Periodicals of Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 18-25
e-ISSN: 2962-584X
http://journal2.uad.ac.id/index.php/posh/index

The Relationship between Age, Working Period, and Duration of Work with Work Fatigue in Online Taxi Drivers in Yogyakarta City

Roudhotan Qulubil Malikie[1], Julian Dwi Saptadi[2*]
[1,2] Faculty of Public Health, Ahmad Dahlan University, Yogyakarta, Indonesia
[1] roudhotan2100029191@webmail.uad.ac.id ; [2] julian.saptadi@ikm.uad.ac.id
* corresponding author

ARTICLE INFO

Article history
Received 18 Mar 2025
Revised 2 Apr 2025
Accepted 12 Apr 2025

Keywords
Fatigue
Age
Working period
Working duration
Online taxis

ABSTRACT (10PT)

Background: Fatigue is a physical and mental condition that can reduce the ability to work and weaken the body's resistance during activities. The job as a driver demands high concentration because it requires quick and precise coordination between the brain, hands, feet, and eyes, making it susceptible to fatigue. Continuous fatigue not only has an impact on decreased performance, but also increases the risk of work accidents and endangers the safety of passengers and drivers themselves. Based on this, this study aims to determine the relationship between age, working period, and duration of work and work fatigue in online taxi drivers in Yogyakarta City, so that the results are expected to be considered in efforts to prevent and manage the risk of work fatigue in the online transportation sector. **Methods:** This study used a quantitative approach with a cross-sectional design. The sample studied consisted of 54 online taxi drivers taken from three online taxi driver associations. The sampling technique used is stratified random sampling. A tool for collecting data is in the form of IFRC questionnaires. Data analysis was carried out using the Pearson correlation test. This requires that the data meet the normal distribution assumptions. If this assumption is not met, an alternative Spearman Rank test is used. **Results:** Age was not significantly related to the fatigue of online taxi drivers in Yogyakarta ($p=0.881>0.05$). In contrast, working time ($p=0.002<0.05$) and duration of work ($p<0.001<0.05$) showed a significant relationship with work fatigue. **Conclusion:** There is a significant association between working time and duration of work with fatigue levels, however, no significant association was found between age and work fatigue in online taxi drivers in the city of Yogyakarta.

1. Introduction

Transportation plays a very crucial role in a person's life. In general, transportation can be interpreted as an activity or effort to move goods and/or people from one location to another. The more advanced technology is, the more advanced the transportation system that develops in Indonesia [1]. One of them that we can recognize is online transportation. Online transportation is a transportation service that utilizes information and communication technology to make it easier for its users to move from one place to another. There are several types of online transportation, one of which is online taxis.

Online taxis are one of the preferred public transportation options because they provide better quality services, especially in terms of comfort and ease of travel compared to other modes of transportation [2]. Almost all major cities have online taxi services, one of which is the city of Yogyakarta. Yogyakarta is one of the cities in Indonesia that is in great demand by tourists. In addition to being famous as a tourist destination, this city is also known as a city of education and cultural center. So that the level of users of online taxi services is quite in demand by both the public, tourists, and students because online taxi services provide flexibility and convenience in daily mobility [3].

Regulations regarding online taxis have been stipulated in the Regulation of the Minister of Transportation Number 118 of 2018 concerning the Implementation of Special Rental Transportation which states that special rental transportation is a transportation service from the original location to the destination location carried out by the driver, with the rates listed in the application [4]. Based on data from the Central Statistics Agency (BPS) regarding land transportation, there was an increase in the number of traffic accident incidents in Indonesia during the 2018-2022 period with an average increase of 6.26% per year, reaching a total of 139,258 cases [5] The Yogyakarta Special Region Transportation Agency in the 2018-2021 period recorded as many as 1,956 cases of passenger car accidents in Yogyakarta City [6]. One of the causes of accidents that is quite significant is the human factor which contributes 28%, where driver fatigue is the main cause of accidents [7].

Fatigue is a condition of the body and mind that results in decreased work productivity and decreased immunity when doing work. Driving is a type of work that requires a very high concentration because it involves fast and precise cooperation between the brain, hands, feet, and eyes. Therefore, this profession has a high risk of work fatigue and various other possible health disorders.

