

SUBSEQUENT INJURIES FOLLOWING A SPORTS-RELATED CONCUSSION IN HIGH SCHOOL ATHLETES: A CASE SERIES

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INTRODUCTION

Recently, it has been suggested concussions may be associated with an increased risk of a subsequent injury (SI), particularly within the lower extremity.¹⁻³ This risk may be associated with alterations in gait patterns⁴ or lower extremity neuromuscular control⁵ during loading tasks or cognitive function.⁶ Given the etiology of this relationship is not fully understood, it is important to recognize potential factors related to sports-related concussions (SRC) and subsequent injuries within a high school population. The purpose of this case series was to describe the SI occurring within 6-months of SRC within a sample of high school athletes.

METHODS

- Electronic medical records (Epic, Verona, WI) of 103 student-athletes (67% male, M±SD: age = 16.0±1.2 yrs) from 16 area high schools were reviewed retrospectively between July and September 2019
- SI occurring within 6-months of the SRC were recorded
- Data were analyzed using descriptive statistics

RESULTS

- 40 (38.8%) reported at least one previous concussion in their lifetime
- 16 (15.5%) went to the emergency room
- 2 (1.9%) experienced a loss of consciousness
- 99 (96.1%) returned to play (RTP) within 15.0±8.6 days of the SRC
- 23 (47.9%) of the SI were classified as a sprain
- 16 (33.3%) student-athletes reported previously injuring the body part

CONCLUSION

These findings provide an overview of the characteristics associated with a SRC and the SI within a sample of high school student-athletes. Most SI occurred in the lower extremity within the first two months of RTP from the SRC.

