Analysis of Stress Levels and Musculoskeletal Complaints in Pencak Silat Athletes

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ABSTRACT

Stress is a non-specific response of the body to the demands that arise, which can be physiological and psychological reactions. Stress is a form of perception experienced by a person due to the gap between individual abilities and environmental demands that they experience. Psychological stress and high physical demands in training and competition are interrelated and often become factors that influence the performance and risk of musculoskeletal disorders in athletes. The musculoskeletal system consists of bones, joints, muscles, tendons, ligaments, and other supporting structures. The purpose of this study was to determine the level of stress and musculoskeletal complaints experienced by pencak silat athletes. This study used a cross-sectional method to describe the level of stress and musculoskeletal complaints in pencak silat athletes. Stress levels were measured using the Perceived Stress Scale (PSS) while musculoskeletal disorders were assessed using the Nordic Body Map. The research data showed that 75% of athletes experienced stress in the moderate category, while 25% were in the mild stress category. The results also revealed that 75% of athletes did not experience musculoskeletal complaints, while 25% needed attention in the future. Comprehensive monitoring of the physical and psychological condition of athletes is an important step for coaches and support teams to maintain consistent performance, prevent injuries, and ensure optimal athlete readiness.

AUTHORS' CONTRIBUTION

A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

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INTRODUCTION

Stress is a condition in which a person feels mentally or emotionally under pressure. This factor has a significant impact and can reduce an individual's cognitive function and physical abilities (Corrado et al., 2021; Przybylska et al., 2023). However, stress is inseparable from everyday life and the world of sport, as it manifests as physical, mental, or emotional demands that disrupt the body's balance. To some extent, stress can be positive because it provides the necessary impetus to improve performance. However, if the intensity is excessive, stress can have detrimental effects (Tortella et al., 2025)

The constant demand to exceed one's limits can trigger chronic stress, which ultimately has the potential to cause physical and mental overload. This overload

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condition caused by various stressors is not always directly apparent in an athlete's environment, especially in elite sports (Nuetzel, 2025).

Sports involving physical contact are associated with high levels of cognitive and somatic anxiety, while sports involving individual judgment based on judges' observations predict high levels of cognitive anxiety (Tossici et al., 2024). Athletes can exhibit both positive and negative emotional responses, which can either hinder or enhance high-intensity physical performance. These emotions also affect effort levels, attention span, decision-making ability, and overall physical function (Aliriad et al., 2024). The development of mental health disorders often goes undisclosed, as these conditions are often perceived as signs of weakness or an athlete's inability to cope with the pressures inherent in elite-level sport (Nuetzel, 2025).

For athletes, sports competition places high mental pressure on them. Because their physical abilities are generally equal, psychological preparedness is a key factor in determining victory (Kapl, 2024). Athletes actively add psychological pressure to motivate themselves, regulate the intensity of the pressure, and manipulate emotions as needed. Although the training environment does require a certain level of pressure, some athletes intentionally increase it. This is especially true when they feel less competitive or under-motivated (Endo et al., 2023).

According to a biomechanical study of elite young soccer players, mental stress significantly alters muscle force patterns during dynamic change-of-direction movements, such as an increase in peak muscle force in some players under psychological stress compared to unstressed conditions, which may increase the risk of musculoskeletal injuries (Auer et al., 2020). Sport-related musculoskeletal disorders (MSK) are common conditions that can reduce performance and hinder an athlete's ability to compete (Patel 2006; Iolascon & Tarantino, 2022). The type and location of MSK disorders vary according to the characteristics of each sport, with the most frequently affected areas including joints, skeletal muscles, and tendons. The high prevalence of these conditions and their significant impact on athlete performance have prompted numerous studies to examine their pathogenesis mechanisms and develop effective therapeutic strategies (Iolascon & Tarantino, 2022).

