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Analysis Of Factors Influencing Fatigue In Minibus Drivers At PT Executive Tiomaz Trans Kota Medan

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ABSTRACT

Fatigue among drivers remains a significant cause of accidents in the transportation sector, often resulting in fatalities. This study aims to analyze the risk factors associated with driver fatigue among mini-bus drivers at PT Executive Tsiomaz Trans in Medan City. Employing a cross-sectional design, the research encompasses the entire population of bus drivers working at PT Executive Tiomaz Trans Kota Medan, with a sample size of 54 mini-bus drivers selected using total sampling techniques. Data analysis involved univariate and bivariate analyses utilizing chi-square and Fisher exact tests. Based on the bivariate analysis, variables found to be correlated include age (p value: 0.016), nutritional status (p value: 0.034), driving duration (p value: 0.01), and sleep quantity (p value: 0.01). Conversely, variables such as physical health condition, tenure, workload, and rest time showed no significant correlation with driver fatigue.

Introduction

The Buses are a type of long-distance transportation that has an important role in providing transportation services, which also contributes to improving the quality of human social life by fulfilling their needs and tasks. Bus drivers are required to always provide comfort to users of transportation services and take full responsibility for maintaining the security and safety of passengers during the journey. As bus drivers, they have a big responsibility in taking passengers to their destination. Fatigue experienced by drivers is one of the factors that influences their performance when driving a bus. There are many factors of fatigue and various forms of fatigue experienced by drivers. Fatigue is a distinct physical and mental condition, but they all lead to decreased productivity and reduced

endurance for work. Fatigue is generally characterized by a loss of motivation to work, which can be caused by physiological factors or psychological factors.(Hardi, 2020)

Accidents are becoming more frequent due to the continuous and rapid development of traffic and roads, causing an increase in the number of injuries and deaths every year. According to the "Global Plan for the Decade of Action for Road Safety 2011-2020" released by the World Health Organization (WHO) the annual global death toll caused by road traffic-related accidents is almost 1.25 million. Traffic accidents have become the third cause of death worldwide.(J.J et al., 2022)

Public transportation and other means of transportation must be driven by drivers correctly and carefully. This gives the driver full responsibility for the safety of himself, passengers and goods. Driving is a part of work that is quite tiring, driving is a monotonous job, the activities carried out are repetitive activities and require good conditions and special attention. The need for a fit and healthy body condition when driving, especially good eye condition because driving requires focus and sharp eyes when driving. (Maulina & Syafitri, 2019)

PT Executive Tiomaz Trans is a company that operates in the field of passenger and goods transportation services using minibuses. To date, PT Executive Tiomaz has service destinations spread across several areas in North Sumatra, namely in the cities of Medan, Pematang Siantar, Tarutung, Sibolga, Padangsidimpuan. Each route has a different distance, this can affect the driving duration for each driver.

Based on PT Executive Tiomaz Trans's annual accident data, the implementation of PT Executive Tiomaz Trans's minibus operations is not free from traffic accidents. From 2019 to 2022, there were approximately 12 cases of accidents with various types of accidents. It is known that 20% of accidents are caused by human factors. Mini bus drivers are often given a target time for passengers to complete their journey. The drive to achieve these targets can cause drivers to feel forced to drive at higher speeds and take unnecessary risks.(Hikmah, 2020)

Drivers on all routes work alone without a substitute when making a trip. So minibus drivers have a greater risk compared to bus drivers who have substitutes in taking a change of driving when making a trip. PT Executive Tiomaz Trans minibus drivers also carry out work such as loading passengers' belongings apart from driving, which can increase the incidence of work fatigue due to the additional workload. Work fatigue while driving is one of the causes of the risk of accidents and impacts the health and safety of minibus drivers. As usually happens in cases of traffic accidents on buses caused by drivers who are sleepy and not focused while traveling.(A, n.d.) Seeing that human factors which are influenced by fatigue are the factors that most dominate the occurrence of traffic accidents, researchers are interested in conducting research on "Analysis of factors that influence work fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.

Method

This The research used in this research is a type of quantitative research with the research design used is a cross sectional approach. Research with a cross sectional approach is an observational research design that is used to collect data on dependent and independent variables in the same period. The aim is to analyze the factors that influence minibus driver fatigue at PT Executive Tiomaz Trans Medan, and a sample of 54 minibus drivers using a total sampling technique. The data analysis used was univariate and bivariate using chi square and Fisher exact.

Results and Discussion

Table 4.1 Age Distribution of Respondents

Respondent Age	Frequency	Persentage
> 40 year	18	33.3%
≤ 40 year	36	66.7%
Total	54	100.0%

Based on table 4.1, it is known that the age of drivers in the > 40 years category is 18 (33.3%), while in the ≤ 40 category there are 36 (66.7%).

Table 4.2 Distribution of Respondents' Nutrial Status

Respondents' Nutritional Status	Frequency	Persentage
Abnormal	21	38.9%
Normal	33	61.1%
Total	54	100.0%

Based on table 4.2 above, it is known that the nutritional status of 21 drivers (38.9%) was abnormal, while the nutritional status was normal for 33 people (61.1%).

