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Hubungan Stres Akibat Kerja dengan Kelelahan Kerja pada Pengemudi Mobil Tangki Integrated Terminal Surabaya

The Correlation of Work-Related Stress with Work Fatigue on Surabaya Integrated Terminal Tank Car Driver

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ABSTRAK

Latar Belakang: Banyak lokasi industri telah diteliti memiliki prevalensi kelelahan kerja yang tinggi, yang menimbulkan masalah kesehatan dan keselamatan. Mengemudi bisa melelahkan, apalagi jika tubuh tidak diistirahatkan sehingga dapat meningkatkan risiko kecelakaan. Kecelakaan pada pengemudi mobil tangki dapat berakibat fatal karena dapat menimbulkan kerugian yang besar bagi perusahaan. Kelelahan kerja subjektif dapat disebabkan oleh berbagai faktor, seperti stres terkait pekerjaan.
Tujuan: Tujuan dari penelitian ini adalah untuk menganalisis hubungan stres kerja dengan kelelahan kerja pada kru mobil tangki PT Pertamina Patra Niaga dan manajemen kelelahan dan stres yang harus dilakukan.
Metode: Penelitian ini merupakan penelitian deskriptif observasional yang dilakukan terhadap sampel sebanyak 205 pengemudi mobil tangki. Variabel terikat dalam penelitian ini adalah kelelahan kerja subjektif. Analisis data menggunakan uji Korelasi Spearman.
Hasil: Koefisien korelasi Spearman adalah 0,071 yang berarti bahwa variabel stres kerja dan kelelahan kerja subjektif tidak memiliki hubungan yang signifikan.
Kesimpulan: Variabel stres kerja yang tidak berhubungan dengan kelelahan kerja dapat terjadi karena variabel lain tidak dianalisis sehingga tidak menunjukkan gambaran penyebab kelelahan yang dialami. Perusahaan harus melakukan program intervensi pengemudi untuk mencegah stres dan kelelahan memburuk.

Kata kunci: Pengemudi mobil tangki, Kecelakaan kerja, Kelelahan kerja, Stress akibat kerja

ABSTRACT

Background: *Many industrial locations have been observed to have a high prevalence of work fatigue, which poses health and safety issues. Driving can be tiring, especially if the body is not rested so it can increase the risk of accidents. Accidents to tank car drivers can be fatal because they can cause massive losses to the company. Subjective work fatigue can be induced by various factors, such as work-related stress.*
Objectives: *The purpose of this research was to analyze the relationship between work-related stress with work fatigue on the tank car driver of the PT Pertamina Patra Niaga and the fatigue and stress management that should be carried out.*
Methods: *This research was an observational analytic conducted on a sample of 205 tank car drivers. The dependent variable in this research was subjective work fatigue. Data analysis using Spearman Correlation test.*
Results: *The Spearman correlation coefficient was 0.071, which means that the variables of work-related stress and subjective work fatigue did not have a significant relationship.*

Conclusion: *Variable work-related stress was not related to work fatigue may occur because other variables were not analyzed so it did not show a description of the causes of fatigue experienced. Companies must perform driver intervention programs to prevent stress and fatigue from worsening.*

Keywords: *Tank car driver, Work accident, Work fatigue, Work-related stress*

INTRODUCTION

As many as two million workers die each year experiencing work accidents caused by work fatigue as much as 32.8% (ILO, 2013). Reports of fatigue are as high as 18.3 – 27% in the general population. A high prevalence of fatigue has been reported in many industrial environments causing health and safety problems. Based on the findings, fatigue is a common reason for employees to see their family doctor. The prevalence of fatigue in the industry is reported to be 7 – 45%, depending on the instrument used (Yazdi and Sadeghniiat-Haghighi, 2015).

Fatigue is the body's response that it needs rest which if not treated immediately can have an impact on the ability to work. Work fatigue is often the cause of work accidents because when a person is tired, he becomes unfocused and cannot respond to changes in his surroundings properly. Work fatigue is one of the causes of workplace accidents, which can result in permanent disability or even death (Haqi, 2018). Every day on average there are 414 work accidents of which 27.8% are caused by high fatigue (Sartono, Martaferry and Winaresmi, 2016). Based on these data, it can be concluded that fatigue is still a frequent cause of work accidents.

Work fatigue is one of the causes of workplace accidents, which can result in permanent disability or even death. Work fatigue can be induced by a variety of factors, such as stress. Work stress is one of the factors that can influence the occurrence of work fatigue, as well as psychological pressure, resulting in health problems, including physical, psychological, and mental disorders (Rudyarti, 2021). Workplace issues that arise as a result of a person refusing to complete a task or having issues with other individuals, families, and social groups.

