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ANALYSIS OF FACTORS RELATED TO WORK FATIGUE IN THE LOADING AND OFFERING WORKERS IN MANADO PORT

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ABSTRACT

Background: high operational loading and unloading activities cause various risks to K3. Therefore, every loading and unloading activity must be equipped with safety facilities, factors that affect work fatigue in loading and unloading workers include age, years of service, nutritional status and work shifts.

Research Objectives: To determine the relationship between age, years of service, nutritional status and work fatigue in loading and unloading workers at the port of Manado. **Type of research:** analytic observational study with a cross sectional study approach .

Conclusion: There is a significant relationship between age, years of service, nutritional status and work fatigue in loading and unloading workers at Manado port in 2020 with p value = 0.000. There is no significant relationship between work shifts and work fatigue in loading and unloading workers at the port Manado in 2020 with a p value = 0.583

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INTRODUCTION

Occupational Safety and Health or more commonly known as K3 is a program provided by a company to prevent accidents caused by work, as well as the occurrence of work-related illnesses, namely by analyzing which jobs have potential hazards that can result in accidents, work and work-related diseases. The existence of a system that regulates the continuity of the workforce in the form of K3 can create a sense of security and comfort at work for each worker, also helps increase work productivity of workers which in turn can reduce the risk of work accidents and work-related diseases.¹ In Improving K3 in the Loading and Unloading Workforce environment is very important to implement so that the operational system at the Port can run safely and smoothly. The implementation of the K3 system, in fact, often gets special attention from both the organization because it includes elements of humanity, material, and economic benefits, to legal aspects that can affect the accountability and image of the organization.²

Based on data from *the International Labor Organization* (ILO), where there are more than 2.78 million deaths each year caused by work accidents or work-related diseases.¹ On the other hand according to *the National Safety Council* which states that there are 13% of

injuries that occur in the workplace environment which is related to fatigue, and also 2000 adults who have worked in accidents, and 97% of incidents occur one of the factors is the risk of burnout at work. Fatigue is defined as a decrease in the strength function of the muscles which is caused by exhaustion of energy and an increase in metabolic waste, including lactic acid, carbon dioxide. From the level of fatigue arising from work, it can cause discomfort, dissatisfaction, and a decrease in the level of productivity which is then indicated by reduced formation speed, product quality, increased errors and damage, and finally accidents often occur. Factors that affect fatigue at work can be due to age, years of service, nutritional status of a person, intake of nutrients that enter the body, marital status, including impaired musculoskeletal function, exercise, smoking habits, drinking alcohol and drug abuse.³

Work activities of loading and unloading which are carried out with a high operational system can cause various risks of accidents and work-related illnesses. Every activity within the scope of loading and unloading must be equipped with K3 facilities so as to help minimize OHS disturbances.

Based on the results of pre-research carried out on 18 loading and unloading workers in the freight transportation section,

both from ship to truck and vice versa from truck to ship at the Port of Manado, where there are 2 shifts namely morning and evening and it is known that the average worker experiences fatigue as much as 38% and on the other hand who did not experience fatigue, namely 62%. From this, the researcher is interested in examining various factors related to work accidents among TKBM workers at the Port of Manado including age, years of service, nutritional status, work shifts and work fatigue.

1. RESEARCH METHODOLOGY

This type of research is analytic observational research with a *cross sectional study approach*.

2. RESULTS

A. Overview of TKBM Cooperatives

The Manado port loading and unloading workforce cooperative was established based on the instructions of the Minister of Transportation and the Minister of Labor based on a joint decision of the Director General of Seaports, the Director General of Labor Relations and Oversight of Work Norms, and the Director General of Bima Cooperative Institutions. Managers and Supervisors of Manado Harbor TKBM Cooperatives.

The TKBM cooperative at Manado port has a work system, so the TKBM is divided into several working groups, namely: *Stevdoring*, *Cargodoring*, People's Services (Perla), Local Services (Plok). The number of workers working at the Manado port TKBM is 72 workers divided into each section.

A. Univariate analysis

a. Age of TKBM at Manado Harbor

Table 4.1 Age Frequency Distribution of TKBM at Manado Port

Age	F	Percentage %
Not at risk < 30 years	8	11,1
At risk > 30 years	64	88.9
Total	72	100.0

Based on table 4.1 it can be seen that 11 people (11.1%) are of age with no risk of burnout, while 64 people (88.9%) are at risk of age.

a. TKBM Working Period at the Port of Manado

Table 4.2 Distribution of Frequency of Work Period at TKBM in Manado Port

Years of service	F	Percentage %
Not at risk < 8 years	1	22,2
At risk $\geq$ 8 years	5	77,8
Total	7	100.0

Based on table 4.2, it can be seen that 16 respondents (22.2%) had working years without a risk of burnout, while 56 people (77.8%) had at-risk working periods.