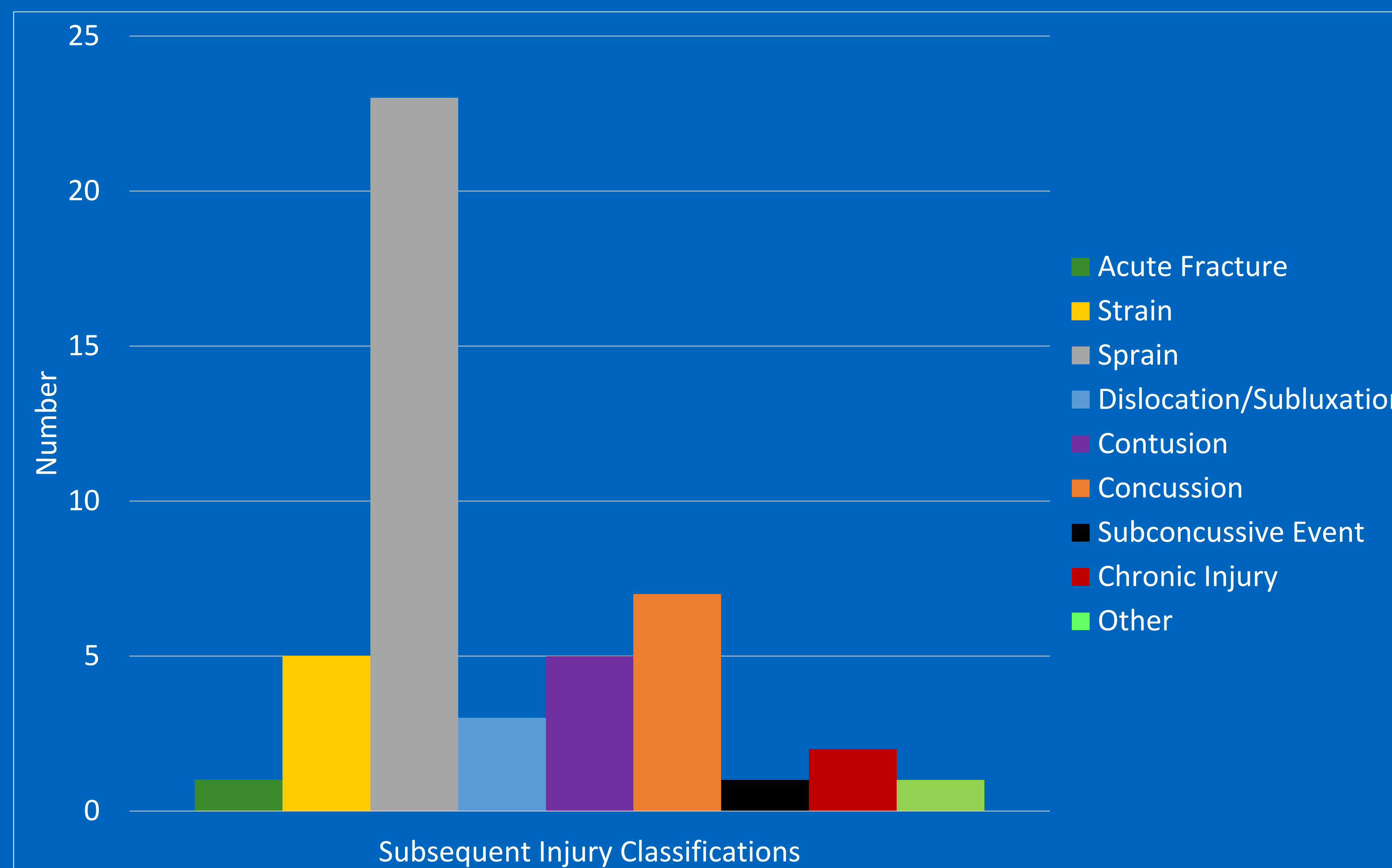
PRACTICAL APPLICATION

It is imperative for healthcare professionals to understand potential injury risk factors for high school athletes to design return to play protocols and injury reduction programs. As such, these types of protocols and programs may need to mitigate the risk of a subsequent injury, particularly in the lower extremity, following a sports-related concussion.

44 (42.7%) student-athletes sustained one subsequent injury and 4 had two subsequent injuries within 6 months from the Sports-Related Concussion

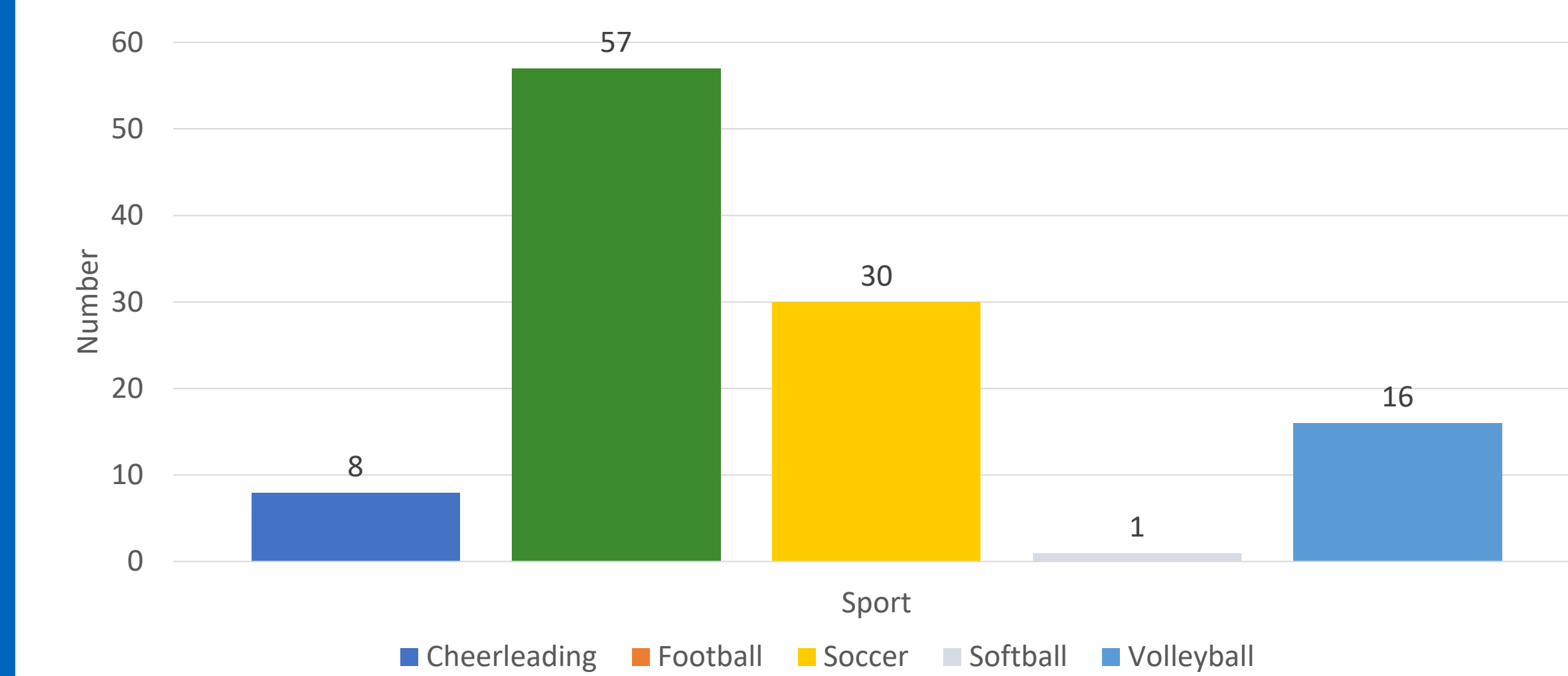
Average length of time from the initial SRC to the SI was 55.4±45.9 days, and 66.7% (n = 32) occurred during a competition

62.5% of the subsequent injuries occurred in the lower extremity (n = 30)

