THE EFFECT OF PHYSICAL RELAXATION ON STRESS LEVELS IN CILACAP REFINERY DRIVERS

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ABSTRACT

Stress is an adaptive response to challenging conditions and can have a negative impact on health. One simple and effective method to reduce stress is physical relaxation, which involves alternating muscle relaxation to reduce body tension. This study aimed to determine the effect of physical relaxation on stress levels among drivers at the Cilacap Refinery. A pre-experimental design with a One-Group Pretest-Posttest approach was used. The sample consisted of 60 drivers selected using total sampling. Stress levels were measured using the **Perceived Stress Scale (PSS)** questionnaire. The intervention included 15 physical relaxation movements targeting the muscles of the hands, shoulders, face, neck, back, chest, abdomen, and legs. The exercises were carried out for 15 minutes, twice a week, for 4 weeks, and were directly guided by the researcher. Data were analyzed using the Wilcoxon test. The results showed a significant effect of physical relaxation on reducing stress levels, with a p-value of 0.000 ($p < 0.05$). It can be concluded that physical relaxation is effective in lowering stress levels among drivers at the Cilacap Refinery. This program can be routinely implemented as part of occupational health promotion efforts.

Keywords: Physical relaxation, work stress; refinery drivers.

INTRODUCTION

Stress is an adaptive reaction to perceived conditions or situations that are challenging and pose a threat to an individual's personal health (Giyati and Whibowo, 2023). Several factors may cause a person to feel stressed, including having too many tasks that are not well understood, an uncomfortable work environment, or income that does not meet expectations (Suparjiman, Zulkarnaen and Sasangka, 2021), resulting in dissatisfaction and cognitive overload due to the fast pace of technological development (Maghfirah, 2023). In the workplace, stress levels are

often related to workload, including task demands or deadlines influenced by emotions, thoughts, and conditions that prevent individuals from responding positively to their environment (Riny Chandra and Adriansyah, 2017). Work-related stress can have both positive and negative effects (Sugiarto and Nanda, 2020). The positive effects of stress can function as a motivator that improves performance (Tsalasah, Noermijati and Ratnawati, 2019). while the negative effects can drastically reduce employee performance (Sugiarto and Nanda, 2020).

According to the 2023 State of the Global Workplace survey, 44% of workers worldwide experienced stress in 2022 the same percentage as the previous year. The percentage of workers experiencing stress has shown a general upward trend from 2009 to 2022 (Natasya and Pujianto, 2024). This increase has been attributed to external factors such as inflation or family health issues, while workplace stress was also influenced by social restrictions during the COVID-19 pandemic (Rahmah and Wardiani, 2021).

Based on data on mental disorders such as stress and depression among the Indonesian population, cited from the 2018 Basic Health Research Report (Riskesdas), there were 706,688 individuals affected across 34 provinces, from Aceh to Papua. The prevalence of stress-related mental disorders among laborers or drivers was 9.7%, while in other professional categories such as civil servants (PNS), military (TNI),

police (POLRI), private employees, and entrepreneurs, the prevalence was below 8%. At the provincial level, Central Java recorded a prevalence of 4.4% (95,461 individuals) experiencing stress and depressive mental disorders (Kementerian Kesehatan RI, 2018).

In terms of **workplace accidents** classified by type, in Central Java, the majority were due to **traffic-related incidents (motorcycles and cars)**, with 136 cases reported in 2021 a nearly 50% increase from 70 cases in 2020 (Disnakertrans Pemerintah Provinsi Jawa Tengah, 2021). Afif Mauludi, Djunaidi and Saiful Arif (2021) stated that several human-related factors caused accidents according to police and public perspectives. These include distractions while driving (such as phone use and smoking), stress-related influences (such as drugs and alcohol), and other instability issues while driving.

