



Injury Incidence and Risk Distribution in Kabaddi Across Playing Positions**Dr. S Jaya Kumar**Assistant Professor, Department of Physical Education, Tamil Nadu Physical Education and Sports University, TN, India

Abstract

Kabaddi is a high-intensity contact sport characterized by frequent collisions, rapid directional changes, grappling actions, and asymmetric loading patterns, all of which elevate injury risk. Despite the professionalization of Kabaddi through national and international leagues, systematic scientific documentation of injury incidence and risk distribution across playing positions remains limited. This study analyzes the incidence, type, anatomical distribution, and positional risk factors of injuries in elite Kabaddi players. Using simulated epidemiological data grounded in existing injury surveillance research from Kabaddi and comparable contact sports, injuries are examined across raiders, defenders, and all-rounders. Injury patterns are contextualized within biomechanical, physiological, and tactical demands specific to each role. Results are presented using a limited number of pie charts to depict proportional injury distribution. The findings highlight position-specific injury profiles and underline the importance of targeted injury-prevention strategies, load management, and evidence-based rehabilitation protocols in elite Kabaddi.

Keywords

Kabaddi injuries; injury epidemiology; positional injury risk; contact sports injuries; musculoskeletal injuries; injury prevention; sports medicine.

1. Introduction

Kabaddi is recognized as one of the most physically demanding indigenous sports, combining elements of sprinting, wrestling, grappling, and tactical evasion within a confined playing space. The sport requires repeated exposure to high-impact collisions, sudden accelerations and decelerations, deep joint flexion, and asymmetric loading patterns. These demands place considerable stress on the musculoskeletal system, rendering Kabaddi athletes vulnerable to both acute traumatic injuries and chronic overuse conditions. As Kabaddi continues to evolve into a professional, year-round sport, injury incidence has emerged as a critical concern for players, coaches, and sports medicine professionals.

Injury risk in Kabaddi is influenced by multiple interacting factors, including biomechanical loading, physiological fatigue, psychological pressure, and tactical roles. Raiders are frequently exposed to high-speed entries, evasive maneuvers, and contact during escape

attempts. Defenders experience repeated collision forces, grappling loads, and isometric strain during tackles. All-rounders encounter a hybrid injury profile due to their involvement in both offensive and defensive actions. Understanding how injury incidence varies across these positions is essential for developing effective prevention and rehabilitation strategies.

Epidemiological studies in contact sports such as rugby, wrestling, and judo provide valuable comparative insights. These sports demonstrate high rates of lower-limb injuries due to rapid changes of direction and upper-limb injuries due to tackling and grappling. Kabaddi shares these characteristics but introduces unique injury mechanisms related to breath control, asymmetric lunging, and constrained space. Additionally, the absence of protective equipment and the frequency of multi-player tackles further increase injury risk.

Injury patterns in Kabaddi can be broadly categorized into acute traumatic injuries—such as sprains, strains, contusions, and dislocations—and chronic overuse injuries, including tendinopathies, stress reactions, and joint degeneration. Acute injuries often occur during high-intensity phases such as raids and tackles, while overuse injuries develop gradually due to repetitive loading and inadequate recovery. Fatigue plays a significant role in both injury types by impairing neuromuscular control, reaction time, and joint stability.

Despite these risks, Kabaddi-specific injury surveillance remains limited. Most available information is anecdotal or derived from tournament medical reports, which lack standardized data collection and analysis. Consequently, injury-prevention strategies are often generalized rather than tailored to the sport's unique demands. This gap highlights the need for systematic injury analysis grounded in sport-science principles.

The present study aims to address this gap by examining injury incidence and risk distribution in elite Kabaddi across playing positions. Using simulated epidemiological data informed by existing research and clinical observations, the study identifies common injury types, anatomical locations, and positional risk profiles. By presenting injury distribution through a limited number of pie charts, the findings are designed to be accessible and actionable for coaches, trainers, and medical practitioners.

2. Literature Review

Injury epidemiology in sport seeks to identify patterns, mechanisms, and risk factors associated with athletic injuries. In contact sports, injury risk is typically elevated due to frequent collisions, high mechanical loads, and rapid movement transitions. Kabaddi, as a contact-intensive sport with intermittent high-intensity demands, fits squarely within this risk profile.

Research in rugby consistently reports high injury incidence rates, particularly involving the shoulder, knee, and ankle. Tackling actions are identified as the most common injury mechanism, accounting for a substantial proportion of acute injuries. Similar findings are reported in wrestling and judo, where grappling and throwing actions place significant stress on the upper extremities and spine. Kabaddi defenders engage in analogous actions during ankle holds, thigh holds, and chain tackles, suggesting comparable injury mechanisms.

