

Head and Neck Injuries in Gymnastics Pediatric Participants from 2017-2021



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Introduction

Gymnastics is known to have one of the youngest ages of sport specialization with the average age being 8.9 +/- 1.7¹. Sport specialization can be defined as “year-round intensive training in a single sport at the exclusion of other sports.”²

This young age of sport specialization coupled with the increased demand of tasks has proven to be a significant risk factor for injuries in the sport of gymnastics.

Prior literature has investigated the association of upper and lower extremity injuries within pediatric gymnasts.³ To date, no study has reviewed the association between the incidence of head and neck injuries within gymnastics.

Objective

To analyze the epidemiology of pediatric head and neck injuries in the sport of gymnastics.

Methods

The National Electronic Injury Surveillance System (NEISS - an injury surveillance database operated by the United States Consumer Product Safety Commission) was queried for epidemiologic data associated with gymnastics-related head and neck injuries in children up to 18 years old from 2017 to 2021. The NEISS collects data from 100 United States Emergency Departments as a sample for the 5000+ United States Emergency Departments. Chi-squared analysis was performed where applicable to determine statistical significance in distribution of different groups.

Results

Diagnosis of the Head and Neck	N	% total
INTERNAL INJURY (HEAD INJURY)	184	23.32
STRAIN, SPRAIN	148	18.76
CONCUSSION	143	18.12
LACERATION	133	16.86
OTHER (GENERAL PAIN)	101	12.80
CONTUSIONS, ABRASIONS	41	5.20
FRACTURE	22	2.79
DENTAL INJURY	11	1.39
HEMATOMA	3	0.38
HEMORRHAGE	2	0.25
NERVE DAMAGE	1	0.13

Figure 1. **Diagnoses of the Head and Neck**
List of different diagnoses extracted from the NEISS as it pertains to anatomy of the head & neck from 2017 to 2021.

