

Late Adolescent Athletes Suffer More Musculoskeletal Injuries in Contact Sports Compared to Other Young Adults: A 10-Year NEISS Analysis

Brianna Fee, Rachit Saggar, Andrew Qi, Eva Heidinger, Cortez Brown, and MaCalus Hogan

University of Pittsburgh Department of Orthopedic Surgery

INTRODUCTION

Objectives: The purpose of this study was to analyze epidemiological patterns of musculoskeletal injuries among young athletes in contact sports. This information is crucial to the field of sports medicine, and is important to better understand which demographics may experience disparities or require targeted injury-prevention strategies.

Hypothesis: Disparities exist in the rates, types, distribution, and severity of injuries among young athletes in contact sports.

METHODS

- Data collection:** National Electronic Injury Surveillance System (NEISS) from 2014 to 2023
- Injuries included:** musculoskeletal (dislocations, sprains/strains, & fractures)
- Age groups:** 15-18, 19-21, 22-25
- Sports included:** basketball, soccer, rugby, and ice hockey
- Body regions:** upper extremity, lower extremity, face/neck, and trunk

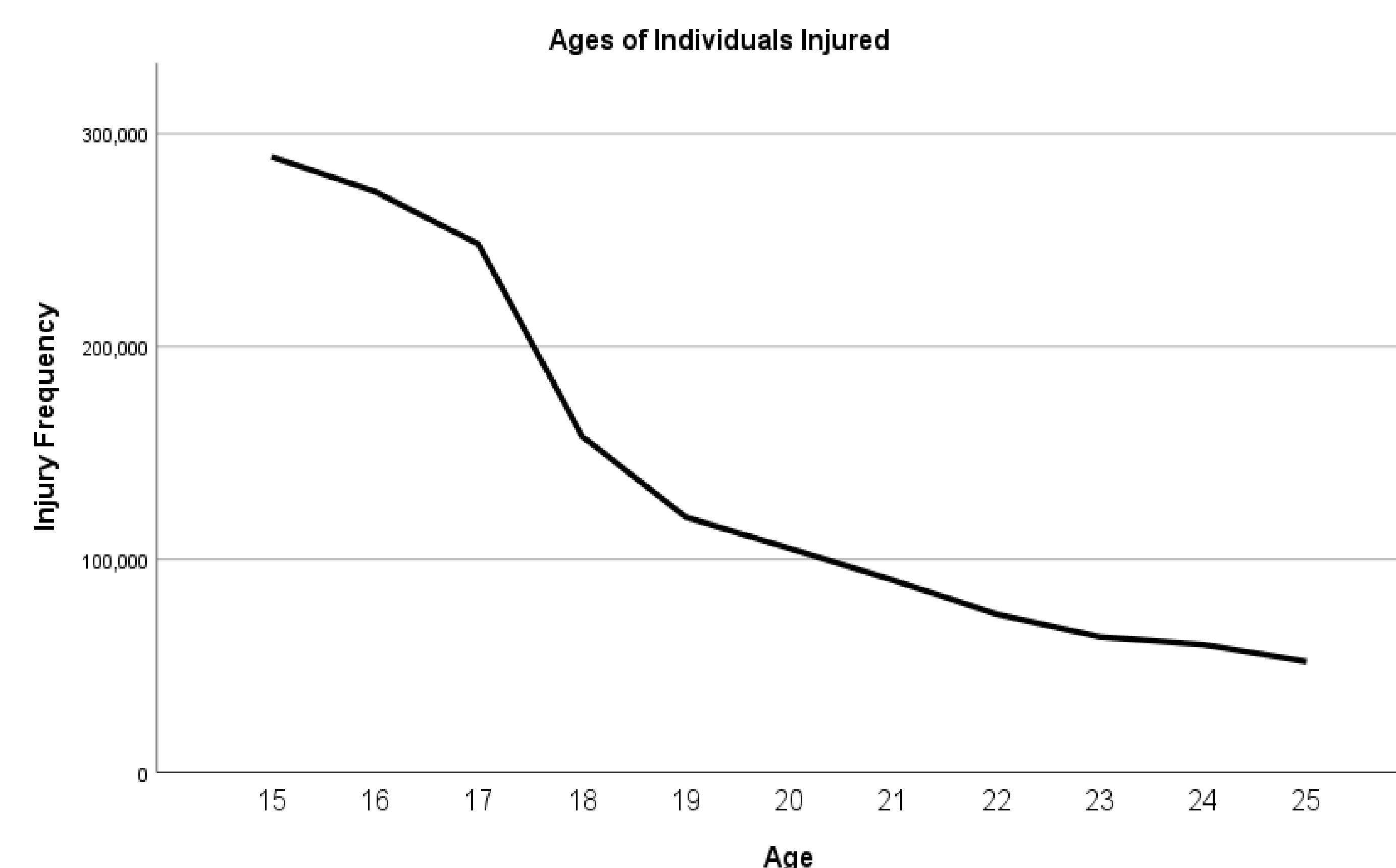
Data analyses:
SPSS
Statistics
v.28

- Descriptive stats → demographic variables & injury characteristics
- Weighted national estimates (WNE) → derived from NEISS
- Chi-squared tests → check for relationships between categorical variables
- Univariate logistic regression → hospitalization odds ratios (ORs) and risk factors