Stress is a prevalent issue in the workplace. According to a mental health study, one in every five workers takes sick leave due to stress, but the majority of workers refuse to admit that they are sick as a result of stress (Ulum, Wahyuni and Ekawati, 2018). Stress can be caused by a sense of responsibility. This is demonstrated by the fact that the greater the individual's level of responsibility, the greater the likelihood of stress occurring (Supit, Kawatu and Kalesaran, 2021). Workplace relationships also played a significant role in the development of fatigue, as specific psychosocial experiences can intensify mental fatigue (Huang *et al.*, 2019). Other common sources of work stress are low salaries, excessive workloads, lack of social support, work that isn't challenging (American Psychological Association, 2014).

PT Pertamina Patra Niaga is the Sub-Holding Commercial and Trading of PT Pertamina (Persero) which is responsible for managing the business and operations of Pertamina Patra Niaga in the form of fuel and fleet management and depots for handling fuel and materials, as well as conducting various downstream business activities by Pertamina. Integrated Terminal Surabaya (ITS) is one of the work locations of PT Pertamina Patra Niaga which has the function to distribute fuel oil to all operational areas in East Java. The driver of the Tank Car is the driver of the tank car that distributes the fuel oil.

Driving can be tiring, especially if the body is not rested which can increase the risk for accidents. Tired drivers can experience a loss of alertness while driving, slow decision making, decreased reflex reaction time, decreased concentration, and decreased skill levels. An accident can cause massive losses to the company in terms of materials, production and distribution processes, facilities and infrastructure, and much more. Traffic accidents continue to be a major issue in both developing and developed countries. 90% of accidents are caused by the driver's misunderstanding of driving safety (Rahma, Kurniawan and Jayanti, 2017). Data obtained from ITS shows that the number of accidents that occurred until November 2021 occurred 14 times tank car accidents with 9 of them being active accidents while the number of tank car accidents for the entire Pertamina Patra Niaga Regional Java Balinus area was 27 times.

One of the subjective work fatigue can be caused by work-related stress on workers. According to (Tarwaka, 2015), stress is a psychological pressure that can lead to physical and mental health problems. As much as 83% of US workers suffer from work-related stress (The American Institute of Stress, 2020). In 2005 it was reported that around 22% of workers in Europe were affected by work-related stress and several other workers experienced work-related stress-related disorders. In addition, the CDC in (Karima, 2014) states that work stress can result in the loss of working days due to work accidents and the onset of illness.

Fatigue is something that must be considered by companies because it is often the

cause of accidents. Work fatigue can be caused by complex factors, so it is necessary to analyze what causes fatigue in the workforce beforehand. This research aims to investigate the correlation between job stress and fatigue in the driver of the PT Pertamina Patra Niaga Tank Car, as well as the fatigue management procedures that should be followed.

METHOD

This research has received ethical clearance number 64/EA/KEPK/2022 on behalf of Siti Arum Alia as the main researcher on April 19, 2022. This research is a observational analytic research that has the objective to provide an overview of the state of the object and analyze the problem being studied. This research was conducted on tanker car drivers at Integrated Terminal Surabaya from March to April 2022. Sampling was carried out on Tank Car Driver 1 who were drivers. There are 420 tank car drivers at the Surabaya Integrated Terminal, all of which are male. The determination of the sample size was carried out using the Slovin formula with a degree of error of 5%.

The independent variable is work-related stress while the dependent variable is subjective work fatigue. Primary and secondary data sources were used in this investigation. Measurement questionnaires and in-depth interviews provided primary data while secondary data was obtained from literature and company data. Measurement of all variables was obtained by using a questionnaire. The subjective work fatigue variable was measured using a job fatigue questionnaire from the Japan IFRC (Tarwaka, 2015) and the work stress variable was measured using a questionnaire from (Health and Safety Executive, 2003).

Assessment of subjective work fatigue with the scoring method of the Japanese IFRC questionnaire was carried out with four Likert scales on each question totaling 30 questions. A score of 0 means never feeling, a score of 1 means sometimes feeling, a score of 2 means often feeling, and a score of 3 means feeling very often. The next step is to add up the total score and then classify it into four, namely a score of 0-21 means low fatigue, a score of 22-44 means moderate fatigue, a score of 45-67 means high fatigue, and a score of 68-90 means very high fatigue.

