Factors that Cause Work Fatigue of Nurses in the Inpatient Installation RSUD Prof. Dr. Soekandar Mojosari

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Abstract— *Work fatigue is a feel of weary body with work activities in a long time indicated by increase the concentration of blood lactic acid the amount range between 1-2 mmol/l of blood. RSUD Prof. Dr. Soekandar Mojosari was one of the hospitals located in Mojokerto, nurses Installation Inpatient in there was susceptible to get work fatigue caused by overload weakness.This research aims to analyze the factors cause to the work nurse fatigue in the RSUD Prof. Dr. Soekandar Mojosari. This research is quantitative research with cross sectional design research obtained by using the technique of sampling means that 28 nurses. Linier regression test results revealed that the work load (p=0,001) has a relationship with the work fatigue at the time of 4 hours after the work and age (p=0,005) has a relationship with the work fatigue at the time of 8 hours after the work.*

Keywords— Work Fatigue, Nurses, Inpatient.

I. INTRODUCTION

Hospitals are the service industries that require human resources, among others, a nurse, so its presence needs to be protected in an effort to improve health status of work that health workers healthy and productive [1]. It is as large capital strength that provide services to the patient for 24 hours continuously, especially inpatient services.

Inpatient care is playing an important role in hospital because it is very complex service and contributes to the healing of inpatients. The role of a nursing while serving patients in inpatient is very influential on the patient's recovery so that it can be said that nurses are the forefront Hospital services because they always interact directly with the patient, family members, doctors and other workers. Nurses have a responsibility that is quite large and is required to work professionally in providing services to patients [2].

With the condition like mentioning above, inpatient nurses feared could be experiencing burnout. Burnout is a collection of symptoms that arise as a result of energy usage that exceeds the resources that resulted in physical exhaustion, emotional and mental [3]. Work fatigue is the total response of influential individuals psychosocial experienced in a certain period of time and fatigue that tends to lower achievement and motivation of the worker[4].

Fatigue happens to nurses in Inpatient if not handled properly can lead to physical illness, psychological and may affect the performance of nurses to care for patients. This condition is either directly or indirectly may affect the hospital performance in the view of patient or their family that can be detrimental to the Hospital itself.

II. METHOD

The research design was cross-sectional in which the fatigue of nurses in this study was measured by using the tool Accutrend® Plus brand Roche. Measurement of fatigue in workers using blood lactic acid concentration indicators performed as much as three times that at the time before work, after work 4 hours and 8 hours after work on the morning shift. The samples in this study were nurses who were part Inpatient in RSUD Prof. Dr. Soekandar Mojosari. Samples were selected using stratified random sampling because the population is divided into 7 classes so we got 28 nurses, comprising four nurses in 1st class internal disease room, 4 nurses in 2nd internal disease room, 4 nurses in 3rd internal disease room, 4 nurses in the surgery room, 4 nurses in the nursery room, 4 nurses in neonatal room and 4 nurses in the VIP room.

III. RESULT

Distributions of independent and dependent variables are the results of studies conducted on nurses who were part Inpatient in RSUD Prof. Dr. Soekandar Mojosari.

Table 1: The distribution of age respondent

Age (year)	Frequence	Percentage
> 33 year	15	53,57
≤ 33 year	13	46,43

Table 1 shows the age of respondents in this study are categorized based on the mean value for the age distribution of respondents in this study is a normal distribution and the mean is 32.82 years results were rounded to 33 years. Lowest age of respondents is 24 years and the highest age of the respondents is 46 years. Respondents mostly aged > 33 years as many as 15 people (53.57 %) and respondents who had aged ≤ 33 years as many as 13 people (46.43 %)

Table 2: The distribution of Work Period

Work Period	Frequence	Percentage
> 10 tahun	10	35,71
≤ 10 tahun	18	64,29

Table 2 shows the work period of the respondents in this study are categorized based on the mean value for the distribution of life of respondents in this study is a normal distribution and the mean is 10.14 years results were rounded to 10 years. Working period is at least 3 years, while the longest tenure of 20 years. Most respondents have a service life of ≤ 10 years as many as 16 people (57.14 %) and respondents who have a service life of > 10 years of the 12 nurses (42.86 %

Table 3: The distribution of Nutrition Status, Job stress and Work load

	Category	Frequence	Percentage
Nutrition Status	Normal	19	67,86
	Fat	9	32,14
Job Stres	No stress	25	89,29
	Stres	3	10,71
Workload 0-4	Moderate	16	57,14
	Heavy	12	42,86
Workload 0-8	Light	20	71,43
	Moderate	8	28,57

Table 3 shows the big majority of 28 respondents had a normal nutritional status were 19 people (67.86 %) and the rest have the nutritional status fat as much as 9 people (32.14 %) . The work stress experienced by respondents Only about 3 people (10.71 %) of the 28 respondents and the rest is not experiencing job stress as much as 25 people (89.29 %) and then workload experienced by the respondents at the time before working until 4 hours after the work is moderate and heavy workloads where the majority of respondents have a moderate work load as many as 16 people (57.14 %), heavy the weight workload of 12 people (42.86 %). Workload experienced by the respondent at the time after 8 hours after the work is light and moderate workloads where that has a light workload as many as 20 people (71.43 %) moderate the workload was as much as 8 people (28.57 %)

The distribution of lactic acid levels of research has been done on Inpatient nurses of RSUD Prof. Dr. Soekandar Mojosari as follows

Table 4:The distribution of lactic acid levels

	Lactic Acid Levels	
	Average	Deviation Std.
Before work	0,521	0,347
4 hour after work	2,068	0,599
8 hour after work	1,164	0,380
Difference between 0-4 hours after work	1,546	0,483
Difference between 0-8 hours after work	0,643	0,230

Table 4 shows according to [4] noted that lactic acid levels that are above the normal average (greater than 2 mmol / l) is indication of fatigue.