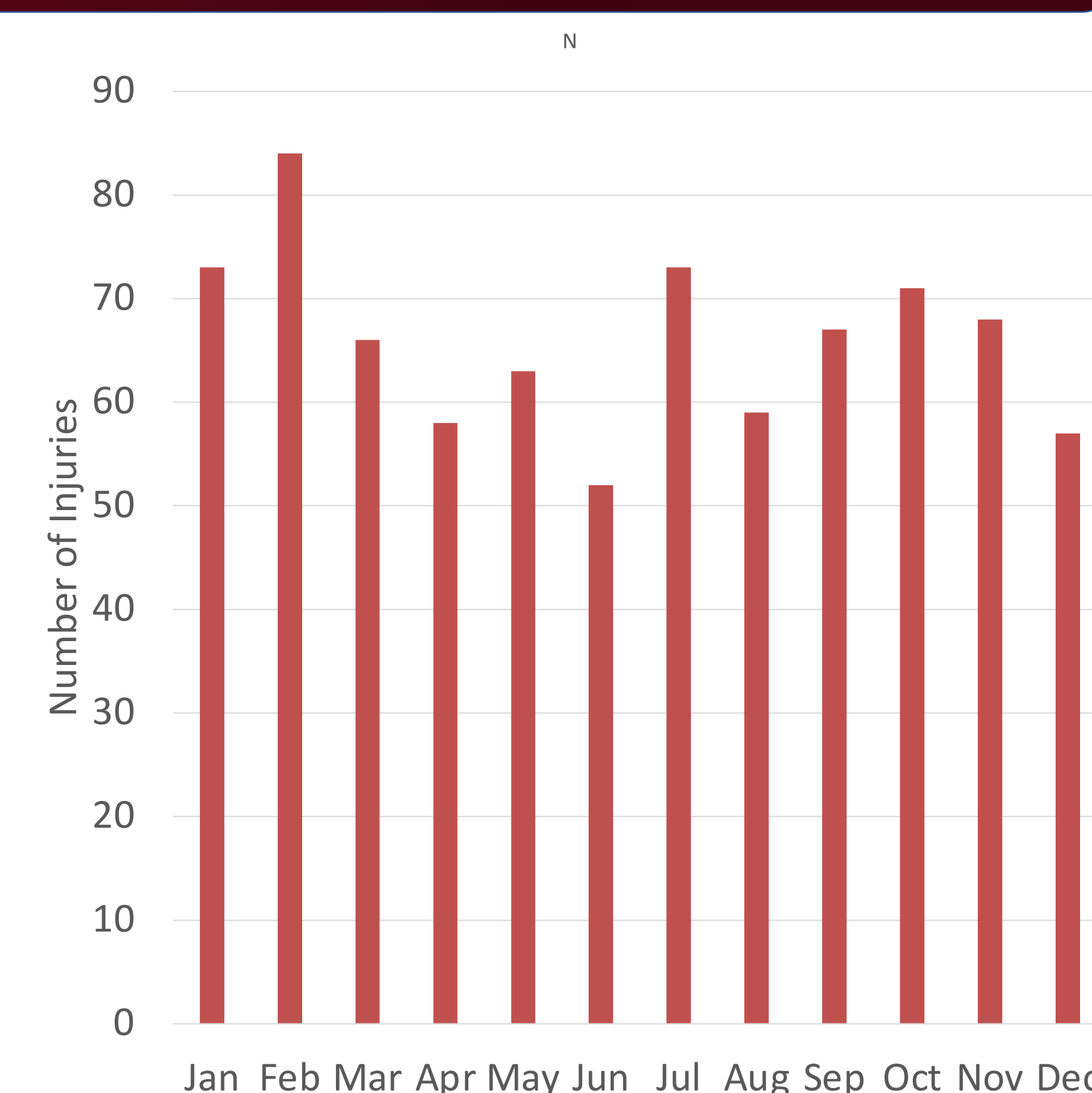


Figure 2. **Month of Injury**
Patients presented significantly more ($p < 0.05$) during the winter months (Dec-Feb, 30.5%) compared to the summer months (June-Aug, 23.3%).

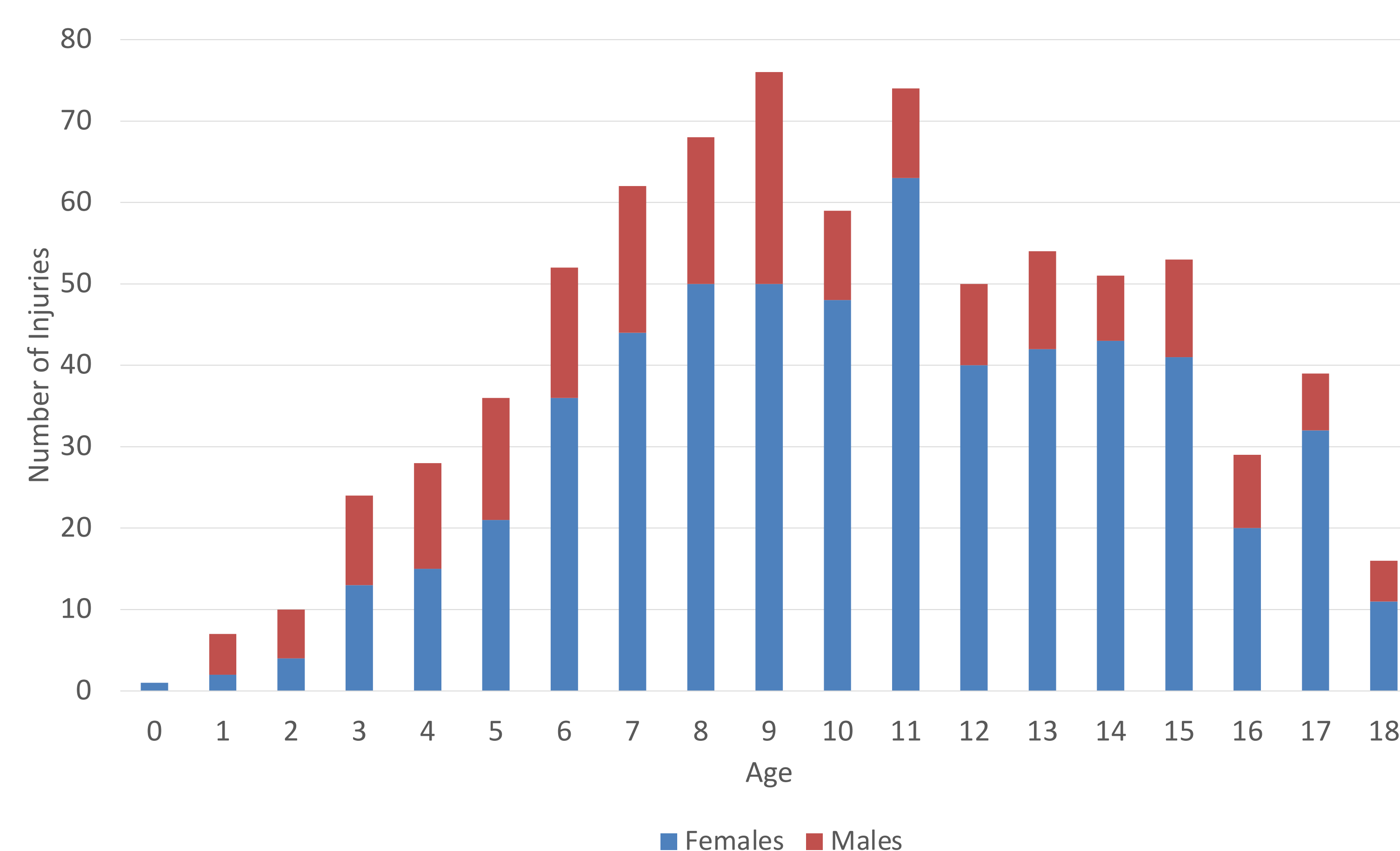


Figure 3. **Age of Injury.**
Female patients were significantly older than male patients (mean 10.5 yo SD 3.85 vs. 9.07 yo SD 4.37, $p < 0.05$, respectively).

