

Early Sport Specialization is Associated with Increased Chance of Injury

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Young athletes are specializing in a single sport at a much earlier age compared with a generation ago. With early sport specialization, physical, mental, and social ramifications are possible.

Focused Clinical Question: “In youth athletes aged 7-18 years(P), does increased sport specialization(I) increase the chance of injury(O) compared to those who have low levels of sport specialization(C)?” Secondly, we asked “In youth athletes(P), do females(I) compared to males(C) have an increased chance of sport specialization(O)?”

Data Sources: PubMed and SPORTDiscus were searched through September 2018.

Search terms included iterations of “sport specialization”, “female”, “women”, “intense training”, “prolonged training”, “competition volume”, and “injury or injury rates”. Studies were limited to peer-reviewed, original studies, published in English within the past 5 years.

Study Selection: Selection criteria required that studies 1) evaluated sport specialization in youth athletes; and 2) included injury rates.

Data Extraction: Selected outcomes of interest were 1) sport participation numbers; 2) sport specialization classification (low, moderate, or high); 3) injury frequencies; and 4) sex of injured athletes, where available. Sport specialization classification was performed utilizing validated or unvalidated scales, with questions targeted at the 1) athlete being able to identify a “primary sport”; 2) participation in a “single sport only”; 3) necessity of the athlete to “quit one sport to focus on primary sport”; or 4) amount of time spent in a single sport with “primary sport participation >8 months of the year”.

Summary Measures: Odds ratios(OR) [95% ICs] were calculated to determine the association of 1) sport specialization (low v. moderate, low v. high) on injury (injury v. no injury) and 2) sex (female v male) on sport specialization (low v. moderate, low v. high). Using these odds ratios, 4 summary models were calculated to determine pooled effects across studies.

Evidence Appraisal: An 8-question critical appraisal tool for cohort & case-control studies was used to assess the quality of evidence and potential threats validity.

Search Results: Seven studies were eligible (6 case-control, 1 cohort). Two studies (both case-control) were subsequently removed as they utilized the same datasets as 2 of the already included studies, and would have led to artificially inflated numbers for the extracted data.

Data Synthesis: For the effect of sport specialization on injury, athletes with moderate specialization were 50% more likely to be injured (OR=1.5[1.3, 1.8], p<.001) compared

to athletes with low levels of specialization. Highly specialized athletes were 80% more likely to have incurred an injury (OR=1.8[1.5, 2.1), $p<.001$) than low specialized athletes. For low v. moderate specialization, females were more strongly associated with moderate specialization compared to males (OR=1.2[1.1, 1.4], $p=0.01$). For low vs. high specialization, females were more strongly associated with high specialization compared to males (OR=1.5[1.1, 2.0], $p=0.01$). In studies that delineated across multiple injuries, approximately 50% of reported injuries were to the lower extremity(LE), and ~40-70% were reported as overuse.

Evidence Quality: Included studies each scored 7/8. All studies failed to blind participants or assessors.

Conclusions: Early sport specialization has a biopsychosocial impact on young athletes. Based on the included studies, there was a strong association between sport specialization and injury. In particular, injuries to the LE and overuse injuries were common. Further, female athletes were more likely to be more highly specialized in a sport compared to males. Physically, early sport specialization appears to be an injury risk factor for both sexes. From a psychosocial perspective, the rationale for increased sport specialization in female athletes needs further exploration, including a determination of its full impact on injury rates. The clinical magnitude of sport specialization on young athletes has an impact on how ATs can better educate young athletes and parents.

Word Count: 599