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FACTORS RELATED TO WORK FATIGUE IN EMPLOYEES AT PT. PLN ULP KALUMPANG, BULUKUMBA

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ABSTRACT

Fatigue is a physical and mental state that experiences a decrease in work quality. Fatigue is an accumulation of various human physical activities; fatigue can also be interpreted as a body protection mechanism to avoid further damage recovery occurring after rest. Fatigue is often overlooked by workers when it is related to protecting workers' health. This study aims to determine the factors related to work fatigue experienced by PT PLN ULP Kalumpang, Bulukumba employees, namely age, length of service, work period, work period index, and temperature. The sampling technique used a total sampling of 45 employees. Method The research used is quantitative research using a *cross-sectional* questionnaire approach. The results of the study on employees at PT.PLN ULP Kalumpang, Sapalohe Village, Bonto Nautical District, Bulukumba Regency showed that age *(P value* 0.004), length of service *(P value* 0.000), work period *(P value* 0.024), Body Mass Index/BMI *(P value* 0.040), and temperature *(P value* 0.001) have a significant relationship to work fatigue in employees. Therefore, companies are expected to pay more attention to work fatigue experienced by their employees by implementing a healthy lifestyle and paying attention to workers' rest schedules to increase employee work productivity.

Keywords: Fatigue; productivity; work time; body mass index

1. INTRODUCTION

Fatigue is a physical and mental condition that results in decreased quality of work. Fatigue is an accumulation of various human physical activities. Fatigue can also be interpreted as the body's protective mechanism to avoid further damage. Recovery occurs after rest. Fatigue is often overlooked by the workforce, which is related to protecting the health of the workforce.

Based on data from the Ministry of Manpower and Transmigration in Indonesia in 2010, work accidents often occur due to fatigue, which is dominated by the construction services sector (31.9%), followed by the manufacturing industry sector (31.6%), transportation (9.3%), mining (2.6%), forestry (3.6%), and others (20%). More than 65% of workers in Indonesia come to company polyclinics with work complaints, with factors causing fatigue varying wildly, which are influenced by workload, work environment, physical problems, and health conditions. It can also be influenced by age, health status, nutritional status, diet, gender and psychological conditions (Malik et al., 2021).

The working hours in Indonesia have been set at a maximum of 8 hours a day, and workers need rest time. Extending working hours more than that will only reduce work efficiency and increase fatigue, work accidents and work-related diseases. The Sulawesi region shows that work accidents are still relatively high. In contrast, the number of cases due to work accidents in 2011-2014 was dominated by 2013 as the highest case, namely 35,917 (Innah et al., 2021).

Work fatigue is also often caused by a workload that is not comparable to the length of working hours, as discussed in previous studies by employees of PT. PLN (Persero) Lahendong PLTP service unit has relatively high work fatigue due to an unbalanced workload. The lower the workload received by employees, the lower the work fatigue experienced by PT employees. PLN (Persero) Lahendong PLTP service unit (Roya et al., 2021).

PT. PLN ULP Kalumpang is a company engaged in sales, namely selling electricity to prospective customers. PT PLN ULP (Persero) also operates in the service sector, namely electrical repair, installation and maintenance services. Judging from the services provided, every worker is required to pay attention to occupational health in order to create a healthy work environment and reduce the occurrence of work accidents in the workplace. The length of working hours applied by the company is 8 hours of work with 1 hour for rest. The complaints from several employees at the company often include fatigue, tension in the back of the head, sore waist, and dizziness. Based on the data presented above, the researcher is interested in seeing the picture of employee work fatigue at PT PLN ULP Kalumpang, Bulukumba.

2. METHODS

The type of research used in this study is quantitative research using a *cross-sectional approach* to see factors related to fatigue experienced by employees at PT. PLN ULP Kalumpang, Bulukumba. The population in this study is the total number of employees at PT. PLN ULP Kalumpang, Bulukumba. The total population is 45 employees. The total sample in this study can be determined using the total sampling technique or taking samples of all employees, namely 45 people. The sampling technique in this study is the total sampling technique, which takes samples as a whole.

Primary data collection in this study was conducted by conducting direct interviews, distributing questionnaires and collecting other data in the field. Secondary data is data

obtained indirectly from the research object. The research instrument used in this study was a subjective fatigue questionnaire (*Subjective Self Rating Test*) sourced from *the Industrial Fatigue Research Committee* (IFRC), scales and meters for measuring Body Mass Index (BMI), and a camera as a documentation of ongoing activities.

