



(RESEARCH ARTICLE)



Relationship between age and length of working with work fatigue among workers in the motorcycle spare part industry

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Abstract

Fatigue is the inability to function optimally because of the use of physical and mental energy beyond existing capacity. Internal factors have a very important role because they are one of the things that cannot be separated from employees. Some things that are included in the internal factors of workers include age and length of work. The purpose of this study is to analyze the relationship between age and length of work with work fatigue among workers in the motorcycle spare parts industry. The type of study used was an observational analysis with a cross-sectional research design. The population in this study were spare part industry workers, with a total of 27 workers who were also in the research sample. The results of this study indicate that the majority of workers are over 40 years old, have a working duration of eight hours, and experience moderate levels of fatigue. There was a weak relationship between age and work fatigue, with a p-value of 0.041 and a correlation coefficient of 0.396. In addition, there was no relationship between the length of work and work fatigue, with a p-value of 0.174 and a correlation coefficient of 0.386. Companies are expected to provide a limit on overtime work, which is three hours in one day, and provide short breaks between jobs. Additionally, workers are expected to make the best use of their rest time and stretch their muscles between jobs.

Keywords: Age; Length of Working; Work Fatigue; Spare Part Industry

1. Introduction

A workplace that wants to achieve its goals optimally must pay attention to the most basic aspect, namely, the quality of human resources, or workforce [1]. Therefore, the workplace must pay attention to occupational safety and health and protect workers from work accidents and occupational diseases that can harm the workplace itself. Work fatigue is a problem often encountered in the workplace. This is an important problem that needs to be handled properly because it can cause various problems, such as low work productivity, decreased performance, increased human error, work stress, and increased risk of work accidents [2].

Fatigue can be defined as the inability to function optimally because the use of physical and mental energy exceeds the existing capacity [3]. Fatigue experienced by workers can result in a decrease in work performance and lack of physical endurance during work [4]. Global data from the International Commission on Occupational Health (ICOH) show that every year there are 2.9 million deaths caused by work-related accidents, including 80% deaths due to occupational illnesses and 20% due to work injuries [5]. One of the causes of a high number of work accidents is fatigue, which contributes 50% to the occurrence of work accidents [6].

According to Suma'mur [7], factors that influence fatigue include worker characteristics, work-related problems, the work environment, and the psychological conditions of workers. The concept of ergonomic balance explains that work fatigue is caused by an imbalance between work capacity and task demand factors. When doing work, several internal and external factors can affect work fatigue [8]. Some things that are included in the internal factors of workers include

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age and length of work. Older workers have the potential to decrease muscle strength owing to the accumulation of lactic acid, which can cause fatigue [9]. According to Ramdan [10], long work hours and overcapacity are often associated with decreased work quality and productivity, as well as a tendency for work fatigue, health problems, and work accidents.

Internal factors have a very important role because they are one of the things that cannot be separated from employees. Research conducted by Andriani [11] on workers in PT. X Jakarta stated that there is a relationship between age and work fatigue. In addition, the length of time workers spend can also affect the emergence of fatigue, health problems, and work accidents [7]. Research conducted by Narpati et al., [12] on laundry workers in the production section at CV. X Tembalang showed that there is a relationship between length of work and work fatigue.

The motorcycle spare part industry is a small-scale or home industry; therefore, attention to occupational health and safety is lacking or even ignored. The large number of task demands given, long working hours, and the existence of targets that must be completed within a predetermined period can be some of the factors causing workers to experience burnout. The purpose of this study was to analyze the relationship between age and length of work with work fatigue among workers in the motorcycle spare parts industry.

2. Material and methods

This research was included in an observational study using a cross-sectional approach because data collection on variables was carried out and collected at one time or a certain period. Based on the analysis, this research is descriptive, where the results describe the frequency distribution of each research variable and the cross-tabulation between the dependent and independent variables. The dependent variables in this study were age and length of work, whereas the independent variable was work fatigue. This study was conducted in the motorcycle spare parts industry from January to February 2023. The population in this study consisted of all workers in the spare parts industry, namely 27 workers. The total sampling technique was used to determine the sample size, which consisted of 27 workers. The data collection instrument used a questionnaire to obtain data related to age and length of work as well as a reaction timer tool to measure work fatigue. Data will be presented descriptively in the form of frequency distribution tables, percentages, and cross tabulations. The test used in this study is the Spearman correlation test, which is used to determine the strength of the relationship between the independent and dependent variables.

