FACTORS RELATED TO WORK FATIGUE IN OIL PALM FARMERS

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ABSTRACT

Every year 2 million workers die due to work accidents caused by fatigue. This research aims to determine the factors related to work fatigue in oil palm farmer workers in Tanjung Medan Labuhanbatu Village. The research method used is descriptive quantitative with a cross-sectional research design. The population of workers is 104 people and the sample is 85 people. The sampling technique uses simple random sampling. The results of the analysis showed that there was a relationship between age and work fatigue (p-value = 0.000) r = 0.607, there was a relationship between length of service and work fatigue (p-value 0.000) r = 0.526, there was a relationship between length of work and work fatigue (p-value 0.010) r = 0.078, there is a relationship between workload and work fatigue (p-value 0.012) r = 0.647, there is no relationship between nutritional status and work fatigue (p-value 0.353) r = 0.049. This research concludes that there is a relationship between age, length of service, length of work, and workload on work fatigue, there is no relationship between nutritional status and work fatigue in oil palm farmers. Advice for workers is that they should pay attention to their health while working to avoid work fatigue which could pose a risk of work accidents.

Keywords: oil palm farmers; work accidents; work fatigue

INTRODUCTION

One of the symptoms of health problems in the workforce arising from work is fatigue. Work fatigue is a problem that is often encountered in the workforce. Work fatigue is an important problem that needs to be addressed properly because it can cause various problems such as loss of efficiency at work, decreased productivity and work capacity as well as health ability and survivability of the body that causes work accidents.(Lintje Boekoesoe, 2023) According to the International Labour Organization (ILO), every year as many as 2 million workers die due to work accidents caused by fatigue factors. Fatigue due to continuous work will cause employee health to decline to cause work accidents. In Law Number 36 of 2009 concerning Health, articles 164 and 165 state that occupational health efforts are aimed at protecting workers to live healthy lives and be free from health problems and adverse influences caused by work. (St. Aisyah, 2019)(Dea Elsa Ananda, 2023)

According to the Ministry of Manpower (Kemenaker) 2023, as many as 370,747 cases of work accidents have befallen workers in Indonesia, both wage-receiving workers, non-wage earners, and workers in the construction services sector. Meanwhile, according to the number of claims for work accidents in the informal sector (not wage earners) in North Sumatra amounted to 1.6 billion workers. (Pratiwi, 2024)(BPJS-TK, 2023) Every year more than 2.78 million workers die at work due to workplace accidents and occupational diseases. In

addition, as many as 374 million workers sustain injuries each year resulting in more than 4 days of absence from work, according to the ILO. (Iskandar Arfan, 2020)

Farmers are the largest working group in Indonesia, farmers work in an open area and farmers are informal laborers. According to the Law of the Republic of Indonesia, No.19 of 2013 farmers are individual Indonesian citizens and/or their families who carry out farming in the fields of food crops, horticulture, plantations, and/or animal husbandry. Agriculture is a human activity that involves the production process, producing materials for human needs both derived from plants and animals accompanied by efforts to renew, develop, and consider economic factors. (Mira Lestari Wurarah, 2020) There are two aspects causing work fatigue, namely external aspects (work and work environment) and internal aspects (individual characteristics). Every job is a burden for the perpetrator. The load in question may be physical, mental, or social. Workload determines how long a person can result in fatigue or distraction. Work that is too heavy and excessive will accelerate one's work fatigue. (Lintje Boekoesoe, 2023)

Factors causing work fatigue from individual factors are age, gender, nutritional status, working period, and lack of rest, while work environment factors are workload, shift work, monotonous conditions, non-ergonomic workplace, temperature, lighting, noise, and inadequate and extreme environment. (Anis Farihatin, 2023) A comfortable work environment, the absence of noise, proportional rest and work time, adequate nutrition, and workload by the psychological and physical abilities of workers, can all affect occupational health conditions in general and work fatigue in particular. Workload determines how long a person can work according to work capacity. The farmer's workload is more directed at the farmer's ability to carry out all activities that must be carried out conscientiously. (Mira Lestari Wurarah, 2020) In a study of factors related to work fatigue in construction workers, there were 35.4% of workers experienced work fatigue over 35 years, as many as 30.8% of workers experienced work fatigue over 2 years of work, and 38.5% of workers experienced work fatigue due to workload. (Lintje Boekoesoe, 2023)