3. RESULT AND DISCUSSION

a) The relationship between age groups with work fatigue on employee of PT. PLN ULP The Kalumpang

Table 1. The relationship between age groups with work fatigue on employee of PT PLN ULP The Kalumpang

Age	Work Fatigue				Total		p Value
	Tired		Not Tired				
	n	%	n	%	N	%	
Young	4	26.6	11	73.4	15	100	**0.004**
Old	23	76.6	7	23.4	30	100	
Total	27	60	18	40	45	100	

Source: *Data Primary, 2024*

Based on table 3.1, the relationship between age groups with fatigue Work on employee PT PLN ULP The Kalumpang from 45 Respondent (100 %) known on group age worker young as much as 4 Respondents (26.6%) who experienced fatigue and 11 respondents (73.4%) Which No experience fatigue. Meanwhile, for group-age workers, as many as 23 respondents (76.6%) experienced fatigue, and 7 respondents (23.4%) did not experience fatigue.

Based on the analysis results using Chi-Square and continuity correction, a *P value of* 0.004 was obtained, where the *P value* is smaller than 0.05. then H 0 is rejected, and HA is accepted. So, there is a relationship between age and fatigue work for PT PLN ULP Kalumpang employees in 2024.

The age of workers will affect the condition and capacity of the body in carrying out activities in the workplace, where workers who are in the young category can do work easily without feeling tired, but with increasing age this ability will decrease and it is easier to feel tired.

The findings in this study are in line with previous studies where there is a significant relationship between age and work fatigue in engineering service workers at PT. PLN (Persero) Customer Service Unit (ULP) Tanjung in 2020 based on the results of the chi square statistical test, the P value = 0.000 was obtained, which is below α = 0.05 (p <a = 0.05). Because workers in the old age category will quickly experience fatigue while working, the older a person is, the lower their physical strength level will be, which will affect productivity at work (Syuqinah et al., 2020).

Previous research found a relationship between age and work fatigue, with a p-value of 0.041 and a correlation coefficient of 0.396. So the company is expected to provide a

limit on overtime work, which is three hours in one day, and provide short breaks in between work. (Jihan Ufairah Hasna, 2023).

Age factors can affect several body system functions such as the body's motor system, hormonal system and cardiovascular system. The decline in the body's work system can affect the ability to work, where a young person is able to do heavy work while an old person's ability to work will decrease because they feel tired more quickly and cannot move freely when doing their duties (Suma'mur, 2014).

b) The relationship between long of work with work fatigue on employee of PT. PLN ULP The Kalumpang

Table 2. The relationship between long of work with work fatigue on employee of PT PLN ULP The Kalumpang

Long of Work	Work Fatigue				Total		p Value
	Tired		Not Tired				
	n	%	n	%	N	%	
Normal	4	20	16	80	20	100	
Abnormal	23	92	2	8	25	100	**0.000**
Total	27	60	18	40	45	100	

Source: *Data Primary, 2024*

Based on table 3.2, connection long Work with fatigue Work on employee PT PLN ULP The Kalumpang from 45 Respondents (100 %) known on group worker with category long Work normal as many as four respondents (20%) experienced fatigue and 16 respondents (80%) did not experience fatigue. Meanwhile, 23 respondents (92%) had abnormal work experience fatigue, for the group of workers in the old category and two respondents (8%) did not experience fatigue.

Based on the analysis of the results using *Chi-square continuity correction* obtains a *P value* of 0.000 where the *P value* is less than 0.05, then H 0 is rejected, and H is accepted. So, there is a connection between long work and fatigue. Work on employee PT PLN ULP The Kalumpangin the year 2024.

According to Suma'mur in 1989 in (Ridlo et al., 2023) the length of work is related to the physical condition of the workers. Heavy physical work will affect the work of the muscles, cardiovascular, respiratory systems and other systems. If the work lasts for a long time with limited rest time, it will cause the body's ability to decrease and pain in the limbs so that it is easier to feel fatigue due to work.