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Tabel 4.3 Distribution of Respondents' Physical/Health Conditions

Physical Condition/Health of Respondents	Frekuency	Persentage
Unfit	45	83.3%
Fit	9	16.7%
Total	54	100.0%

Based on table 4.3 above, it is known that 45 people in the driver's physical/health condition category are not fit (83.3%), while 9 people in the physical health condition category are fit (16.7%).(Nurbaity et al., 2019)

Table 4.4 Distribution of Respondents' Workload Load

Respondents' Workload	Frekuency	Persentage
Light	54	100.0%
Weigh	0	0
Total	54	100.0%

Based on table 4.4 above, it is known that the workload distribution of respondents in the light category is 54 people (100.0%), while the workload of respondents in the heavy category is 0 people (0%).(P & Hotmaria, 2021)

Table 4.5 Distribution of Respondents' Years of Work

Respondent's Work Period	Frekuency	Persentage
≥5 years	2	3.7%
<5 years	52	96.3%
Total	54	100.0%

Based on table 4.5 above, it is known that the distribution of respondents' working period in the category ≥5 years was 2 people (3.7%), the distribution of respondents' working period in the <5 years category was 52 people (96.3%).

Tabel 4.6 Distribution of Respondents' Rest Time

Respondents' Rest Time	Frekuency	Persentage
1 hour	54	100.0
<1 hour	0	0
Total	54	100.0%

Based on table 4.6 above, it is known that the distribution of rest time for respondents in the 1 hour category is 54 people (100.0%), while the distribution of rest time for respondents in the <1 hour category is 0 people (0%).

Table 4.7 Distribution of Respondents' Driving Duration

Respondents' Driving Duration	Frekuency	Persentage
Weigh	33	61.1%
Normal	21	38.9%
Total	54	100.0%

Based on table 4.7 above, it is known that the distribution of driving duration for respondents in the heavy category was 33 (61.1%), while the distribution of driving duration for respondents in the normal category was 21 people (38.9%).

Table 4.8 Distribution of Respondents' Sleep Quantity

Respondents' Sleep Quantity	Frekuency	Persentage
Less	24	44.4%
Enough	30	55.6%
Total	54	100.0%

Based on table 4.8 above, it is known that the distribution of sleep quantity of respondents in the insufficient category is 24 people (44.4%), while the distribution of sleep quantity of respondents in the sufficient category is 30 people (55.6%).

Table 4.9 Distribution of Work Fatigue Levels

Quantity of Respondents' Work Fatigue	Frequency	Persentage
High	25	46.3%
Low	29	53.7%
Total	54	100.0%

Based on table 4.9 above, it is known that the distribution of work fatigue of respondents in the high category is 25 people (46.3%), while the distribution of work fatigue of respondents in the low category is 29 people (53.7%).

Table 4.10 Distribution of the Relationship between Age and Work Fatigue among Minibus Drivers at PT Executive Tiomaz Trans

Age	Work Fatigue					p-value	PR (95% CI)
	High	%	Low	%	N		
>40 year	13	72.2%	5	27.8%	18	0.016	2.167 (1.258 - 3.731%)
≤40 Year	12	33.3%	24	66.7%	36		

Based on Table 4.10, it can be seen that the work fatigue of drivers aged >40 years in the high fatigue category is 13 people (72.2%), and the work fatigue in the low category is 5 people (27.8%). while the work fatigue of drivers aged ≤40 years in the high fatigue category was 12 people (33.3%), in the low fatigue category there were 24 people (66.7%).

The results of statistical tests using chi square show a p-value of 0.016 (p-value < 0.05), which means that there is a relationship between age and work fatigue in minibus drivers at PT Executive Tiomaz Trans.

Table 4.11 Distribution of the Relationship between Nutritional Status and Work Fatigue in Minibus Driver at PT Executive Tiomaz Trans

Nutritional Status	Work Fatigue					p-value	PR (95% CI)
	High	%	Low	%	N		
Abnormal	14	66.7%	7	33.3%	21	0.034	2.000 (1.132 - 3.535)
Normal	11	33.3%	22	66.7%)	33		

Based on Table 4.11, it can be seen that the incidence of work fatigue in abnormal nutritional status in the high fatigue category was 14 people (66.7%), in the low fatigue category it was 7 people (33.3%).(Vanchapao, 2020) Meanwhile, the incidence of work fatigue in normal nutritional status in the high fatigue category was 11 people (33.3%), in the low fatigue category it was 22 people (66.7%).(Sabaruddin & Abdillah, 2019)

The results of statistical tests using chi square showed a p-value of 0.034 (p-value < 0.05), which means that there is a relationship between nutritional status and work fatigue in minibus drivers at PT Executive Tiomaz Trans.

c. Relationship between physical/health conditions and fatigue

Table 4.12 Distribution of the Relationship between Physical Condition and Work Fatigue among Minibus Drivers at PT Executive Tiomaz Trans

Physical Condition	Work Fatigue					p-value	PR (95% CI)
	High	%	Low	%	N		
UnFit	21	46.7%	24	53.3%	45	1.000	1.050 (0.474 - 2.324)
Fit	4	44.4%	5	55.6%	9		

