

Association Between Sport Specialization and Risk of Musculoskeletal Injury in High School Athletes: A Critically Appraised Topic



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INTRODUCTION

Sport specialization is defined as intensive, year-round training in a single sport to the exclusion of other sports.¹ The increased training and competition loads secondary to this trend have been hypothesized to contribute to psychological burnout and overuse injuries. High school athletes are of interest due to the increased intensity and level of competition compared to youth sports. By classifying levels of sport specialization and analyzing injury history of subjects, correlations have been made to the relationship between sport specialization and the prevalence of musculoskeletal injuries in high school athletes.² Thus, the question being investigated in this critically appraised topic is “Is sport specialization associated with an increased risk of musculoskeletal injury in high school athletes?”

OBJECTIVES

To determine if sport specialization is associated with an increased risk of musculoskeletal injury in high school athletes.

METHODS

An electronic database search included PubMed, SPORTDiscus, and Medline. Search terms included “high school athletes” AND “sport specialization” AND “musculoskeletal injury OR injury”.

Inclusion Criteria:

- Studies utilizing high school athletes
- Studies utilizing both male and female participants
- Level 3 evidence or higher
- Limited to English language
- Limited to the past 10 years (2009-2019)

Exclusion Criteria:

- Participants younger than high school
- Studies that investigated non-musculoskeletal injuries
- Studies that investigated a population from a single sport (i.e. only baseball players)

RESULTS

- Three cross-sectional and one cohort study were included and appraised using the “Checklist for Measuring Quality”.⁹
- All four studies utilized a 3-question sport participation survey in order to classify participants as either high, moderate, or low specialization and an injury history survey.²
- Two studies^{4,6} included high school athletes from 29 different high schools, one³ included high school athletes from 2 different high schools, and one⁵ included high school athletes from only one high school.



Table 1

Author	Bell et al. ³	McGuine et al. ⁴	Dahab et al. ⁵	Post et al. ⁶
Study Title	Prevalence of Sport Specialization in High School Athletics: A 1-Year Observational Study	A Prospective Study on the Effect of Sport Specialization on Lower Extremity Injury Rates in High School Athletes	Sport Specialization, Club Sport Participation, Quality of Life, and Injury History Among High School Athletes	Association of Competition Volume, Club Sports, and Sport Specialization with Sex and Lower Extremity Injury History in High School Athletes
Participants	302 high school athletes from 2 high schools. (122 males, 180 females)	1544 high school athletes from 29 high schools. (764 males, 780 females)	97 high school athletes. (61 males, 36 females)	1544 high school athletes from 29 high schools (764 males, 780 females)
Intervention Investigated	Subjects completed a sport specialization survey and a LE injury history survey.	Subjects completed a sport participation and LE injury history questionnaire reporting their interscholastic and club sport involvement.	Participants completed a questionnaire determining their level of sport specialization, injury history, and participation in club sports.	Subjects completed a non-validated sports participation in both scholastic and club sports and LE injury questionnaire.
Main Findings	Those with a history of overuse knee injuries were more likely to be in the high specialization group vs. low. Those who trained more than 8 months of the year in one sport were more likely to report any type of knee injury, overuse knee injury, and hip injury	Incidence of LE injury was greater in the high and moderate specialization groups compared to low specialization group. Higher incidence of non-acute LE injuries in high and moderate specialization groups compared to low specialization group.	No significant associated between sport specialization and the outcome measures. Higher proportion of prior time-loss musculoskeletal injuries and injuries requiring imaging, injection, cast, brace, or crutches in those who played club sports.	Large schools more likely to specialize. High or moderately specialized athlete were significantly more likely to sustain a LE injury. High to moderate competition volume and participation in club sport in addition to school sport also increased this likelihood.
Level of Evidence	3	2	3	3
Evidence Quality Score*	17/25	17/25	17/25	17/25
Support for the Answer	Yes	Yes	No	Yes



- Level B evidence exists that sport specialization is associated with a higher risk of musculoskeletal injuries in high school athletes. The level B recommendation is based on the consistent of conclusions in one level 2 and three level 3 evidence studies included in this CAT.
- Three studies^{3,4,6} analyzed in this appraisal found positive correlations between moderate and high levels of sport specialization and musculoskeletal injuries while one⁵ did not.
- Additionally, two of the studies^{5,6} found a positive correlation between time-loss injuries and participation in club sports.

Clinical Bottom Line

Studies utilized in this CAT determined that sport specialization is associated with a higher risk of musculoskeletal injuries in high school athletes. Three studies analyzed in this appraisal found positive correlations between moderate and high levels of sport specialization and musculoskeletal injuries while one did not. However, other factors, such as training volume, competition volume, and club sport involvement may all also play a role in this relationship. Recommendations should be made to parents and athletes to delay sport specialization in order to avoid overuse injuries and facilitate skill transfer and balanced neuromuscular development.²

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