person and 1 PAP person, as well as 4 PLR officers who are on holiday. With the number of train dispatcher, when there is 1 train dispatcher who is absent it causes an overhaul of the service pattern, namely: the absent train dispatcher is replaced by the head of the sub-section of railroad travel affairs (Kasubur Perka) or replaced by an officer who was at that time get holidays.

Based on PPKA, PAP and PLR attendance list data for January-March 2022, it is known that there are nine to eleven times the SPV Perka replaces Train Dispatcher in one month. This high intensity of replacement was caused by the absence of the relevant train dispatcher, as a result of the fatigue factor experienced by the officers (Kasubur Perka and Bandung Station Administration). Nurjanah (2019) said that fatigue can affect the level of absenteeism, because work fatigue is a process of decreasing efficiency, work capacity and physical strength/endurance of the body to continue the activities that must be carried out (Suma'mur (1996) in (Virgy, 2011). It can be interpreted that it is important to minimize the level of

work fatigue in Train Dispatcher by paying attention to the factors that affect work fatigue, both internal and external factors. Based on these problems, the researchers seek to analyze the factors that influence work fatigue in Train Dispatcherat Bandung Station.

2. METHODS

This research uses quantitative methods with primary and secondary data sources. Primary data related to data on the level of fatigue of Train Dispatcher collected through a questionnaire to all relevant train dispatcher, namely PPKA, PAP, and PLR. Secondary data is data obtained from agencies related to Train Dispatcherat the Bandung station, including: data on working hours overview (IJK), recapitulation of the number of employees needed and attendance list for officers for January-March 2022.

In accordance with theThe research method used, namely: quantitative method, data processing techniques were carried out on Microsoft Excel and SPSS version 25 applications with multiple linear regression analysis and to measure the level of officer fatigue, the Subjective Self Rating Test method was used.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Characteristics of Respondents

The following is an explanation of the results of the questionnaire regarding the characteristics of the respondents.

a. Age

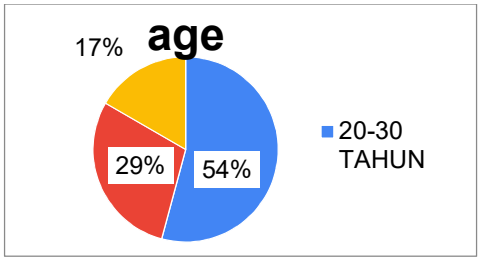

Figure 1. Characteristics of Respondents by Age

The diagram above shows that there are 54% (13 people) of officers aged between 20 and 30 years, officers aged 30-40 years are 29% (7 people), and officers aged over 40 years are 17% (4 people).

b. Nutritional status

After obtaining height and weight data from train dispatcher, the officer's Body Mass Index is calculated with the following results:

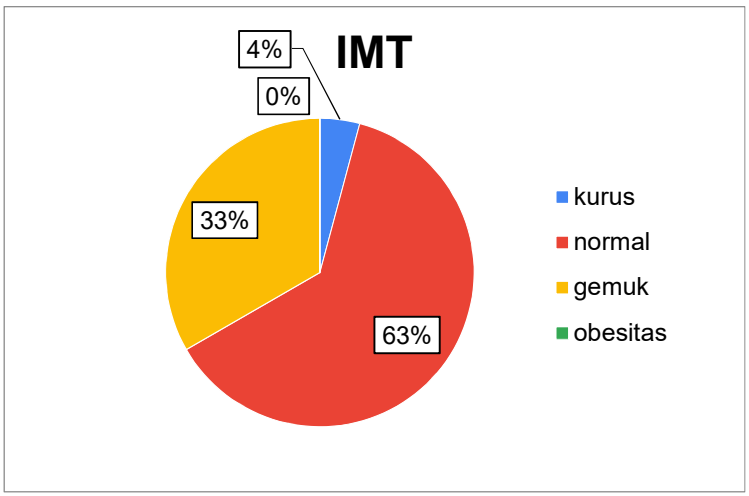

Figure 2 . Characteristics of Respondents Based on Body Mass Index

From the diagram above it can be concluded that the dispatcher the Bandung station train has a lean body mass index of 4% (1 person), 63% normal (15 people), 33% obese (8 people), and officers with an obesity body mass index were not found.

c. Years of service

As many as 17% (4 people) of Train Dispatcherat the station have worked for approximately 3-5 years, as many as 50% (12 people) have worked for 5-10 years, and as many as 33% (8 people) have worked for more from 10 years.