Feeling or condition of fatigue is a condition that is often experienced by someone after doing their activities. Feelings of fatigue, sleepiness, boredom, and thirst usually appear along with symptoms of fatigue. Weakening motivation is characterized by having difficult thinking, being tired of talking, becoming nervous, not concentrating, being unable to focus on something, being prone to forgetting, lack of trust, anxiety about something, unable to control attitude, and unable to persevere in work. Physical weakness is characterized by headaches, stiffness in the shoulders, back pain, depressed breathing, thirst, hoarseness, dizziness, and feeling unwell. These are symptoms of work fatigue experienced by workers. (Silvia Firda Utami, 2020)Farmers become the main job or livelihood in Tanjung Medan Village, Labuhanbatu Regency. Based on initial observations and interviews with 7 oil palm farmers in Tanjung Medan Village, it was found that some farmers experienced symptoms of work fatigue such as full-body fatigue, lack of focus, and drowsiness. The workload of farmers is also quite excessive, where farmers have to do work for a long time in a day, which is about 6-10 hours. The purpose of this study was to determine the factors associated with work fatigue in oil palm smallholder workers in Tanjung Medan Village, Labuhanbatu Regency.

METHOD
The type of research used in this study is Descriptive Quantitative with a sectional Research Design which aims to determine the relationship of independent variables (factors) to dependent variables (work fatigue) in oil palm farmers. This research was conducted in

Tanjung Medan Village, Labuhanbatu Regency from February to March 2024. The population in this study is all wit farmer groups in Tanjung Medan Village, which is 104 people. The determination of the sample using the Lemeshow formula (1997) was 77 people, but to anticipate missing data, the number of samples was added by 10% so that the total sample became 85 people. The sampling technique used is simple random sampling. Univariate analysis is carried out to determine the frequency and distribution of the variables studied. Bivariate analysis is used to analyze the relationship between the independent variable and the dependent variable. The bivariate analysis uses SPSS 20 software with Pearson Correlations Test analysis to see the relationship between variables tested with p-value = 0.05. If the p-value < 0.05, it means that there is a significant relationship between the variables tested.

RESULTS

Table 1.
Characteristics of Respondents

Characteristic	f	%
Age		
≤ 30 years	22	25,9
≥ 30 years	63	74,1
Years of service		
≤ 15 years	58	68,2
≥ 15 years	27	31,8
Length of working		
≤ 8 hours	70	82,4
≥ 8 hours	15	17,6
Body Mass Index (BMI)		
≤ 18.4	4	4,7
18.5 – 25.0	73	85,9
≥ 25.1	8	9,4
Workload		
Low	2	2,4
Currently	78	91,8
Tall	5	5,9
Work Fatigue		
Low	22	25,9
Currently	57	67,1
Tall	6	7,1
Variable	Mean (SD)	95% CI
Age (years)	41,34 (10,41)	39,10 – 43,59
Work Period (years)	13,33 (6,50)	11,93 – 14,73
Working Time (hours)	6,88 (1,30)	6,60 – 7,16
BMI	21,51 (1,91)	21,09 – 21,92
Workload	26,61 (2,86)	25,99 – 27,23
Work Fatigue	59,47 (10,09)	57,25 – 61,49

Based on the data presented in Table 1, it is evident that a significant portion of oil palm farmers in Tanjung Medan Village are over 30 years old, comprising 74.1% of the total surveyed, while those under 30 years old represent 25.9%. Additionally, a majority of workers have a working period under 15 years, constituting 68.2%, whereas those with a working period above 15 years are 31.8%. Furthermore, 17.6% of workers toil for more than 8 hours per day, while the majority, accounting for 82.4%, work under 8 hours. In terms of nutritional status, the majority fall within the normal range (18.5-25.0), comprising 85.9%, while 9.4% are categorized as having a fat nutritional status (> 25.1), and 4.7% as thin (< 18.4). Regarding workload, a significant portion experiences a medium workload (91.8%), whereas a smaller proportion faces a high workload (5.9%). Work fatigue levels vary, with 25.9% experiencing low fatigue, 67.1% experiencing moderate fatigue, and 7.1% experiencing high fatigue.

Table 2.
Relationship of Age, Length of Work, Years of Work, Nutritional Status, and Workload on Work Fatigue

No	Variable	Work Fatigue			Information
		P-*value*	r	r^2	
1	Age	0,000	0,779	0,607	Strong
2	Years of service	0,000	0,725	0,526	Currently
3	Length of working	0,010	0,279	0,078	Weak
4	Nutritional status	0,353	0,049	0,002	Weak
5	Workload	0,012	0,647	0,418	Currently

