

## Injury in Pencak Silat Teenage Competitive Category Athletes at the Special Sports Class in Central Java

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### Abstract

This research aims to identify the patterns, types, and nature of injuries experienced by teenage Pencak Silat athletes in the competitive category from the Special Sports Class in Central Java Province. The method applied in this research is quantitative descriptive with a survey technique using questionnaires and interviews. The subjects of this research are 30 teenage Pencak Silat athletes from the Special Sports Class in Central Java Province who meet the criteria of having trained in Pencak Silat for a minimum of 5 years and having participated in Pencak Silat competitions at the district, provincial, and national levels. The data analysis technique used in this research is the qualitative frequency and percentage analysis conducted using Microsoft Excel software. The results show that all teenage Pencak Silat athletes in the competitive category from the Special Sports Class in Central Java Province have experienced injuries, with the details as follows: head injuries account for 9.26%, body injuries for 4.63%, hand injuries for 46.30%, and leg injuries for 39.81%. Based on this data, it is also evident that hand injuries are the most common among teenage Pencak Silat athletes in the competitive category from the Special Sports Class in Central Java Province, followed by leg injuries, head injuries, and the least common are body injuries.

**Keywords:** Injury, Pencak Silat, Teenage, Competitive Category, Central Java

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## 1. INTRODUCTION

The growing popularity of Pencak Silat as a competitive sport in Indonesia, particularly in Central Java, is steadily increasing. Koiril (2021) states that the high public enthusiasm for Pencak Silat has created an urgent need for a deeper understanding of the injuries frequently experienced by athletes, especially those involved in competitive categories. Pratama (2021) states that the rising public interest in Pencak Silat is due to the sport not only enriching cultural heritage but also becoming a severe competitive arena. This situation has made researchers and health practitioners increasingly aware that Pencak Silat athletes, with high training intensity and fierce competition, are vulnerable to various types of injuries, ranging from minor to severe injuries that could threaten their future careers.

The differences in training intensity, fighting techniques, and competition conditions among teenage Pencak Silat athletes at various training centres raise significant questions regarding the potential variation in individual injury patterns (Yuliani et al., 2018). Adolescents in the growth and physical development phase tend to be more susceptible to injuries, particularly those resulting from the stress placed on bones and joints during intensive training (Setiyowati, 2023). Different fighting techniques and the high level of competition at the teenage level can influence the types of injuries that may occur (Perwira, 2022). Further research is needed on the patterns, types, and nature of injuries experienced by teenage Pencak Silat athletes to develop appropriate prevention strategies, especially in terms of safety protection, to ensure the continuity of their participation in this sport.

The limitations of medical resources and sports infrastructure in rural areas of Central Java province affect the accessibility of treatment and rehabilitation for injured Pencak Silat athletes. Prastyoko & Nila (2021) state that environmental factors are essential in determining the injury risk level for teenage Pencak Silat athletes. Izzah et al., (2020) also note that one of the main factors that can make Pencak Silat athletes prone to injury is inadequate competition arenas. Umar (2022) explains that uneven or slippery surfaces in arenas can pose a significant risk for athletes, as they increase the likelihood of slipping or falling during competitions. Holes or poor levelling in the training grounds can cause athletes to trip or fall unexpectedly, increasing the risk of injuries to specific body parts such as knees, ankles, or wrists.

The limited availability of protective equipment is also a severe issue for Pencak Silat athletes (Anifah et al., 2022). Many teenage Pencak Silat athletes often need more access to protective gear, such as sturdy helmets and high-quality body protectors. The lack of proper protective gear increases the risk of serious injury during fights or training, mainly due to the high physical contact in martial arts (Del Vecchio et al., 2018). Efforts to improve the availability of high-quality protective equipment and enhance the condition of competition grounds are crucial in reducing injury risks for teenage Pencak Silat athletes in Central Java.

