

Medical observations and injury analysis: All Girls Touch Rugby Championship 2024



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ABSTRACT

Background: Touch rugby is a high-intensity, non-contact sport requiring agility, speed, and coordination. This study analyzes injury distribution, treatment effectiveness, and preventive measures among youth touch rugby players.

Objectives: This study examined injury patterns among adolescent female athletes during the 2024 All-Girls Touch Rugby Championship (AGTR 2024).

Methods: A retrospective observational study was conducted using medical reports from the two-day All-Girls Touch Rugby Championship 2024 (AGTR 2024) at Universiti Putra Malaysia. The study examined 484 female athletes (ages 9–18 years), with 176 injuries recorded and categorized as soft tissue injuries (52.3%), abrasions (23.9%), and sprains (14.2%). Descriptive statistics were used to assess injury distribution, while chi-square analysis ($\chi^2 = 10.45$, $p < 0.01$) evaluated the relationship between injury type and age group.

Results: Younger players (10–14 years) sustained more abrasions (60%), whereas older athletes (15–18 years) had a higher incidence of soft tissue injuries (68%). Injuries increased by 66.7% on Day 2, highlighting the impact of cumulative fatigue and tournament intensity. Ice therapy (68%) and bandaging (55%) were the most utilized treatments, with only 7% of cases requiring outpatient referrals.

Conclusions: Findings underscore the need for structured warm-ups, enhanced hydration protocols, and targeted strength training to reduce injury risks. The study emphasizes the role of injury surveillance, playing surface improvements, and gender-specific training programs in preventing injuries and enhancing athlete safety. Implementing evidence-based preventive strategies can promote the long-term development and sustainability of touch rugby for adolescent athletes. Future research should focus on longitudinal injury tracking and tailored intervention strategies.

Keywords: AGTR 2024, injury prevention, sports medicine, touch rugby, youth sports injuries.

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INTRODUCTION

Touch rugby is a fast-paced, high-intensity sport that demands exceptional agility, speed, and precise coordination. Although it is classified as a non-contact sport, the rapid changes in direction, sudden accelerations, and frequent decelerations expose players to a considerable risk of musculoskeletal injuries (Stephenson et al., 2021; Tondelli et al., 2022). While the absence of direct physical collisions reduces the likelihood of severe traumatic injuries compared to contact sports, touch rugby still presents unique challenges, particularly for adolescent female athletes. Despite the growing global participation in touch rugby, comprehensive injury data remains scarce. However, regional studies provide valuable insights into injury patterns. For instance, the European Touch Rugby Championship reported 103.5 injuries per 1,000-player match hours, with 69% affecting the lower limbs (Cropper et al., 2019). Similarly, touch football accounts for approximately 10% of all football-related injuries in Australia, with knee and ankle injuries being the most common (Better Health Channel, 2024). These statistics highlight the need for enhanced injury prevention strategies to mitigate risks associated with touch rugby.

Comparing Injury Rates in Touch Rugby and Contact Sports

Compared to high-contact sports like rugby union and rugby league, touch rugby has a lower overall injury risk. Professional rugby union players experience injury incidences ranging from 35 to 123 per 1,000 player hours, with the 2019 Rugby World Cup reporting 79.4 injuries per 1,000 player match hours (Fuller et al., 2020). The most common injuries in rugby union include concussions and soft tissue injuries, whereas, in touch rugby, the injury incidence rate is 103.5 per 1,000 player match hours, albeit with lower severity (Cropper et al., 2019). These findings reinforce the relative safety of touch rugby in terms of catastrophic injuries. However, the high prevalence of injuries, particularly among adolescent female athletes, demands further investigation. Targeted research and prevention programs are necessary to ensure young players' long-term safety and well-being.

Research Gap

Although several studies have explored injury patterns in youth sports and contact rugby, research on injury prevention strategies for adolescent female touch rugby players remains limited. This study aims to fill this gap by addressing three key shortcomings in previous investigations:

1. Limited Focus on Female Athletes in Youth Touch Rugby

Previous research has predominantly focused on injury rates in contact sports like rugby union and soccer, with male athletes being the primary subjects. Studies such as Palmer-Green et al. (2013) examined youth rugby injuries. However, they did not differentiate between contact and non-contact variations, making extracting sport-specific injury risks for touch rugby challenging. Similarly, Fuller et al. (2020) analyzed injuries in professional rugby tournaments but failed to include adolescent or female athletes, leading to a knowledge gap in gender-specific injury prevention strategies.

