Injury prevalence among cricket athletes in East Java: A cross-sectional study

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ABSTRACT

Background: Cricket has a risk of injury that needs to be considered, especially for athletes in East Java. This study aims to understand the prevalence of injuries in East Java cricket athletes, including the type, location, cause, time of occurrence, and treatment, as an effort to prevent and improve athlete performance.

Objectives: This study aims to determine the prevalence, types, causes, timing, and management of injuries among cricket athletes in East Java.

Methods: This study uses non-experimental descriptive quantitative methods, with a cross-sectional study and total sampling technique. 25 Indonesian East Java Province Cricket athletes with an age of 22.68+2.32, height of 163.2+6.78, and weight of 60.32+10.06, consisting of 13 male athletes and 12 female athletes, were involved in this study. This research instrument used a questionnaire to collect data. Data were analyzed using percentage analysis.

Results: The results showed that abrasions (36%) and muscle cramps (20%) were the most frequent injuries, especially affecting the lower extremities (56%). Overtraining (52%) was the leading cause, and injuries mainly occurred during training (52%). The RICE method was the most frequently applied treatment (60%).

Conclusions: This study highlights the need for structured training programs and preventive strategies to reduce the incidence of injuries.

Keywords: cricket, injury management, injury prevalence, RICE method.

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INTRODUCTION

Sports are physical activities and a basic need that every individual must fulfill. In today's modern life, sports have become integral to various aspects of life, such as education, work, and recreation (Kurnia, 2020). Through regular exercise, one can improve fitness and endurance and maintain optimal performance in the long term (Haryanto & Welis, 2019). Maintaining a healthy lifestyle through intensive exercise is the best step for a healthy body. Diligent exercise is proven to keep the body fresh, healthy, and ready for daily activities (Anggraini & Alnedral, 2019).

One sport that offers many physical and mental benefits is cricket. However, cricket also has injury risks that players must be aware of. Activities such as bowling, catching, and wicket-keeping are the leading causes of injury. The majority of injuries occur acutely, followed by acute-chronic and chronic injuries. Hamstring injuries are the most common in modern cricket, while stress fractures in the lower back region in fast bowlers are among the most serious (Pardiwala et al., 2018).

Sports injuries are one of the major limiting factors in athlete performance and career sustainability, including in cricket, which involves explosive movements such as sprinting, bowling, and fielding (McLeod et al., 2023; Shafi, 2014). Although cricket is not a full-contact sport, the high frequency of intensive physical activity puts athletes at risk of injury, especially to the lower extremities (Pardiwala et al., 2018). Injury epidemiology studies have been conducted in several countries with strong cricketing traditions to develop effective prevention programs (Stretch & Venter, 2003). However, in Indonesia, particularly in the East Java region, valid data on the prevalence and characteristics of injuries in cricket athletes is still minimal. The absence of such data hinders the formulation of evidence-based training and injury management strategies appropriate to the local context (Lystad et al., 2021). Therefore, this study is essential to fill this regional data gap and provide a scientific foundation for coaches, sports federations, and medical teams to optimize training and injury prevention programs to improve the quality and sustainability of cricket athletes in Indonesia (Dubois & Esculier, 2020).

While many studies have addressed the epidemiology of injuries in cricket, most have focused on elite players or communities in countries with strong cricketing traditions such as Australia, England, and India. For example, a study by Stretch & Orchard (2003) examined injury incidence in cricketers in South Africa, while a study by Orchard et al. (2016) focused on professional cricketers in Australia. However, to date, no studies have specifically explored the prevalence and risk factors of injuries in cricket athletes in the East Java region of Indonesia. This suggests a gap in knowledge regarding the epidemiology of cricket injuries at a regional level in Indonesia.

This study aims to fill this gap by exploring the prevalence, etiology, and risk factors of injuries in cricket athletes in East Java. In contrast to previous studies that focused on elite populations or communities in specific countries, this study will provide new insights into the epidemiology of cricket injuries in Indonesia, specifically in East Java. In addition, this study will consider local factors that may influence injury risk, such as field conditions, training facilities, and the level of coach education regarding injury prevention.

The results of this study are expected to contribute significantly to the global understanding of injury epidemiology in cricket. Adding data from Indonesia, specifically East Java, to the existing literature, this study will assist in developing

more inclusive and contextualized injury prevention strategies. Furthermore, the findings from this study can be used as a basis for designing more effective training and injury prevention programs in Indonesia and other countries with similar conditions.