The main factors triggering sports injuries include high levels of stress, impaired concentration, physical trauma, and excessive training loads (Li, Wu, & Chen, 2020). Considering this, implementing risk screening has been shown to play a crucial role in reducing the likelihood of sports injuries (Kardi et al., 2023)

This study aims to determine the levels of stress and musculoskeletal complaints experienced by pencak silat athletes. This study aims to provide information and practical guidance for athletes, coaches, and related parties in understanding, monitoring, and managing stress and musculoskeletal complaints in pencak silat athletes to ensure their well-being.

METHODS

This study was a descriptive observational study. It aimed to describe the levels of stress and musculoskeletal complaints among South Sulawesi pencak silat athletes

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without intervention. The research design used was descriptive with a cross-sectional approach. A cross-sectional method is a study in which data is collected at a single point in time. The study was conducted on September 21, 2024, in the Sports Training Room of the Makassar City Sports Committee (KONI). The sample consisted of all eight South Sulawesi pencak silat athletes.

Stress levels were measured using the Perceived Stress Scale (PSS). This instrument assesses an individual's perception of stress experienced over the past month. The PSS consists of 10 items asking questions about an individual's feelings and thoughts during that period. Musculoskeletal disorders were assessed using the Nordic Body Map, which assesses the prevalence of musculoskeletal disorders in various parts of the body. This instrument consists of questions covering various body areas such as the neck, shoulders, back, and knees.

RESULTS AND DISCUSSION
Result

Data collection was conducted by researchers in September 2024 at the KONI Makassar City, involving eight respondents. The results are presented in accordance with the specific objectives of the study.
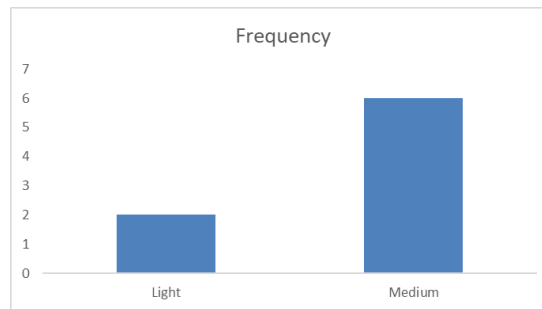
Table 1.
Respondent age characteristics

Age	Frequency
19	1
20	1
21	2
23	1
24	1
25	1
27	1

Table 1 shows the characteristics of respondents. The frequency percentage indicates the proportion of respondents in each age category. 21-year-olds had the largest number of respondents at 25.0%, followed by other ages with lower frequencies.

Table 2.
Respondent gender characteristics

Gender	Frequency
Male	6
Female	1

Table 2 shows the number of respondents by gender. There were 6 male respondents (75.0%) and 1 female respondent (25.0%). The frequency percentages indicate the proportion of respondents in each gender category. In this case, 75.0% of respondents were male, while 25.0% were female. This indicates a male predominance in the sample studied. The data shows that the majority of respondents (75%) were male, while 25% were female.

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Figure 1.
Stress level score

The number of respondents based on stress level in Figure 1 shows that 2 respondents (25%) fell into the Mild category and 6 respondents (75%) fell into the Moderate category. The frequency percentages indicate the proportion of respondents in each stress level category. In this case, 75% of respondents experienced moderate stress, while only 25% of respondents experienced mild stress.
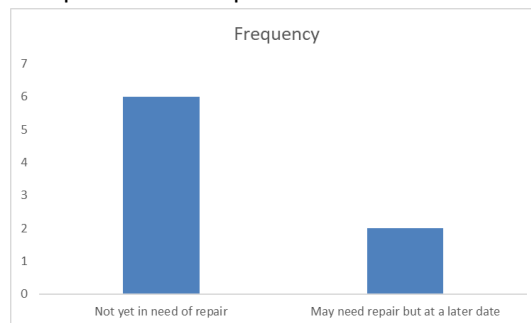
Figure 2.
Musculoskeletal complaint score

Respondents based on musculoskeletal complaints in Figure 2 demonstrated that six respondents (75%) said they did not need improvement, and three respondents (25%) said they might need improvement in the future. Frequency percentages indicate the proportion of respondents in each musculoskeletal complaint category. 75% of respondents did not feel the need for improvement for their musculoskeletal complaints, while 25% felt they might need improvement in the future. This indicates that the majority of respondents did not perceive a serious problem at this time.