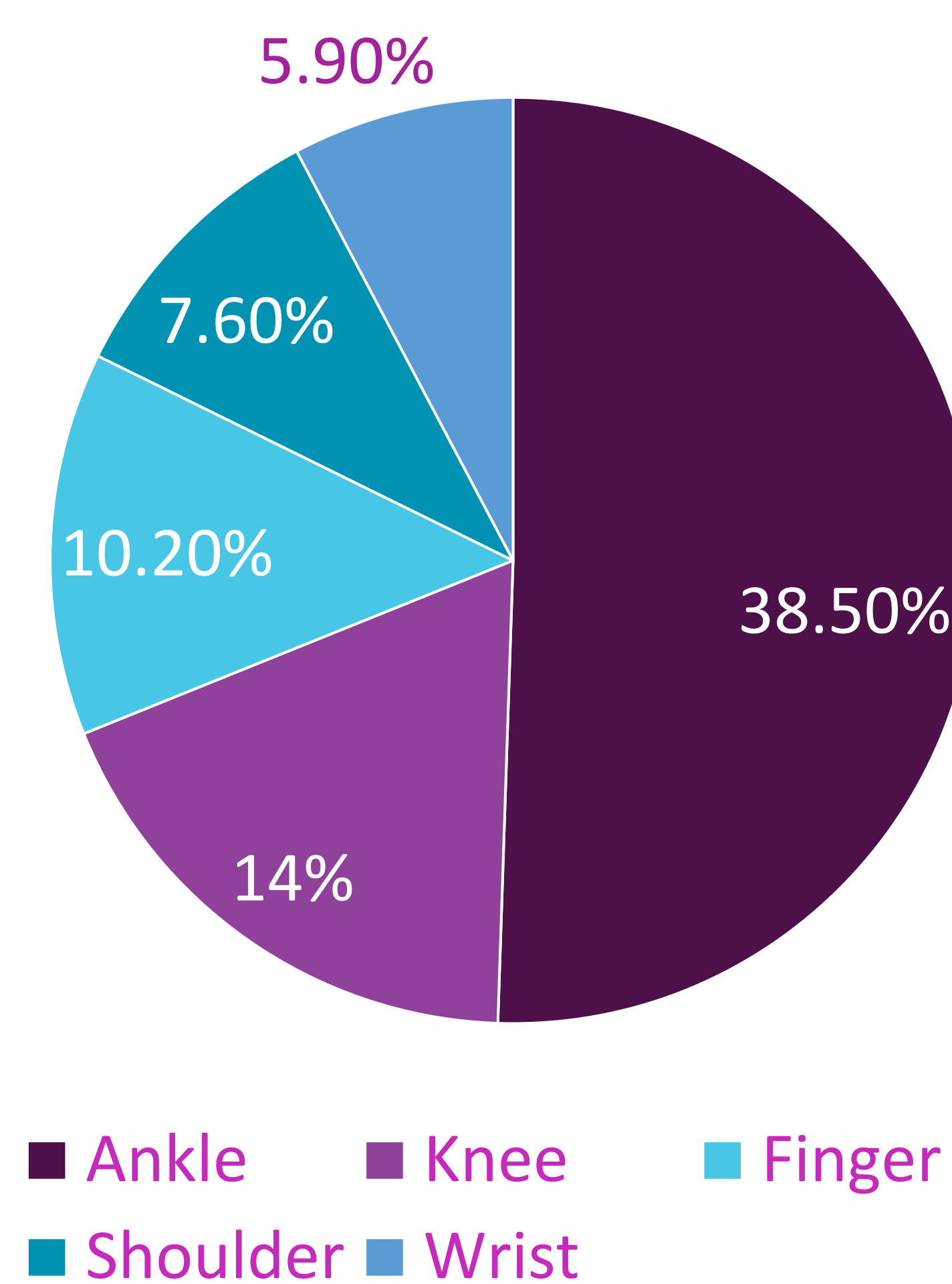
RESULTS

Groups with Highest Odds of Hospitalization

	Odds Ratio (OR)	95% Confidence Interval
Fractures	56.245	[53.126 - 59.547]
Dislocations	20.247	[18.858 - 21.738]
Upper Leg Injuries	19.44	[18.02 - 20.96]
Neck Injuries	7.27	[6.32 - 8.35]
Lower Leg Injuries	4.01	[3.83 - 4.19]
Rugby Injuries	1.777	[1.64 - 1.925]
Ages 21-25	0.844	[0.801 - 0.890]



Most Common Body Part Injuries



Upper Extremity Injuries Most Common:

M/F Ice Hockey Players
Male Rugby Players

Lower Extremity Injuries Most Common:

M/F Basketball Players
M/F Soccer Players
Female Rugby Players

Frequencies by Sport
Basketball – 71.5%
Soccer 25.1%
Rugby – 1.8%
Ice Hockey – 1.7%

Frequencies by Diagnosis
Sprains/Strains – 66.3%
Fractures - 24.9%
Dislocations – 8.8%

DISCUSSION

- **Adolescents more susceptible to injuries**
 - Likely due to puberty, variations in musculoskeletal development, or a decreased risk perception
- **High ORs for rugby and upper extremity injuries**
 - Credited to body checking & high-velocity collisions
- **Highlights sport-specific body regions that require special attention for preventative measures:**
 - Basketball & Soccer: lower extremity
 - Ice Hockey: upper extremity
 - Rugby: both (depending on gender)
- **Supports previous literature suggesting age as an intrinsic risk factor for ankle sprains (Delahunt, et al. 2019)**

CONCLUSION

Main Takeaways:

- ❑ Musculoskeletal injury disparities exist in contact sports, particularly based on age, gender, and sport
- ❑ Targeted prevention strategies needed for adolescents
 - ❑ More emphasis on thorough warm up/stretching regimens
 - ❑ Improved accommodation for varying body types & physiologies
 - ❑ Education on injury prevention and risk factors
 - ❑ Sufficient access to care needed (athletic trainers, strength coaches, etc.)
- ❑ Acute care management for body parts associated with higher hospitalization risks

Our findings offer valuable insight for developing appropriate interventions to enhance athlete safety in contact sports.



References