METHODS

Study Design and Participants

This study uses non-experimental methods, namely descriptive quantitative methods, cross-sectional study methods, and total sampling techniques. Hence, all population members become sample members in the East Java Cricket athletes. Thus, the research sample consisted of 25 athletes, 13 male and 12 female. This instrument uses a questionnaire to collect data. Questionnaires form written questions to collect information from respondents about research topics, usually related to personal data, opinions, or related information (Winarno, 2013).

Ethical approval statement

Ethical clearance of the study was sought from the Universitas Negeri Malang, Indonesia with the Number: 29.11.8/UN32.14/PB/2024.

Research Instruments

This research instrument uses a questionnaire to collect data. A questionnaire is a list of written questions to collect information from respondents about research topics, usually related to personal data, opinions, or related information (Winarno, 2013). Data collection is done by giving a questionnaire that has been loaded in Google Forms to all athletes. The athletes were asked to answer all questions.

Data Analysis

After the data is obtained, it will be analyzed using percentage analysis. The incidence of injury is presented in percentage form. The formula for processing the data is as follows (Malik & Minan Chusni, 2018).

$$\mathbf{P} = \frac{\boldsymbol{F}}{\boldsymbol{N}} \boldsymbol{x}\ \mathbf{100}\ \%$$

P : Percentage
F : Frequency
N : Number of respondents

RESULTS

This description is intended to describe the data, namely, the various answers from respondents encountered and the contents of the questionnaire in the study to find out information on injuries experienced by East Java cricket athletes.

The type of injury experienced by East Java cricket athletes is mostly wound/abrasion injuries which amounted to 9 (36%) and the least is hematoma injury with a percentage of 4% (Table 1). From Table 2, it can be seen that the majority of body parts affected by injuries in East Java cricket athletes occur in the lower extremities with a percentage of 56%. The cause of injury in East Java cricket athletes is mainly external factors in the form of overtraining, with a total incidence of 52%. Moreover, 48% of events are caused by internal factors (Table 3).

Table 1. Injury Types by East Java Province Cricket Athletes

Types of injuries	n	Percentage (%)
Wounds/abrasions	9	36
Muscle cramps	5	20
Strain	5	20
Sprain	2	8
Contusio	3	12
Hematoma	1	4
Dislocation	0	0
Fracture	0	0
Head injury	0	0
Total	25	100

Table 2. Injury locations experienced by East Java Province Cricket Athletes

Regio	Sub Regio	n	Percentage (%)
Head, Neck	Head	2	8
	Nose	0	0
Upper extremity	Shoulder	4	16
	Elbow	0	0
	Hand	2	8
	Wrist	1	4
	Finger	2	8
Torso	Hips	0	0
Lower extremity	Thighs	4	16
	Knee	3	12
	Feet	5	20
	Ankle	2	8
	Toes	0	0
Total		25	100

Table 3. Causes of Injury

Cause	Causal factors	n	Percentage (%)
	Over Training	13	52
	Over Used	3	12
	Field Condition	3	12
	Fatigue	2	8
	Collision	4	16
	Total	25	100

Table 4. Time of injury

Time of injury		n	Percentage (%)
Round	Training	13	52
	Matches	2	8
	Training and Match	10	40
	Total	25	100

52% of injuries experienced by East Java cricket athletes occurred during training, indicating a need to re-evaluate training intensity (Table 4). Table 5 shows the acquisition of injury treatment that must be done. Most first aid was done using the RICE Method, which amounted to 15 (60%). This study has a goal: the type of injury, the cause, the time of occurrence, and how to handle these injuries in East Java cricket athletes, and data obtained through questionnaires addressed to East Java cricket athletes who departed BK-PON CRICKET in 2023.