There are various ways to reduce stress, including maintaining a healthy and nutritious diet, engaging in physical fitness activities, practicing breathing exercises and relaxation techniques, doing enjoyable activities, taking vacations, building harmonious relationships, letting go of past negative experiences, and planning daily routines to avoid isolation that may lead to stress (Schultchen *et al.*, 2019). In this study, the method used to reduce stress is **relaxation exercises**, as they are more effective in reducing anxiety that can trigger stress and are easily implemented in daily life during breaks from work.

Alvionita, Wongkar and Pasiak (2022) found that **progressive muscle relaxation therapy** significantly reduces anxiety. This therapy, with its multiple benefits for daily life, is known to positively impact the body. Indana and Tsabitah (2021) in their study using the **Depression Anxiety Stress Scale (DASS)**, showed significant reductions in stress levels before and after progressive muscle relaxation interventions among staff at Banyuputih Community Health Center in Situbondo. The results showed that the number of respondents with normal stress levels increased from 0 to 20 after

intervention; those with mild stress dropped from 21 to 12, and those with moderate stress from 14 to 3. The research results showed a significant difference in stress levels before and after progressive muscle relaxation therapy among the staff at Banyuputih Community Health Center, Situbondo.

Physical relaxation is a commonly used stress management technique (Asda, Anida and Sholiqah, 2023), It is a skill that helps reduce or eliminate tension, leading to a state of comfort (Cahyanti *et al.*, 2023). This method combats anxiety, stress, or tension by alternately tensing and relaxing muscle groups to create a relaxed state (Pratiwi *et al.*, 2023). Physical relaxation is one of the easiest and most cost-effective techniques to practice independently (Ilmi, Dewi and Rasni, 2017). Its main goal is to prevent stress responses in the nervous and hormonal systems, ultimately helping to **minimize or prevent stress**, especially when the body is overworked in solving problems (Toussaint *et al.*, 2021).

Previous studies have mostly focused on the effects of progressive muscle relaxation on general populations such as students, health workers, or patients in clinical settings. However, limited studies have examined the effectiveness of physical relaxation exercises specifically among occupational drivers working in high-risk, high-pressure environments like oil refineries. This research differs by targeting refinery drivers, a unique population with distinct stressors related to long working hours, limited rest periods, and safety-critical responsibilities.

Drivers at the Cilacap Refinery form a core group consisting of contractors and direct employees tasked with transporting workers from the main gate to the inner work areas of the Cilacap Refinery. During this process, drivers must remain highly focused to avoid accidents that could cause physical, material, or production losses. The refinery area is surrounded by equipment and fuel pipelines that could cause catastrophic incidents if accidents occur along the route. Based on initial observations conducted with the head of the Cilacap Refinery

Drivers, several complaints were reported regarding sudden work overload, excessive working hours (overtime), limited break times, and irregular shifts all of which contributed to work-related stress. Preliminary research involving 11 drivers found that 7 experienced moderate stress, while only 4 were in normal condition. These drivers often reported being disturbed by unexpected events, having difficulty managing important tasks, frequently feeling nervous, and easily angered by things beyond their control. Based on these specific conditions, this study aims to fill the research gap by investigating the impact of physical relaxation interventions on stress levels among drivers in a high risk industrial setting.

Based on the background above, the author intends to examine further the effect of physical relaxation on stress levels among drivers at the Cilacap Refinery.

METHOD

This study employs an experimental research method, using a type of Pre-Experimental Design. The approach applied is the One-Group Pretest-Posttest Design, in which a pretest is conducted before and after the treatment is given.

The population in this study consists of all members of the Cilacap Refinery Drivers, totaling 60 individuals. The sampling technique used is total sampling, where the sample size equals the population size. Therefore, the number of research subjects is 60 participants. This population size is considered appropriate because it is relatively small and manageable, allowing the researcher to implement the intervention consistently and monitor participants thoroughly. It also enables complete coverage of the target group without the need for sampling procedures that could introduce selection bias. The inclusion criteria in this study were: (1) active drivers working at the Cilacap Refinery, (2) willing to participate in the entire intervention process, and (3) not undergoing any pharmacological treatment for stress or mental disorders. The exclusion criteria were: (1) drivers who were absent in more than one intervention session, (2) individuals with a history

of severe psychiatric illness, or (3) those with physical limitations that hindered them from participating in physical relaxation exercises.