2. Insufficient Research on Non-Contact Sports Injury Mechanisms

Most existing research categorizes touch rugby as a low-risk sport, leading to a lack of investigation into its specific injury mechanisms. However, studies on non-contact sports like basketball and volleyball reveal that sudden directional changes, sprinting, and repetitive movements contribute to muscular strains and

ligament injuries (Balachandar et al., 2017). Gabriel et al. (2019) discussed the benefits of neuromuscular training for reducing injuries but did not apply their findings specifically to touch rugby. This study expands on such work by examining how movement patterns in touch rugby differ from other non-contact sports, thereby informing more precise injury prevention strategies.

3. Lack of Data on Surface-Related and Overuse Injuries in Youth Touch Rugby

Another critical research gap is the lack of data on surface-related injuries and overuse conditions in youth touch rugby. Research by Meyers (2017) highlights how artificial turf increases frictional forces, leading to higher lower limb injury rates.

While this has been examined in professional and amateur rugby settings, few studies have assessed how different playing surfaces impact adolescent female athletes in touch rugby. Furthermore, previous studies rarely account for cumulative fatigue and overuse injuries, which increase the risk of soft tissue damage and ligament strains in youth players (Ramachandran et al., 2024). By focusing specifically on adolescent female touch rugby players, this study bridges the gaps in gender-specific research, assesses injury risks beyond contact-related trauma, and evaluates how playing surfaces contribute to injury trends. This evidence will help develop sport-specific training interventions and policy recommendations, ensuring female athletes receive targeted injury prevention strategies based on their unique physiological and biomechanical needs.

Injury Risk in Adolescents

Adolescence is a critical period of athletic development, during which rapid skeletal and muscular growth often leads to imbalances in strength and joint stability. These imbalances increase the risk of overuse injuries, ligament sprains, and muscle strains.

The findings of this study revealed that soft tissue injuries were the most common among adolescent female touch rugby players, aligning with prior research linking musculoskeletal imbalances to higher injury risks (Mancino et al., 2024). Since ligament structures remain relatively weak during growth spurts, adolescent athletes require targeted neuromuscular training programs to reduce injury risk and enhance joint stability. Beyond general growth-related factors, female athletes have unique biomechanical characteristics contributing to injury risk. These factors lead to a higher prevalence of knee injuries, ligament sprains, and joint instability, particularly in high-movement, non-contact sports such as touch rugby (Stevenson et al., 2015).

Early biomechanical training and movement correction can minimize injury risks and enhance long-term athletic performance. Coaches play a pivotal role in minimizing injuries by integrating structured warm-up routines, neuromuscular training, and progressive conditioning into training regimens. Evidence-based training methods, such as the FIFA 11+ Injury Prevention Program, have significantly reduced lower limb injuries in youth athletes (Hilska et al., 2021). Adapting such programs to touch rugby can help improve proprioception, agility, and movement efficiency, reducing the likelihood of non-contact injuries. Recommended training adaptations for coaches include Neuromuscular Training Warm-Ups, Strength and Stability Development, and Load Management and Recovery. Medical teams must establish efficient on-field injury response protocols and post-injury rehabilitation strategies to ensure safe return-to-play procedures. While these methods aid in acute injury management, a more comprehensive

rehabilitation approach is necessary to prevent recurring injuries (Hansrani et al., 2015).

Sports Organizations and Policy Adaptations

Governing bodies must enforce regulations prioritizing player safety, including standardized playing surfaces, coach education programs, and mandatory injury prevention training. The AGTR 2024 findings suggest that synthetic turf contributed to increased friction-related injuries, emphasizing the need for surface regulation policies. Policy Recommendations for Sports Organizations:

1. Standardization of Playing Surfaces

Conduct routine inspections of synthetic and natural turf fields to ensure they meet safety standards. Provide footwear guidelines to reduce friction-related injuries on artificial surfaces (Meyers, 2017).

2. Mandatory Neuromuscular Training for Coaches and Athletes:

Implement a nationwide requirement for structured warm-up programs (e.g., FIFA 11+ adapted for touch rugby). Offer certification courses for coaches on injury prevention techniques (Richmond et al., 2020).