b. TKBM Nutritional Status at the Port of Manado

Table 4.3 Distribution of Work Nutrition Frequency at TKBM in Manado Port

Nutritional status	F	Percentage %
Thin	48	66.7
Normal	21	29,2
Overweight	3	4,2
Obesity	0	0.0
Total	72	100.0

Based on table 4.3, it can be seen that the body mass index of respondents was mostly in the thin category, as many as 48 people (66.7%), while there were 21 people with normal weight (29.2%) and 3 people with excess body weight (4.2%).).

c. TKBM Work Shift at Manado Harbor

Table 4.4 Frequency Distribution of Work Shifts at TKBM in Manado Port

Shift work	F	Percentage %
Morning Shift	33	45,8
Evening Shift	39	54.2
Total	72	100.0

Based on table 4.4, it can be seen that there are 39 people (45.8%) in the morning shift and 39 people in the afternoon shift (54.2%).

d. TKBM Work Fatigue at Manado Port

Table 4.5 Distribution of the Frequency of Work Fatigue in TKBM at the Port of Manado

Work Fatigue	F	Percentage %
Normal	5	6.9
Mild Work Fatigue	7	9.7
Moderate Work Fatigue	18	25.0
Overwork Fatigue	42	58.3
Total	72	100.0

Based on table 4.5, it can be seen that there were 42 people (58.3%) with severe work fatigue (KKB), 18 people (25.0%) moderate work fatigue (25.0%) while 7 people (9, 7%) and Normal 5 people (6.9%).

B. Bivariate Analysis

a. Relationship between Age and Work Fatigue in TKBM at Manado Port

Table 4.6 Relationship between Age and Work Fatigue in TKBM at the Port of Manado

Age	Work Fatigue									
	Normal		TRC	KKS		KKB		Total		P
	f	%	f	%	f	%	f	%	f	%
No risk	5	62.5	3	37.5	0	0.0	0	0.0	8	100
At risk	0	0.0	4	6,2	18	28,2	42	65,6	64	100

The results of table 4.6 show that of the 42 respondents (65.6%) who are at risk of experiencing severe work fatigue, 18 respondents (28.2%) are at risk of work fatigue while 4 respondents (6.2%) are at risk mild fatigue. The results showed that 3 respondents (37.5%) who were not at risk of experiencing mild work fatigue and 5 respondents (62.5%) who were not at risk of normal work fatigue.

b. The Relationship between Tenure and Work Fatigue in TKBM at the Port of Manado

Table 4.7 The Relationship between Tenure and Work Fatigue in TKBM at the Port of Manado

Years of service	Work Fatigue										P
	Normal		TRC		KKS		KKB		Total		
	f	%	f	%	f	%	f	%	f	%	
No risk	4	25	5	31,3	6	37.5	1	6,2	16	100.0	0.000
At risk	1	1,8	2	3,6	12	21,4	41	73,2	56	100.0	

c. The relationship between nutritional status and work fatigue in TKBM at the Port of Manado

The results of table 4.7 show that of the 41 respondents (73.2%) who are at risk of experiencing severe work fatigue, 12 respondents (21.4%) are at risk of work fatigue while 2 respondents (3.6%) are at risk mild work fatigue and 1 respondent (1.8%) who is at risk of normal work fatigue. The results showed 6 respondents (67.5%) who were not at risk of experiencing moderate work fatigue and 5 respondents (31.3%) who were not at risk of mild work fatigue, 4 respondents (25%) who were not at risk of work fatigue normal and 1 respondent (6.2%) who is not at risk

Table 4.8 The relationship between nutritional status and work fatigue in TKBM at the Port of Manado

Nutritional status	Work Fatigue										
	Normal		TRC		KKS		KKB		Total		P
	f	%	f	%	f	%	f	%	f	%	
Thin	3	6,2	5	10,4	7	14,6	33	68.8	48	100.0	0.000
Normal	1	4,7	2	9,5	9	42,9	9	42,9	21	100.0	
BB More	1	33,3	0	0.0	2	66,7	0	0.0	3	100.0	
Obesity	0		0		0		0		0		

The results of table 4.8 show that of the 33 respondents (68.8%) who had a thin nutritional status with severe work fatigue, 7 respondents (14.6%) had a nutritional status with moderate work fatigue, 5 respondents (10.4%) who have a nutritional status with mild work fatigue, 3 respondents (6.2%) who have a thin nutritional status with normal work fatigue. The results showed that 9 respondents (42.9%) had nutritional status with severe work fatigue, 9 respondents (42.9%) had moderate work fatigue nutritional status, the results showed 2 respondents (9.5%) had normal nutritional status with light work fatigue,

1 respondent (4.7%) who has a normal working status. The results showed that 2 respondents (66.7%) had obese nutritional status with moderate work fatigue, 1 respondent (33.3%) had obese nutritional status with normal work fatigue.

d. The relationship between work shift and work fatigue in TKBM at the Port of Manado