Table 5. Injury treatment in athletes

Injury Treatment Performed	n	Percentage (%)
RICE method	15	60
PRICE method	10	40
POLICE method	0	0
PEACE & LOVE method	0	0
Pain medication administration method	0	0
Total	25	100

DISCUSSION

Type of Injuries

Based on the results of the analysis obtained that the type of injury experienced by East Java cricket athletes with a total of 25 respondents is a wound/blister injury (36%), muscle cramps injury (20%), strain injury (20%), sprain injury (8%), contusion injury (12%) and hematoma injury (4%). In previous research, according to Ihsan (2024), bruising injuries, which often occur on the hands, stand out as the most common type of injury, followed by cuts/abrasions and muscle cramps. According to Pardiwala et al. (2018), an epidemiological study showed that in Edinburgh, 22.4% of all injuries were caused by sport, and 2.5% were caused by cricket, i.e., abrasions/bruises.

The findings in this study are consistent with international literature. For example, in a multi-country study, Pardiwala et al. (2018) mentioned that cricketers' abrasions, muscle cramps, and strains were common injury types, mainly due to accumulated fatigue and poor biomechanical posture while bowling and fielding. In Australia, Orchard et al. (2016) also identified that more than 60% of injuries occur during training sessions due to high work volume without adequate recovery breaks.

However, differences emerged in treatment methods. This study used the RICE (60%) and PRICE (40%) methods. In contrast, some developed countries have started to adopt the PEACE & LOVE method, which emphasizes active recovery and education (Dubois & Esculier, 2020). This means the local understanding of injury recovery protocols must still be expanded.

Location of Injury

The part of the body that was injured in East Java cricket athletes occurred in the shoulder at 16%, and the majority in the lower extremities, with a percentage of 56%. This is because cricket is a sport that relies on the body's lower extremities. In addition to the upper body muscles, the lower body muscles, or lower extremities, also have a vital role in the game of cricket. According to Pardiwala et al. (2018), in a longitudinal study on the nature of injuries in South African cricketers, injuries to the lower limbs accounted for almost half of the injuries (49.8%). They mainly included injuries to the hamstrings (17.8%) and quadriceps (10.1%), patella and knee (18.5%), and ankle (10.6%) muscles. Injuries in cricket athletes are often related to suboptimal body mechanics, such as in the lower extremities of the legs, which are often injured excessively without sufficient recovery time. They can cause short or long-term injuries (Jacobs et al., 2021). Handling injuries in cricket athletes can be done using the PRICE method. In addition, developing a rehabilitation program aims to maximize recovery in the legs and prevent the recurrence of injuries. Lower extremity injuries that are not appropriately treated can end the career of a cricket player. Research focusing on injury prevention can reduce the financial burden of medical treatment and loss of playing time.

Factor of Injuries

Based on the research, the causes of injuries that often occur in East Java cricket athletes almost all occur due to overtraining, with a percentage of 52%, collisions of 16%, overuse and field injuries of 12%, and fatigue of 8%. The results showed that most injuries in athletes were caused by external factors in the form of continuous training without recognizing the need for time and rest (overtraining).

This is related to the characteristics of the game of cricket, which requires explosive movements and has a high intensity, resulting in fatigue due to continuous training without knowing when to rest. Overtraining can lead to an increased risk of injury in cricket players, such as shoulder, elbow, lower back, and knee injuries (Forrest et al., 2017; Zondo, Abdullahi, & Noorbhai, 2023). These often result from repetition of movements such as bowling or batting. This research is important to help coaches and health teams design balanced training programs, ensure athletes have adequate recovery time, and avoid overtraining.

Time of Injuries

The incidence of injury in East Java cricket athletes occurred during training, and a percentage of 52%. This shows that most injured athletes can continue the match, even though some are in pain.

The amount of overtraining that causes lower extremity injuries during training is due to several factors, namely 1) minimal rest time increases the risk of injury, 2) insufficient recovery time between training sessions, and 3) increased training intensity without adequate recovery. Research on the timing of injuries can help understand when the risk of injury is highest. Knowing whether the risk is at a particular time (acute) or develops slowly (chronic) can help in prevention planning (Bache-Mathiesen et al., 2023). Injury timing research can help develop optimal training schedules, with sufficient rest periods to prevent injuries from overtraining or matches too close together, and allow specific preventative training programs to reduce the risk of certain injuries at certain times.

Relationship between Variables and Critical Analysis

Data analysis showed that most injuries occurred during training sessions (52%), with the dominant injury type being cuts/abrasions (36%). This suggests that training conditions, including inadequate court surfaces and a lack of protective gear, contributed to the high injury rate. The study by Orchard et al. (2016) also found that injuries were more common during training than matches due to longer training duration and minimal medical supervision.