Fatigue due to work can arise due to several things, including age factors, length of working period, and long work duration [8]. As a person ages, his or her work ability tends to decrease due to changes in physical condition, organ function, cardiovascular system, and hormonal system [9]. On the other hand, the length of work can also contribute to the appearance of work fatigue due to boredom in carrying out work activities [10]. In general, a person's ideal working duration in a day is in the range of 6 to 10 hours. If the working time exceeds this limit, it is generally not accompanied by an increase in efficiency, effectiveness, or productivity, and can actually increase the risk of fatigue due to a lack of sufficient rest time [11].

Based on the results of a preliminary study obtained through interviews with the chairman of the online taxi association and 2 members of the online taxi association in the city of Yogyakarta, information was obtained that the majority of the age of online taxi drivers in the city of Yogyakarta is relative and varied, from the results of interviews with online taxi workers it is stated that the older the age, the more the ability to work decreases and quickly experiences fatigue.

The length of service that has been taken is 7 years. With a working period of 7 years, online taxi drivers have experienced boredom, they stated that the perceived boredom arises due to the length of time online taxi drivers wait for passengers from the mobile application used. The average working time in 1 day for online taxi drivers is 12 to 15 hours, this is because there are demands that have not been met, they feel that the meters provided by the company are very low so that their needs are not easily met. In addition, they also expressed the same symptoms of fatigue after doing work, including heavy eyes, yawning, headache, drowsiness, difficulty thinking, weakness, and not being able to concentrate. Thus, this study aims to identify the relationship between age, length of work, and length of work with work fatigue in online taxi drivers in Yogyakarta City.

2. Methods

This study uses a quantitative approach with a cross sectional design. This research was conducted in three taxi drivers' associations *Online* in the western region of Yogyakarta City, namely Asphalt Fighters and City 1000. Data collection was carried out by stratified random sampling method. This method is used because the population consists of heterogeneous subgroups, then divided into strata proportionally [12] . The total number of participants in this study was 116 people. The sample size was determined by the Slovin formula with an error tolerance of 10%, so that a sample of 54 participants was obtained. The tool used in this study was a questionnaire from the IFRC. Data analysis was carried out using the Pearson Correlation test which requires normally distributed data. If these assumptions are not met, then the alternative used is Spearman Rank correlation.

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e-ISSN: 2962-584X

3. Results and Discussion

3.1. Results

The following is presented the results of a study on the relationship between age, working period, and length of work with work fatigue in online taxi drivers in Yogyakarta City. The data presentation was carried out systematically based on the results of data collection in the field through questionnaires, as well as the results of observation of respondent characteristics. The data obtained were analyzed to describe the relationship between the variables studied. The purpose of this analysis is to present an overview of the relationship between age, length of work, and length of work and the level of fatigue experienced by *online taxi drivers* in Yogyakarta. The following is presented in table 1 frequency distribution, statistical test results, and data interpretation.

3.1.1. Analysis Univariate

Table 1. Respondent Characteristics

Characteristic	Frequency	Percentage (%)
Gender		
Man	54	100
Name of Online Taxi Association		
West Sector of Yogyakarta City	21	38.9
Asphalt Fighters	20	37.0
City 1000	13	24.1
Final education		
High School	42	77.8
D3	3	5.6
S1	8	14.8
S2	1	1.9
Total	54	100

From table 1, it can be seen that all participants were male, which amounted to 54 people or reached 100%. The majority of respondents came from the West Sector of Yogyakarta City as many as 21 people or 38.9% and the last education of the majority respondents was high school/equivalent, which was 42 people or 77.8%.

3.1.2. Bivariate Analysis

Table 2. Values of Variables of Age, Working Period, Duration of Work and Work Fatigue

Variable	Mean	Median	Std. Deviation	Minimum	Maximum
Age	49.11	49.50	7.335	25	62
Tenure	5.70	6.00	2.160	1	9
Duration of Work	9.54	10.00	1.041	7	12
Work Fatigue	101.69	100.00	9.939	79	120

Based on table 2, it can be seen that the age variable has a mean value of 49.11 which means the average age of the respondent is 49 years, the median value is 49.50 which means the median age value is 49 years, the standard deviation value is 7.335 which means the standard deviation value is 7.335, the minimum value is 25 which means the lowest respondent age is 25 years, and the maximum value is 62, which means that the age of the highest respondent is 62 years old. The service period variable has a mean value of 5.70 which indicates that the average working period of the respondent is 5 years, the median score value is 6.00 which means the average score value of the service period is 6 years, the standard deviation score value is 2.160 which means the standard deviation score value is 2.160, the minimum score value is 1 which means the lowest respondent's working period is 1 year, and the maximum score value is 9 which means that the highest respondent's tenure is 9 years. The work duration variable has a mean score of 9.54 which means the average working duration of the respondent is 9 hours, the median score value is 10.00 which means the middle value of the work duration is 10 hours, the standard deviation score value is 1.041 which means the standard deviation value is 1.041, the minimum score value is 7 which means the lowest respondent's working duration is