DISCUSSION
The Relationship of Age to Work Fatigue
Age is the life span of an individual since a person is born. The older the level of maturity and strength a person will be more mature in thinking and working. Age has a relationship with fatigue which explains that age conditions affect a person's physical work ability or muscle strength. A person's maximum physical ability reaches the age between 25-39 years and will continue to decline with age according to Suma'mur. (Paskarini, 2023)(Nur Santriyana, 2023) A younger person can perform heavy work activities compared to older and elderly workers. The muscle strength of a person with a young age and old age is different. The older a person is, there is a decrease in body physiology which affects his performance and work capacity so when a person is given a task or job that is heavier than his work capacity will result in fatigue according to Amin MD.(Oky Noor Diansyah, 2023) Based on table 2. the results of the *Pearson Correlations Test* study obtained an age P-value of 0.000 which means that age has a relationship with work fatigue in oil palm smallholder workers in Tanjung Medan Village.
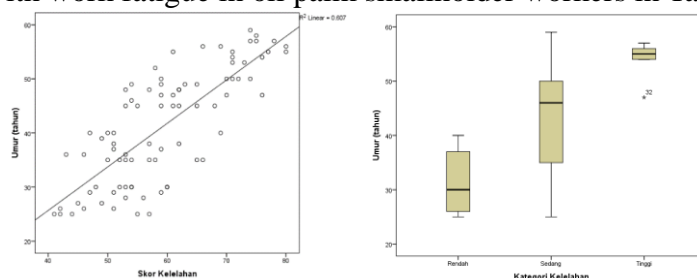

Figure 1. Box Plot and Scatter Plot of Work Fatigue Based on Age

Based on figure 1. obtained R2 0.607 which shows that the direction of the correlation is positive with a strong correlation strength, so that the higher the age, the more risk of increasing work fatigue in oil palm smallholder workers in Tanjung Medan Village. Based on the data obtained, 74.1% or as many as 63 oil palm farmers over the age of 30 are at risk of experiencing work burnout.   This research is in line with research conducted by Oky Noor, et al. 2023 on Loading and Unloading Workers (TKBM) of the Fertilizer Bagging Unit at Tanjung Emas Port, the statistical test results of the Spearman P-Value Rank Test *of* 0.000 were obtained, which means that there is a relationship between age and work fatigue.

The Relationship of Working Time to Work Burnout
Working period is one of the factors that can affect fatigue, this is because the length of work will affect the mechanism in the body. If the working period is >5 years, it will accelerate muscle contraction, in other words, there is a significant influence between work time and work fatigue. (Nurul Fidinia Hijah, 2021) The longer working life of a person negatively affects the body's resistance to deep processes in his job leading to the accumulation of fatigue in the body of workers. The length of service has an impact on the mechanisms of the worker's body. This is because physical pressure on the worker's body for a long time can

cause decreased muscle performance. The pressure accumulates over a long period resulting in fatigue. (Oky Noor Diansyah, 2023) Based on the results of the statistical test analysis in Table 2, a *P-Value value of* 0.000 is obtained, which means that the working period has a relationship with work fatigue in oil palm farmers in Tanjung Medan Village.
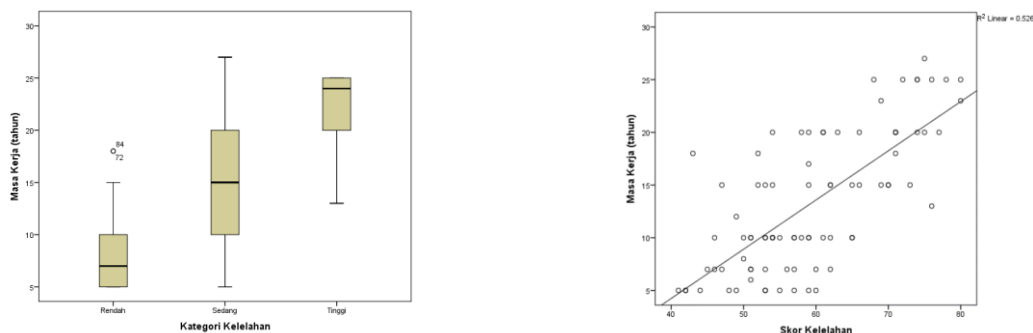

Figure 2. *Box Plot and Scatter Plot of Work Fatigue Based on Working Period*

Based on figure 2. obtained a correlation value of R2 0.526 which shows that the direction of the correlation is positive with moderate correlation strength, so that the longer the working life of oil palm smallholder workers, the more at-risk farmers in Tanjung Medan Village experience work fatigue. Based on the data obtained, 31.8% or as many as 27 oil palm farmers working for more than 15 years are at risk of experiencing work burnout. This research is in line with research by Noor Muhammad Ikhsan, 2021 on employees of PT. Sea of Bahat Diamonds with Test *Chi-Square* obtained a P- value of 0.04 which means that the working period has a relationship to work fatigue. This is in line with research conducted by Oky Noor in 2023 on Loading and Unloading Workers (TKBM) of the Fertilizer Bagging Unit at Tanjung Emas Port obtained the results of Test statistics (Ikhsan, 2021)*Rank Spearman* gets a P-*value* of 0,000.

