

The Relationship between Work Duration and Physical Workload with Work Fatigue Levels Workers at the Kisaran Fantasy Car Repair Shop

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ABSTRACT

Work fatigue is a common issue encountered across various types of occupations, one of which is in a workshop. The Kisaran Fantasy Car Repair Shop is one of the car repair shops whose work involves muscle and energy. Workers are required to complete repairs according to the queue that exists per day. The queue makes workers have to work late into the night and even rest periods are often used to work when the repair queue does not stop. With poor physical activity and work duration occurring continuously, workers often experience dizziness, frequent yawning, excessive thirst, and a weakening of activity that makes workers often feel like lying down and unable to concentrate. The purpose of this study was to determine the relationship between work duration and physical workload with the level of fatigue in workers at the Fantasy Car Repair Shop. This research is descriptive quantitative research with a Cross Sectional approach. The sampling technique used total sampling with a research sample of 55 respondents. Data collection instruments used questionnaires, observations and interviews. Data were analyzed with Univariate and Bivariate analysis. Statistical test using Chi-Square test with significance $\alpha = <0.05$. The results showed that there was a relationship between work duration (P value = 0.000) and physical workload (P value = 0.000) with the level of job fatigue in workers at the Kisaran Fantasy Car Workshop. The researcher suggests that workshops improve occupational.

Keywords: Physical Workload; Job Burnout; Tenure

INTRODUCTION

Fatigue is one of the Occupational Health and Safety (OHS) concerns that has the potential to cause accidents in the workplace. According to data from the International Labour Organization (ILO), each year more than 160 million out of a total of 250 million workers worldwide suffer from work-related diseases (WRD) caused by exposure to hazards in their work environment. In addition, in 2021, the ILO also reported that around 2 million workers died due to work-related accidents, mostly caused by fatigue factors. The Indonesian Ministry of Manpower in 2021 also stated that 27.8% of workplace accidents were caused by fatigue factors. (Haworth & Hughes, 2021) Employees who suffer workplace accidents due to fatigue will experience a direct decline in their work productivity levels. (Ananda & Mustopa, 2023) In 2021, the Ministry of Manpower also reported 234,270 workplace accidents in Indonesia. Work fatigue are significant contributors to workplace accidents (Angelita et al., 2023). Investigations in several countries also show that fatigue significantly contributes to workplace accidents. (Kadir, 2023)

The term fatigue refers to a condition of decreased ability of the workforce to perform activities, which results in reduced physical capacity and endurance at work. (Rusila & Edward, 2022). The symptoms of fatigue consist of several forms, namely activity impairment, physical fatigue, and motivational impairment. The feeling of fatigue throughout the body, becoming

drowsy, frequent yawning, heavy legs, head, and eyes, chaotic thoughts, stiffness, awkwardness, and imbalance while standing are forms of activity weakening (Alfikri et al., 2021). Work fatigue can be caused by physical work activities, forced postures, non-ergonomic workstations such as poor lighting, disorganized tool and equipment positions, scattered cables, and unstable floor surfaces. Monotonous work, insufficient calorie intake, and inadequate work breaks can also contribute to this (Melvira & Fauziah, 2024). Suma'mur (2014) states that work fatigue that occurs continuously over a long period will become chronic fatigue. Fatigue occurs when the workload is 30-40% of work capacity, in addition to the effects of static work performed over a prolonged period (Rusila & Edward, 2022).

Another factor that causes work fatigue is physical workload. According to Tarwaka (2010) one of the causes of work fatigue is physical workload. Physical workload involves the activity of muscles, the heart, and the lungs. When the physical workload increases, the heart and lungs are required to work harder, conversely, when the workload is light, the strain on the heart and lungs is also reduced. (Oktavia & Uslianti, 2021). In addition to physical workload, excessive work duration can also lead to fatigue. Work duration is a period counted from the start of work until its completion, carried out according to the predetermined time (Alfikri et al., 2021). The duration of work in Indonesia has been determined based on Article 81 number 23 of the Appendix to Law No. 6 of 2023. Based on the law, the working duration is 7 hours a day and 40 hours a week for 6 working days in 1 week; or 8 hours a day and 40 hours a week for 5 working days in 1 week. (Undang-Undang, 2023)

Fantasy Car Repair Shop is a general workshop that provides vehicle repairs every day, from Monday to Sunday. Workers in this workshop carry out quite heavy physical activities, such as carrying workshop equipment, lifting car components, jacking up vehicles, spooling and balancing, and manually repairing car engines. Based on a survey of 30 workers, 76.7% admitted that they often experience signs of fatigue such as dizziness, excessive yawning, extreme thirst, body weakness, and difficulty concentrating. In addition, 63.3% of them stated that they often wanted to lie down or rest between jobs. The high intensity of work is exacerbated by a work system with no days off and breaks that are often neglected, as all vehicles that arrive that day must be completed on the same day. This suggests that the high physical workload and lack of recovery time may contribute to increased levels of fatigue in workshop workers. Kisaran Fantasy Car Workshop does not provide official health guarantees to workers, so health check-ups are not conducted to avoid work-related diseases (WRD).