7 hours, and the maximum score value is 12 which means the highest respondent's work duration is 12 hours. Then the work fatigue variable has an average score (mean) of 101.69 which means that the average respondent experiences fatigue in the very high category, a median score of 100.00 which means that the middle value of work fatigue is in the very high category, a standard deviation score of 9.939 which means a standard deviation value of 9.939, a minimum score of 79 which means the lowest respondent's work fatigue category is 79 (high), and a maximum score of 120 which means the highest respondent's work fatigue category is 120 (very high).

Table 3. Relationship between Age, Length of Work, Duration of Work and Work Fatigue

Variable	Work Fatigue	
	R	*P value*
Age	0,167	0.227
Working period	0,410	0,002
Working duration	0,912	< 0.001

Based on table 3, the analysis uses Pearson and Rank correlation. Spearman showed that the data is considered to have a relationship if the p-value is less than 0.05. From the table, the normality test for the age variable yielded a p-value greater than 0.05, so it can be concluded that the data is normally distributed. Therefore, the method used is Pearson correlation. Age had a correlation coefficient (r) of 0.167 and a p-value of 0.227, indicating that there was no statistically significant positive association and that the pattern of association between age and work fatigue was very weak. In addition, the results of the normality test for the variables of working period and duration of work showed a p-value of 0.000 (<0.05) for both, indicating that the data was not normally distributed. Therefore, the test used is Rank Spearman. The test results showed that the working period had a correlation coefficient (r) of 0.410 with a p value of 0.002 (<0.05) which showed a statistically significant positive relationship with the strength of moderate correlation between the working period and work fatigue. The duration of work had a correlation coefficient (r) of 0.912 with a p value of <0.001 (<0.05) which showed a very strong and statistically significant positive relationship between work duration and work fatigue.

3.2. Discussion

3.2.1 The Relationship between Age and Work Fatigue in Online Taxi Drivers in Yogyakarta City

Based on Table 3, the results of bivariate analysis with the Pearson correlation test show that there is no relationship between age and work fatigue. This can be seen from the p value of 0.881 which is greater than 0.05. In addition, the correlation coefficient value (r) of 0.021 indicates that the relationship between age and work fatigue is very weak and not statistically significant.

Age is included in the individual factors in influencing work fatigue. Age can affect a person's physical and psychological capacity to carry out daily workloads [13]. An individual's age is closely related to physical ability to some extent, with the peak of that capacity occurring at the age of 25. By the age of 50 to 60, muscle capacity can decrease by up to 25%, and sensory-motor ability can decrease by up to 60%. In addition, the physical abilities of individuals over the age of 60 are only about 50% when compared to those over the age of 25. As we age, there is a decrease in VO2 max, sharpness of vision and hearing, speed in recognizing things, decision-making, and the ability to remember in the short term. Therefore, in giving a job to someone, the age factor needs to be carefully considered [14].

This study shows that age does not have a significant relationship with work fatigue, based on facts in the field it can happen because online taxi drivers are able to adapt to the demands of the job where the driver has an unstable income and high operational costs. The income of online taxi drivers fluctuates greatly depending on the number of orders, and incentives from the platform, while the costs for gasoline, vehicle maintenance, installments, internet quotas, and food needs during work and daily needs are large enough to reduce net income. This makes economic motivation the main driver for drivers to always work hard every day. In addition, online taxi drivers have set work schedules/times, exercise diligently, and maintain sleep quality every day, so that body stamina is maintained. This can help reduce work fatigue, because when online taxi drivers can implement a healthy lifestyle, age is no longer an obstacle to doing various jobs.

Individuals who are in the stage of adulthood (especially 30-60 years old) tend to have a stronger sense of social and personal responsibility, this makes individuals able to manage work stress more effectively, adapt to work pressure and maintain stable emotional control and mental resilience so that

Periodical of Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 18-25
e-ISSN: 2962-584X

they do not easily experience fatigue [15]. This psychological maturity allows online taxi drivers to focus more on work, maintaining emotional stability when dealing with customers and traffic jams. Thus, in this study there was no significant relationship between age and work fatigue.

