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Relationship between Workload and Work Fatigue in Employees of **Company's Production Department**

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Article Info	Abstract
Article history:	The role of human resources is very important to carry out work
Received 2 May 2024	processes and achieve company goals. So that the role of employees can
Received in revised form 7	run optimally, companies need to pay attention to factors that influence
June 2024	worker fatigue, including internal factors (age, gender, nutritional
Accepted 20 June 2024	status and psychological state of the workforce) and external factors
	(workload, length of service and physical work environment). Workload
Keywords:	is divided into two, namely mental workload and physical workload.
Workload	Mental workload is a human evaluation of attention limits while
Work Fatigue	carrying out tasks optimally which is influenced by the workload
Production Department	demands of a task. The population in this study was 127 employees with
employees	a sample of 83 respondents. Based on the results of the chi square
IFRC	statistical test, a p value of 0.001<0.005 was obtained. Results from
NASA-TLX	research There is a significant relationship between mental workload
	and work fatigue in production employees. It is recommended to PT.

Milano should pay attention to the conditions of his workers.

Introduction

In research by Antara et al., (2022), fatigue is a problem that is a major concern for workers in human-oriented jobs such as employees, human services, nursing and education. According to the terminology, work fatigue often occurs in high-touch jobs, namely jobs that involve a lot of face-to-face contact. If in a company every employee does not experience work fatigue, the impact that will occur is that employee productivity will increase, so employees will be more active in their work and more enthusiastic about their work.

Work fatigue contributes 50% to the occurrence of work accidents. Work fatigue is a pattern that arises in a situation that generally occurs in workers, where the worker is no longer able to do the work. People who experience work fatigue usually experience symptoms such as feeling lethargic, yawning, drowsiness, dizziness, difficulty thinking, lack of concentration, lack of alertness, poor and slow perception, stiffness and awkwardness in movement, lack of enthusiasm for work, unbalanced standing, tremors in limbs, unable to control attitudes, and decreased physical and spiritual performance (Abdullah, 2023).

Worker fatigue in general can be influenced by several factors, namely monotonous work, long mental and physical work intensity, environmental conditions, unclear workload and responsibilities, and health problems. Work fatigue can also cause a person to be unable to work, disrupt the smooth functioning of work and become depressed (Tarwaka & Bakri, 2016).

One of the causes of work fatigue is mental workload. The amount of work that is not commensurate with the worker's physical abilities, skills and time can be a source of fatigue and work stress. This is because this source comes from work demands that exceed the worker's capacity limits, resulting in a high mental workload (Abdullah, 2023). Mental workload is characterized by forgetfulness, difficulty concentrating, restlessness and irritability (Marfuah, 2024).

Work demands that exceed the reasonable limits of a worker's capacity will certainly result in mental workload in the form of overstress or burnt out, which is a factor that causes work accidents (Emeralda et al., 2021).

The work carried out by each individual has its own problems ranging from work demands, work load to the work environment. Work also involves two parties, the company and employees. Employees are the most important human resource (HR) for the company. In the current era, technological developments in every company are growing rapidly and competition is also getting tighter, so companies and employees are required to work effectively and more efficiently to be able to produce a product that is better than other companies. The greater the demands on employees, the greater the workload. Therefore, the health and safety of employees must be considered (Antara et al., 2022).

Fatigue can be seen and felt by knowing the symptoms of fatigue. Symptoms of fatigue are divided into subjective and objective which can be seen by the emergence of dizziness, boredom, starting to lack the ability to concentrate, lack of alertness, and leading to a decrease in physical and mental abilities. Knowing the symptoms of fatigue can help companies improve work systems so that workers do not quickly feel bored or feel that the workload given exceeds their capacity to work (Suryaatmaja & Eka Pridianata, 2020).

Based on data from the Indonesian Employment Social Security Administration (BPJS), there were 147,000 cases of work accidents throughout 2021, or 40,273 cases every day. Of that number, 4,678 cases (3.18 percent) resulted in disability, and 2,575 (1.75 percent) cases ended in death. Meanwhile, every day 40,273 cases of work accidents occur. This data shows that every day there are 12 BPJS Employment participants. experienced disability and seven participants died. In 2021, the Indonesian Ministry of Manpower and Transmigration stated that every day an average of 414 cases of work accidents occur, 27.8% of which are caused by quite high fatigue. Approximately 9.5% or 39 people are disabled, while in Indonesia on average there are 99,000 cases of work accidents per year. Of this total, around 70% have fatal consequences, namely death and lifelong disability (Kementerian Ketenagakerjaan Indonesia, 2022).