The average age of injury was found to be 10.13 yo; correlating with the early specialization seen in the sport.

The average age of face (8.15 yo) and mouth (8.1 yo) injuries were significantly less than the average age of patients who presented with head (region restricted to scalp, brain, skull) (10.8 yo) or neck (10.7 yo) injuries ($p < 0.05$).

Results

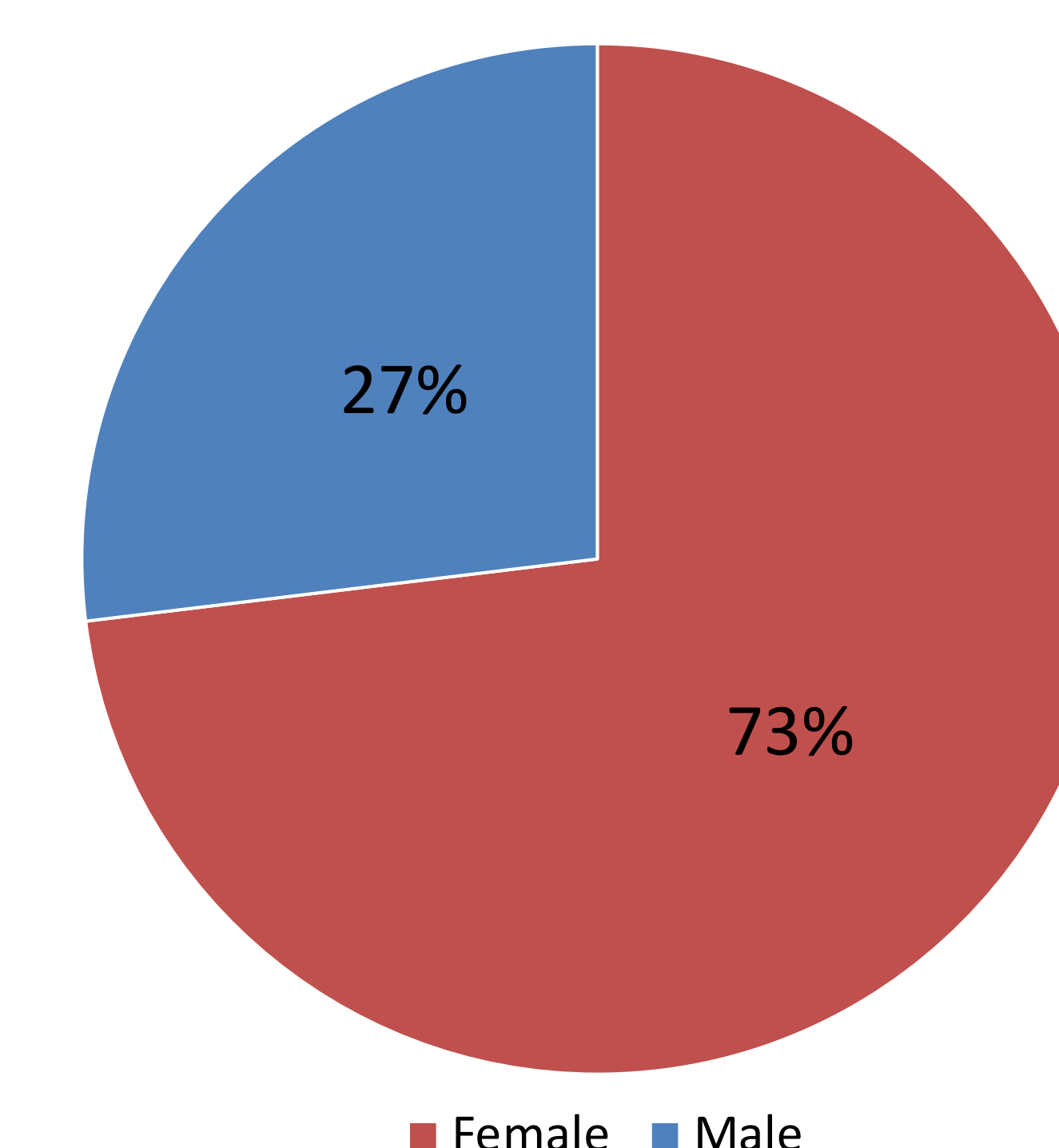


Figure 4. **Sex of participant**

Male patients presented more with lacerations (30.0%), while female patients were more likely to present with strains/sprains (22.3%).

Conclusions

The results of this study characterizes head and neck injuries of pediatric participants in gymnastics and demonstrates a possible relationship and risk factor within gymnastics. Special attention and concerns should be brought forth by physicians when evaluating pediatric gymnastics participants.

References

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