The lack of adequate scientific literature on injuries experienced by teenage martial arts athletes, including head, body, hand, and foot injuries, hinders the development of effective prevention and treatment strategies (Hughes, 2020). The limited understanding of the types and patterns of injuries experienced by teenage Pencak Silat athletes causes many parents to worry about their children's safety (Subhan et al., 2018). Researchers and health practitioners struggle to design appropriate prevention programmes and treatment methods without sufficient scientific literature. A low understanding of injuries in martial arts reduces Pencak Silat athletes' confidence in avoiding severe injuries that could affect their health and performance in competitions (Latif

et al., 2022). Further research on data collection processes regarding injuries among teenage Pencak Silat athletes, particularly in Central Java, is urgently needed. Data on injuries to teenage Pencak Silat athletes can provide a foundation for coaches and various stakeholders to address the challenges these athletes face, especially regarding injury care standards for head, body, hand, and foot injuries.

A better understanding of the most common types of injuries and the risk factors associated with Pencak Silat athletes will enhance awareness of injury prevention and management among teenage Pencak Silat athletes. More profound knowledge of the types of injuries frequently occurring in Pencak Silat practice, such as head, body, and foot injuries, along with a better understanding of the factors that cause these injuries, such as training conditions and intensity, will help formulate more effective prevention strategies. Additionally, with a better understanding of how to manage injuries immediately and through appropriate rehabilitation programmes, teenage Pencak Silat athletes can receive better and faster care. This enables them to return to optimal physical condition and continue participating in the sport more confidently and safely.

## **2. METHOD**

This study falls within the realm of quantitative descriptive research in the form of a survey aimed at depicting phenomena or occurrences by collecting and analysing quantitative data. This aligns with the perspective of Kim et al., (2017), who stated that qualitative descriptive research describes the characteristics or state of a phenomenon without statistical measurement or analysis. In the context of Pencak Silat, this type of research can provide a deeper understanding of the types and patterns of injuries commonly experienced by teenage athletes and the environmental or training factors contributing to these injury risks. Quantitative data can be systematically collected and statistically analysed to identify specific patterns or trends in injuries among teenage Pencak Silat athletes.

### **2.1 Participants**

The subjects of this study are 30 teenage Pencak Silat athletes aged 14-17, originating from the Special Sports Class of Central Java, who have criteria of having trained in Pencak Silat for a minimum of 5 years and have participated in Pencak Silat competitions at various levels from district to national level. Establishing specific criteria for research subjects ensures an accurate depiction of the effects of the variables (Cypress, 2017). In this study, criteria are set to ensure that the research subjects have sufficient experience and skills in Pencak Silat so that the research results can reflect relevant physical conditions and performance for experienced Pencak Silat athletes. A minimum of 5 years of training experience and participation in various competitions ensure that the athletes have gone through multiple learning and skill development phases and have a deep understanding of techniques, strategies, and competition conditions.

### **2.2 Research Design**

The research design employs a quantitative descriptive survey approach. This survey is conducted to gather quantitative data on injuries experienced by teenage competitive category Pencak Silat athletes at the Special Sports Class in Central Java, including head, body, hand, and foot injuries. Researchers can directly collect data from participants through specially designed questionnaires using a survey design. This approach allows statistical analysis to identify specific patterns or trends in injuries among teenage Pencak Silat athletes and understand the relationship

between environmental or training factors and injury occurrences. Thus, this research design enables researchers to gain a deeper understanding of the injury phenomenon in the teenage competitive category Pencak Silat at the Special Sports Class in Central Java.

### **2.3 Instruments**

The instrument used in this research is a questionnaire, a standard data collection tool in quantitative research. According to (Breakwell et al., 2020), a questionnaire is a set of written questions designed to gather information from respondents about specific attitudes, behaviours, or characteristics. In this study, the questionnaire is divided into four primary indicators: head injuries, body injuries, hand injuries, and foot injuries, to provide a comprehensive framework for understanding the types of injuries experienced by teenage Pencak Silat athletes in Central Java. By employing the questionnaire as the primary instrument, researchers can systematically gather structured data regarding injuries experienced by respondents and analyse the results to identify significant patterns or trends.

### **2.4 Procedures**

In this study, the survey implementation procedure involves a systematic approach to data collection. Firstly, participants are provided a carefully prepared questionnaire covering various injuries relevant to Pencak Silat. Subsequently, they are requested to complete the questionnaire honestly and accurately based on their experiences. Throughout the questionnaire completion process, researchers are present to provide clarification or assistance if needed. Once the data is collected, statistical analysis is conducted to identify patterns or trends emerging in injuries among teenage Pencak Silat athletes. This procedure ensures the obtained data are valid and reliable to support the research findings.