In the study by Kurnia et al., (2024) working conditions in workshops that generally involve heavy physical activity, exposure to noise, and long work duration are the main factors that can trigger fatigue. In research by Anugrah Awaliah Julianti et al., (2022) also mentioned the relationship between workload and fatigue due to work fatigue felt by workers demanded to be maximized and on time, such as lifting heavy equipment, resulting in workers feeling sleepy, decreased concentration so that later when returning to work the work productivity of workers decreased. If done continuously, it will have an impact on the fatigue and health of workers and can even harm customers and companies.

Considering these problems, the researcher is motivated to carry out a study entitled "The Relationship Between Work Duration and Physical Workload with Work Fatigue Levels Among Workers at the Fantasy Car Repair Shop." To determine the relationship between work duration and physical workload with the level of job fatigue in workers at the Fantasy Car Repair Shop.

METHOD

This research is a quantitative study using a descriptive methodology, aimed at objectively detailing a situation. Employing a cross-sectional design, both causal factors and outcome

variables were measured simultaneously among workers at the Kisaran Fantasi Car Workshop in January 2025. The sample included 55 male employees from various sections, such as balancing, spooling, oil, AC, body and paint, engine repair, transmission repair, electrical systems, car accessories, and doors Meer, along with a few who assist other mechanics. Total sampling was used to gather primary data through observation, interviews, and questionnaires. The independent variables are work duration and physical workload, while the dependent variable is work fatigue. Work duration is assessed based on Law No. 13 of 2003, which mandates 40 hours a week (8 hours/day for 5 days or 7 hours/day for 6 days), categorized as ≤ 8 hours and > 8 hours. Physical workload is evaluated using Cardiovascular Load (CVL) as per Tarwaka (2004), measured with a Pulse Oximeter. CVL is classified into light ($< 30\%$), moderate ($30-60\%$), and heavy workloads ($61-100\%$) (Tarwaka & Bakri, 2004).

Work fatigue was measured using the IFRC questionnaire, comprising 30 items on a Likert scale, covering activity impairment, motivational decline, and physical condition. Fatigue levels are categorized based on total scores: low (30-52), moderate (53-75), high (76-98), and very high (99-120). Data were processed using SPSS for Windows version 20, employing univariate and bivariate analysis. The Chi-Square test was used to assess relationships between work duration and fatigue, and physical workload and fatigue, with a significance level of < 0.05 .

RESULTS AND DISCUSSION

Univariate Analysis

Table 1. Frequency Distribution Characteristic of Respondents.

Variable	Frequency (n)	%
Age		
19 – 39 Years	31	56,4
40 – 60 Years	24	43,6
Work Duration		
8 hours	28	50,9
> 8 hours	27	49,1
Physical Workload		
Light	14	25,4
Moderate	38	69,1
Heavy	3	5,5
Work Fatigue		
Low	11	20
Medium	29	52,7
High	15	27,3
TOTAL	55	100

Source: Primary data 2025

Based on Table 1, from 55 respondents, the frequency distribution of respondents' ages was 19 – 39 years with 31 respondents (56.4%) and 40 – 60 years with 24 respondents (43.6%). The frequency distribution of respondents' work duration of 8 hours was 28 respondents (50.9%), while the category of > 8 hours was 27 respondents (49.1%). Meanwhile, the frequency distribution of physical workload performed by workers at the Fantasy Car Repair Shop is as follows: light category 14 respondents (24.4%), moderate category 38 respondents (69.1%), heavy category 3 respondents (5.5%). And the frequency distribution of respondents' work fatigue with a low

category was 11 respondents (20%), a moderate category was 29 respondents (52.7%), a high category was 15 respondents (27.3%), and there were no respondents who experienced work fatigue in the very high category.

Bivariate Analysis

The bivariate analysis used in this study was to determine the relationship between two variables, namely work duration with job fatigue, and physical workload with job fatigue in workers at the Car Repair Shop in Kisaran. To determine the relationship between the two variables, the Chi-Square test was used. The results of the Chi-Square test with data processing are presented as follows.

Table 2. Chi-Square Test Results on the Relationship between Work Duration and Work Fatigue Level.

Work Duration	Fatigue level								P Value	POR
	Low		Medium		High		Total			
	n	%	n	%	n	%	N	%		
8 hours	1	20	14	25,5	3	5,5	28	50,9	0,000	4,000
>8 hours	0	0	15	27,3	12	21,8	27	49,1		
Total	11	20	29	52,7	15	27,3	55	100		

Source: Primary data 2025

Based on Table 2, the statistical test results using Chi-Square show a p-value < 0.05 (0.000), which leads to the conclusion that H_0 is rejected and H_a is accepted. This means there is a relationship between work duration and work fatigue among the workers at the Fantasy Car Repair Shop, with a POR value of 4.000, indicating that poor work duration is 4,000 times more likely to experience fatigue.