This study is in line with the study [16] results show that there is no relationship between age and work fatigue, based on the Chi-Square statistical test which produces a significance value of 0.827 which means a p-value > 0.05. Thus, no relationship was found between age and work fatigue. This result is in accordance with research [17] which also confirms that the age variable is not correlated with work fatigue, with a p-value of 0.237 (> 0.05). This may be due to the driver's work experience which can help lower fatigue levels, so no significant association between age and fatigue has been found.

On the other hand, the results of this study are not in line with the study [18] which revealed

There was a significant relationship between age and work fatigue, with a p value of 0.001 and a correlation coefficient (R) of 0.583. This shows that age has a great influence on the likelihood of work fatigue in public transportation drivers.

3.2.2 The Relationship between Working Time and Work Fatigue in Online Taxi Drivers in Yogyakarta City

Based on Table 3, bivariate analysis using the Spearman Rank test showed a relationship between working time and work fatigue, which was shown by a p value of 0.002 < 0.05. The value of the correlation coefficient (r) of 0.431 indicates a positive relationship with the strength of moderate correlation between the working period and work fatigue, and is statistically significant.

The results of the study showed that there was a relationship between the working period and work fatigue. Online taxi drivers with a working period of ≥ 5 years tend to experience work fatigue faster than drivers with less than 5 years of work. This is due to the feeling of boredom that arises from monotonous routines as the working period increases, thus increasing the level of fatigue in online taxi drivers. The sense of boredom experienced by online taxi drivers arises due to repetitive driving routines with the same and long routes so that drivers have to fully concentrate on controlling the vehicle for hours without significant variations in activities, thus causing mental and physical fatigue that contributes to work fatigue. Long working hours accompanied by high work intensity can also increase the risk of work fatigue in online taxi drivers.

Monotony is a characteristic of the human environment that is fixed, unchanged, or occurs repeatedly under the same conditions. Monotony at work can affect work fatigue through neurophysiological mechanisms involving two antagonistic systems in the brain, namely the activation system (driver) and the inhibition system (inhibitor). In monotonous working conditions characterized by routine tasks, lack of variety, and a boring work environment, the inhibition system tends to be more dominant. The dominance of this inhibition system decreases a person's ability to react and be alert, thereby increasing the tendency to feel tired [19].

A long working period can be beneficial, because the longer a person does his work, the more experience and skills he gains in completing the work. However, on the other hand, a long working period can have negative impacts, such as fatigue arising from boredom due to the same work routine [20].

Thus, a correlation coefficient of 0.431 indicates a positive relationship with a moderate correlation strength between working time and work fatigue. This means that the longer the working period as an online taxi driver, the higher the level of work fatigue he experiences tends to increase. This relationship is unidirectional, the longer the working period, the more work fatigue increases. However, the strength of the moderate correlation suggests that although there is a relationship, there are other factors that play a role in influencing work fatigue.

This study is in line with research [21] which showed that in the group of respondents with a working period of ≤ 5 years, 16 people (48.5%) experienced mild fatigue and 17 people (51.5%) experienced severe fatigue. Meanwhile, in the group with a working period of > 5 years, 5 people (6.5%) experienced mild fatigue and 72 people (93.5%) experienced severe fatigue. The p-value obtained is 0.000, then p < 0.05. From the results of statistical analysis, it can be concluded that there is a significant relationship between working time and work fatigue in online motorcycle taxi drivers in South Tangerang City. This study also supports the results of the study [22] which revealed that in the variable working period, as many as 21 respondents were included in the category at risk of experiencing high levels of fatigue, while 12 respondents were included in the category of not at risk of experiencing low levels of fatigue. Using the Chi-square statistical test, a p value of 0.027 < 0.05 was obtained, which indicates a relationship between working time and work fatigue in public transportation drivers. High work fatigue is most commonly found in drivers with a working ≥ of 5 years. Workers with a working period of ≥ 5

years tend to experience work fatigue faster than workers with a working period of less than 5 years, because the length of work can cause boredom due to monotonous work which then increases the level of fatigue experienced.