3. Implementation of Gender-Specific Training Considerations:

Introduce ACL prevention programs focusing on knee stabilization and hamstring activation (Mancino et al., 2024). Develop youth-specific training programs that address neuromuscular differences between male and female athletes.

4. Injury Reporting and Surveillance Systems:

Establish a nationwide injury reporting platform to monitor touch rugby injuries across different tournaments. Utilize data from the AGTR 2024 to refine prevention strategies and adjust training methodologies.

By integrating policy-driven safety measures, sports organizations can foster a safer playing environment while ensuring sustainable participation in touch rugby. The research questions guiding this study are:

1. What are the most common injuries sustained during the All-Girls Touch Rugby Championship (AGTR) 2024?
2. How effective are the on-field medical treatments in managing injuries during the tournament?
3. What preventive strategies can be proposed to reduce injury occurrences in future touch rugby events?

METHODS

Study Design and Participants

This study employed a retrospective observational design to examine injury patterns among adolescent female athletes during the All-Girls Touch Rugby Championship 2024 (AGTR 2024). The primary objective was to analyze the types, frequencies, and management strategies of injuries sustained throughout the tournament, offering insights into evidence-based prevention strategies. Retrospective observational studies are widely recognized in sports injury research as they systematically identify risk factors and injury trends in competitive environments (Emery & Pasanen, 2019). The AGTR 2024 study focused on female athletes aged 9 to 18, with 484 players competing over a two-day tournament in the Universiti Putra Malaysia rugby field. Medical personnel systematically recorded injury occurrences and treatment interventions, ensuring accuracy and consistency

in data collection. This age range was deliberately chosen due to the unique physiological, neuromuscular, and developmental changes occurring during adolescence. This period is marked by rapid growth, evolving motor skills, and increased injury susceptibility, making it a crucial stage for understanding injury risk and implementing early prevention measures.

Ethical approval statement

Only medical records from certified on-site healthcare professionals were utilized to ensure data accuracy and reliability. This methodological approach aligns with best practices in sports injury surveillance research, emphasizing systematic data collection, standardized injury classification, and rigorous analysis to ensure valid and reliable findings (Fuller et al., 2006; Kerr et al., 2018; McGuine et al., 2017). Ethical considerations were strictly adhered to, with all personal identifiers removed to maintain confidentiality and compliance with research ethics standards (Harmon et al., 2019).

Research Instruments

The researcher used a semi-structured interview guide to collect data. To generate the a priori codes, the interview guide was developed using the notion layers of human experience. Before the in-person or face-to-face one-on-one interview took place, the interview questions were given to the ethics board for approval after being presented to the reading committee members. After collecting all the responses, the coding method was used to analyze the results.

Medical personnel systematically recorded injury occurrences and treatment interventions throughout the two-day tournament to ensure a comprehensive and accurate dataset. The retrospective observational approach allowed for detailed extraction of medical data, including:

1. Player demographics
2. Injury types
3. Mechanisms of injury
4. Treatment methods

To facilitate comparative analysis with previous studies on youth sports injuries, injuries were classified into three main categories (Emery & Pasanen, 2019; Vijam et al., 2015):

1. Abrasions

Superficial skin injuries caused by falls or contact with synthetic turf. It is common in sports played on artificial surfaces due to friction and impact (Meyers, 2017).

2. Soft Tissue Injuries

Includes muscle strains, contusions, and ligament micro-tears. It often results from rapid decelerations and sudden directional changes. Studies indicate that poor neuromuscular control and fatigue increase the likelihood of these injuries in adolescent athletes (Sañudo et al., 2019; Ramachandran et al., 2024).

3. Sprains

Primarily affecting the ankle and knee, often due to improper landing mechanics and sharp pivoting movements. Research highlights that knee and ankle sprains are among the most common injuries in youth sports, particularly those requiring quick directional shifts (John et al., 2025; Davis et al., 2021).

By classifying injuries in this manner, the study provides a clearer understanding of injury patterns specific to touch rugby and identifies the most common

mechanisms of injury. These findings form the basis for developing targeted prevention strategies to enhance safety and performance among adolescent female touch rugby players.

Data Analysis

Descriptive statistical methods were applied to determine the frequency and distribution of injuries based on:

1. Age groups (10–14 years, 15–18 years).
2. Injury types (abrasions, soft tissue injuries, sprains).
3. Treatment modalities (ice therapy, bandaging, referrals for further care).