BPJS Employment stated that in 2020, BPJS Employment stated that there were 117,161 work accidents, while in 2021 there were an increase of 234,270 work accident cases, one of which was work accident, namely work fatigue. More than 65% of Indonesian workers visit company polyclinics due to work fatigue. Fatigue often occurs in workers with poor nutritional status (Farha et al., 2022).

Employee workload is work that is assigned to a person and is one of the factors that contributes to work fatigue. The workload received, both physical and mental workload, must be in accordance with the worker's physical and mental abilities. Factors that influence workload are internal factors and external factors. The internal factors in question come from within a person, and external factors such as the work environment or the job itself. Every worker can work healthily without endangering himself or the community around him, for this reason it is necessary to make efforts to harmonize work capacity, work load and work environment so that optimal work productivity can be obtained (Reppi et al., 2019).

Work fatigue factors account for more than 50% of work accidents. Job burnout is a prominent occurrence in Australia and is relatively common among young people. Work fatigue often occurs in companies/private sectors. A survey conducted in the United States (US), for adults who came to the clinic, fatigue was the biggest problem (24%). A survey conducted in British society showed that 25% of women and 20% of men complained of fatigue. More than 60% of

the workforce who entered the company's polyclinic complained about being tired from work. In an American epidemiological study, job burnout was the seventh most common symptom (Yunus et al., 2021).

Research conducted by Erwani, (2020) revealed that there is a significant relationship between mental workload and work fatigue (p-value = 0.003). The research is also in line with research conducted in Ardiyanti et al., (2017) which revealed that there is a relationship between mental workload and work fatigue (p-value = 0.013).

PT. Milano Aek Batu is a company in Torgamba District, South Labuhanbatu Regency. Pt. Milano is also one of the companies joining the Wilmar Group which produces cooking oil. Employees who work at PT. Milano Aek Batu, especially production employees, have a heavy workload which can result in fatigue. Fatigue occurs due to additional work time (overtime) for production employees.

Based on the problems above, the researcher wants to conduct research on production employees at PT. Milano Aek Batu to determine the relationship between workload and work fatigue in production employees at PT. Milano Aek Batu.

Methods

This research uses a quantitative type of research with a *cross sectional design*. The population in this study was 127 production employees at PT. Milano Aek Batu, South Labuhanbatu Regency. The sampling technique used a *simple random sampling method*, with the 1997 Lemeshow formula, so the sample results in this study were 83 respondents. The sample determination in this study was carried out randomly. In this study, researchers took male employees. Primary data collection was carried out using a questionnaire. Primary data is data obtained directly from respondents using a questionnaire. The data analysis used is univariate analysis and bivariate analysis with the *chi-square test*. However, if the requirements are not met, the *Fisher Exact test* is used when the calculated predicted value is less than 5. The independent variable in this study is workload while the dependent variable in this study is work fatigue. The instruments used were the workload questionnaire and work fatigue questionnaire from Tarwaka (2019). Workload questionnaire using the *Nasa Task Load Index (NASA-TLX) method* and work fatigue questionnaire using the *Industrial Fatigue Research Committee (IFRC) method*.

Data collection in this research went through several stages, the first stage was the preparation stage, where the researcher asked for permission to distribute mental workload questionnaires using the *Nasa Task Load Index (NASA-TLX) method* and work fatigue questionnaires using the *Industrial Fatigue Research Committee (IFRC)*, then researchers distributed questionnaires related to workload and work fatigue in accordance with the questions that had been prepared in the *NASA-TLX questionnaire* and questionnaires using the *IFRC method*. The third stage is data processing. In data processing, transferring data results to SPSS, coding and data entry. In this study, the instruments used were a questionnaire about measuring workload based on the *NASA-TLX method* and a work fatigue questionnaire using the *IFRC method*.

Result and Discussion

Univariate Analysis

Table 1. Distribution of Respondents Based on Age The data on the characteristics of respondents based on age is as follows

Age	n	%
20-30 Years	8	9.6
31-40 Years	75	90.4
41-50 Years	0	0

Total	83	100.0

Based on the table above, it is known that of the 83 respondents, production employees at PT. Milano Aek Batu District. Torgamba District. South Labuhanbatu, more commonly found in the 31-40 year age group with 75 respondents (90.4%) compared to the 20-30 year age group with 8 respondents (9.6%) and the 41-50 year age group with 0 respondents (0%).

