



Using Progressive Muscle Relaxation for Reducing Fatigue among Truck Drivers

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Abstract

Background: Long working hours, poor working conditions, and irregular sleep patterns increase the risk of burnout in freight truck drivers. Progressive muscle relaxation (PMR) is a procedure to relax muscles. This study aims to analyze the effectiveness of progressive muscle relaxation on truck drivers.

Methods: This research is a quasi-experimental study with one group pretest-posttest design. 60 truck drivers working in Belawan Port were given PMR video tutorials and underwent PMR therapy for two months. The researcher used the standard KAUPKK questionnaire to measure subject fatigue. The data were tested using the Wilcoxon Signed-Rank test.

Results: With a z score (-5.798) greater than the z-table value (-1.645) and a p-value of 0.000, it can be concluded that there are differences in complaints of fatigue among truck drivers before and after PMR.

Conclusions: The results of this study indicate that the fatigue of truck drivers can be reduced by PMR therapy.

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INTRODUCTION

Fatigue experienced by individuals can lead to decreased performance, decreased control and response, and poor decision-making (Moore, 2016; Sadeghniiat-Haghighi & Yazdi, 2015). Truck drivers are a group of workers at high risk of experiencing fatigue as an implication of work requiring a high level of concentration (Meuleners et al., 2017; Wise et al., 2019). Truck drivers face inconsistent and changing working conditions and schedules, demands for timely delivery of goods, and unpredictable road and weather conditions (Chen et al., 2015; Heaton et al., 2021). In addition, the fairly large size of the freight truck and poor flexibility due to its heavy load can increase the risk of an accident (Han et al., 2021). Previous studies reported that fatigue could cause impaired alertness, concentration, and attention in a driver (Jagannath & Balasubramanian, 2014).

A comprehensive approach based on scientific evidence to manage work fatigue needs to be taken to minimize the risk of accidents (Sadeghniiat-Haghighi & Yazdi, 2015). Playing music can reduce sleepiness and boredom due to the monotonous nature of work. Moreover, music can reduce fatigue when considering the right music tempo (Li et al., 2019). Stretching training also contributes positively to the alertness of drivers in driving vehicles (M. Ghasemi et al., 2020; Hutabarat et al., 2017; Opplert & Babault, 2018). One form of relaxation therapy that is simple and easy to learn is progressive muscle relaxation (PMR). This technique is carried out only by tensing and relaxing the body muscles (Carrillo et al., 2021; Chiaramonte et al., 2014). PMR can also increase the patient's independence in overcoming health problems non-pharmacologically (Syarif & Putra, 2014). Previous literature reports that PMR is beneficial in reducing anxiety, stress, and depression (Pradhan et al., 2020). PMR can relieve complaints of low back pain and improve the quality of life during pregnancy in pregnant women (Akmeşe & Oran, 2014). Furthermore, PMR is also effective in reducing acute pain and chronic pain. (Fitriani et al., 2019). There are not many studies in Indonesia that have focused on measuring the effectiveness of PMR in groups of workers, especially truck drivers

(Pratiwi et al., 2022; Siregar & Rabani, 2022; Uli & Modjo, 2019).

Researchers conducted the initial study by assessing the level of fatigue in 5 truck drivers at Belawan Port. The measuring instrument used is the Work Fatigue Measuring Tool Questionnaire/ Kuesioner Alat Ukur Perasaan Kelelahan Kerja (KAUPKK) (Maurits, 2011). The measurement results found that three drivers experienced severe fatigue, and two drivers experienced moderate fatigue. Researchers also conducted interviews about working conditions and the causes of fatigue experienced. Some truck drivers stated that they were tired at work due to irregular working hours and limited rest time, resulting in irregular sleep. In addition, there is a demand to send goods according to the time determined by the warehouse manager. As a result, truck drivers drive at high speeds, which can endanger their safety and other motorists' safety. The activity of the arms that work long enough and the driver's sitting position during the trip causes fatigue and pain in the shoulders, neck, and back. Therefore, this study aims to analyze the effectiveness of progressive muscle relaxation on truck drivers at Belawan Port.

METHODS

This research is a quasi-experiment with one group pretest-posttest design. The study was conducted from November 14, 2021 to January 20, 2021, involving 60 truck drivers working at Belawan Port. Determination of the sample using purposive sampling technique with the inclusion criteria of truck drivers aged 17-60 years and who have worked for at least ten years.