Data collection was carried out using a questionnaire. The data sources in this study consist of primary data, obtained directly from individuals such as the questionnaire results filled out by the respondents. The primary data collected focuses on stress levels. The secondary data were obtained indirectly through intermediaries and include information such as participants' names, ages, genders, general job descriptions, and the total number of Cilacap Refinery Drivers.

Stress levels were measured using a questionnaire instrument known as the Perceived Stress Scale (PSS), consisting of 10 items including both positively and negatively worded questions. This tool is used to assess an individual's stress level over the past month.

In this study, physical relaxation was implemented through 15 movements targeting various body areas, including the hands, shoulders, face, back, abdomen, chest, and legs. The relaxation was applied for 15 minutes, twice a week, over a period of 4 weeks. **The intervention was conducted during April 2025 in a designated rest area near the drivers' waiting zone. Due to the drivers' work shifts and space limitations, the sessions were carried out in small groups of 10 participants at a time, according to a predetermined schedule. This ensured that all 60 drivers received the same intervention exposure. Each session began with a short explanation and demonstration of the movements.**

The physical relaxation sessions were directly guided by the researcher, who had received training in relaxation techniques prior to the study. Participants were encouraged to perform the movements slowly and mindfully, in synchronization with their breathing. All sessions were conducted under the direct supervision of the researcher to ensure safety and accuracy of technique. This study did not implement a blinding procedure during data collection or analysis due to the nature of the intervention, which required direct interaction between the researcher and

participants. However, to minimize bias, the researcher used standardized instructions and ensured that the same protocol was applied consistently across all sessions and participants.

Figure 1. Movement 1
(Clenching and releasing the fists to **exercise and relax the hand muscles**, helping to reduce stiffness and improve circulation in the palms and fingers)

Figure 2. Movement 2
(Stretching the fingers backward to **exercise the extensor muscles on the back of the hand**, promoting flexibility and relieving hand fatigue)

Figure 3. Movement 3
(Flexing and extending the elbows to **activate the biceps muscles**, which aids in reducing upper arm tension and improving muscle tone)

Figure 4. Movement 4
(Shoulder lifting and rolling to **loosen the shoulder muscles**, relieve upper body tension, and promote relaxation in the neck and upper back area)

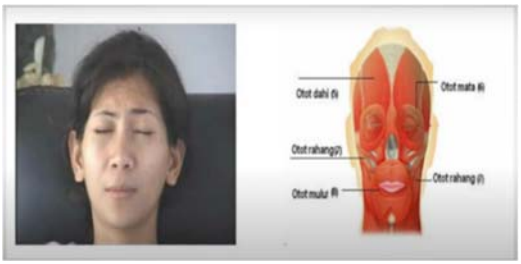

Figure 5. Movement 5
(Frowning and relaxing the eyebrows to **relax the facial muscles**, helping release built up tension in the forehead and eye area)

Figure 6. Movement 6
(Cheek puffing to **exercise the facial muscles**, increasing blood flow and releasing facial tension)

Figure 7. Movement 7
(Jaw stretching by opening the mouth wide to **exercise the lower facial and jaw muscles**, which can reduce clenching and jaw stiffness)

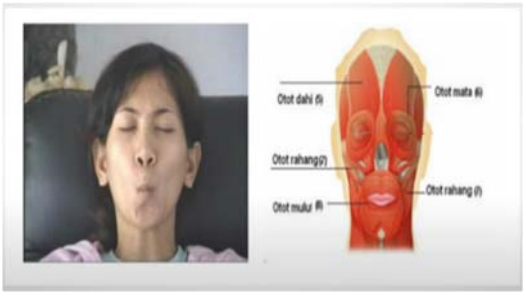

Figure 8. Movement 8
(Smiling widely and holding the expression to **activate the facial muscles**, enhance mood, and improve facial muscle elasticity)