3. Results and discussion

3.1. The Relationship between Age and Work Fatigue

Table 1 Distribution of Respondents by Age in the Spare Part Industry

Age (year)	Frequency	Percentage
≤ 30	5	18.5%
31 – 40	3	11.1%
> 40	19	70.4%

Source: Primary Data, 2023

Table 2 Cross-Tabulation Between Age and Work Fatigue in the Spare Part Industry

Age (years)	Work Fatigue								Total		P-Value	Correlation Coefficient
	Normal		Mild		Moderate		Severe					
	n	%	n	%	n	%	n	%	n	%		
≤ 30	3	60	2	40	0	0	0	0	5	100	0.041	0.396
31 – 40	2	66	1	33.3	0	0	0	0	3	100		
> 40	5	26.3	8	42.1	5	26.3	1	5.3	19	100		

Source: Primary Data, 2023

Table 1 shows the age frequency distribution of the respondents. Based on Table 1, it can be seen that the age of the motorcycle spare part industry workers is mostly in the age category above 40 years, namely 19 respondents (70.4%). There were 5 respondents (18.5%) who were in the ≤ 30 year category, while 3 respondents (11.1%) were above 40 years old.

Based on the results of the study, it shows that of the 19 respondents who fall into the age category of more than 40 years, there are 5 respondents (26.3%) experiencing normal work fatigue and moderate work fatigue. Respondents who experienced mild work fatigue were 8 (42.1%), while the remaining 1 (5.3%) experienced severe work fatigue. In addition, five respondents who were in the age category ≤ 30 years, there were 3 respondents (60%) experienced normal work fatigue, and two (40%) experienced mild work fatigue.

This study shows that there is a relationship between age and work fatigue, which is indicated by the p-value of 0.041 (<0.05). The two variables have a weak relationship, as indicated by the correlation coefficient value of 0.396. It can be concluded that the older the worker, the higher the chance of the worker experiencing higher fatigue.

The results of this study are in line with research conducted on field workers in PT. Pelabuhan Indonesia IV (Persero) [13], which shows that there is a relationship between age and work fatigue. In addition, the same results were also shown in a study conducted by Kusgiyanto [14], which stated that there was a relationship between age and work fatigue. As age increases, there is a decrease in lung volume, vision, hearing, the ability to distinguish objects quickly, and the ability to make decisions [4]. Increasing age is also followed by organ degeneration, resulting in decreased organ capacity, which can easily increase work fatigue in workers [15]]. Therefore, an individual's age must be considered when giving someone a job.

Age can affect a person's physical strength. Age is an important factor because it can affect a person's physical and psychological strength [16]. Based on observations made by older workers, they generally engage in heavier work activities than younger workers. In addition, most older workers had longer worked hours than younger workers did. A person's physical abilities reach their peak at 25–35 years, whereas at the age of 50–60 years, muscle strength decreases by approximately 15–25% [16].

3.2. The Relationship between Length of Working and Work Fatigue

Table 3 Distribution of Respondents by Length of Work in the Spare Part Industry

Length of Work	Frequency	Percentage
≤ 8 jam	15	55.6%
> 8 jam	12	44.4%

Source: Primary Data, 2023

Based on Table 3, the frequency of working hours in the spare part industry is grouped into ≤ 8 hours and > 8 hours. Respondents who worked for ≤ 8 hours were 15 respondents with a percentage of 55.6%, while respondents who worked for > 8 hours were 12 respondents with a percentage of 44.4%. From these results, it can be concluded that most respondents had a working time of eight hours.