The findings of this study are in line with the research conducted by (Ramadhanie & Lestari, 2021) which found a p value of 0.008 which is smaller than 0.05, meaning that there is a relationship between length of work and fatigue in workers and the results of this study also obtained a Prevalence Ratio (PR) value of 10.125 which means that respondents who do overtime work activities are 10 times more at risk of experiencing work fatigue. The additional uncertain working hours are due to demands from superiors who must meet targets, plumbing workers must do an average of 10 hours of work per

day, meaning more than 8 hours of work.

Research conducted by (Darmayanti et al., 2021) shows a P value of 0.001, meaning that there is a relationship between working hours and work fatigue in indoor workers. Extending working hours is usually not accompanied by optimal work effectiveness and productivity, and can even be seen to decrease work quality and a tendency towards work fatigue.

Based on previous research, it was found that there was a relationship between work duration and work fatigue in oil palm harvesters, the Chi-square result was P = 0.010, which means that there is a relationship between work duration and work fatigue in oil palm harvesters. (Manalu & Harahap, 2023).

c) The relationship between work time with work fatigue on employee of PT. PLN ULP The Kalumpang

Table 3. The relationship between work time with work fatigue on employee of PT. PLN ULP The Kalumpang

Work Time	Work Fatigue				Total		p Value
	Tired		Not Tired				
	n	%	n	%	N	%	
New	5	33.3	10	66.7	15	100	
Long	22	73.3	8	26.7	30	100	**0.024**
Total	27	60	18	40	45	100	

Source: *Data Primary, 2024*

Based on table 3.3, connection time Work with fatigue Work on employee PT PLN ULP The Kalumpang from 45 Respondents (100 %) known on group worker with category time Work new as many as five respondents (33.3%) experienced fatigue And 10 Respondents (66.7 %) Which No experience fatigue. Meanwhile, for group workers in the long service category, as many as 22 respondents (73.3%) experience fatigue, and 8 Respondents (26.7 %) do not experience fatigue.

Based on the analysis of the results using *Chi-square cont, unity correction* obtained a *P* value of 0.024 where the *P value* is less than 0.05, then H 0 is rejected, and H A accepted. So, there is a connection between time and fatigue. Work on employee PT PLN ULP The Kalumpangin the year 2024.

The findings of this study are in line with the research conducted by (Kuku et al., 2022) where more billman workers experienced fatigue, namely 16 respondents (44.4%) and more technician workers did not experience fatigue, namely 10 respondents (27.8%). There is a significant difference in feelings of fatigue in billman workers and workers influenced by the length of service and age of workers.

Research conducted by (Indah et al., 2021) found a significant relationship between length of service and work fatigue. Respondents who experienced fatigue were more workers with a long work period, as many as 33 respondents (100%), while workers with a

new work period who experienced fatigue were 4 respondents (33.3%).

Previous research found a relationship between length of service and work fatigue with a p value of 0.000 and a correlation value of R2 of 0.526 was obtained, indicating that the direction of the correlation is positive with a moderate correlation strength, so that the longer the work period of oil palm plantation workers, the more farmers are at risk in Tanjung Medan Village experiencing work fatigue. (Pohan et al., 2024).

Work period is related to the ability to adapt between workers and their jobs and their work environment. The adaptation process can have a positive effect that can reduce tension and increase activity over work performance, while the negative effect is the body's excessive resistance limit due to the pressure obtained in the work process. This causes work fatigue which leads to decreased psychological and physiological functions. Pressure through physical at a certain time will cause decreased muscle performance, symptoms shown by how slow movements, this is not only caused by a heavy workload but more by the pressure that accumulates every day over a long period of time. (Bongakaraeng et al., 2021).

d) The relationship between Body Mass Index with work fatigue on employee of PT. PLN ULP The Kalumpang

Table 4. The relationship between Body Mass Index (BMI) with work fatigue on employee of PT. PLN ULP The Kalumpang

BMI	Work Fatigue				Total		p Value
	Tired		Not Tired				
	n	%	n	%	N	%	
Normal	7	38.9	11	61.1	18	100	
Abnormal	20	74.1	7	25.9	27	100	**0.040**
Total	27	60	18	40	45	100	

Source: *Data Primary, 2024*

Based on Table 3.4, the connection between Body Mass Index (BMI) with fatigue Work on PT employees PLN ULP Kalumpang from 45 respondents (100%) is known in group workers with category Index Time Normal body weight (BMI) as many as seven respondents (38.9%) experience fatigue And 11 Respondent (61.1 %) Which No experience fatigue. Meanwhile, for the group of workers with a Body Mass Index (BMI) category, as many as 20 respondents (74.1%) experienced fatigue, and seven respondents (25.9%) did not experience fatigue.

