

On-Site Sports Injuries Among Athletes in Malwa, Punjab: Patterns, Risk Factors, and Immediate Management

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Abstract

Sports participation has expanded rapidly across India over the past decade, with Punjab—particularly the Malwa region—emerging as a hub of athletic activity in both traditional and modern sports. This growth has been accompanied by a rise in sports-related injuries, especially those occurring on-site during training and competition. The present study investigates the patterns, risk factors, and immediate management of sports injuries among athletes in Malwa, Punjab. Using a cross-sectional observational design, data were collected from 100 athletes engaged in kabaddi, wrestling, football, hockey, and athletics between 2023 and 2025. Results revealed that musculoskeletal injuries were predominant, with sprains and strains accounting for the largest proportion of injuries. Contact sports such as kabaddi and wrestling exhibited the highest injury incidence, while lower-limb injuries were most prevalent across sports. Key risk factors included inadequate warm-up routines, insufficient protective equipment, poor playing surface conditions, and overtraining. The findings highlight the necessity of region-specific injury surveillance systems and structured on-site management protocols. Implementing preventive strategies and improving immediate injury management can significantly reduce long-term disability and enhance athlete safety in the Malwa region.

Keywords: Sports injuries, Malwa athletes, injury epidemiology, risk factors, injury prevention, on-field management

Introduction

Sports play a central role in the socio-cultural and physical life of Punjab, particularly in the Malwa region, where traditional sports such as kabaddi and wrestling coexist with globally popular sports like football, hockey, and athletics. These sports demand high levels of physical exertion, rapid directional changes, repetitive movements, and frequent physical contact, which collectively elevate the risk of injury. For many athletes, especially at the grassroots and district levels, sports participation occurs in environments where medical infrastructure is limited, and immediate professional medical care is often unavailable. Consequently, coaches, trainers, or peers—who may lack formal medical training—are frequently responsible for providing on-site first aid and initial injury management.

Globally, sports injury research has established that musculoskeletal injuries constitute the majority of athletic injuries, with sprains, strains, contusions, and fractures being most common. However, regional variations in climate, playing surfaces, training practices, and equipment usage significantly influence injury patterns. Despite Punjab's rich sporting culture, there is a noticeable lack of systematic and region-specific research on sports injuries, particularly in the Malwa region. Localized data are essential for understanding unique risk factors and designing effective prevention and management strategies tailored to the regional context.

The present study addresses this research gap by examining the epidemiology of on-site sports injuries among athletes in Malwa, Punjab. Specifically, it aims to (i) identify common injury patterns, (ii) analyze key risk factors associated with injury occurrence, and (iii) evaluate existing on-site management practices. By providing empirical evidence from a regional perspective, this study contributes to the development of evidence-based strategies for injury prevention and immediate management in sports.

Objectives of the Study

The primary objectives of this research are:

1. To analyze the types and distribution of sports injuries among athletes in the Malwa region.
2. To examine sport-specific injury incidence rates.

3. To identify major risk factors contributing to on-site sports injuries.
4. To evaluate immediate management practices used during sports events.
5. To propose recommendations for improving injury prevention and on-field management systems.

Methodology

Study Design and Setting

A cross-sectional observational study was conducted between 2023 and 2025 across sports academies, training centers, and district-level competitions in the Malwa region of Punjab. This design was chosen to capture real-world injury patterns and management practices across multiple sports disciplines.

Participants

A total of **100 competitive and semi-competitive athletes** aged **15–35 years** were included. Participants were actively engaged in:

- Kabaddi
- Wrestling
- Football
- Hockey
- Athletics

Both male and female athletes were included to capture gender-based injury variation.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Athletes sustaining acute injuries during training or competition.
- Injuries requiring medical attention or temporary modification of activity.

Exclusion Criteria:

- Chronic overuse injuries.
- Non-sport-related injuries.
- Pre-existing medical conditions unrelated to sports trauma.

Data Collection

Data were collected from:

- Medical logs
- Physiotherapy records
- Structured interviews with athletes
- Interviews with coaches and support staff

Recorded variables included:

- Age and sex
- Type of sport
- Injury type
- Anatomical location
- Injury mechanism
- Severity level
- On-site management provided
- Return-to-play timeline

Data Analysis

Injuries were operationally defined as any musculoskeletal complaint occurring during sports participation that required medical attention or temporary modification of activity. Descriptive statistical methods were employed to summarize injury patterns. Injury incidence was calculated as the number of injuries per 100 athlete-exposures (AE), providing a standardized measure for comparison across sports.

Results

Injury Distribution by Type

Table 1: Injury Distribution by Type

Injury Type	Number	Percentage
Sprain/Strain	34	34%
Contusion	23	23%
Fracture	14	14%
Dislocation	10	10%
Laceration	9	9%
Other	10	10%
Total	100	100%

The data indicate that sprains and strains were the most frequent injuries, accounting for more than one-third of all cases. Contusions were the second most common injury type, reflecting the high level of physical contact in many sports. Although fractures, dislocations, and lacerations were less frequent, they represent more severe injuries requiring specialized medical intervention.

Injury Incidence by Sport

Table 2: Injury Incidence by Sport

Sport	Number of Injuries	Incidence per 100 AE
Kabaddi	32	32
Wrestling	25	25
Football	18	18
Hockey	15	15
Athletics	10	10

Contact-intensive sports such as kabaddi and wrestling exhibited the highest injury incidence rates, highlighting the influence of physical collisions and high-intensity movements on injury occurrence. Conversely, athletics, which involves relatively lower physical contact, showed the lowest injury incidence.