The subjective assessment of work-related stress was carried out using the scoring method of the HSE (2003) questionnaire by filling out a questionnaire with five Likert scales on each question, totaling 35 questions. Likert scale scoring answers range from never to always. Furthermore, the overall scores are added up to produce individual scores which are categorized into four, namely a score of 140 – 175 means low stress, a score of 105 – 139 means moderate stress, a score of 70 – 104 means high stress, and 35 – 69 means very high stress.

The primary data that has been obtained is then analyzed using statistical techniques. The data variable analysis technique in this research used the Spearman test to test the relationship between variables on an ordinal scale.

RESULT AND DISCUSSION

Work stress can be one of the factors causing fatigue in workers because excessive pressure obtained during work can drain a person's energy during work so that the body feels tired. This is because our bodies activate a fight-or-flight response in stressful situations, whether we choose to remain active or remain silent. As a result, we expend more energy, and this can lead to fatigue. The distributions of tank car drivers based on subjective work fatigue and the work-related stress level as follows in the table 1.

Based on table number 1, it was found that 191 (93.2%) tank car drivers experienced low subjective work fatigue while 14 (6.8%) tank car drivers experienced moderate subjective work fatigue.

Table 1. Distribution of Subjective Work Fatigue on Tank Car Driver Integrated Terminal Surabaya

Subjective Work Fatigue	Total	Percentage
Low	191	93.2
Moderate	14	6.8
Total	**205**	**100**

Based on table number 2, it was found that a total of 19 (9.3%) tank car drivers experienced low levels of work-related stress, 174 (84.9%) tanker drivers experienced moderate work-related stress, and 12 (5.9%) tanker drivers experienced experience high levels of work-related stress.

Table 2. Distribution of Work Stress on Tank Car Driver Integrated Terminal Surabaya

Work-Related Stress	Total	Percentage
Low	19	9.3
Moderate	174	84.9
High	12	5.8
Total	**205**	**100**

Based on the results of research on 205 tanker truck drivers at ITS, it was found that a total of 17 drivers with low work-related stress experienced low subjective work fatigue, and as many as 2 drivers with low work-related stress experienced moderate subjective work fatigue. A total of 165 drivers with moderate work-related stress experienced low subjective work fatigue and as many as 9 drivers with moderate work-related stress experienced moderate subjective work fatigue.

Table 3. The results of the Spearman Correlation analysis of the variable Stress due to Work with Subjective Work Fatigue

Work-Related Stress	Subjective Work Fatigue						Sig. (2-Sided)	*Correlation Coefficient*
	Low		Moderate		Total			
	n	%	n	%	n	%		
Low	17	89,5	2	10,5	19	100	0,313	0,071
Moderate	165	94,8	9	5,2	174	100		
High	9	75	3	25	12	100		
Total	**191**	**93,2**	**14**	**100**	**205**	**100**		

A total of 165 drivers with moderate work-related stress experienced low subjective work fatigue and as many as 9 drivers with moderate work-related stress experienced moderate subjective work fatigue. A total of 9 drivers with high work-related stress experienced low subjective work fatigue and as many as 3 drivers with high work-related stress experienced moderate subjective work fatigue.

According to the results of the Spearman correlation test, the results obtained = 0.05 (5%) and it can be seen that the value of Sig. (2-tailed) = 0.313. Value of Sig. (2-tailed) = 0.313 > = 0.05 so it can be concluded that there is no significant relationship between work-related stress and subjective work fatigue. The Correlation Coefficient value is 0.071, which means that the strength of the correlation between work-related stress and subjective work fatigue is weak.

Several tanker car drivers at the Integrated Terminal Surabaya experience moderate and low subjective work fatigue. This is due to differences in working time and the distance they have traveled at the time of data collection. The fatigue experienced by drivers is caused by their working hours which tend to be long and can even take up to a full day. Symptoms of fatigue include a heavy feeling in the head, confused thoughts, difficulty thinking, headaches, stiff shoulders, and difficulty controlling emotions.

Work fatigue is one of the factors that play a role in 60% of work accidents. Work accidents can result in very large expenses from the company, including the cost of disability benefits, reduced work productivity, unused tools and machines, and delays in the production process. In addition, workers who experience work accidents can affect body functions and even death (Muliawan *et al.*, 2018). Work fatigue also poses some risks to workers, including decreased work motivation, poor performance, poor work quality, frequent errors, low work productivity, work-related stress, occupational disease, injury, and work accidents (Widyastuti, 2017). Fatigue, if not treated promptly, can develop into chronic fatigue, which might lead to heart disease, diabetes, high blood pressure, anxiety, depression, etc (Safe Work Australia, 2013).