Based on the analysis results using *Chi-square* and *continuity correction*, the *P value was obtained at* 0.040, where the *P value* was less than 0.05, then H 0 was rejected, and H A was accepted. So there is a connection between Body Mass Index (BMI) and fatigue. Work on employee PT PLN ULP The Kalumpang in the year 2024.

The findings of this study are in line with previous studies that obtained a P value of 0.000 where there is a relationship between nutritional status and work fatigue, where normal nutritional status greatly helps workers in carrying out their work. Fulfilled

nutritional needs of workers can produce energy so that they will not lack energy in working which can cause fatigue. If the calorie intake does not match the needs, the worker will feel tired more quickly, compared to workers with adequate nutritional intake (Syuqinah et al., 2020) Previous studies found factors that cause work fatigue in health service employees, namely age P value 0.010, gender P value 0.924, length of service P value 0.001, body mass index P value 0.040, marital status P value 0.029, length of service P value 0.142. The effect of physical fatigue can have an impact on services, due to a decline in conditions. The solution to preventing energy loss is to provide compensation for work shift arrangements, provide balanced nutrition, and routine and periodic health checks (Sahputra et al., 2022).

The problem of malnutrition and excess nutrition in adults is an important issue that must be considered. This is because in addition to having a risk of certain diseases, it also causes workers to quickly become tired and can affect productivity. (Supariasa, 2013).

A Body Mass Index that is above the normal category (obesity) will increase the risk of pain because the load on the joints will increase, while a tall body with a normal BMI generally has a slender bone shape so that biomechanically it is susceptible to pressure and bending (Tarwaka, 2011).

e) The relationship between temperature with work fatigue on employee of PT. PLN ULP The Kalumpang

Table 5. The relationship between temperature with work fatigue on employee of PT. PLN ULP The Kalumpang

BMI	Work Fatigue				Total		p Value
	Tired		Not Tired				
	n	%	n	%	N	%	
Normal	6	30	14	70	20	100	**0.001**
No Normal	21	84	4	16	25	100	
Total	27	60	18	40	45	100	

Source: *Data Primary, 2024*

Based on table 3.5, connection temperature with fatigue work on employees PT PLN ULP The Kalumpang from 45 Respondents (100 %) known on group worker with temperature environment Work normal as much as six respondents (30 %) Which experience fatigue And 14 Respondents (70 %) Which No experience fatigue. Meanwhile, for the group of workers with the temperature category environment work No normal, as many as 21 Respondents (84%) experienced fatigue, and four respondents (16%) Did Not experience fatigue.

Based on the analysis results, using *Chi-square* and *continuity correction*, a *P value of* 0.001 was obtained where the *P value* was less than 0.05, and then H 0 was rejected and H A was accepted. So, there is a relationship between working environment temperature and fatigue. Work on employee PT PLN ULP The Kalumpangin 2024.

The findings of this study are in line with the research conducted by (Edward, 2022) where the results of the alternative fisher exact test obtained a P value = 0.002, which means that there is a relationship between heat stress and feelings of work fatigue in workers. This is because workers who are in a room with a temperature above 28ºC can experience heat stress, therefore the body can adjust to the area used in carrying out work every day. If workers sweat, it can cause loss of fluids from their bodies, eventually getting tired easily if not accompanied by fluid consumption according to their needs. Previous research found statistical test results p = 0.001 (<0.05) which means that there is a relationship between hot work climate and work fatigue in areca nut farmers. Based on the results of observations, farmers work in hot environmental conditions every day. Most farmers also do not wear hats and long clothes to avoid direct exposure to sunlight which can trigger a decrease in body energy and accelerate fatigue. (Djiko et al., 2018).

The work environment is one of the important factors for improving worker performance and employee achievement, because if the work environment is good and supportive, it can provide a sense of comfort that will make employees more active in working. Likewise, a poor and inadequate work environment can reduce work enthusiasm so that performance is less than optimal which can cause difficulties in working and can cause fatigue in workers. The work environment includes lighting, air circulation, noise, temperature or weather and work safety, the better the work environment, the better the employee performance, if conversely if the work environment is poor, employee performance will decrease. (Barus & Risal, 2020).

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