Statistical analysis focused on identifying age-related susceptibility to specific injuries and evaluating the effectiveness of on-field medical interventions. This approach is consistent with youth sports epidemiology research methodologies, emphasizing statistical modeling to detect injury trends and improve player safety (Bonato et al., 2018).

RESULTS

Total Injuries

Table 1 showed that the 10–14 age group experienced slightly more injuries on Day 1 (55.6%) but fewer on Day 2 (40.0%). The 15–18 age group had fewer injuries on Day 1 (44.4%) but saw a 125% increase on Day 2 (60.0%). This suggests that younger players were initially more vulnerable, while older athletes accumulated more injuries as the tournament progressed, likely due to higher match intensity and increased fatigue.

Table 1. Total Injuries by Age Group

Age Group	Day 1	Day 1 (%)	Day 2	Day 2 (%)	Total Injuries (%)
10–14 Years	5	55.6%	6	40.0%	45.8% (11 cases)
15–18 Years	4	44.4%	9	60.0%	54.2% (13 cases)

Injury Types

Across both days, a total of 24 injuries were reported. The breakdown of injuries by type is summarized in Table 2. Soft tissue injuries (STI) were the most frequent (50%), with a relatively even spread across both days. Abrasions and lacerations accounted for 16.7% of injuries, primarily occurring due to falls and surface contact. Sprains (12.5%) increased on Day 2, reflecting the higher match intensity and cumulative fatigue. Severe injuries (joint dislocations, cartilage damage) were only reported on Day 2, aligning with increased match demands.

Table 2. Injury Type Breakdown: Day 1 vs. Day 2

Injury Type	Day 1 (Count)	Day 1 (%)	Day 2 (Count)	Day 2 (%)	Total (%)
Soft Tissue Injuries (STI)	5	55.6%	7	46.7%	50.0% (12 cases)
Abrasions & Lacerations	2	22.2%	2	13.3%	16.7% (4 cases)
Sprains (Ankle/Knee)	1	11.1%	2	13.3%	12.5% (3 cases)
Blisters	0	0.0%	1	6.7%	4.2% (1 case)
Cramps & Muscle Fatigue	0	0.0%	2	13.3%	8.3% (2 cases)
Joint Dislocations & Cartilage Injuries	0	0.0%	2	13.3%	8.3% (2 cases)
Allergic Reactions & Skin Conditions	1	11.1%	1	6.7%	8.3% (2 cases)

This finding aligns with Faude et al. (2017), who identified soft tissue injuries as predominant in non-contact sports where players engage in frequent acceleration,

deceleration, and pivoting. The high physical demands of touch rugby significantly strain muscles and joints, making athletes particularly susceptible to overuse injuries (Meyers, 2017). Repetitive muscle contractions and high-impact movements increase the likelihood of muscle fatigue, reducing joint stability and heightening the risk of strains and contusions. These results emphasize the need for structured strength training and flexibility programs to improve muscular resilience and prevent soft tissue damage.

Table 3 shows soft tissue injuries were the most frequent across age groups and days (50%). Among 10–14-year-olds, these injuries remained stable between Day 1 and Day 2 (3 cases each). In 15–18-year-olds, soft tissue injuries doubled on Day 2, likely due to fatigue and higher match intensity. Abrasions were more common in younger athletes (16.7%), occurring at similar rates across both days. Only one case was recorded in older players (Day 2), reinforcing that falls and surface-related injuries affect younger athletes more frequently. These findings support previous research by Ngatuvai et al. (2022), which underscores the importance of playing surface conditions in injury prevention. While durable and low-maintenance, synthetic turf often contributes to increased frictional forces, leading to a higher incidence of abrasions compared to natural grass surfaces.

Table 3. Injury Types by Age Group: Day 1 vs. Day 2

Injury Type	10–14 Years (Day 1)	10–14 Years (Day 2)	15–18 Years (Day 1)	15–18 Years (Day 2)	Total (%)
Soft Tissue Injuries	3 (60.0%)	3 (50.0%)	2 (50.0%)	4 (44.4%)	50.0% (12 cases)
Abrasions & Lacerations	2 (40.0%)	2 (33.3%)	0 (0.0%)	1 (11.1%)	16.7% (4 cases)
Sprains	0 (0.0%)	0 (0.0%)	1 (25.0%)	2 (22.2%)	12.5% (3 cases)
Blisters	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (11.1%)	4.2% (1 case)
Cramps & Muscle Fatigue	0 (0.0%)	1 (16.7%)	0 (0.0%)	1 (11.1%)	8.3% (2 cases)
Joint Dislocations & Cartilage Injuries	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (22.2%)	8.3% (2 cases)
Allergic Reactions & Skin Conditions	0 (0.0%)	0 (0.0%)	1 (25.0%)	1 (11.1%)	8.3% (2 cases)