Table 4 Cross-Tabulation Between Length of Work and Work Fatigue in the Spare Part Industry

Length of Work	Work Fatigue								Total		P-Value	Correlation Coefficient
	Normal		Mild		Moderate		Severe					
	n	%	n	%	n	%	n	%	n	%		
≤ 8 jam	6	40	7	46.7	2	13.3	0	0	15	100	0.174	0.386
> 8 jam	4	33.3	4	33.3	3	25	1	8.3	12	100		

Source: Primary Data, 2023

Based on the results of the study, it can be seen that of 15 respondents who had a working duration of ≤ 8 hours, six (40%) experienced normal work fatigue, and seven (46.7%) experienced mild work fatigue. The remaining two respondents (13.3%) experienced moderate work fatigue. In addition, of the 12 respondents who had worked for > 8

hours, four (3.33%) experienced normal work fatigue and mild work fatigue. Three other respondents (25%) experienced moderate work fatigue, and one respondent (8.3%) experienced severe work fatigue.

This study shows that there is no relationship between the length of work and work fatigue, which is indicated by the p-value of 0.174 (> 0.05). The two variables have a weak relationship, as indicated by the correlation coefficient of 0.386. It can be concluded that the longer a worker's working time, the less likely it is to cause an increase in work fatigue.

The results of this study are not in line with research conducted by Narpati et al., [12] on production workers at PT. Sari Usaha Mandiri Bitung, which shows that there is a very strong relationship between length of work and work fatigue. Workers who work longer than 8 hours will experience fatigue more quickly [12]. However, this research is in line with research conducted on Toyota car repair shop workers by PT. Hadji Kalla [17] who stated that there is no relationship between length of work and work fatigue. This can be caused by the provision of time off for adequate rest and the use of good rest time by workers so that they can adjust the rest time according to their needs to reduce the level of fatigue they feel. This is in accordance with Suma'mur statement [7] that fatigue can be reduced or prevented in various ways that are general in nature and through the management of working conditions and work environment.

The normal working time in the spare part industry is 8 hours with a 1-hour break. However, some workers have working hours of more than 8 hours because there are still tasks to complete. The addition of working time is as much as 4 hours, so the total length of work per day reaches 12 hours. This is not in accordance with Manpower Law Number 13 of 2003, which states that if a company employs workers beyond normal working hours, then overtime work can only be done for a maximum of three hours in one day [18].

Jobs with long working hours can potentially lead to fatigue, health problems, and accidents. Recovery of physical and mental abilities can be achieved by taking breaks and eating after 4 hours of continuous work. This can increase blood sugar levels again as fuel or produce energy for work [7].

4. Conclusion

Based on the results of the study, it can be concluded that most of the respondents were over 40 years old and had a working duration of eight hours. In addition, most of the respondents experienced moderate work fatigue. There is a weak correlation between age and work fatigue, whereas there is no relationship between the length of work and work fatigue in workers in the motorcycle spare parts industry. Companies are expected to rearrange work between the abilities of workers and the demands of the work that will be given, provide a limit on overtime, which is three hours in one day, and provide short breaks between jobs. Additionally, workers are expected to make the best use of their rest time and stretch their muscles between jobs.

Compliance with ethical standards

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Disclosure of Conflict of interest

There is no potential conflict of interest in this study.

Statement of ethical approval

This research has passed an ethical review from the ethics commission of FKG UNAIR: no. 120/HRECC.FODM/II/2023.

Statement of informed consent

This research was approved by the respondents who signed a consent form to participate in this research.

References

- [1] Rachmawati D, Paskarini I. Correlation between Individual Characteristics and Rest Break with Work-related Fatigue on Telecommunication Network Service Workers. The Indonesian Journal of Occupational Safety and Health. 2022; 10(1):25–33. <https://doi.org/10.20473/ijosh.v10i1.2021.25-33>.