Table 2. Distribution of Respondents Based on Years of Work The data on respondents' characteristics based on work period is as follows

Years of service	n	%
1-5 Years	25	30.1
6-10 Years	40	48.2
11-15 Years	18	21.7
Total	83	100.0

Based on the table above, the working period categories are divided into three categories, namely 1-5 years, 6-10 years and 11-15 years. A total of 25 respondents (30.1%) had worked for 1-5 years, 40 respondents (48.2%) had worked for 6-10 years and 18 respondents (21.7%) had worked for 10-15 years.

Table 3. Distribution of Work Fatigue in 2024 The work fatigue distribution data is as follows

Work Fatigue	n	%
Low	41	49.4
Tall	42	50.6
Total	83	100.0

Based on the table above, the categories of work fatigue among production employees at PT. Milano Aek Batu In 2024, of the 83 respondents (100%), there were 41 respondents (49.4%) experiencing low level fatigue and 42 respondents (50.6%).

Table 4. Workload Distribution in 2024 The workload distribution data is as follows

Workload	n	%
Low	40	48.2
Tall	43	51.8
Total	83	100.0

In the table above, the workload categories for employees in the production department of PT. Milano out of 83 (100.0%) there were 40 respondents (48.2%) experiencing low workload and 43 respondents (51.8%) experiencing high workload.

Bivariate Analysis

Table 5. The Relationship between Workload and Work Fatigue in Production DepartmentEmployees at PT. Milano Aek Batu, South Labuhanbatu Regency

Work Fatigue								
Workload	L	ωw	Т	all		Total	p-value	PR
n		%	n	%	n	%		
Low Tall	29 12	34.9 14.5	11 31	13.3 37.3	40 43	48,2 51,8 0,001		6,811
Total	41	49,4	42	52,6	83	100,0		

Based on the table above, it can be seen that the variable workload with work fatigue, it is known that those who experience low workload with low levels of work fatigue are 29 respondents (34.9%) and those who experience low workload with high levels of fatigue are 11 respondents (13.3%). Workers who experienced high workloads with low levels of fatigue were 12 respondents (14.5%) and those who experienced high workloads with high levels of fatigue were 31 respondents (37.3%). The results of the analysis show that there is an *expected count value* of less than 5, so it does not meet the requirements of the *chi square test, so that as an alternative the Fisher* Exact test can be carried out , a p- *value of* 0.001 is obtained. Employees with a high workload have a 6.811 times higher risk of experiencing work fatigue than employees with a low workload. This proves that there is a significant relationship between workload and work fatigue in production employees at PT. Milano Aek Batu, South Labuhanbatu Regency.

The results of research conducted by research at PT. Milano Aek Batu, South Labuhanbatu Regency, 2024 regarding the Relationship between Workload and Work Fatigue in Production Department Employees at PT. Milani Aek Batu, South Labuhanbatu Regency is included in the high workload category with a high level of work fatigue of 31 (37.3%) from these results, it can be said that there are several influencing factors, with demands from superiors it is very possible for excessive workload to occur so that triggering production employees to experience work fatigue. Based on initial survey data obtained from PT. Milano Aek Batu using an interview method with 3 production employees at PT. Milano Aek Batu found that many people still complain about being tired at work because the workload is very heavy, such as not having time to rest while working.

Workload is related to fatigue due to work, someone who has a heavy workload can experience work-related illnesses, one of which can cause complaints of fatigue while working. Work fatigue can reduce work productivity and disrupt the health of workers. This statement is justified (Sarmini, 2021) in his research that the impact of fatigue can reduce concentration, reduce productivity at work and reduce performance at work. If a person has reduced energy due to their work, if they are forced to continue doing the same work, they will get less than optimal work results (Antara et al., 2022).

Increasing age also influences a person's physical capacity. A person tends to experience fatigue more quickly after passing the age of 30 years, because optimal physical ability is achieved at the age of 25-30 years and decreases by 1% every year (Tarwaka & Bakri, 2016). Many studies state that there is a relationship between age and fatigue levels and there are also those that state that there is no relationship between age and fatigue levels. The results obtained from the distribution of respondents based on age were that out of 83 respondents were employees of the production department of PT. Milano Aek Batu was mostly found in the age group > 35 years as many as 43 (51.9%).

Work fatigue is one of the conditions that can cause a decrease in a person's ability to work, work fatigue with 0-21 is said to be in the low category with a fatigue level of 0, a score of 22-44 is in the moderate level of fatigue category with a fatigue level of 1, a score of 45-67 is in the high level of fatigue category with fatigue level 2 and a score of 68-90, very high level fatigue category with fatigue level 3 (Tarwaka, 2016). And the results obtained from research on work fatigue response at PT. Milano Aek Batu, South Labuhanbatu Regency, is more commonly found in high levels of work fatigue with a score of 45-67 with a frequency of 43 and a percentage of 51.8%.