The Relationship of Working Time to Work Burnout
According to Suma'mur, the length of working hours is the length of time a person works well in a day, generally 6-10 hours. The rest is used for family life, community, sleep, rest, and others. Extending work time more than the ability of the length of work is usually not accompanied by optimal work efficiency, effectiveness, and productivity, even usually a decrease in the quality and results of work and working for a prolonged time there is a tendency to fatigue, health problems, diseases and accidents and dissatisfaction according to Suma'mur in. (Nadya Baharuddin, 2023) Based on Table 2. the results of the *Pearson Correlations statistical test* obtained a P-value value of 0.010 which means that there is a relationship between length of work and work fatigue in oil palm farmers in Tanjung Medan Village.
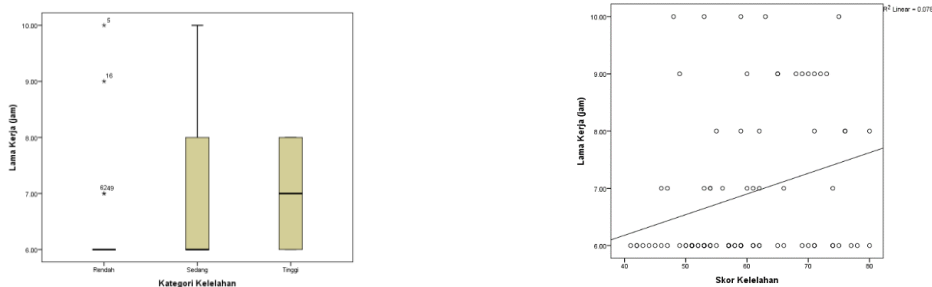

Figure 3. Box Plot and Scatter Plot of Work Fatigue Based on Length of Work

Based on Figure 3. The correlation value obtained is R2 0.078 which indicates the direction of positive correlation with very weak correlation strength, meaning that the longer the working hours, the higher the worker experiences work fatigue. Based on the data obtained, 17.6% or as many as 15 oil palm farmers worked for more than 8 hours experiencing work fatigue. This research is in line with Nadya Baharuddin's research in 2023 on employees of PT. FKS Multi Agro TBK. Makassar with *the Chi-Square test* obtained a P-value value of 0.002 which means that there is a significant relationship between the length of work and work fatigue.

The relationship between nutritional status and work fatigue
Nutritional status is the result of food consumption and the use of nutrients in the body. In the body with adequate nutrition, the optimal nutritional status will be achieved that can support physical growth, brain, workability, and health degrees according to Almatsier. (Oky Noor Diansyah, 2023) The picture of the right nutritional status to do work is normal, this situation can increase work power because it has enough energy, but abnormal nutritional status which is less and excess will hurt work power because the organs of the body cannot work properly so they will experience lack of energy. (Nadya Baharuddin, 2023)
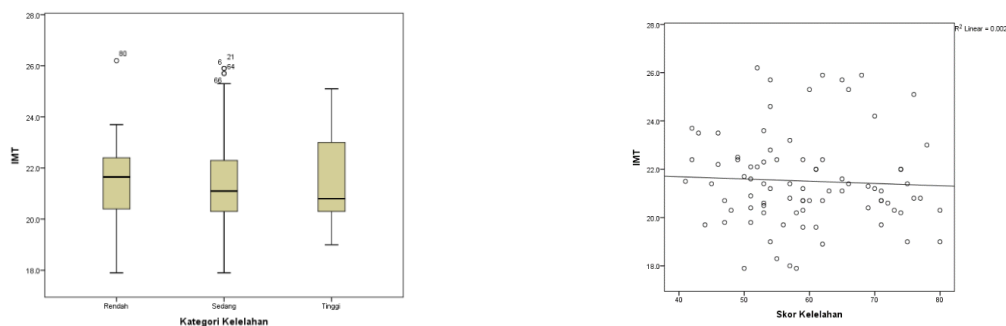