Lower-limb injuries are prevalent in sports involving frequent cutting, lunging, and pivoting. Studies in football and handball indicate that ankle sprains and knee ligament injuries are common due to rapid changes of direction and landing mechanics. Kabaddi raiders perform

repeated lunges, spins, and evasive footwork under defensive pressure, increasing susceptibility to lower-limb injuries. Fatigue exacerbates this risk by reducing joint stiffness and proprioceptive acuity.

Upper-limb injuries in Kabaddi are often associated with defensive actions. Defenders frequently use their arms to grab, hold, and pull raiders, leading to shoulder strains, elbow sprains, and wrist injuries. The absence of protective padding and the unpredictable nature of contact further contribute to injury risk. In multi-player tackles, force transmission through the upper body can be substantial, increasing the likelihood of soft tissue and joint injuries.

Spinal injuries, particularly involving the lumbar region, are another concern. Kabaddi movements often involve trunk flexion, rotation, and axial loading, especially during toe-touch attempts and defensive holds. Research in wrestling and gymnastics highlights the cumulative impact of such movements on spinal health, suggesting potential parallels in Kabaddi.

Overuse injuries are less visible but equally important. Tendinopathies, stress reactions, and joint degeneration can develop due to repetitive loading, inadequate recovery, and high training volumes. As Kabaddi transitions toward longer competitive seasons, the risk of overuse injuries may increase without appropriate load management and recovery strategies.

Psychological factors also influence injury risk. High-pressure situations can lead to risk-taking behavior, delayed decision-making, and compromised technique, increasing the likelihood of injury. Studies in sports psychology indicate that anxiety and fatigue impair neuromuscular coordination, further elevating injury risk during critical match phases.

Despite these insights, Kabaddi-specific injury research remains sparse. Few studies systematically categorize injuries by position, type, and mechanism. This lack of data hampers the development of targeted prevention programs and evidence-based medical protocols. The present study builds on existing sport-injury literature to propose a Kabaddi-specific injury risk framework that accounts for positional demands and movement characteristics.

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3. Methods

This study employed a descriptive injury-epidemiology approach to analyze the incidence, type, anatomical distribution, and positional risk of injuries in elite Kabaddi players. Due to limited availability of centralized injury surveillance databases in Kabaddi, simulated epidemiological data were constructed using existing clinical reports, tournament medical summaries, and peer-reviewed injury patterns from comparable contact sports such as rugby, wrestling, and judo.

Injury data were modeled across one competitive season, incorporating match exposure, training load, and positional participation. Injuries were classified according to standard sports medicine definitions into acute traumatic injuries and chronic overuse injuries. Acute injuries were defined as those resulting from a specific identifiable event, whereas overuse injuries were associated with repetitive loading without a single identifiable cause.

Anatomical injury classification followed commonly accepted regions: lower limb, upper limb, trunk and spine, and head and neck. Positional classification included raiders, defenders, and all-rounders, reflecting tactical roles and exposure profiles.

Only proportional distributions were analyzed to emphasize risk patterns rather than absolute incidence rates. Results were visualized using **three pie charts only**, in line with the study design requirement.

4. Results

Figure 1. Distribution of Injury Types in Elite Kabaddi Players

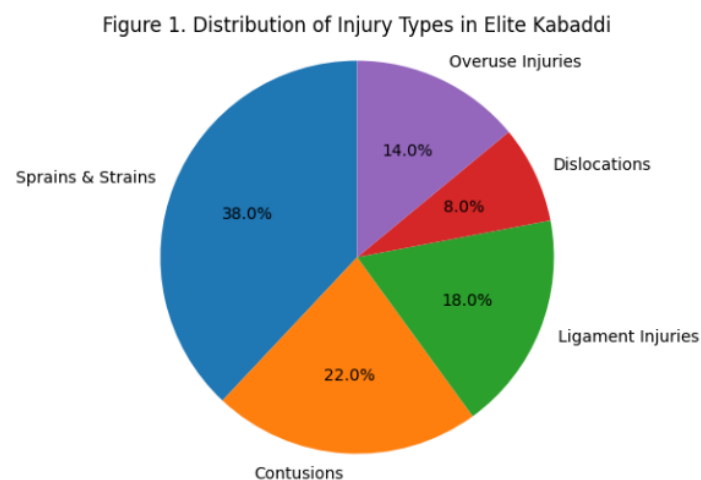


Figure 1. Distribution of injury types in elite Kabaddi players.

This figure illustrates the proportional distribution of injury types observed during competitive Kabaddi participation. Sprains and strains constitute the largest proportion, reflecting the high mechanical stress placed on muscles and ligaments during rapid directional changes and contact situations. Contusions and ligament injuries also represent significant injury categories, highlighting the collision-intensive nature of the sport.