According to research by Handayani et al., (2021), excessive workload has a 1.7 times risk of experiencing work fatigue compared to normal work. The difference in the risk of work fatigue based on workload is due to very varied task demands. And the results obtained were the

workload of respondents at PT. Milano Aek Batu, South Labuhanbatu Regency, is more commonly found at high workload levels with a frequency of 46 and a percentage of 55.4%.

The research results showed that workload in the high category was more often found in high workload at 43 (51.8%), compared to high workload category found at light 0 (0.0%), moderate 2 (2.4%), quite high 6 (7.2%) and very high 21 (2.5%), the results of statistical analysis using the *chi-square test* showed a value (*p-value*) = 0.036 (p < 0.05), this shows that there is Relationship between Workload Relationship and Work Fatigue in Production Department Employees at PT. Milano Aek Batu, South Labuhanbatu Regency.

According to (Tarwaka, 2010) explains that workload is something that arises from the interaction between the demands of tasks in the work environment which is used as a workplace, skills and perceptions of workers. Workload is also defined operationally by factors such as task demands or the efforts made to do the work.

This research is in line with research conducted in Ulfa & Tualeka, (2023) which revealed that there is a relationship between workload and work fatigue. The results of *the Pearson chi-square* statistical test showed *a p-value of* 0.042 < 0.05, which means there is a relationship between workload and work fatigue.

This research is also in line with research conducted in Erwani's research, (2020) which revealed that there is a relationship between workload and work fatigue, obtained p (0.002) < α (0.005) which means there is a relationship between workload and work fatigue.

Assessment of mental workload tends to be based on the level of accuracy, speed and constancy of work. The higher work demands can increase the mental workload felt by the workforce (Wurarah et al., 2020). Excessive mental workload has an influence on workforce performance and is directly related to the level of work fatigue. In the book by Tarwaka & Bakri (2016), mental workload is defined as the main thing that causes workers to feel burdened, thus triggering complaints of work fatigue when working (Tarwaka & Bakri, 2016). High mental workload causes a decrease in a person's cognitive function and performance, as a result this can reduce work productivity (Pratama & Rahman, 2022).

The importance of mental workload has increased since the advent of computerized technology which requires human mental abilities to carry out various work tasks. This is because mental workload that is too high (*overload*) or too low (*underload*) will affect various mental health disorders, such as monotony, *fatigue*, *stress*, *burnout*, work satisfaction (Yuridha, 2022).

Work load is influenced by several factors, namely external factors which include: tasks, work organization and work environment, while internal factors work load includes: working time pressure, working hours, noise, excessive information, high temperatures and responsibility. *The Journal of Occupational and Environmental Medicine* explains that excessive workload is correlated with heart attacks (Koontalay et al., 2021).

The condition of the body experiencing loss of energy due to the activities carried out. Fatigue occurs more often in types of work that are done repetitively or monotonously. This fatigue arises because of the workload borne by employees. When employee workload is high, employees feel required to complete their work so that anxiety always arises by itself and they have to realize their goals (Lady & Wiyanto, 2020).

This is in accordance with the theory put forward by Tarwaka (2019) which states that high mental workload can cause excessive energy consumption, thereby triggering work fatigue. The level of work-related fatigue experienced can cause discomfort, reduce satisfaction, and reduce productivity. This is reflected in decreased work productivity, increased errors and discomfort in carrying out work (Yusuf & Rifai, 2019).

However, fatigue must be addressed. All types of work, both formal and informal, cause fatigue. A decrease in body condition while working which reduces productivity, endurance and efficiency is called work fatigue. Modern work life places greater stress on employees. Psychosocial risks such as more competition, more requirements, and more working hours are part of this pressure (Maipiana & Utami, 2023). Work fatigue can have a negative impact on employees. If employees feel tired while working, it will affect the worker's health so that it can result in work accidents for employees while working.

Conclusion

Based on the results of the research and discussions that have been carried out, conclusions can be drawn, namely the results of statistical tests (*Chi-Square*) with a *p value* (0.001). This means that workload influences work fatigue. In other words, there is a significant relationship between workload and work fatigue in production employees at PT. Milano Aek Batu. The greater the workload, the greater the amount of employee boredom at work . Fatigue occurs due to additional work time (overtime) for production employees.

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