Figure 9. Movement 9
(Neck tilt to the sides to **stretch the lateral neck muscles**, relieving tension caused by prolonged static posture)

Figure 10. Movement 10
(Chin tuck and head lift to **exercise the front neck muscles**, improving posture and reducing strain in the cervical spine)

Figure 11. Movement 11
(Forward bend in seated position to **stretch the back muscles**, helping to release tension in the lumbar and thoracic region)

Figure 12. Movement 12
(Arm opening while inhaling deeply to **expand the chest muscles**, facilitating better breathing and reducing upper body tightness)

Figure 13. Movement 13
(Abdominal tightening and deep breathing to **activate the abdominal muscles**, promoting core relaxation and improving respiratory control)

Figure 14 and 15. Movements 14 and 15
(Toe curling and ankle rotation to **exercise the leg muscles**, improve lower limb circulation, and prevent cramps or stiffness in the legs).

Data analysis was conducted using **univariate analysis** (frequency distribution) and **bivariate analysis** with the **Wilcoxon test.** Prior to participation, all respondents were provided with detailed information about the purpose, procedures, and potential risks and benefits of the study, and written informed consent was obtained.

RESULTS AND DISCUSSION

The study was conducted in June 2024, with a sample size of 60 respondents (total sampling). The Secretariat of the Cilacap Refinery Drivers is located at Jalan MT. Haryono No. 77, Rawakeong, Lomanis, Cilacap Tengah District, Cilacap Regency, Central Java. The Cilacap Refinery Drivers consist of 60 male individuals from contractors and the owner, with ages ranging from 17 to 55 years. They work in mobilizing and transporting workers from the main gate to the work area within the Cilacap Refinery, with a standard working duration of 8 hours per shift.

A. Characteristics of Research Respondents

Table 1. Age Characteristics of Research Respondents

No	Age Range	N	%
1	17 - 25 yrs	1	1.7
2	26 - 35 yrs	22	36.7
3	36 - 45 yrs	19	31.7
4	46 - 55 yrs	18	30
	Total	60	100

Based on Table 1, in terms of the respondents' age, the largest group of respondents falls within the age range of 26 – 35 years, with a total of 22 respondents (36.7%). There are 19 respondents (31.7%) in the 36 – 45 years range, 18 respondents (30%) in the 46 – 55 years range, and 1 respondent (1.7%) in the 17 – 25 years range.

B. Stress Levels Before Physical Relaxation Intervention

Table 2. Stress Levels Before Physical Relaxation Intervention

No	Stress Level	N	%
1	Normal	5	8.3
2	Moderate	55	91.7
3	High	0	0
Total		60	100

Based on Table 2, it shows that before the physical relaxation intervention, the majority of respondents had a moderate stress level, with 55 respondents (91.7%). There were no respondents with a high stress level, while 5 respondents (8.3%) were categorized as normal. The majority of respondents with moderate stress experienced disturbances from sudden events, frequently feeling nervous and emotional due to occurrences beyond their control, such as additional working hours, vehicle troubles, and sudden workload increases.

C. Stress Levels After Physical Relaxation Intervention

Table 3. Stress Levels After Physical Relaxation Intervention

No	Stress Level	N	%
1	Normal	48	80
2	Moderate	12	20
3	High	0	0
Total		60	100

Based on Table 3, it shows that after the physical relaxation intervention, the majority of respondents had a normal stress level, with 48 respondents (80%). There were no respondents with a high stress level, while 12 respondents (20%) were categorized as moderate. The majority of respondents with normal stress levels showed improvement in emotional regulation, work control, and time management after receiving the intervention regularly, twice a week for one month.

D. **The Effect of Physical Relaxation on Stress Levels**

Table 4. The Effect of Physical Relaxation on Stress Levels

Stress Level	Mean/ SD	p-value
Before	17.25/ 3.8	0.000
After	12.5/ 2.6	

Based on Table 4, there is a significant effect of physical relaxation intervention on stress levels among the drivers at Kilang Cilacap, indicated by a p-value of 0.000 (< 0.05). In terms of the mean score, stress levels decreased from 17.25 before the intervention to 12.5 after the intervention. During the intervention period, no participants reported experiencing any negative effects or discomfort from the relaxation sessions. All participants completed the intervention without any adverse events.