However, this study is different from the study [23] which shows that based on the results of statistical tests, there is no relationship between working time and work fatigue in drivers. This is evidenced by a p value of 0.178 which is greater than the significance level of 0.05 so that the null (Ho) hypothesis fails to be rejected. Thus, it can be concluded that there is no relationship between working time and work fatigue among intercity and interprovincial bus drivers at PT Eka Sari Lorena Transport Tbk Bogor in 2020.

3.2.3 The Relationship between Work Duration and Work Fatigue in Online Taxi Drivers in Yogyakarta City

Based on Table 3, the results of the bivariate test using the Spearman Rank test show that there is a relationship between the length of work and work fatigue which is shown by a p-value of < 0.001 (< 0.05). The value of the correlation coefficient (r) is 0.907 which means that there is a very strong positive correlation between working time and work fatigue, and the relationship is partial. statistically significant.

This study revealed that work duration is related to work fatigue. Online taxi drivers in Yogyakarta City generally have a fairly high working duration. Based on the data collected, the average respondent works for 7 to 10 hours per day. In fact, there are some drivers who claim to work up to 12 hours, especially on days with high incentives or when economic needs are urgent. The fact found in the field is that most drivers do not have a fixed work schedule, and some workers often do not take advantage of their break time and choose to do other activities such as playing games, playing social media, and chatting, so many drivers experience burnout. This condition shows that long work durations without good rest time management greatly contribute to the appearance of work fatigue.

Work duration is one of the work factors that affect work fatigue. The ideal working duration for a person generally ranges from 6 to 10 hours per day. If the working time is extended beyond this limit, it is usually not followed by an increase in efficiency, effectiveness, or optimal work productivity. On the contrary, the quality and results of work tend to decline. In addition, working too long can pose a risk of fatigue, health problems, illnesses, accidents, and job dissatisfaction. Productivity begins to decline after 4 hours of work. To overcome this, it is important to provide rest time and eating opportunities so that blood sugar levels can rise again which serves as a source of energy for the body to perform its work properly [19].

This research is in accordance with the research [24]. The study revealed that drivers who had a driving duration of ≥ 8 hours felt moderate fatigue as many as 17 out of 19 drivers (51.4%). Meanwhile, drivers with a driving duration of ≤ 8 hours felt moderate fatigue as many as 16 out of 18 drivers (48.6%). Based on statistical tests, a p value of 0.000 (p < 0.05) was obtained, so it was concluded that there was a relationship between work duration and work fatigue in public transportation drivers in Suoh in 2023.

This study also supports the results of the study [17] which shows that respondents with a working duration of more than 8 hours mostly experience a high level of fatigue, namely as many as 29 respondents (59.2%) compared to respondents who work less than 8 hours. In addition, respondents with a working duration of more than 8 hours also mostly experienced a very high level of work fatigue, namely as many as 13 respondents (68.4%) compared to those who worked less than 8 hours. This study obtained a p value of 0.024 which shows a significant relationship between work duration and work fatigue in online motorcycle taxi drivers in East Jakarta in 2020. Working hours that exceed normal limits such as overtime usually cause a decrease in work ability and trigger fatigue.

However, the results of this study are different from the study [25] which reported that of the 27 respondents with qualified work duration, as many as 4 people (26.7%) experienced work fatigue, while of the respondents with unqualified work duration, as many as 23 people (35.4%) experienced work fatigue. The results of the statistical test using Chi-Square showed a p value of 0.733 which means p > 0.05, then the Null Hypothesis (H0) was accepted and the Alternative Hypothesis (Ha) was rejected. Thus, it can be concluded that there is no significant relationship between work duration and work fatigue in public passenger transportation drivers in Bone-Makassar.

4. Conclusion

Based on a study entitled "The Relationship between Age, Length of Work, and Length of Work with Work Fatigue in Online Taxi Drivers in Yogyakarta City" it can be concluded that there is no relationship between age and work fatigue in online taxi drivers in Yogyakarta City. This can be seen from the results of the Pearson Correlations test which shows a p value of 0.881 (>0.05). On the other

Periodical of Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 18-25
e-ISSN: 2962-584X

hand, there was a significant relationship between length of work and work fatigue in online taxi drivers in Yogyakarta City, as evidenced by a p value of 0.002 (<0.05) from the Spearman Correlations test. In addition, a significant relationship was also found between working time and work fatigue, with a p value of < 0.001 (<0.05) based on the Spearman Correlations test.

Statement

Conflicts of Interest: "The authors declare no conflict of interest."

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