Figure 4. Box Plot and Scatter Plot of Work Fatigue Based on Nutritional Status

Based on figure 4. obtained a correlation value of R2 0.002 which indicates a positive correlation direction and there is no strong correlation between nutritional status and work fatigue, which means workers with normal nutritional status are less at risk of experiencing work fatigue during and after work. This research is in line with research conducted by Oky Noor, et al in 2023 on the Loading and Unloading Manpower (TKBM) of the Fertilizer Bagging Unit at Tanjung Emas Port Semarang with a sample of 58 people with the *Spearman Rank* Test. A P-value of 0.231 is obtained, which means there is no relationship between nutritional status and work fatigue. This research is in line with research conducted by Anis Farihatin, et al in 2023 at PT Selaras Citra Lestari Bawen with Uji *Correlation Spearman* in getting the value of P-*Value* of 0.538 which means there is no relationship between nutritional status and work fatigue with a value (r) of 0.146 which indicates a positive correlation direction with a very weak correlation strength.(Anis Farihatin, 2023)

This research is not in line with research conducted by Rindi Antika, et al in 2023 on rice farmers in Wado Village, it was found that there was a significant relationship between nutritional status and work fatigue in rice farmers. (Rindi Antika, 2023) The results of this study are not by the theory that shows that nutritional status is one of the factors that affect the level of work fatigue because it is related to the work power, usually someone with less nutritional status will experience fatigue faster due to lack of nutrition to produce energy while working, causing a person to be easily sleepy and less focused at work. If the amount of food consumed before work and during rest is not balanced with the energy expended during work, then workers are more susceptible to fatigue than workers with adequate food intake.

The relationship of workload with burnout

During the work process that involves physical activity, the work pulse will continue to increase in line with the higher physical workload carried by a worker. The pulse of work will support someone to complete their work well so that if the worker's pulse rate increases, it is likely that the level of fatigue will be higher so that the results of work involving physical activity will also decrease. (Nadya Baharuddin, 2023) Based on Table 2, the results of the Pearson Correlation statistical test obtained a P-Value of 0.012 which means that there is a significant relationship between workload and work fatigue in oil palm farmers in Tanjung Medan Village. This research was dominated by a medium workload, which was 78 people, a high workload of 5 people, and a workload of 2 people.

Figure 5. Box Plot and Scatter Plot Work Fatigue Based on Workload

Based on Figure 5. obtained R2 value of 0.418 indicates a positive correlation direction with moderate correlation strength, so the higher the workload of workers will be at risk of experiencing work fatigue. This research is in line with research conducted by Anis Farihatin, et al in 2023 on production personnel at Pt. Selaras Citra Lestari Bawen with the Spearman Correlation statistical test obtained a P-value = 0.000 which means there is a significant relationship between workload and work fatigue. However, this research is not in line with research conducted by Nadya Baharuddin, et al in 2023 on employees of Pt. FKS Multi Agro Tbk. Makassar with the Chi-Square test obtained a P-value of 0.099 which means there is no significant relationship between workload and work fatigue. The impact of a workload that is too heavy can cause physical and mental fatigue based on the results of interviews with respondents, it was found that most respondents experienced a lack of concentration, headaches, body aches, back pain, and leg pain after work. One of the efforts to reduce the occurrence of fatigue caused by workload is the distribution of tasks by adjusting the capacity and workability that can be accepted by workers to achieve maximum work productivity.

CONCLUSION

Based on the results of research on the relationship between age, length of work, working mass, nutritional status, and workload with work fatigue in oil palm smallholder workers in Tanjung Medan Village, it can be concluded that most of them are over 30 years old as many as 63 people (74.1%), the mass of work under 15 years old is 58 people (68.2%), the most length of work is dominated by under 8 hours as many as 70 people (82.4%), Normal nutritional status of 73 people (85.9%), the highest level of workload at the medium level of 78 people (91.8%) and the level of high workload of 5 people (5.9%), high work fatigue in oil palm smallholder workers as many as 6 people (7.1%) and the most dominated by moderate fatigue as many as 57 people (67.1%). Based on the results of the study there is a significant relationship between age to work fatigue (P-Value = 0.000) with a strong correlation strength (R^2 = 0.607), there is a relationship between work mass to work fatigue (P-Value = 0.000) with moderate correlation strength (R^2 = 0.526), there is a significant relationship between the length of work to work fatigue (P-Value = 0.010) with weak correlation strength (R^2 =

0.078), there is a relationship between workload to work fatigue (P-Value = 0.012) and moderate correlation strength (R2 = 0.418), there is no significant relationship between nutritional status to work fatigue (P-Value = 0.353) and no correlation strength (R2 = 0.002). It is expected that oil palm smallholder workers pay more attention to their health conditions while working both from external and internal factors to avoid high levels of work fatigue that allow work accidents to occur while working. Healthy workers are less at risk of job burnout and workplace accidents.

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