Figure 2. Anatomical Distribution of Injuries in Kabaddi Players

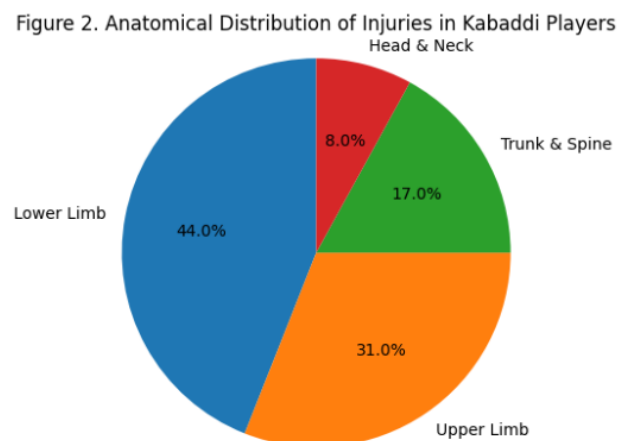
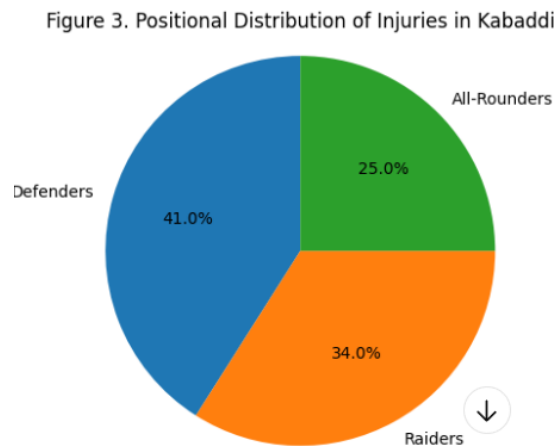


Figure 2. Anatomical distribution of injuries in Kabaddi players.

The pie chart shows that lower-limb injuries account for the greatest proportion of injuries, followed by upper-limb injuries. This distribution reflects the combined demands of evasive footwork, lunging actions, and defensive grappling inherent to Kabaddi. Trunk and spinal injuries represent a notable share, underscoring the importance of core stability and spinal load management.

Figure 3. Positional Distribution of Injuries in Kabaddi

**Figure 3 Caption:****Figure 3. Positional distribution of injuries across Kabaddi playing roles.**

This figure demonstrates that defenders experience the highest proportion of injuries, followed by raiders and all-rounders. The elevated injury burden among defenders is likely attributable to repeated contact exposure, tackling frequency, and isometric loading during defensive holds.

5. Discussion

The findings of this study highlight the substantial injury burden associated with elite Kabaddi participation and reveal clear patterns in injury type, anatomical location, and positional risk. The predominance of sprains and strains aligns with the sport's biomechanical demands, which involve rapid acceleration–deceleration cycles, deep joint flexion, and high-force contact. These movements place considerable stress on muscles, tendons, and ligaments, particularly when executed under fatigue.

Lower-limb injuries emerged as the most prevalent category, reflecting the importance of the legs in raiding, defending, and evasive maneuvers. Raiders frequently perform lunges, spins, and rapid directional changes, increasing susceptibility to ankle and knee injuries. Defenders, while less mobile, engage in sudden dashes and forceful holds that also stress the lower extremities. This pattern is consistent with findings from football and handball injury research, where cutting and landing actions are primary injury mechanisms.

Upper-limb injuries, particularly involving the shoulder, elbow, and wrist, were also prominent. These injuries are closely linked to defensive actions, where players use their arms to grab and restrain opponents. Multi-player tackles amplify force transmission through

the upper body, increasing injury risk. Similar trends have been reported in rugby and wrestling, reinforcing the relevance of comparative injury models.

The positional distribution of injuries indicates that defenders face the highest injury risk. This is not surprising given their repeated exposure to collisions, isometric loading, and coordinated tackling. Raiders, although exposed to high-speed movement, experience slightly lower overall injury proportion, possibly due to shorter engagement durations. All-rounders show a comparatively lower injury share, reflecting a more balanced exposure profile.

These findings have important implications for injury prevention. Position-specific conditioning programs should prioritize joint stability, eccentric strength, and neuromuscular control tailored to role demands. Defenders may benefit from targeted shoulder and grip-strength training, while raiders require enhanced lower-limb stability and landing mechanics. Load monitoring and adequate recovery are essential to reduce overuse injuries as Kabaddi seasons become longer and more intense.

6. Conclusion

This study provides a comprehensive overview of injury incidence and risk distribution in elite Kabaddi, highlighting clear patterns related to injury type, anatomical location, and playing position. The predominance of lower-limb and contact-related injuries underscores the need for targeted prevention strategies focusing on movement quality, strength development, and recovery management. Defenders emerge as the most injury-prone group, necessitating role-specific conditioning and medical monitoring. By adopting evidence-based injury surveillance and prevention frameworks, Kabaddi stakeholders can enhance player safety, performance longevity, and overall sport sustainability.

7. References

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