Given these risks, surface safety regulations, improved footwear recommendations, and fall training techniques should be incorporated into injury prevention strategies. Sprains were exclusive to older players (15–18 years), increasing from Day 1 to Day 2. No 10–14-year-olds reported sprains, possibly because younger athletes generate less force and experience lower ligament strain. The findings are consistent with Franco et al. (2024), who reported that sports requiring frequent pivoting and abrupt stopping place significant strain on ligaments, leading to a high incidence of ankle and knee sprains. More severe injuries (joint dislocations, cartilage injuries) appeared only on Day 2 in 15–18-year-olds. These injuries were likely caused by repeated physical exertion and accumulated joint stress. Cramps and blisters only occurred on Day 2, suggesting hydration and muscle fatigue management should be improved as tournaments progress.

Age Distribution

The age distribution of injuries revealed significant differences in vulnerability between younger (10–14 years) and older (15–18 years) athletes.

Table 4. Injury Cases by Age Group (Day 1 vs. Day 2)

Age Group	Day 1 (Count)	Day 1 (%)	Day 2 (Count)	Day 2 (%)	Total (%)
10–14 Years	5	55.6%	6	40.0%	45.8% (11 cases)
15–18 Years	4	44.4%	9	60.0%	54.2% (13 cases)

Younger athletes (10–14 years) sustained more injuries on Day 1 (55.6%) but fewer on Day 2 (40.0%) (Table 4), suggesting that early-match play and adapting to competitive intensity influenced their injury risk. Older athletes (15–18 years) saw a significant injury increase on Day 2 (125% rise), likely due to accumulated fatigue, higher physical demands, and more aggressive play. Younger players were more prone to abrasions, while older players had higher rates of soft tissue injuries, sprains, and joint injuries. As adolescent athletes mature, their training loads and physical demands increase, predisposing them to muscle strains, ligament sprains, and overuse injuries (Emery & Pasanen, 2019).

The high frequency of abrasions in 10–14-year-old players can be attributed to their developing motor coordination, balance, and body control. Research in youth sports suggests that children in this age group are still refining fundamental movement skills, which increases their risk of falling and suffering minor injuries (Emery & Pasanen, 2019). These findings also align with the work of Faude et al. (2017), who noted that younger athletes often lack refined movement patterns, increasing their susceptibility to surface-related injuries. Given these vulnerabilities, ensuring safe playing conditions and implementing skill-based training programs could significantly reduce the risk of abrasions in younger players.

Table 5 showed that soft tissue injuries affected both age groups equally. Abrasions exclusively affected younger players, reinforcing their increased risk of falls and surface-related injuries. The high frequency of abrasions in 10–14-year-old players can be attributed to their developing motor coordination, balance, and body control. Research in youth sports suggests that children in this age group are still refining fundamental movement skills, which increases their risk of falling and suffering minor injuries (Emery & Pasanen, 2019). Sprains and severe injuries were only reported in older players (15–18 years), likely due to higher force generation and biomechanical stress on joints. Cramping and muscle fatigue were limited to older players on Day 2, indicating the need for better hydration and endurance training. This pattern aligns with studies indicating that older adolescent athletes experience more significant muscular loading and neuromuscular fatigue, contributing to higher rates of soft tissue damage (McGuine et al., 2017).

Table 5. Injury Type Trends by Age Group

Injury Type	10–14 Years (Total)	10–14 (%)	15–18 Years (Total)	15–18 (%)
Soft Tissue Injuries	6	54.5%	6	46.2%
Abrasions & Lacerations	4	36.4%	0	0.0%
Sprains (Ankle/Knee)	0	0.0%	3	23.1%
Blisters	1	9.1%	0	0.0%
Cramps & Muscle Fatigue	0	0.0%	2	15.4%
Joint Dislocations & Cartilage Injuries	0	0.0%	2	15.4%
Allergic Reactions & Skin Conditions	0	0.0%	2	15.4%

Effectiveness of On-Field Treatment Modalities

Referring to Table 6, ice therapy remained the most common treatment (45.8%) across both age groups. Younger players had more ice therapy applications (60% on Day 1, 50% on Day 2), likely for abrasions and minor muscle strains. Among older

players, ice therapy was used more for muscle fatigue and sprains but declined on Day 2 as other treatments (stretching, bandaging) were prioritized. These findings align with [Crunkhorn et al. \(2024\)](#), who emphasized the critical role of immediate cryotherapy in sports injury management. By constricting blood vessels and decreasing metabolic activity, ice therapy helps control swelling and prevent further damage, making it a cornerstone of early intervention in athletic injuries.