### **2.5 Data Analysis**

The data analysis technique employed in this research is the qualitative frequency and percentage analysis conducted using Microsoft Excel software. Qualitative analysis is a research method to understand complex phenomena deeply (Tomaszewski et al., 2020). In this study, qualitative analysis is performed by gathering data on the types of injuries experienced by teenage Pencak Silat athletes in Central Java, classified based on their frequency of occurrence and presented in percentage form for each identified injury type. This aims to provide a more precise and structured overview of the severity and prevalence of each injury type. By utilising tools such as Microsoft Excel, researchers can efficiently process and analyse data systematically, thereby enabling the generation of more accurate and accountable findings.

The analysed data is then presented in tables and histograms, aiming to facilitate readers in comprehending the meaning of the research findings visually. According to (Ahmad & Wathon, 2023), presenting data in graphical forms such as tables and histograms can aid in presenting information more clearly and comprehensibly, allowing readers to observe emerging patterns or trends directly. In this way, readers can quickly identify relevant information about the most common types of injuries and the distribution and frequency of each injury type among teenage Pencak Silat athletes in Central Java. By employing this method, the research findings can make a meaningful contribution to understanding injury issues in Pencak Silat sports and assist in developing more effective prevention strategies.

### 3. RESULTS

Based on the research findings conducted over 4 weeks, a significant amount of important information regarding injuries experienced by teenage competitive category Pencak Silat athletes at the Special Sports Class in Central Java has been obtained. This study provides a more precise overview of the types and prevalence of injuries in Pencak Silat sports, particularly among teenage competitive category athletes. One of the initial findings in this research is that the competitive category in Pencak Silat is the most susceptible to injuries, supported by factors such as the high level of competition intensity and the complexity of fighting techniques employed. Some sources suggest that inadequate competition arena conditions, lack of quality protective equipment, and high training intensity may influence the injury rate among teenage Pencak Silat athletes.

The teenage Pencak Silat athletes from the Special Sports Class in Central Java revealed that almost every part of their bodies, from the head, body, hands and legs, has experienced injuries ranging from mild to severe. This is due to the high training intensity, where almost every training session includes sparring programs, during which the athletes engage in intensive physical contact. In these training sessions, they are accustomed to striking, kicking, blocking, and even throwing their opponents, increasing the risk of injuries to various body parts. The impact of such rigorous training underscores the importance of efforts to enhance awareness of safe training techniques and the need to implement more effective injury prevention strategies in teenage Pencak Silat training in Central Java. The following presents the data on injuries experienced by teenage Pencak Silat athletes from the Special Sports Class in Central Java.

**Table 1.**

Injuries Data of Teenage Competitive Category Pencak Silat Athletes at the Special Sports Class in Central Java

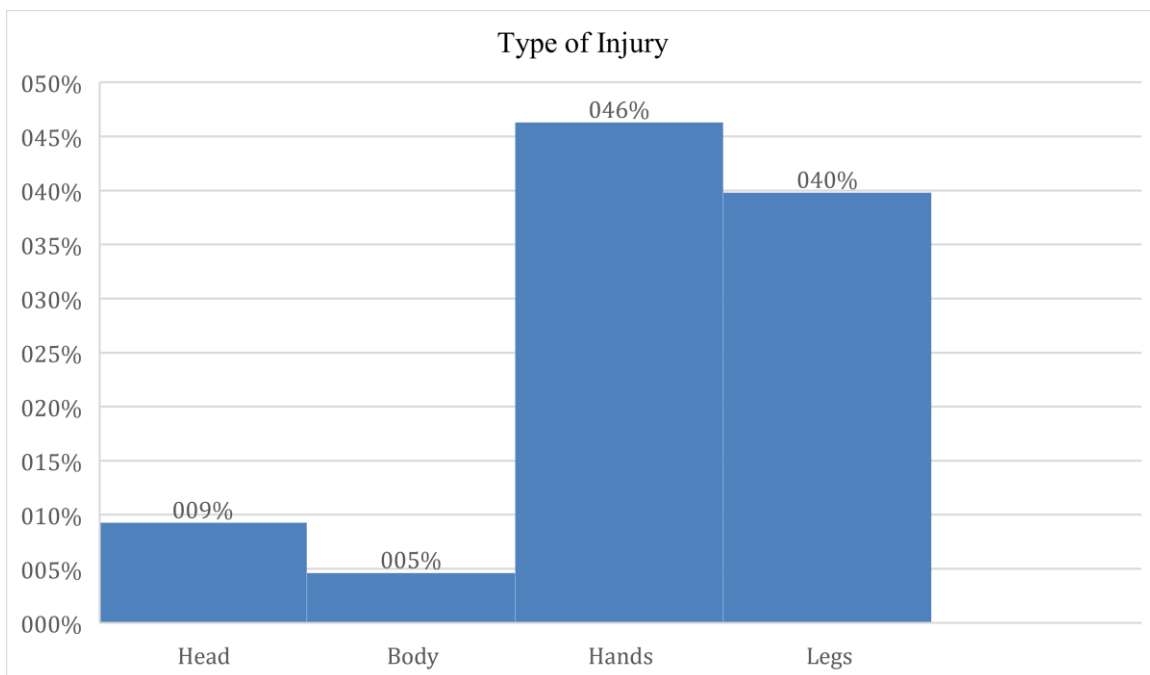
Number	Type of Injury	Frequency	Present
1	Head	10	9,26%
2	Body	5	4,63%
3	Hands	50	46,30%
4	Legs	43	39,81%
	Total	108	100%