Table 4.9 Relationship between work shifts and work fatigue in TKBM at the Port of Manado

Shift work	Work Fatigue										
	Normal		TRC		KKS		KKB		Total		P
	f	%	f	%	f	%	f	%	f	%	
Morning shift	2	6,1	3	9,1	6	18,1	22	67,6	33	100.0	0.583
Evening Shift	3	7,6	4	10.5	12	30,7	20	51,2	39	100.0	

The results of table 4.9 show that of the 22 respondents (67.6%) who have the morning shift with heavy work fatigue, 6 respondents (18.1%) have the morning shift with moderate work fatigue, 3 respondents (9.1%) have morning shift with light work fatigue and 2 respondents (6.1%) who have morning shift. The results

showed that 20 respondents (51.2%) had the afternoon shift with heavy work fatigue, 12 respondents (30.7%) had the afternoon shift with moderate work fatigue, 4 respondents (10.5%) had the afternoon shift with light work fatigue, and 3 respondents (7.6%) who have the afternoon shift with normal work fatigue.

DISCUSSION

1. Relationship between Age and Work Fatigue

The older a person is, the more basal metabolism will decrease and the individual will experience fatigue more easily. The age factor of a person will affect the individual's basal metabolism. ⁽⁹⁾ In this study, a relationship was obtained between age and work fatigue in loading and unloading workers at the port of Manado. Workers aged ≥ 30 years experience more severe, mild and moderate work fatigue than workers aged ≤ 30 years. In line with research on TKBM workers at Tanjung Emas Port, Semarang in 2019. Generally, skeletal muscle complaints begin to be felt at the age of 25-65 years. ⁽⁵⁾ A person who is young is capable of doing heavy work and someone who is old or elderly has a decreased ability to do heavy work.

2. The Relationship between Tenure and Work Fatigue

A person's work experience greatly influences the occurrence of work fatigue. Because the longer a person works, the feeling of being bored with his work affects the level of fatigue he will experience. ⁽¹²⁾ This study obtained a relationship between work tenure and work fatigue at TKBM at Manado port. This is in line with research on TKBM at Samudra Bitung port. ⁽³⁾ The negative impact is in the form of a limit on the body's resistance to work processes which results in fatigue. Work that continues to be repetitive can affect the circulatory system, digestive system, muscles and nerves and the respiratory system. ⁽⁷⁾

3. Relationship between nutritional status and work fatigue

Nutritional status is the state of the body as a result of consumption of food with the use of nutrients. The categories of good nutritional status, moderate nutrition and

poor nutrition, poor body condition can affect workers at work and cause work fatigue. In this study, the results obtained were that there was a relationship between nutritional status and work fatigue at TKBM at Manado port. The occurrence of fatigue is due to a lack of energy reserves in the body and increased metabolism as a cause of loss of muscle efficiency and will inhibit brain centers in controlling movement so that the potential frequency of nerve cell activity decreases. Likewise, the slower a person's movement will show the weaker the condition of a person's muscles. ⁽⁵⁾

4. Relationship between shift work and work fatigue.

Shift work is a pattern of working time given to workers to do something by the company which is usually divided into morning, afternoon and evening work. In this study, it was found that there was no relationship between work shifts and work fatigue in loading and unloading workers at Manado port. This is in line with Dwi's research on loading and unloading workers at the Tanjung Emas port in Semarang. This condition is probably because functionally all organs during the day are in a state of readiness for activities, whereas at night it is the other way around, the body's function will naturally rest for refreshment. In this study, both pafi and soere shift workers

showed no difference in experiencing work fatigue.

CONCLUSION

1. Most of the workers are at risk, namely 42 people (65.6%) and those who are not at risk are 5 (62.5%).
2. Most of the workers had a risky working period, namely 41 people (73.2%) and as many as 6 people (37.5%).
3. Most of the workers with underweight nutritional status experienced severe work fatigue, 33 people (68.8%) and as many as 9 people (42.9%) normal nutritional status.
4. Most of the workers who had the morning shift experienced severe work fatigue as many as 22 (67.9%) and the afternoon shift experienced 20 people (51.2%) experienced severe work fatigue.
5. There is a significant relationship between age and work fatigue in loading and unloading workers at Manado port in 2020 with p value = 0.000
6. There is a significant relationship between length of service and work fatigue in loading and unloading workers at Manado port in 2020 with p value = 0.000
7. There is a significant relationship between nutritional status and work fatigue in loading and unloading workers at Manado port in 2020 with p value = 0.000

8. There is no significant relationship between work shifts and work fatigue in loading and unloading workers at the Manado port in 2020 with a p value = 0.583

SUGGESTION

Based on the results of the research, the authors put forward several suggestions:

1. Researchers suggest that the company should conduct K3 training and provide personal protective equipment (PPE).
2. It is better for the company to rotate workers with different jobs, so as to minimize the occurrence of fatigue due to work.

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