Table 3. Results of the Chi-Square Test on the Relationship between Physical Workload and Level of Work Fatigue.

Physical Workload	Fatigue Level								P Value	POR
	Low		Medium		High		Total			
	n	%	n	%	n	%	N	%		
Light	9	16,4	5	9,1	0	0	14	25,5	0,000	5,102
Moderate	2	3,6	24	43,3	12	21,8	38	69,1		
Heavy	0	0	0	0	3	5,5	3	5,5		
Total	11	20	29	52,7	15	27,3	55	100		

Source: Primary data 2025

Based on Table 3, the results of the statistical test using Chi-Square show a p-value < 0.05 (0.000), which allows us to conclude that H_0 is rejected and H_a is accepted. This means there is a relationship between physical workload and work fatigue among the workers at the Fantasy Car Repair Shop, with a POR value of 510.200, indicating that a heavy physical workload is 510.200 times more likely to cause fatigue.

The Relationship Between Work Duration and Work Fatigue

The results of the chi-square test showed a significant relationship between work duration and fatigue in workers at the Fantasy Car Repair Shop, with a p-value = 0.000 (<0.05). This finding indicates that the longer the duration of work, the higher the level of fatigue experienced by workers. The main cause of poor work duration in this workshop is the high volume of work due to the continuous queue of vehicle repairs, so workers are often required to complete all work on the same day without delay. This condition causes working hours to exceed the time limit

stipulated in the Labor Law No. 13 Year 2003, which is 8 hours per day or 40 hours per week. In addition, rest periods that should be used for physical recovery are often used to continue work, so workers' bodies do not get adequate recovery time.

This accumulation of excessive workload contributes to the increased risk of physical and mental fatigue in workshop workers. This study aligns with the findings of Darmayanti et al., 2021 which indicate a significant correlation between working hours and the level of work fatigue. In their research, it is mentioned that someone who works more than 8 hours a day will incur risks, experiencing undesirable outcomes such as work-related diseases. In line with the research (Wahyuni et al., 2021), it was found that there is a relationship between length of work and job fatigue in Furniture Industry workers in Tempe District, Wajo Regency.

The duration of working hours is related to the physical condition of the workers' bodies. It is advisable to work with proper break arrangements. In the study (Angelita et al., 2023) it is stated that the longer someone works without taking preventive measures to avoid fatigue, the greater the likelihood of experiencing fatigue. Long working hours can increase the risk of injuries and accidents and can lead to poor health and worker fatigue. Studies show that long working hours can lead to increased stress, poor eating habits, and can cause work-related illnesses (Alfikri et al., 2021).

The Relationship Between Physical Workload and Work Fatigue

The results of the chi-square test indicate a relationship between physical workload and work fatigue with a $p\text{-value} = 0.000 < 0.05$, thus it can be concluded that there is a significant relationship between work duration and work fatigue among the workers at the Fantasy Car Repair Shop. This is because the activities performed involve lifting and moving heavy components such as tires, engines, transmissions, or other components that require extra effort without using any tools. However, this is not the case for female workers who only work as workshop administrators and do not perform heavy physical labor. The higher the physical workload, the higher the occurrence of work fatigue, and vice versa.

Long working hours combined with heavy workloads will increase the risk of work fatigue. The increase in physical workload on workers causes an increase in work fatigue. This occurs because the increase in physical workload causes an increase in oxygen consumption among workers (Muzikha Yamaula et al., 2021). If a person's workload does not match their work capacity, it can lead to fatigue because the higher the energy required during work, the longer the muscles will work to cope with the workload they receive. If during relaxation the recovery energy is not adequate, it will cause fatigue. (Rusila & Edward, 2022)

This research is consistent with the study by Rusila & Edward, 2022 which found a significant relationship between physical workload and work fatigue among employees at the Subur and Sahara cracker factories in Yogyakarta. This finding is also supported by the study of Muzikha Yamaula et al., 2021, which revealed a connection between physical workload and work fatigue, as most physical tasks were carried out without the aid of assistive equipment. In line with the research by Adisty (Amardibta & Darnoto, 2023). which states that there is a significant relationship between physical workload and work fatigue among cap batik workers in Kenep Village, Sukoharjo.

The increase in physical workload on workers causes an increase in work fatigue. This occurs due to the increase in physical workload, which causes the oxygen consumption of workers to rise. The physical workload that exceeds the maximum oxygen intake causes a decrease in the oxygen supplied to the muscles, leading to an anaerobic metabolism process to break down muscle glycogen into energy and lactic acid. Lactic acid then accumulates in the muscles, causing the muscles to swell and become difficult to contract, which subsequently leads to a feeling of

fatigue (Rusila & Edward, 2022).

CONCLUSION

Based on the research results from the analyzed variables, it was concluded that there is a significant relationship between work duration and physical workload on work fatigue among workers at the Fantasy Car Repair Shop. The researcher suggests that the workshop should improve occupational health and safety by implementing preventive measures and ensuring a safer and more comfortable work environment for workers. In addition, it must also provide policies related to more optimal workload management.

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