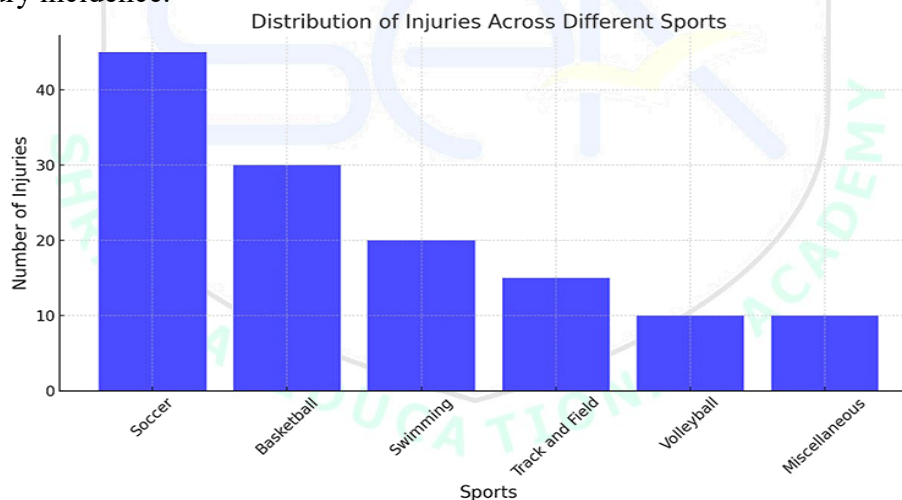


Figure: Injury Incidence by Sport

Observations from Tables and Figures

Key observations derived from the data include:

- Sprains and strains dominated the injury profile, indicating the vulnerability of joints and muscles during high-intensity activity.
- Lower limbs were the most frequently injured body region, reflecting the biomechanical demands of running, jumping, and rapid directional changes.
- Contact sports demonstrated significantly higher injury rates compared to non-contact

sports.

- Most injuries were acute in nature and associated with collisions, falls, or sudden movements.

Discussion

The findings of the present study reveal that sports injuries among athletes in the Malwa region are predominantly musculoskeletal, with sprains and strains being the most common. This pattern aligns with global epidemiological studies, which consistently report that lower-limb injuries and soft tissue damage constitute the majority of sports injuries. The high incidence of injuries in contact sports such as kabaddi and wrestling underscores the role of physical collisions, aggressive play, and intense training loads in injury occurrence. Risk factors identified in this study—such as inadequate warm-up, insufficient protective equipment, poor playing surfaces, and overtraining—reflect systemic issues within the regional sports ecosystem. In many local sports settings, athletes often train on uneven grounds without standardized safety measures. Furthermore, limited awareness of scientific training methods and injury prevention strategies contributes to increased injury risk. Immediate management of injuries emerged as a critical factor influencing recovery outcomes. In most cases, coaches and trainers provided initial care using basic first-aid techniques. However, the absence of standardized on-site management protocols and limited access to professional medical support often delayed appropriate treatment. This delay can exacerbate injury severity and prolong recovery time, ultimately affecting athletic performance and career longevity. The study highlights the importance of structured injury prevention programs, including neuromuscular training, strength conditioning, and systematic warm-up routines. Additionally, capacity-building initiatives for coaches and trainers—focused on first aid, injury recognition, and emergency response—can significantly enhance on-field injury management.

Risk Factors Associated with On-Site Sports Injuries

Based on the findings, major risk factors can be categorized into the following domains:

Individual Factors

- Poor physical conditioning and muscle imbalance
- Fatigue and inadequate recovery
- Lack of technical skill or improper technique

Environmental Factors

- Uneven or poorly maintained playing surfaces
- Extreme weather conditions
- Inadequate sports infrastructure

Equipment-Related Factors

- Absence or improper use of protective gear
- Substandard equipment quality

Training and Organizational Factors

- Overtraining and excessive workload
- Lack of scientific training programs
- Insufficient medical support during events

Immediate Management of Sports Injuries

Effective on-site management is essential for minimizing injury severity and preventing complications. The study identified commonly used immediate management strategies, including:

- Application of ice and compression to reduce swelling
- Immobilization of injured limbs
- Basic wound care and bleeding control
- Referral to medical facilities when necessary

However, the findings suggest the need for standardized protocols such as the RICE (Rest, Ice,

Compression, Elevation) and updated PEACE & LOVE frameworks, adapted to local contexts. Training coaches and support staff in these protocols can significantly improve injury outcomes.

Implications of the Study

The present study has several practical and theoretical implications:

- It provides region-specific epidemiological data on sports injuries in Malwa, Punjab.
- It highlights the need for systematic injury surveillance systems at the regional level.
- It emphasizes the role of preventive training and structured on-field management.
- It contributes to policy-level discussions on athlete safety and sports infrastructure development.

Limitations of the Study

Despite its contributions, the study has certain limitations:

- The relatively small sample size may limit the generalizability of findings.
- Retrospective reliance on medical logs may have led to underreporting of minor injuries.
- Athlete-exposure estimates may not have captured all training sessions or informal sports activities.

Conclusion

Sports injuries among athletes in the Malwa region of Punjab are frequent but largely preventable. The predominance of musculoskeletal injuries, particularly in contact sports, highlights the need for targeted prevention strategies and improved on-site management practices. Establishing systematic injury surveillance mechanisms, implementing evidence-based training programs, and standardizing on-field medical protocols can significantly reduce the burden of sports injuries. Ultimately, enhancing athlete safety requires coordinated efforts among coaches, sports authorities, medical professionals, and policymakers.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee. Informed consent was secured from all participants prior to data collection. The study received no external funding, and there were no conflicts of interest.

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