Fatigue can be overcome by several steps taken with the work fatigue management program in the workplace carried out by the company and is intended for both tank car drivers and the management concerned. This can be managed through risk management, which includes preventive action through an innovative and participatory approach, curative and rehabilitative measures, old age insurance, and so on.

One of the steps, namely providing additional nutritious food intake, can increase energy for tank car drivers, especially when driving at night (Salim, Suoth and Malonda, 2019). In addition, always provide sufficient drinking water so that the driver can always rehydrate. The company should improve the ergonomics factor and working conditions for the driver because it can affect work fatigue. Staff encouragement and the implementation of reward/punishment systems also can be beneficial in increasing employee motivation (Azmoon *et al.*, 2018).

Stress due to work is not related to the incidence of subjective work fatigue in fuel oil tanker car drivers. Work stress can be one of the factors causing fatigue in workers because excessive pressure obtained during work can drain a person's energy during work so that the body feels tired. This is because our bodies activate a fight-or-flight response in stressful situations, whether we choose to remain active or remain silent. As a result, we expend more energy, and this can lead to fatigue. Previous research indicates that stress and negative affect may contribute to compassion fatigue, whereas positive affect and sociality may contribute to compassion satisfaction (Zhang *et al.*, 2018).

Based on the results of research on tank car drivers, the results obtained are that at most several tank car drivers experience moderate work stress and are followed by light work stress. This happens because not all tank car drivers experience the same work stressors and how they respond to this stress can affect the level of stress they experience. In addition, while driving, several tank car drivers tune their fun songs so that they can reduce the stress they experience. Chatting with other co-drivers can also help reduce stress from work. Playing music that evokes excitement for work and utilizing rest time with mild physical activity can help to alleviate stress at work (Suma'mur, 2014).

It can be concluded that there is a need for management of work-related stress by the company for tank car drivers who experience stress due to moderate work and to prevent additional work-related stress on other drivers. One of the

management steps is knowing the symptoms of stress in yourself. Symptoms caused by work stress include physical symptoms such as headaches and stiff shoulders, psychological symptoms such as forgetfulness and lack of concentration, and behavioral symptoms such as hypersensitivity (Tarwaka, 2015).

When workers are stressed at work, one of the solutions they use is social support. Furthermore, individuals' social skills in communicating can be a cause or an intervention when experiencing work stress (Hardiyanti and Permana, 2019). Stress can be reduced by managing a better work environment in terms of physical, biological, chemical, ergonomic, and psychosocial factors (Krisnawati and Lestari, 2018).

This research supports the findings of (Setyowati, Shaluhiyah and Widjasena, 2014), who found no correlation between work-related stress and fatigue in furniture workers. However, the findings of this research are contrary to (Mulfiyanti, Muis and Rivai, 2019) research on nurses at Tenriawaru Hospital, which found a strong correlation between work stress and fatigue. Nurse research at Bitung Hospital discovered a correlation between stress and work fatigue. This occurs because the body expends a lot of energy when stressed, which can lead to fatigue (Dimkatni, Sumampouw and Manampiring, 2020).

This research is inversely proportional to that carried out on Transjakarta drivers in corridor 8 at SBU PERUM DAMRI, showing that there is a significant relationship between job stress complaints and work fatigue. Stress and fatigue are caused by monotonous working conditions, causing boredom. In addition, it can also be caused by ergonomic factors, environment, emotional control, working hours and rest periods, and nutritional status (Nurchasanah, Wijasa and Wiharto, 2014).

The influence of the causes of work fatigue consists of a combination of several factors, including the intensity and duration of physical and mental work, the environment, circadian rhythms, physical problems, responsibilities, pain and health conditions, and nutrition (Grandjean, 1991 in Tarwaka, 2015). These factors influence each other's body conditions which can cause work fatigue so that it requires refreshment in the form of a short break or maybe even a vacation.

The results showed that the work-related stress variable was not related to work fatigue because there might be other variables that caused the driver's fatigue to be minimal or other variables that were not analyzed so they could not show an overview of the causes of fatigue experienced.

CONCLUSION

The results showed that there was no significant relationship between work-related stress and subjective work fatigue. This may occur because other variables are not analyzed so it does not show a description of the causes of fatigue experienced. Tank car drivers are advised to take part in the induction program provided by the company as a form of program to prevent fatigue and overcome work-related stress. In addition, the program by the company should be aimed not only at tank car drivers, but also for the management concerned. Suggestions that can be given to the next researcher who will research with the same topic is to use a different data collection method which is a limitation of this study.

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