In addition, injuries to the lower extremities, such as the thighs and legs (56%), were closely associated with activities such as sprinting and sudden changes of direction that are common in cricket. Lempainen et al. (2022) noted that such activities increase the risk of hamstring and quadriceps muscle injuries.

Injury Treatment

Handling given to athletes is done using the rice method by 60% and the price method by 40%. Coaches and teams entirely carry out first aid for injuries to East Java cricket athletes. The handling must be based on the type of injury experienced by the athlete, so that the athlete can recover quickly and vice versa. If the handling is inappropriate, it will hurt the athlete's injury condition. The provision of proper handling also has a positive impact on psychological conditions in the form of a decrease in anxiety levels (Catalá, Peñacoba, Pocinho, & Margarido, 2021;

Lempainen et al., 2022; Reese, Pittsinger, & Yang, 2012). This indicates that the medical team and the coach's role are important for injury relief outside their primary tasks.

The RICE (Rest, Ice, Compression, Elevation) method is one of the standard approaches in managing acute injuries, especially soft tissue injuries, such as sprains, strains, or hard impacts (Harmianto, Nurman, Erlinawati, & Age, 2024; Setiawati, E., Ivan, & Sjaaf, 2024). The basic theory behind the RICE method is to reduce swelling, pain, and inflammation in the early stages of injury, thereby speeding up recovery. It is important to understand how to administer first aid for injuries properly.

Cricket players often suffer acute injuries from explosive movements, such as ankle, hamstring, and knee sprains. In cricket, players need a quick recovery strategy to avoid injury accumulation. The RICE method can be an efficient solution for acute injury management amid competition. Proper management of acute injuries using the RICE method can prevent the development of chronic injuries. Rapid recovery from injury with the RICE method supports long-term fitness and prolongs the career of professional athletes.

This study has not stratified the data by gender, playing position (bowler, batsman, wicket keeper), or length of athlete experience, even though these variables may influence the injury profile. Stretch & Venter (2003) showed that bowlers have a higher risk of lower back and shoulder injuries, while batters are more prone to hand injuries. Gender differences are also influential; a study by Lystad et al. (2021) mentioned that female athletes have a greater risk of ligament injuries due to biomechanical and hormonal differences. Further research should consider stratifying data based on these characteristics to better target recommendations.

The results of this study are important for coaches, sports federations, and medical teams. First, training programs should be designed with athletes' physical limits in mind and provide adequate rest periods to prevent overtraining. Secondly, there is a need for first aid education and training for coaches to provide timely treatment. Third, these results provide an important basis for sports organizations to design national guidelines on injury management in young athletes.

Theoretically, this study enriches the literature on the epidemiology of sports injuries in developing countries. It opens opportunities for further exploration of the influence of training culture, infrastructure, and tropical climate on athlete injury patterns.

This study provides an initial foundation for developing injury prevention policies in cricket in Indonesia, especially at the regional level. Going forward, studies with longitudinal designs or interventions such as implementing structured warm-up programs or wearable technology to monitor training loads are highly recommended. Studies can also be expanded to include early age athletes, school competitions, and interprovincial comparisons to understand national variations in injury patterns.

Limitations of the study

One of the limitations of this study is that it has limited sample criteria, so it cannot represent the entire population of young athletes. Questionnaires or interviews can be influenced by social and psychological factors, such as providing answers that aim to satisfy researchers. Finally, the study's results may be less applicable to types of sports with different characteristics from cricket games.

CONCLUSIONS

The study concludes that some types of injuries that most often occur in East Java cricket athletes are wounds/abrasions, muscle cramps, strains, contusions, and sprains, with the location of the majority of injuries occurring in the legs, thighs, shoulders, knees, and head, for handling injuries that are done mainly with first aid, namely the RICE and PRICE methods. Injury prevention in East Java cricket athletes is the first step in maintaining athlete performance and success. Prevention can be done with some structured efforts by providing the right training program, paying attention to facilities and appeals to wear protective equipment according to existing regulations, and paying attention to the training intensity load and time for recovery.

Coaches should implement a structured injury prevention program focusing on lower limb protection, and further research should investigate the long-term outcomes of this type of injury among young athletes.

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DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author, ARFN. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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CONFLICT OF INTEREST

The author officially certifies that there are no conflicts of interest with any party with respect to this research.

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