3.1.2 Work Fatigue

To be able to determine work fatigue on train dispatcherfire, the author uses the Subjective Self Rating Test method, with the result of the sum of the scores from the distribution of the questionnaires that have been carried out to all respondents as follows:

Table 1. SSRT Test Results

No	Rep.	Total	Ket.	No	Rep.	Total	Ket.
1	Yosa	65	Currently	**13**	Asep	39	Low
2	inspiration	43	Low	**14**	Rukmana	54	Currently
3	Yudi	61	Currently	**15**	Raffi	36	Low
4	Uus	39	Low	**16**	Cece	55	Currently
5	great	40	Low	**17**	Ryan	36	Low
6	Riyandi	34	Low	**18**	Tayudin	39	Low
7	Giar	48	Low	**19**	Lutfi	35	Low
8	eco	54	Currently	**20**	Deni	38	Low
9	Herman	54	Currently	**21**	embryo	43	Low
10	Setyo	35	Low	**22**	Yogis	44	Low
11	Ahmad	35	Low	**23**	Hilly	44	Low
12	Sudrajat	39	Low	**24**	Crisna	41	Low

From the table above it can be concluded that all Train Dispatcherexperience work fatigue with a low fatigue percentage of 75% (18 people) and moderate fatigue as much as 25% (6 people).

Multiple Linear Regression Test

Multiple linear regression test is used to determine the effect of variable x on variable y which is then obtained by a regression model.

Table 2 Multiple Linear Regression Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	21.575	8.882		2.429	0.027		
	X01	18.237	6.061	1.114	3.009	0.008	0.149	6.695
	X02	1.821	3.677	0.112	0.495	0.627	0.404	2.477
	X03	-10.161	4.307	-0.696	-2.359	0.031	0.235	4.257
	X04	-4.166	3.949	-0.256	-1.055	0.306	0.347	2.881
	X05	2.928	3.965	0.194	0.738	0.470	0.297	3.368
	X06	0.134	6.241	0.007	0.021	0.983	0.169	5.901

a. Dependent Variable: Y

From the table above it can be seen the significance value of each variable. Of the six variables studied, only two variables had a significance value below 0.05. Which means there are only two variables that affect work fatigue on Train Dispatcher at the Bandung station. Namely the variables of age and nutritional status, so that the regression model can be obtained as follows:

Y = 21.575 + 18.237X1 – 10.161X2

The regression equation can be explained as follows:

a. If everything the independent variables are considered constant (X = 0) so the value of fatigue for Train Dispatcheris 21.575.
b. Mark α_1 of 18.237 means that if the age variable (α_1) increases by one unit, the fatigue variable for train travellers (Y) will increase by 18.237 units. The coefficient is positive, meaning that there is a positive influence between age and work fatigue, the higher the age of the worker, the higher the level of work fatigue received by train dispatcher.
c. Mark α_2 of -10.161 means that if the nutritional status variable (α_2) increases by one unit, then the work fatigue of Train Dispatcher(Y) will decrease by 10.161 units. The coefficient is negative, meaning that there is a negative relationship between nutritional status and work fatigue of train dispatcher, the higher the nutritional status, the lower the fatigue level of train dispatcher.

Discussion

The discussion contains a description of the level of fatigue received by officers, both medium and low, seen from the characteristics of the respondents' age, body mass index, and years of service. And the discussion regarding hypothesis testing is the partial t test, simultaneous f test, and the coefficient of determination.

Factors Influencing the Work Fatigue of Train dispatcher

To find out whether the author's initial assumption that all X variables affect Y variables either partially or simultaneously is true or false, a hypothesis test is carried out by conducting a t test, F test, and the coefficient of determination. The following are the results of testing the hypothesis using the t test, F test, and the coefficient of determination:

1. Partial T test

Table 3. Partial T Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	21.575	8.882		2.429	0.027		
	X01	18.237	6.061	1.114	3.009	0.008	0.149	6.695
	X02	1.821	3.677	0.112	0.495	0.627	0.404	2.477
	X03	-10.161	4.307	-0.696	-2.359	0.031	0.235	4.257
	X04	-4.166	3.949	-0.256	-1.055	0.306	0.347	2.881
	X05	2.928	3.965	0.194	0.738	0.470	0.297	3.368
	X06	0.134	6.241	0.007	0.021	0.983	0.169	5.901

a. Dependent Variable: Y

From the results of the calculation of the multiple linear regression test as shown in the table above shows:

a. The results of the t test, the age variable (X01) shows a significant value of 0.008 which is smaller than the predetermined significance value of 0.05 and the t_{hitung} of (3.009) which is greater than the value $t_{tabel}$of 2.074. So it is rejected, which means the age factor has a significant effect on the fatigue of Train DispatcherH_{01}
b. The results of the t test, sleep hours variable (X02) showed a significant value of 0.627 which was greater than the predetermined significance value of 0.05 and the t_{hitung} of (0.495) which is smaller than the value t_{tabel} of 2.074. So that,H_{02} accepted which means the sleep hours factor does not have a significant effect on the work fatigue of train dispatcher.
c. The results of the t test, the nutritional status variable (X03) shows a significant value of 0.031 which is smaller than the predetermined significance value of 0.05 and the t_{hitung} of (-2.359) which is absolute to 2.359 which is greater than the value t_{tabel} of 2.074. So it is rejected, which means that the nutritional status factor has a significant effect on the fatigue of Train DispatcherH_{03}
d. The results of the t test, the workload variable (X04) shows a significant value of 0.306 which is greater than the predetermined significance value of 0.05 and the t_{hitung} of (-1.055) which is absolute to 1.055 which is smaller than the value t_{tabel} of 2.074. So that, H_{04} accepted, which means the workload factor does not have a significant effect on the fatigue of train dispatcher.

