Association of Youth Distance Running and Lower Extremity Injury: A Systematic Review
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RESULTS – COHORT STUDIES

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Exposure</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>Goldman et al. 2019</td>
<td>720 middle school (MS) SRLA participants</td>
<td>28-week marathon training program</td>
<td>102 reported MS injuries 20.8% of HS runners reported injuries vs. 14.2% of MS runners Most common injury: knee (33%)</td>
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<td>Reid et al. 2012</td>
<td>Age 10-12: ~ 25,243 Age 13-14: ~ 53,504</td>
<td>Cross country events</td>
<td>10-12 yo: ~ 1,234 (4.9%) injuries 13-14 yo: ~ 4,964 (9.3%) injuries Most frequent injury region: lower extremity (58.2%)</td>
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RESULTS – CASE REPORTS & CASE SERIES

**Hip Injuries**
- Bilateral Avulsion Fx of Pelvis Apophyses; 14 yo F; 20-30 mi weekly
- Fx Separation of Anterior Iliac Apophysis; 14 yo M; cross country

**Femoral Injuries**
- Adductor Insertion Avulsion Syndrome: 14 yo M; 10 km daily
- Bilateral Supracondylar Stress Fx: 14 yo M; cross country
- Pathological Fx: 12 yo M; more than 5 km per day

**Knee Injuries**
- Dorsal Defect of Patella: 13 yo F; running, 10 km race

**Tibial Injuries**
- Tibial Stress Fx: 11 yo M; 2-3 mi per day

CONCLUSIONS
- The main finding was a paucity of research
- Emerging evidence suggests low risk of injury associated with youth distance running.
- This review helps establish the need for additional research on the effects of distance running in youth under the age of 15.

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- Scan QR Code for a list of references
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BACKGROUND
- Distance running has become increasingly popular among youth athletes over the past decade.
- Distance running-related injuries have been well researched in the adult and high school (HS) populations, yet little is known on the effects of distance running for those under 15.
- Controversy exists whether distance running is safe for youth runners.
- There are several guidelines available to the public.

METHODS
- Registered with PROSPERO and followed PRISMA guidelines
- Data Sources: MEDLINE, EMBASE and Scopus
- Participants under 15 years of age
- Distance reported was at least 800 m
- Athlete sustained an injury to the lower extremity from running
- Distance Running: cross country or a minimum of 800 m if specified
- Youth Running: population under 15 years of age

PURPOSE
To examine the association of youth distance running and lower extremity musculoskeletal injury.

RESULTS
- 258 full texts were screened with nine articles retained for data extraction, seven were case reports or case series
- Reid et al. found cross country accounted for less than 10% of injuries in youth under 15 years of age compared to various other track activities and events.
- Goldman et al. found no correlation between running mileage or gender and sustaining an injury.
- Middle school runners reported fewer injuries than high school runners.
- Available literature suggests youth may be able to participate in distance running with minimal adverse effects. One exception may be potential vulnerability to growth plate injury.

CLINICAL RELEVANCE
- There is not sufficient evidence to support that youth distance running should be discouraged.
- Available literature suggests youth may be able to participate in distance running with minimal adverse effects. One exception may be potential vulnerability to growth plate injury.