Based on the table above, it can be explained that all teenage competitive category Pencak Silat athletes at the Special Sports Class in Central Java have experienced injuries, with the following accumulation details: 10 head injuries, accounting for 9.26%; 5 body injuries, accounting for 4.63%; 50 hand injuries, accounting for 46.30%; and 43 leg injuries, accounting for 39.81%. This description shows that hand injuries are the most common among teenage competitive Pencak Silat athletes at the Special Sports Class in Central Java, accounting for

46.30%, followed by leg injuries at 39.81%. Head injuries are at 9.26%, and the least frequent injuries occur in the body at 4.63%. This data also demonstrates that in the competitive category of Pencak Silat, striking and kicking techniques are the most frequently used to score points and win matches. This condition leads Pencak Silat athletes to excessively exert their hand and leg muscles during training and competition, resulting in frequent injuries. If the data in the table above were presented in the form of a histogram, it would appear as follows:

**Figure 1.**

Histogram of Injury Data for Teenage Competitive Category Pencak Silat Athletes at the Special Sports Class in Central Java



Based on the research findings, various factors contributing to the injury rates among teenage Pencak Silat athletes have been identified, including head, body, hand, and foot injuries, which can be detailed as follows. Firstly, non-standard field conditions, such as unevenness or surface slipperiness, pose a significant risk, increasing the likelihood of slipping or falling. Secondly, the lack of quality protective equipment amplifies the risk of serious injuries when engaging in intensive physical contact. Thirdly, high training intensity, including sparring programs involving intensive physical contact, places extra strain on the athletes' bodies, increasing the risk of injuries to various body parts. By understanding these factors, preventive measures and improvements can be implemented to safeguard the athletes' health and minimise injury risks in teenage Pencak Silat.

#### 4. DISCUSSIONS

In the context of Pencak Silat sports, the most common types of injuries include head, body, hand, and leg injuries. Head injuries often result from impacts or blows during training or matches, mainly due to intensive punching and kicking techniques. This aligns with the findings of Hammami et al., (2018), who highlighted factors such as the high intensity of physical contact

and inadequate use of head protection contributing to head injuries. Many athletes and coaches still overlook the importance of head protection, particularly during daily routine training. Body injuries typically occur from falls or hard impacts, with uneven or slippery field conditions being the primary risk factors, as indicated by (Behar et al., 2019). Therefore, coaches and athletes should utilise comprehensive body protective equipment to mitigate these risks. Hand injuries commonly arise from excessive pressure during blocking or striking, influenced by inadequate fighting techniques and lack of hand protection (Beránek et al., 2023). Leg injuries often stem from unstable positions or muscle fatigue (Heidarian, 2018). Leg injuries also occur due to kicking movements or evading opponent attacks unsupported by balance and adequate footwear. By understanding the most common types of injuries and their influencing factors, appropriate preventive measures can be taken to safeguard the health of teenage Pencak Silat athletes and minimise the risk of serious injuries.