Based on Table 4.12, it can be seen that the incidence of work fatigue in unfit physical/health conditions in the high fatigue category was 21 people (46.7%), for conditions in the low fatigue category it was 24 people (53.3%). Meanwhile, the incidence of work fatigue in fit physical/health conditions in the high fatigue category was 4 people (44.4%), in the low fatigue category it was 5 people (55.6%).(Juliawati, 2020)

The results of statistical tests using chi square show a p-value of 1,000 (p-value > 0.05), which means that there is no relationship between physical/health condition and work fatigue in minibus drivers at PT Executive Tiomaz Trans.

d. The Relationship between Working Period and Job Fatigue

Table 4.13 Distribution of the Relationship between Work Period and Job Fatigue among Minibus Drivers at PT Executive Tiomaz Trans

Work Period	Work fatigue					p-value	PR (95% CI)
	High	%	Low	%	N		
≥5 years	2	100.0%	0	0%	2	0.407	2.261 (1.666 - 3.068)
<5 years	23	44.2%	29	53.7%	42		

Based on Table 4.13, it can be seen that the incidence of work fatigue in those working for ≥5 years in the high fatigue category is 2 people (100.0%), for the low fatigue category it is 0 people (0%). Meanwhile, the incidence of work fatigue in the working period <5 years in the high fatigue category was 23 people (44.2%), in the low fatigue category it was 29 people (53.7%).(Amalia & Widajat, 2019)

The results of statistical tests using chi square show a p-value of 0.407 (p-value > 0.05), which means that there is no relationship between length of service and work fatigue in minibus drivers at PT Executive Tiomaz Trans. (Setiaji, 2019)

Table 4.14 Distribution of the Relationship between Driving Duration and Work Fatigue among Minibus Drivers at PT Executive Tiomaz Trans

Drive Duration	Work fatigue					p-value	PR (95% CI)
	High	%	Low	%	N		
Weigh	20	60.6%	13	39.4%	33	0.018	2.545 (1.129 - 5.739)
Normal	5	23.8%	16	76.2%	21		

Based on Table 4.14, it can be seen that the incidence of work fatigue during heavy driving duration in the high fatigue category was 20 people (60.6%), in the low fatigue category it was 13 people (39.4%). Meanwhile, in the normal driving duration category, there were 5 people (23.8%) in the high fatigue category, 16 people (76.2%) in the low fatigue category.(Agustian et al., 2019)

The results of statistical tests using chi square show a p-value of 0.018 (p-value < 0.05), which means that there is a relationship between driving duration and work fatigue in minibus drivers at PT Executive Tiomaz Trans.

h. Relationship between Sleep Quantity and Work Fatigue

Table 4.15 Distribution of the Relationship between Sleep Quantity and Work Fatigue among Minibus Drivers at PT Executive Tiomaz Trans

Sleep Quantitiy	Work Fatigue					p-value	PR (95% CI)
	High	%	Low	%	N		
Less	16	66.7%	8	33.3%	24	0.016	2.222 (1.201 - 4.112)
fair	9	30.0%	21	70.0%	30		

Based on Table 4.15, it can be seen that the incidence of work fatigue with insufficient sleep quantity in the high fatigue category was 16 people (66.7%), in the low fatigue category it was 8 people (33.3%).(Vania & Barus, 2020) Meanwhile, the incidence of work fatigue, sufficient sleep quantity, in the high fatigue category was 9 people (30.0%), in the low fatigue category it was 21 people (70.0%).(Ardian, 2019)

The results of statistical tests using chi square show a p-value of 0.016 (p-value < 0.05), which means that there is a relationship between sleep quantity and work fatigue in minibus drivers at PT Executive Tiomaz Trans.

Discussion

Based on a literature, it appears that there is an relationship between job fatigue and age characteristics where in the journals there is a relationship between age and work fatigue where one of them is in the journal which says one of the factors that affect fatigue is age. The lowest age of respondents was 18 years while the highest age is 36 years.

work fatigue of drivers aged >40 years in the high fatigue category is 13 people (72.2%), and

the work fatigue in the low category is 5 people (27.8%). while the work fatigue of drivers aged ≤40 years in the high fatigue category was 12 people (33.3%), in the low fatigue category there were 24 people (66.7%). The results of statistical tests using chi square show a p-value of 0.016 (p-value < 0.05), which means that there is a relationship between age and work fatigue in minibus drivers at PT Executive Tiomaz Trans.

Conclusion

Based on the results of the research and data processing and data analysis carried out, the following conclusions can be drawn:

1) Based on bivariate analysis, there is a relationship between age and fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.
2) Based on bivariate analysis, there is a relationship between nutritional status and work fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.
3) Based on bivariate analysis, there is no relationship between physical condition and work fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.
4) Based on bivariate analysis, there is no relationship between workload and work fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.
5) Based on bivariate analysis, there is no relationship between length of service and work fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.
6) Based on bivariate analysis, there is no relationship between rest time and work fatigue in minibus drivers at PT Executive Tiomaz Trans, Medan city.

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