Discussion

Stress is an inherent part of life that every individual faces continuously and can cause various physical, psychological, and socio-contextual impacts (Ghasemi et al., 2024). This concept is rooted in the body's basic need to maintain a stable internal state, or homeostasis, as proposed by Claude Bernard (Ghasemi et al., 2024). Any condition or factor that threatens this balance is known as a stressor. These stressors can manifest in a wide variety of forms, ranging from acute triggers such as the fear of a near-accident to chronic stressors such as prolonged emotional distress. The level of stress a person experiences is greatly influenced by the nature of the stressor and how the individual's body and psychology respond to it (Ghasemi et al., 2024).

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This study found that 75% of respondents experienced moderate levels of stress, while only 25% experienced mild levels of stress. The average stress score for South Sulawesi pencak silat athletes was 1.88, indicating that most respondents experienced relatively low levels of stress. Low levels of stress are characterized by a person experiencing moderate levels of emotional or physical tension. This mild stress is useful for helping them cope with everyday problems and carry out their daily routines. This condition can occur in everyday life and provides a warning signal to prevent unwanted events from occurring. This aligns with the survey results in a study conducted by Rusdiyanto (2018), which stated that all athletes were able to control their emotions regardless of how dire the circumstances.

When things got worse, these athletes were able to offer advice on how to remain calm, and this was very helpful. When athletes felt tense, they were able to manage the tension and defuse it. These athletes were able to think positively and remain prepared during the competition without dwelling on the severity of the situation. Almost all athletes assumed that pressing situations were obstacles they could welcome and enjoy. However, not all athletes performed better under pressure, but they were able to overcome it. Mistakes often occur when athletes are under pressure, but this should not be considered a weakness (Rusdiyanto, 2018). A period of complete rest to recover from a severe acute injury can also help relieve emotional burdens. This condition shows that each type of injury requires different attention, consideration, and treatment approaches according to the characteristics of the injury pattern (Aldanyuwi & ALQirani, 2024).

Developing short-term and long-term psychological readiness for team athletes, especially soccer players, needs to focus on increasing self-confidence. Strengthening this aspect can increase motivation to achieve, help athletes set clearer goals, and improve their ability to accept and respond to criticism from the environment (Kapl, 2024).

Psychological stress requires special attention, especially for individuals with mental health problems or who lack effective stress management strategies (Scheid et al., 2024). Stress levels that are above or below optimal limits do not support peak performance. Several studies on mental stress resulting from participation in sports competitions, as reported by B.A., show that individual nervous system characteristics and temperament play a significant role in the formation of stress, the dynamics of stress responses, and its impact on athlete success in competition (Boltobaev, 2022)..

Under relatively low stress conditions, athletes with both strong and weak nervous systems are generally able to perform close to their training levels (Boltobaev, 2022). However, under high stress levels, athletes with strong nervous systems tend to experience a slight decline in performance, while athletes with weak nervous systems show a greater decline. Longitudinal studies of the same athletes also revealed that the two groups performed best at different levels of stress: athletes with weak nervous systems performed optimally under low stress conditions, while athletes with strong nervous systems performed best under moderate to high levels of stress. These findings are reinforced by research on competitive stress that considers variations in temperament, particularly anxiety, impulsivity, and emotional responsiveness (Boltobaev, 2022).

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Life pressures can cause athletes to lose direction due to a lack of experience and skill, thus impairing concentration, motivation, and physical condition. If sustained, this stress and negative emotions drain mental and physical energy, ultimately leading to emotional exhaustion, decreased motivation, and a diminished sense of accomplishment—conditions that manifest as athlete burnout (Ma et al., 2025).

CONCLUSION

The study results indicated that most athletes experienced moderate stress levels, followed by mild stress. Furthermore, the findings indicated that most athletes did not report musculoskeletal complaints, with some requiring more attention in the subsequent period. Overall, thorough monitoring of athletes' physical and psychological conditions provides an important foundation for developing more adaptive training strategies that are responsive to their needs.

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