Paired-sample *t-test* method used in comparison test between dependent and independent variables because the comparison data is two dependent variables, the data ratio scale and normal distribution.

Table 5: Comparison test lactic acid before work, 4 hours after work and 8 hours after work in all samples

	Blood Lactic Acid Level	
	p-value	Conclusion
0-4 hours after work	0,000	Significant
0-8 hours after work	0,000	Significant

Table 5 shows the levels of lactic acid in the blood, before working until 4 hours after work on all samples or significant responder and the dependent variable comparison test results before working until 8 hours after work on all samples or significant responder. It can be seen from *p-value* less than 0.05.

Comparison test between dependent and independent variables using *Repeated Mesures* because of the data comparison is 3 dependent variable ratio scale and normal distribution of data by comparing their working section.

Table 6: Comparison test lactic acid before work, 4 hours after work and 8 hours after work of inpatient nurses

	Blood Lactic Acid Level before and after work	
Inpatient	***p-value***	**Conclusion**
Installation	0,000	Significant

Table 6 shows the results of blood lactic acid comparison test of nurse in inpatient section are significant. It can be seen from *p-value* less than 0.05.

Here are the results of linear regression of the factors that influence fatigue is seen by lactic acid levels in the blood.

Table 7:Linear Regression Test Results of all the Dependent Variables by the Independent Variables (Lactic Acid Levels in the Blood) at the time before working until 4 hours after work

Independent Variables	Anova Pvalue	Stdized Beta	*p-value*	Conclusion
Age	0,016	-0,182	0,282	No Significant
Nutrition Status		0,093	0,570	No Significant
Job stress		0,041	0,819	No Significant
Workload		0,686	0,001	Significant
Work Period		-0,134	0,415	No Significant

Table 7 shows that the independent variables have most influence on the occurrence of fatigue are the workload seen by Stdized Beta value of 0.686.

Table 8:Linear Regression Test Results of all the Dependent Variables by the Independent Variables (Lactic Acid Levels in the Blood) at the time before working up to 8 hours after work

Independen Variables	Anova p-value	Stdized Beta	*p-value*	Conclusion
Age	0,041	-0,541	0,005	Significant
Nutrition Status		0,328	0,066	No Significant
Job stress		-0,022	0,916	No Significant
Workload		0,094	0,655	No Significant
Work Period		-0,250	0,162	No Significant

Table 8 shows that the independent variables that most influence on the occurrence of fatigue is age based on Stdized Beta value of 0.541.

IV. DISCUSSION

The results of the examination of blood lactic acid levels with the tools Accutrend® Plus showed that blood lactic acid levels after 4 hours of work and 8 hours of work have increased. A Blood lactic acid level is used as a parameter to evaluate the response of physical activity and levels of fatigue. In healthy people, the amount of blood lactic acid levels by Janssen ranges between 1-2 mmol / l and according to Mc-Gee lowest blood lactic acid levels during breaks reaches 0.5 to 2.2 mmol / l [6].

This study shows that blood lfore went to workactic acid levels be on research subjects an average of 0.507 mmol / l of blood. This value is equal to the normal value of blood lactic acid levels recess. This is done with a consideration that resting blood lactic acid levels above the average normal blood lactic acid levels is an indication of fatigue.

Statistical test results that blood lactic acid concentration before working until 4 hours after work and before working until 8 hours after work with Paired Sample t-test showed that there were significant differences between the concentration of blood lactic acid before work and after work (4 hours after work and 8 hours after work). This is because before they work, they didn't do work activities in inpatient section but after doing the activity as the work performed, the body requires more energy. The amount of energy required depends on the intensity of the work done on each inpatient pavilion section.

The workload has a relationship with fatigue during 4 hours after work than 8 hours after work. High workload was 4 hours after work and without any time for rest whereas 8 hours after work there is still time for break. An increased workload during 4 hours after work causing oxygen consumption increases proportionally to obtain maximum conditions. Higher workload cannot be done under aerobic conditions so that the supply of energy from anaerobic energy source dominates so it takes extra ATP (Adenosine triphosphate) through the MEA (Anaerobic Energy Metabolism) that caused the lactic acid concentration increased [7].

The factor such as age worker characteristics has a relationship with fatigue during 8 hours after work because the fatigue are more general and easily infect anyone, including young age (<30 years) because it involves whether physically healthy or not, a working system applied and duration of rest required is different [8].

V. CONCLUSION

1. There is a significant difference between the concentration of blood lactic acid before work and 4 hours after work on a section Inpatient nurses in hospitals Prof. Dr. Soekandar Mojosari.
2. There is a significant difference between the concentration of blood lactic acid before work and 8 hours after work on a section Inpatient nurses in hospitals Prof. Dr. Soekandar Mojosari.
3. The work factors such as workload have a relationship with fatigue during 4 hours after work.
4. The worker characteristics such as age factor have a relationship with fatigue during 8 hours after work.

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