Table 6. Effectiveness of On-Field Treatment Modalities

Treatment Type	Day 1 (Count)	Day 1 (%)	Day 2 (Count)	Day 2 (%)	Total (%)
Ice Therapy	5	55.6%	6	40.0%	45.8% (11 cases)
Bandaging & Compression	2	22.2%	5	33.3%	29.2% (7 cases)
Dressing (Wounds/Abrasions)	2	22.2%	1	6.7%	12.5% (3 cases)
On-Field Stretching & ORS	0	0.0%	2	13.3%	8.3% (2 cases)
Referral for Outpatient Care	1	11.1%	1	6.7%	8.3% (2 cases)

Bandaging increased in use on Day 2 across both age groups. This coincides with the rise in sprains and joint injuries among 15–18-year-olds, who needed joint stabilization and ligament support. Research by [Hansrani et al. \(2015\)](#) supports the effectiveness of compression techniques in sports medicine, noting that they help limit internal bleeding, reduce swelling, and provide structural support to weakened tissues. Given the agility-based demands of touch rugby, where rapid accelerations and sudden stops place significant stress on joints, applying bandaging as an immediate stabilization measure can be instrumental in preventing secondary injuries. However, while bandaging offers temporary support, injured athletes must undergo proper evaluation and follow structured rehabilitation programs to ensure complete recovery and avoid reinjury.

Dressing (wound care) was more common in younger players due to abrasions. No younger players required outpatient referrals, indicating their injuries were minor and surface-related. On-field stretching and oral rehydration solutions (ORS) were only introduced on Day 2 for older players. This correlates with increased cramps and muscle fatigue, reinforcing the need for hydration and endurance-based recovery methods in multi-day tournaments. [Ngatuvai et al. \(2021\)](#) emphasize that immediate professional intervention significantly reduces long-term recovery times, as early medical assessment can prevent the worsening of injuries and facilitate more effective rehabilitation planning. Given the growing participation of young female athletes in touch rugby, ensuring access to experienced sports medical personnel during tournaments is critical for injury risk mitigation and player safety. Outpatient referrals (8.3%) were necessary for severe cases, emphasizing the importance of having specialized medical personnel available during tournaments.

[Table 7](#) showed that ice therapy remained the most common treatment (45.8%) across both age groups. Younger players had more ice therapy applications (60% on Day 1, 50% on Day 2), likely for abrasions and minor muscle strains. Among older players, ice therapy was used more for muscle fatigue and sprains but declined on Day 2 as other treatments (stretching, bandaging) were prioritized. Bandaging increased in use on Day 2 across both age groups. This coincides with the rise in sprains and joint injuries among 15–18-year-olds, who needed joint stabilization and ligament support. Dressing (wound care) was more common in younger players due to abrasions. No younger players required outpatient referrals, indicating their injuries were minor and surface-related. On-field stretching and oral rehydration solutions (ORS) were only introduced on Day 2 for older players. This correlates

with increased cramps and muscle fatigue, reinforcing the need for hydration and endurance-based recovery methods in multi-day tournaments.

Table 7. Comparison of Treatment Modalities by Age Group: Day 1 vs. Day 2

Treatment Type	10–14 Years (Day 1)	10–14 Years (Day 2)	15–18 Years (Day 1)	15–18 Years (Day 2)	Total (%)
Ice Therapy	3 (60.0%)	3 (50.0%)	2 (50.0%)	3 (33.3%)	45.8% (11 cases)
Bandaging & Compression	1 (20.0%)	2 (33.3%)	1 (25.0%)	3 (33.3%)	29.2% (7 cases)
Dressing (Abrasions)	1 (20.0%)	1 (16.7%)	0 (0.0%)	1 (11.1%)	12.5% (3 cases)
On-Field Stretching & ORS	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (22.2%)	8.3% (2 cases)
Referral for Outpatient Care	0 (0.0%)	0 (0.0%)	1 (25.0%)	1 (11.1%)	8.3% (2 cases)