e. The results of the t test, the monotonous state variable (X05) shows a significant value of 0.470 which is greater than the predetermined significance value of 0.05 and the value t_{hitung} of (0.738) which is smaller than the value t_{tabel} of 2.074. So that, H_{05} accepted, which means the monotony factor does not have a significant effect on the fatigue of train dispatcher.
f. The results of the t test, the work shift variable (X06) shows a significant value of 0.983 which is greater than the predetermined significance value of 0.05 and the t_{hitung} of (0.021) which is smaller than the value t_{tabel} of 2.074. So that, H_{06} accepted, which means the work shift factor does not have a significant effect on the fatigue of train dispatcher.

2. Simultaneous F Test

Table 4 Simultaneous F Test Results

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2813.334	6	468.889	5.308	.003[b]
	Residual	1501.771	17	88.339		
	Total	4315.106	23			

a. Dependent Variable: Y
b. Predictors: (Constant), X06, X03, X04, X02, X05, X01

F test results, obtained value F_{hitung} of 5.308 which is greater thanF_{tabel} 2.70 means significant. The significance value in the F test is 0.003 which is smaller than the standard significance of 0.05. This means that there is a significant influence between the factors of age, hours of sleep, nutritional status, workload, monotony, and work shifts on work fatigue on Train Dispatcher, so it was rejected H_{07}

3. The coefficient of determination

Table 5 Determination Coefficient Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.807[a]	0.652	0.529	9.39891	1.677

a. Predictors: (Constant), X06, X03, X04, X02, X05, X01
b. Dependent Variable: Y

The test results for the coefficient of determination with an Adjusted R2 (Coefficient of Determination) value of 0.529. This can be interpreted that the independent variables (age, hours of sleep, nutritional status, workload, monotony, and work shifts) can explain or influence the dependent variable (work fatigue of train dispatcher) of 52.9%, while the rest is explained by other factors not examined.

Table of Work Fatigue Frequency Distribution

The following is a frequency table of the characteristics of the respondents to work fatigue:

Table 6 Frequency Distribution of Respondents' Age of Work Fatigue

Characteristics of Respondents			Fatigue_work		Total
			Low Fatigue	Moderate Fatigue	
Age	20 - 30 Years	Count	12	1	13
		% within Age	92.3%	7.7%	100.0%
	30 - 40 Years	Count	5	2	7
		% within Age	71.4%	28.6%	100.0%
	> 40 Years	Count	1	3	4
		% within Age	25.0%	75.0%	100.0%

From the table above it can be concluded that Train Dispatcheraged 20-30 years experienced 12 people with low fatigue and 1 person with moderate fatigue. Among officers aged between 30-40 years, 5 people experienced low fatigue and 2 people experienced moderate fatigue. While for officers aged over 40 years, 1 person experienced low fatigue and 3 people experienced moderate fatigue.

Table 7 Frequency Distribution of Respondents' BMI Against Work Fatigue

Characteristics of Respondents			Fatigue_work		Total
			Low Fatigue	Moderate Fatigue	
BMI	Thin	Count	0	1	1
		% within BMI	0.0%	100.0%	100.0%
	Normal	Count	12	3	15
		% within BMI	80.0%	20.0%	100.0%
	Fat	Count	6	2	8
		% within BMI	75.0%	25.0%	100.0%

From the table above it can be seen that 1 person with a thin Body Mass Index experienced moderate fatigue, 12 workers with a normal body mass index found that they experienced low fatigue and 3 people experienced moderate fatigue. Meanwhile, there were 6 officers with a fat body mass index who experienced low fatigue and 2 workers experienced moderate fatigue.

Table 8 Frequency Distribution of Respondents Working Period Against Work Fatigue

Characteristics of Respondents			Fatigue_work		Total
			Low Fatigue	Moderate Fatigue	
Years of service	35 years old	Count	4	0	4
		% within Work_Time	100.0%	0.0%	100.0%
	5 - 10 Years	Count	10	2	12
		% within Work_Time	83.3%	16.7%	100.0%
	> 10 Years	Count	4	4	8
		% within Work_Time	50.0%	50.0%	100.0%

From the table above it can be explained that Train Dispatcherwith a working period of 3-5 years experience low fatigue as many as 4 people. Then officers with 5-10 years of service experienced low fatigue as many as 10 people and 2 people experienced moderate fatigue. Meanwhile, officers with more than 10 years of experience experienced low fatigue as many as 4 people and moderate fatigue as many as 4 people.

4. CONCLUSION

The results of this research were 18 officers get low fatigue and 6 people moderate fatigue. Factors that affect work fatigue are age and nutritional status, with a percentage of 52.9% while the rest is influenced by other factors,

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