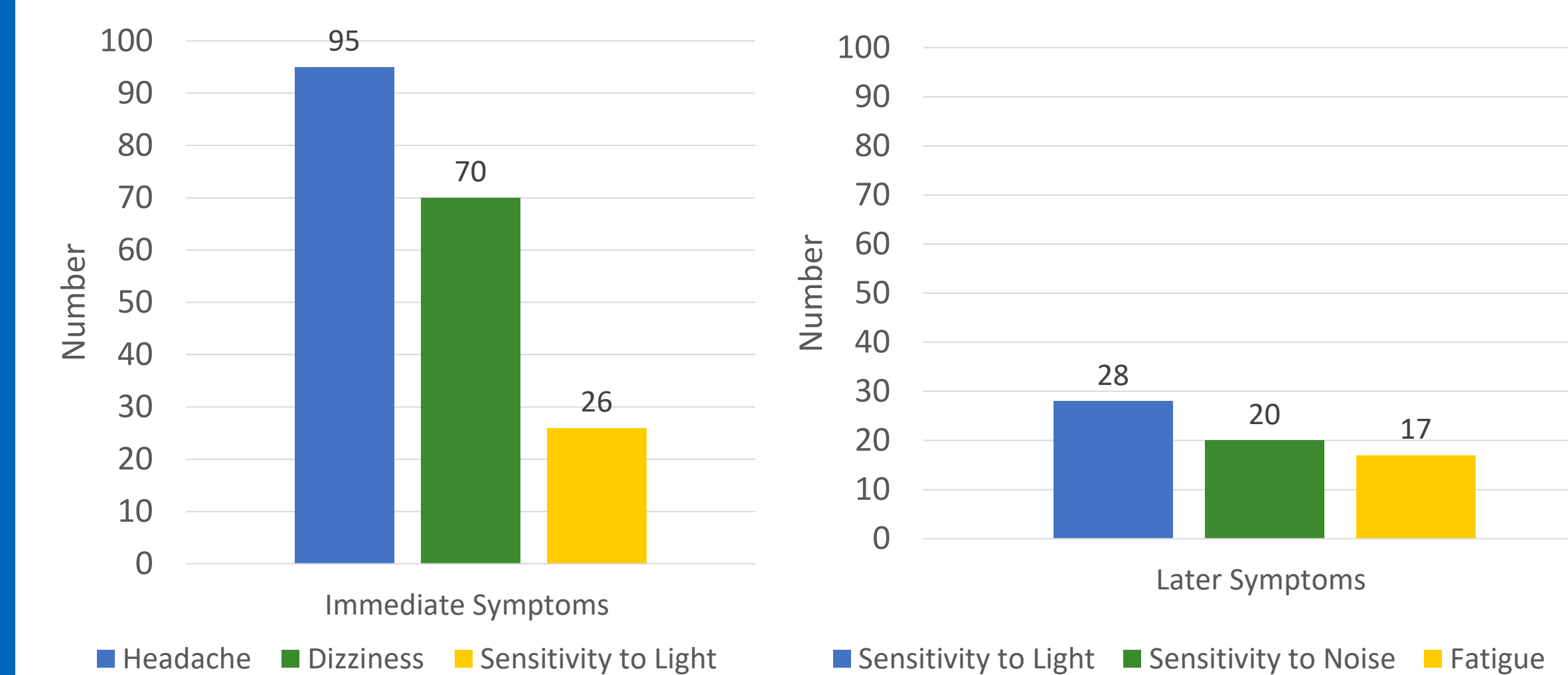


Classification of the subsequent injury (N = 48) occurring 6 months after a high school athlete sustained a sports-related concussion.

Demographics	Count (%)
Male	69 (67.0%)
Female	34 (33.0%)
White or Caucasian	90 (87.4%)
Non-white or Caucasian	13 (12.6%)
Co-Morbidities	Count (%)
Migraines	5 (4.9%)
Depression	5 (4.9%)
Anxiety	5 (4.9%)
ADHD	14 (13.6%)
Learning Disability	5 (4.9%)
Other	5 (4.9%)
None of these	77 (74.8%)



Sport the student-athlete was playing when they sustained the concussion (N = 103) and 60 occurred during a competition (58.3%).



The three most common symptoms reported immediately following the SRC and symptoms that developed later within a sample of 103 high school student-athletes.

Subsequent Injury Body Part Classification	Count (%)
Hip	2 (4.2%)
Groin	1 (2.1%)
Thigh	1 (2.1%)
Knee	12 (25%)
Lower Leg	3 (6.3%)
Ankle	5 (10.4%)
Foot	1 (2.1%)
Trunk	2 (4.2%)
Neck	1 (2.1%)
Shoulder	4 (8.3%)
Wrist	2 (4.2%)
Hand	2 (4.2%)
Head/Face	10 (20.8%)
Multiple	2 (4.2%)

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