The researcher distributed the KAUPKK questionnaire to the subjects to obtain data on the subject's fatigue condition before the intervention. The number of questions listed on the questionnaire is 17 questions. Furthermore, the researchers formed a group on the Whatsapp application to facilitate education on PMR materials and monitoring subjects during the intervention. Educational materials are provided in the form of video shows featuring PMR tutorials. Video edukasi dibuat oleh peneliti berdasarkan panduan gerakan relaksasai yang dikembangkan oleh

Wehrenberg (2008). The tutorial contains three stages: preparation before relaxation, the relaxation implementation stage (instructions and movement procedures), and the termination stage. PMR was divided into three sessions and involved 20 people in each session. So the therapy is done for 10 days by the driver at each session. The first session was held at 09.00 WIB, the second session was held at 10.00 WIB, and the third session was held at 11.00 WIB. Each session lasts 15 minutes. After the worker performed the PMR, the worker returned to work with the departure time to deliver the goods. PMR was carried out for one month. PMR can be practiced either in a sitting or lying down position. It is important to find a comfortable position that allows for deep relaxation. The exercise typically involves the following steps: 1) Preparation: Find a quiet and comfortable environment. Close your eyes (optional) and focus your attention on your breath.; 2) Tensing and relaxing muscles: Begin by tensing a specific muscle group for a few seconds while inhaling. Hold the tension for a brief moment, then exhale completely and relax the muscles. Focus on the feeling of relaxation that spreads through the tensed area. Repeat this process of tensing, holding, and releasing two to three times for each muscle group.; 3) Progression: Systematically work your way through different muscle groups, either starting from the head and moving down the body (top-down approach) or starting from the feet and moving up (bottom-up approach). Common muscle groups targeted include the face, neck, shoulders, arms, back, abdomen, buttocks, legs, and feet.; and 4) Ending the exercise: After completing the sequence for all muscle groups, spend a few minutes focusing on the overall feeling of relaxation in your body. Furthermore, the researchers again distributed the KAUPKK questionnaire to the subject to measure the level of driver fatigue after the intervention.

The researcher used the standard KAUPKK questionnaire (Questionnaire for measuring feelings of work fatigue) to measure the subject's fatigue level. The questionnaire consists of 17 questions with three categories of fatigue levels, namely mild fatigue (< 23), moderate fatigue (23-31), and severe fatigue (> 32). Each question was scored: often (1), rarely

(2), never (3). Questionnaires were given when the truck driver took a break for lunch (12.00 – 13.00 WIB) or at the time of unloading goods.

The data that were collected were analyzed by univariate and bivariate. The univariate analysis aims to explain or describe characteristics such as age and years of service. Meanwhile, bivariate analysis was used to measure the effectiveness of progressive muscle relaxation in reducing work fatigue before and after the intervention. The normality of the data was tested by the Kolmogorov-Smirnov test. If the data is normally distributed, then the test used to see the effect of the pre-post intervention is the paired sample t-test. The researcher uses the Wilcoxon Signed-Rank test if the data is not normally distributed. All statistical tests used IBM SPSS Statistics 26. This study has received ethical approval from the Health Research Ethics Commission of Universitas Prima Indonesia with the number 019/KEPK/UNPRI/XII/2021.

RESULTS AND DISCUSSIONS

This study involved 60 truck drivers who work to deliver goods to processing plants and logistics warehouses. Most drivers are less than 25 years old (38.33%), while drivers over 35 years old are the fewest (28.33%). In this study, most drivers had worked less than ten years (85%). A systematic review has shown that age is a risk factor for fatigue for truck drivers. In addition, the driver's experience also determines the behavior of anticipating traffic hazards when driving in a tired state (Ren, 2021). Another study that linked age and fatigue concluded that drivers over the age of 55 had a higher risk. At a young age, you are not too at risk of experiencing fatigue, which impacts falling asleep while driving (Rosso et al., 2014).

The analysis of the subject's answers to the KAUPKK questionnaire given before the intervention showed that most respondents often experienced complaints of fatigue (78.3%). A total of 12 respondents (20%) did not feel any complaints of fatigue before the progressive muscle relaxation treatment. After the progressive muscle relaxation treatment, the number of respondents who no longer felt complaints of fatigue increased by 23

respondents (38.3%). The symptoms of the body when experiencing fatigue are difficulty thinking, tiredness of talking, nervousness about something, lack of concentration, and others. After being given the intervention, the percentage of subjects who often experience fatigue decreased (13,3%). This can also be seen from the difference in scores on each question before treatment and after treatment (see Table

2). The average level of fatigue complaints after the intervention was at the level of rarely experiencing fatigue. PMR, which was carried out for ten days, was proven to be able to reduce the level of fatigue of truck drivers in this study. Previous literature has stated that PMR can have an effect after three times of training (Anuar & Yusof, 2011).

Table 1. Characteristics of Truck Drivers Based on Age and Working Period

Characteristics	Frequency	Percentage
Age		
< 25 years	23	38,33%
25 – 35 years	20	33,33%
> 35 years	17	28,33%
Working Period		
< 10 years	51	85,00%
> 10 years	9	15,00%