Injuries in teenage Pencak Silat athletes have significant impacts not only on the physical aspect but also on the mental and emotional aspects, directly affecting their well-being and performance. The mental and emotional effects of injuries encompass stress, anxiety, and uncertainty about recovery and the future of their sports careers (Wiese-Bjornstal, 2019). Physically, injuries can cause pain, discomfort, and even impairments that hinder participation in training and competitions. For some athletes, injuries can disrupt motivation and confidence, potentially leading to depression or reduced competitive spirit (Martín-Rodríguez et al., 2024). The long-term implications of head, body, hand, and leg injuries can significantly affect their sports careers in the short and long term (Hammami et al., 2018). For example, head injuries may potentially lead to long-term neurological impacts such as cognitive impairments or balance issues. Body injuries can disrupt body movements and the athlete's ability to participate optimally in training and competitions. Hand and leg injuries can impede athletes' ability to perform typical Pencak Silat techniques and movements, affecting their performance in competitions. Therefore, paying attention to and managing injuries properly and taking appropriate preventive measures to safeguard the health and performance of teenage Pencak Silat athletes in the long term is essential.

Preventive strategies for head, body, hand, and leg injuries are recommended based on research findings. Preventive measures include enhancing facilities, providing adequate protective equipment, and developing safer training techniques (Liu et al., 2023). Awareness of the importance of proper warm-up and cool-down before and after training or competitions is also essential. By implementing these strategies, it is hoped that the risk of injury can be reduced, ensuring the long-term health and optimal performance of teenage Pencak Silat athletes. Collaboration among coaches, athletes, and medical personnel is crucial in monitoring health conditions and providing appropriate care when injuries occur (Follmer et al., 2020). Through collective efforts and injury prevention awareness, teenage Pencak Silat athletes can maintain their physical and mental fitness and pursue their sports careers more effectively.

The role played by coaches and team managers in minimising the risk of head, body, hand, and leg injuries is crucial. The coach emphasises the importance of safe combat techniques and closely supervises athletes during training and matches (Tulendiyeva et al., 2021). By maintaining strict supervision, they can identify potentially risky situations and take necessary preventive steps to avoid injuries. Swift and accurate handling of combat athlete injuries is also essential to the coach and team manager's role, speeding up athlete recovery processes and preventing further complications (Korobeynikov et al., 2017). This collaboration among coaches, team managers, and medical staff is critical in creating a safe and supportive environment for

teenage Pencak Silat athletes. Coaches and team managers are also responsible for educating athletes about the signs and symptoms of injuries and the preventive measures they can take independently. With sufficient knowledge, athletes will better identify potential injury risks and take appropriate actions to protect themselves during training and competitions.

## 5. CONCLUSIONS

Understanding the injuries sustained by teenage Pencak Silat athletes opens up opportunities to enhance their protection and well-being during training and competition. By considering the most common types of injuries and the factors influencing them, appropriate preventive measures can be taken to minimise the risk of serious injuries. The research findings indicate that all teenage Pencak Silat athletes in the competitive category from the Special Sports Class in Central Java have experienced injuries, with the following breakdown: head injuries at 9.26%, body injuries at 4.63%, hand injuries at 46.30%, and leg injuries at 39.81%. Based on this data, it can also be inferred that hand injuries are the most commonly experienced by teenage Pencak Silat athletes in the competitive category from the Special Sports Class in Central Java, followed by leg injuries and head injuries, with body injuries being the least frequent.

Through collaboration among coaches, team managers, athletes, and medical personnel, as well as an increased awareness of safe training techniques, it is hoped that teenage Pencak Silat athletes can maintain their health and performance and pursue their sports careers enthusiastically and confidently. Recommended injury prevention and management strategies based on research findings include improved and innovative protective facilities and equipment, such as wearable and sensor technology, development of safer exercise techniques, such as data analysis, AI, new recovery methods, and holistic approaches, as well as promotion of awareness about proper heating and cooling. Collaboration among coaches, athletes, and medical personnel is vital in monitoring health conditions, providing appropriate care, and educating athletes about injury signs, symptoms, and preventive measures they can take. With collective efforts and awareness of the importance of injury prevention, it is expected that teenage Pencak Silat athletes can maintain their physical and mental fitness and pursue their sports careers more effectively.

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