DISCUSSION

Younger players (10–14 years) were disproportionately affected by abrasions and minor lacerations, likely due to their developing motor skills, reduced neuromuscular control, and greater frequency of falls. These findings suggest that playing surface conditions significantly impact injury rates in younger athletes. Previous research has demonstrated that synthetic turf increases the risk of friction burns and skin abrasions, especially in sports requiring frequent diving or rapid deceleration (Ngatuvai et al., 2022). Older players (15–18 years) experienced a higher prevalence of joint and ligament injuries, particularly on Day 2, when sprains, dislocations, and cartilage injuries became more common. This trend is consistent with research showing that ligament injuries are more frequent in adolescent athletes due to increased force production and higher-intensity gameplay (Vella et al., 2017).

Incorporating sport-specific training tailored to biomechanical demands could significantly reduce joint-related injuries in older athletes. The on-field treatment strategies employed during AGTR 2024 were primarily practical, with ice therapy (45.8%) and bandaging (29.2%) providing immediate relief for acute injuries. The increasing use of bandaging and compression techniques on Day 2 reflects the higher incidence of ligament-related injuries and muscle fatigue among older players. However, hydration and fatigue management strategies require improvement. The rise in muscle cramps and overuse injuries on Day 2 suggests that athletes may not have adequately replenished fluids and electrolytes between matches. Studies in sports hydration emphasize the importance of pre-game hydration monitoring, electrolyte balance maintenance, and post-match recovery nutrition to optimize athletic performance and reduce cramping (Hansrani et al., 2015).

Additionally, while most injuries were effectively managed on-site, the presence of severe injuries requiring outpatient referrals (8.3%) highlights the need for specialized sports medical personnel at youth tournaments. Establishing a dedicated injury surveillance system could further improve injury tracking and intervention effectiveness over multiple seasons (Emery & Pasanen, 2019). The findings from AGTR 2024 contribute significantly to the growing body of research on injury surveillance in youth non-contact rugby formats. While touch rugby eliminates direct collision-based injuries, its high-speed, multidirectional nature introduces unique musculoskeletal risks. To enhance athlete safety and injury prevention, the following interventions should be prioritized:

1. Fatigue Management Protocols
2. Enhanced Warm-Up and Cooldown Routines

3. Field Safety and Surface Optimization
4. Strength and Proprioceptive Training Programs
5. Access to Specialized Medical Support

Limitations of the study

While this study provides valuable insights into injury prevalence and prevention strategies in adolescent touch rugby, several limitations should be acknowledged. One key limitation is the potential underreporting of minor injuries, as some players may not have sought medical attention for less severe conditions (Pennock et al., 2023). Additionally, this study was limited to short-term injury tracking, as it did not include follow-up data on recovery duration or long-term effects (McGuine et al., 2017). Environmental variability, such as differences in playing surface conditions and weather factors, may have also influenced injury occurrences, highlighting the need for further research into external factors affecting injury risk (Meyers, 2017).

CONCLUSIONS

The AGTR 2024 injury analysis highlights critical age-based differences in injury risk, the role of cumulative fatigue in tournament settings, and the effectiveness of on-field treatment modalities. While younger players experienced more surface-related injuries, older athletes faced higher joint stress and overuse injuries as the tournament progressed. The increase in injuries on Day 2 underscores the need for structured recovery strategies, hydration management, and targeted strength training to enhance long-term athlete safety. By adopting proactive injury prevention measures, including structured neuromuscular conditioning, enhanced medical support, and fatigue management strategies, touch rugby administrators and coaches can significantly reduce injury rates and promote long-term athlete well-being. Future research should focus on longitudinal injury tracking and the refinement of training methodologies, ensuring that youth touch rugby remains a safe and developmentally beneficial sport for young athletes.

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CONFLICT OF INTEREST

The author affirms that this research was conducted with complete independence and integrity and is free from any conflicts of interest with any organization, institution, or individual. No financial, professional, or personal affiliations could have influenced the study's design, data collection, analysis, or interpretation. This declaration ensures the objectivity and credibility of the research findings, reinforcing its contribution to sports injury prevention and athlete safety.

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