Table 2. Fatigue score component values before and after treatment

Statement	Pretest			Posttest		
	Yes, Often	Yes, Rarely	Never	Yes, Often	Yes, Rarely	Never
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Do you find it difficult to think?	44 (73)	3 (5)	13 (22)	14 (23)	16 (27)	30 (50)
Do you feel tired of talking?	10 (17)	3 (5)	47 (78)	4 (7)	6 (10)	50 (83)
Do you feel nervous about things?	9 (15)	6 (10)	45 (75)	2 (3)	6 (10)	52 (87)
Do you feel like you never concentrate on work?	42 (70)	5 (8)	13 (22)	11 (18)	14 (23)	35 (59)
Do you feel like you don't pay attention to things?	11 (18)	37 (62)	12 (20)	4 (7)	17 (28)	39 (65)
Do you tend to forget things?	46 (77)	2 (3)	12 (20)	16 (27)	4 (7)	40 (66)
Do you feel a lack of confidence in yourself?	13 (22)	34 (57)	13 (21)	3 (5)	23 (38)	34 (57)
Do you feel that you are not diligent in your work?	12 (20)	36 (60)	12 (20)	4 (7)	19 (37)	37 (66)
Do you feel reluctant to look people in the eye?	44 (73)	5 (8)	11 (19)	12 (20)	2 (3)	46 (77)
Do you feel reluctant to work dexterously?	9 (15)	43 (72)	8 (13)	0 (0)	24 (40)	36 (60)
Do you feel unsettled at work?	42 (70)	5 (8)	13 (22)	12 (20)	3 (5)	45 (75)
Do you feel tired all over?	12 (20)	41 (68)	7 (12)	4 (7)	21 (35)	35 (58)
Do you feel that you are acting slowly?	19 (32)	1 (2)	40 (66)	6 (10)	3 (5)	51 (85)
Do you feel that you can no longer walk?	45 (75)	2 (3)	13 (22)	17 (28)	4 (7)	39 (65)
Do you feel that you are already tired?	11 (18)	37 (62)	12 (20)	3 (5)	22 (37)	35 (58)
Are you experiencing a decline in cognitive function?	14 (23)	34 (57)	12 (20)	8 (13)	20 (33)	32 (54)
Do you feel anxious about things?	12 (20)	47 (78)	1 (2)	9 (15)	27 (45)	24 (40)

Table 3. Level of truck driver fatigue before and after intervention

Variables	Level of Fatigue			Mean	SD
	Mild	Moderate	Severe		
Pretest	12 (20,0%)	1 (1,7%)	47 (78,3%)	1,42	0,809
Posttest	23 (38,3%)	29 (48,3%)	8 (13,3%)	2,25	0,680

Table 4. Differences in Truck Driver Fatigue Complaints Before and After PMR

Variable	Posttest-Pretest	n (60)	Mean Rank	Rank Sum	Wilcoxon Signed-Rank Test	
					z	p
Fatigue Complaints	Negative	0	0,00	0,00	-5.798	0,000
	Positive	40	20,50	820,00		
	Ties	20				

This study shows that 12 respondents (20%) did not feel fatigued before the progressive muscle relaxation treatment. After the progressive muscle relaxation treatment, the number of respondents who no longer felt complaints of fatigue increased by 23 respondents (38.3%).

Then, the researcher tested the normality of the data using the Kolmogorov-Smirnov test because the number of samples was less than 50 (A. Ghasemi & Zahediasl, 2012). The test results showed that the p-value in the pretest (0.000) and post-test (0.000) was smaller than 0.05. So, it can be concluded that the data is not normally distributed. Therefore, the Wilcoxon Signed-Rank test was used to see the average comparison between paired variables.

The results of the Wilcoxon Signed-Rank test showed that 40 respondents felt a better effect on PMR. With a z score (-5.798) greater than the z-table value (-1.645) and a p-value of 0.000, it means that there are differences in complaints of fatigue truck drivers before and after PMR. PMR is based on the workings of the sympathetic and parasympathetic nervous systems that work to influence each other's organs so that they can reduce tension and affect the fulfillment of one's sleep needs (Toussaint et al., 2021; Yousefi & Taraghi, 2017).

The poor working environment conditions experienced by the subject, such as noise coming from transport ships at the port, air pollution, high temperatures, and vibrations from truck engines, are the causes of stress and fatigue for truck drivers. PMR is effectively able to reduce muscle tension so that it helps reduce fatigue. In addition, body movements when truck drivers perform PMR can improve balance, strength, flexibility, and stamina and strengthen bones (Kartilah & Februant, 2020; Mahdavi et al., 2020).

However, 20 respondents stated that they did not feel any change in their complaints before and after PMR. The unsuccessful treatment (no change in complaints) occurred because some respondents were over 40 years old and had more than 15 years of service. In addition, this research process only lasted ten days. In this case, the treatment given to respondents with these criteria must be carried out in the long term to get a real impact from

progressive muscle relaxation.

This study had several limitations. First, this study involved 60 truck drivers from Belawan Port. While this sample size is sufficient for preliminary findings, it limits the generalizability of the results to truck drivers in other locations or different work environments. A larger and more diverse sample would provide more reliable and generalizable results. Second, fatigue levels were measured using a self-reported questionnaire (KAUPKK). Self-reported data can be biased due to social desirability bias, recall bias, and subjective interpretation of questions. Finally, this study did not include a control group. Without a control group, it is difficult to attribute changes in fatigue levels solely to PMR intervention, as other external factors may also influence the results.

CONCLUSION

The fatigue experienced by truck drivers increases the risk of accidents while driving. The results of this study indicate that the fatigue experienced by truck drivers can be reduced by PMR therapy. This means that there are differences in complaints of fatigue truck drivers before and after PMR.

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