The results of the study show a significant effect of physical relaxation intervention before and after on the stress levels of the Kilang Cilacap Drivers, with a p-value of 0.000 < 0.05. Based on the questionnaire responses, before the intervention, many respondents complained of feeling disturbed by sudden events, difficulty managing important tasks, feeling nervous,

and easily angered due to situations beyond their control such as sudden additional working hours, vehicle trouble, and unexpected workload. After the intervention, respondents reported being better able to regulate their emotions, manage tasks, and allocate time for important duties.

Anuar, Anas and Samad (2019) explained that physical relaxation is used to counter feelings of anxiety, stress, or tension by tensing and then relaxing several muscle groups to produce a relaxed sensation. Progressive muscle relaxation or physical relaxation was developed by a doctor from Chicago, Jacobson, in the 1920s (Tapeh *et al.*, 2024). Jacobson theorized that anxiety and stress cause muscle tension, which in turn increases feelings of anxiety (Torales *et al.*, 2020), Thus, when the body is relaxed, there is less muscle tension, leading to a decrease in anxiety (Burhan, Erika and Said, 2022).

Physiologically, physical relaxation activates the parasympathetic nervous system, which functions to return the body to a state of calm after stress. This activation helps reduce the production of stress hormones such as cortisol, lower heart rate and blood pressure, and promote a feeling of calm and control. For workers like drivers, who often face pressure from long working hours, traffic stress, and high responsibility, this mechanism is especially important in maintaining mental well being.

This research is in line with a study conducted by Puspitasari, Pratiwi and Sari (2019) which demonstrated a significant effect of physical relaxation on stress levels among YATSI Health Science Institute staff in 2019 with a p-value of 0.000. In that study, the researchers conducted relaxation sessions over six consecutive days with participants sitting back in a relaxed position while receiving guidance during the intervention. It was explained that physical relaxation was used to counter anxiety, stress, or tension by tensing and relaxing several muscle groups, allowing respondents to feel relaxed.

A study by Mutawalli, Setiawan and Saimi (2020) also confirmed a significant effect of physical relaxation in reducing stress levels in the community of Central Lombok Regency, with a p-

value of 0.000. In that research, a calm and conducive environment was a main focus, enabling respondents to better concentrate during the relaxation exercises. It was noted that a conducive environment helps participants focus their attention on releasing muscle tension in major muscle groups while being mindful of their breathing patterns.

Another study conducted by Indana and Tsabitah (2021) found a significant effect of physical relaxation exercises on stress levels among staff at the Banyuputih Public Health Center in Situbondo, with a p-value of 0.000. The study emphasized the importance of respondent commitment to regularly perform progressive muscle relaxation during each session. It was stated that regularly practicing progressive muscle relaxation or physical relaxation can reduce stress levels compared to before engaging in such exercises.

The findings in this study support the notion that consistent physical relaxation exercises, even for short durations such as 15 minutes twice a week, can create measurable improvements in emotional regulation and stress resilience. This is especially relevant for industrial and transport workers, where chronic stress may contribute to fatigue, decreased job performance, and long-term health issues. By integrating brief, structured relaxation sessions into work routines, employers and health professionals can offer effective, low-cost interventions to promote psychological well-being in the workplace.

The limitation of this study is that there were still 12 respondents (20%) who remained in the moderate stress category. This may be due to negative environmental conditions in the community, family demands in meeting needs, and individual perceptions of their environment, which were not identified by the researcher.

CONCLUSION

Based on the research results and the discussion presented, it can be concluded that there is an effect of physical relaxation intervention on the stress levels of the Kilang Cilacap Drivers. This is evidenced by the statistical test results which indicate significance, as well as an increase in the number of respondents with normal stress levels, a decrease in those with moderate stress levels, and

the absence of respondents with high stress levels.

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