- [2] Irwanto BSP. Analysis of Mental and Physical Fatigue Risk Factors in Utility Unit of Petrochemical Company. *The Indonesian Journal of Occupational Safety and Health*. 2020; 9(1):21–29. <https://doi.org/10.20473/ijosh.v9i1.2020.21-29>.
- [3] Banks S, Landon LB, Dorrian J, Waggoner LB, Centofanti SA, Roma PG, et al. Effects of fatigue on teams and their role in 24/7 operations. *Sleep Med Rev*. 2019; 48:101216. <https://doi.org/10.1016/j.SMRV.2019.101216>.
- [4] Syahfudin AJ. The Description of Internal and External Factors of Fatigue at Sidoarjo Steel Smelting Company. *The Indonesian Journal of Occupational Safety and Health*. 2019; 8(3):36–45. <https://doi.org/10.20473/IJOSH.V8I3.2019.336-345>.
- [5] ILO. World Day for Safety and Health at Work: Social dialogue is key to mitigate work accidents and increase productivity [Internet]. Jakarta: ILO; 2022 [cited 2022 Oct 13]. Available from https://www.ilo.org/jakarta/info/public/pr/WCMS_844891/lang--en/index.htm.
- [6] Samahati G v., Pinontoan OR, Kawatu PAT. The Relationship Between Work Shifts and Workload with Work Fatigue in Limited Area Workers at PT. Pertamina Fuel Oil Terminal (BBM) Bitung City. *Scientific Article* 2017.
- [7] Suma'mur. *Company Hygiene and Occupational Health*. 2nd ed. Jakarta: Sagung Seto; 2009.
- [8] Mustofani, Dwiyanti E. Relationship between Work Climate and Physical Workload with Work-Related Fatigue. *The Indonesian Journal of Occupational Safety and Health*. 2019; 8(2):150–157. <https://doi.org/10.20473/IJOSH.V8I2.2019.150-157>.
- [9] Rambulangi CJ. Relationship Between Workload and Employee Fatigue. *Psychoborneo: Journal of Scientific Psychology*. 2016; 4(2):210–216.
- [10] Ramdan IM. *Work Fatigue in Traditional Samarinda Sarong Weavers*: Uwais; 2018.
- [11] Andriani KW. Relationship between Age, Noise and Air Temperature with Individual Subjective Fatigue at PT X Jakarta. *Indonesian Journal of Occupational Safety and Health*. 2016; 5(2):112–120.
- [12] Narpati RJ, Kkawati E, Wahyuni I. Correlation between Physical Workload, Exercise Frequency, Sleep Length, Rest Time and Work Time with Work Fatigue (Case Study on Laundry Workers in the Production Section at CV.X Tembalang, Semarang). *Journal of Public Health (Undip)*. 2019; 7(1):337–344. <https://doi.org/10.14710/JKM.V7I1.22996>.
- [13] Amin MD, Kawatu PAT, Amisi MD. Relationship between Age and Nutritional Status with Work Fatigue in PT Pelabuhan Indonesia IV (Persero) Bitung Branch Field Workers. *EBiomedik*. 2019; 7(2):113–117. <https://doi.org/10.35790/EBM.V7I2.24643>.
- [14] Kusgiyanto W, Suroto S, Ekawati E. Analysis of the Relationship between Physical Workload, Years of Service, Age, and Gender on the Level of Work Fatigue in Workers in the Lumpia Skin Manufacturing Section in Kranggan Village, Central Semarang District. *Journal of Public Health (Undip)*. 2017; 5(5):413–423. <https://doi.org/10.14710/JKM.V5I5.18963>.
- [15] Paulina, Salbiah. Factors Associated with Fatigue in Workers at PT Kalimantan Steel. *Health Vocational Journal*. 2016; 2(2):165–172.
- [16] [Prastuti TN, Martiana T. Analysis of Individual Characteristics with Complaints of Work Fatigue in Taxi Drivers in Rungkut Surabaya. *The Indonesian Journal of Public Health*. 2017; 12(1):64–74. <https://doi.org/10.20473/IJPH.V12I1.2017.64-74>.
- [17] Julianti AA, Hardi S I, Andayanie E. Factors Associated with Work Fatigue in Toyota Workshop Workers at PT. Hadji Kalla Urip Sumohardjo Branch. *Window of Public Health Journal*. 2022; 3(2):1902–1910. <https://doi.org/10.33096/WOPH.V2I6.399>.
- [18] Law No. 13 of 2003 concerning Manpower.