A SCOPING REVIEW OF TRAINING-RELATED INJURIES AMONG FEMALES IN THE MILITARY

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Review title and timescale

1 **Review title:**
   A scoping review of training-related injuries among females in the military

2 **Anticipated or actual start date:**
   February 11, 2019

3 **Anticipated completion date:**
   June 15, 2019

4 **Stage of review at time of this submission:**
   This review has not yet started

   **Review stage (Please check all that apply)**

<table>
<thead>
<tr>
<th>Preliminary searches</th>
<th>Started</th>
<th>Completed</th>
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</thead>
<tbody>
<tr>
<td>Piloting of the study selection process</td>
<td>☐</td>
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<tr>
<td>Formal screening of search results against eligibility criteria</td>
<td>☐</td>
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<tr>
<td>Data extraction</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Risk of bias (quality) assessment</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Data analysis</td>
<td>☐</td>
<td>☐</td>
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</table>

   **Provide any other relevant information about the stage of the review here:** Not applicable

Review team details

5 **Named contact**
   Brian Hutton

6 **Named contact email**
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7 **Named contact address**
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9 **Organisational affiliation of the review**
   University of Ottawa

10 **Review team members and their organisational affiliations**
   Give the title, first name and last name of all members of the team working directly on the review. Give the organisational affiliations of each member of the review team.

<table>
<thead>
<tr>
<th>Title</th>
<th>First name</th>
<th>Last name</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>Dr.</td>
<td>Samantha</td>
<td>Cukier</td>
<td>Ottawa Hospital Research Institute</td>
</tr>
<tr>
<td>Ms.</td>
<td>Fatemeh</td>
<td>Yazdi</td>
<td>Ottawa Hospital Research Institute</td>
</tr>
<tr>
<td>Mr.</td>
<td>Alan</td>
<td>Michaud</td>
<td>Ottawa Hospital Research Institute</td>
</tr>
<tr>
<td>Mrs.</td>
<td>Chantelle</td>
<td>Garrity</td>
<td>Ottawa Hospital Research Institute</td>
</tr>
<tr>
<td>Dr.</td>
<td>Brian</td>
<td>Hutton</td>
<td>Ottawa Hospital Research Institute</td>
</tr>
<tr>
<td>Mrs.</td>
<td>Becky</td>
<td>Skidmore</td>
<td>Independent consultant</td>
</tr>
<tr>
<td>Mr.</td>
<td>Kevin</td>
<td>Semeniuk</td>
<td>University of Ottawa</td>
</tr>
<tr>
<td>Dr.</td>
<td>Kristi</td>
<td>Adamo</td>
<td>University of Ottawa</td>
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11 Funding sources/sponsors
Canadian Department of National Defence

12 Conflicts of interest
None

Review methods

13 Review question(s):
In females in the military aged 18-55 years:

1. What anthropometric (e.g. measures of size/shape/composition of the body), physiological (e.g. fitness level, flexibility, blood pressure, EEG/ECG measures) and biomechanical (e.g. lifting technique, movement efficiency) factors have been identified that impact musculoskeletal injuries?

2. What risk factors for musculoskeletal injury have been observed/reported in the literature?

3. What injuries are occurring and what are the causes of these injuries?

14 Literature Search:
1. Military Personnel/ (67519)
2. Armed Forces.tw,kf. (11807)
3. defen#e force?.tw,kf. (2279)
4. militar*.tw,kf. (104478)
5. ((airborne or assault* or battle* or combat* or warfare) adj3 train*).tw,kf. (1399)
6. combat arms.tw,kf. (106)
7. combat-centric.tw,kf. (6)
8. combat-related.tw,kf. (3444)
9. (army or armies or naval or navy or navies or airforce* or air force* or soldier* or sailor* or submarine* or infantry* or infantry including reservists or conscript* or militia* or special forces.tw,kf. (15) or/1-15 [MILITARY] (191914)
10. exp Musculoskeletal System/in [Injuries] (88854)
11. exp Musculoskeletal System/ and Occupational Injuries/ (1109)
12. ((musculoskeletal* or musculo-skeletal* or muscle?) adj3 (damag* or disorder? or fractur* or injur* or ruptur* or tear* or trauma*)).tw,kf. (72860)
13. exp Fractures, Bone/ (477063)
14. ((break* or damag* or diastas* or fractur* or injur*) adj3 (ankle? or arm or arms or back or bone? or cartilage or clavicle? or coccyx? or elbow? or femur? or femoral or fibula? or foot or feet or finger? or forearm? or hand? or hip or hips or humerus or humeral or knee? or kneecap? or leg or legs or limb or limbs or lower extremit* or metatarsal? or neck? or patella? or pelvic or pelvis or radius or radial or rib or ribs or scapula* or shoulder? or skull? or spine? or spinal or tailbone* or tibia? or toe or toes or ulna? or upper extremit* or vertebra* or wrist?)}.tw,kf. (499591)
15. fracter? adj3 (avulsion or dislocat* or closed or comminute* or compound or compression* or crush* or fatigue or march or micro or multiple or open or spontaneous* or sprain* or stress*)).tw,kf. (92508)
16. microfractur*.tw,kf. (3903)
17. exp Joint Dislocations/ (40477)
18. ((joint? or shoulder?) adj3 (damag* or dislocat* or displac* or injur* or subluxation?)}.tw,kf. (42365)
19. exp Spinal Injuries/ (67542)
20. exp "Sprains and Strains"/ (2211565)
21. sprain*.tw,kf. (12718)
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### Primary outcome(s):  
Musculoskeletal injury; Anthropometric, physiological or biomechanical differences

### Secondary outcome(s):  
Risk factors for injury; Causes of injury

### Data extraction (selection and coding):  
A standardized data charting form implemented for recording key items. A pilot exercise of three relevant studies was performed in Microsoft Excel (version 2016) to help develop the draft data charting form. Data charting will be performed by one reviewer and verification will be carried out by a second reviewer. A list of draft data variables includes general study characteristics (e.g., author and publication year), study population characteristics (e.g., age, % female), measurement characteristics (e.g., test name, method of testing), nature of comparator group, and outcomes collected. The approach for further refining and developing the data extraction form will depend on the volume and extent of the diversity of the included studies. Once the included studies have been identified, we will further pilot the draft form on a select number of studies (5-10) that represent perceived diversity in concepts and variables. The extent of extraction may depend on the feasibility according to the volume of included studies and resources to complete the work.

### Risk of bias (quality) assessment:  
As this scoping review is being conducted to provide an overview of the existing evidence, regardless of methodological quality or risk of bias, a risk of bias assessment of the individual studies will not be undertaken.

### Strategy for data synthesis:  
Study characteristics (e.g., author, year, country, number of participants) and population demographics (e.g., age, physical fitness levels) will be presented in tabular form. Organizing data first by injury type will allow for all anthropometric, physiological, and biomechanical factors to be identified, as an injury could be caused by one or several factors. Results will be presented using tables and visual representations (e.g., maps, radar charts, bar charts), as appropriate. A narrative summary will be used to further describe the results from the tables and charts. Other risk factors (as identified in the literature), incidence and causes of each injury will also be presented, with any similar and/or contradictory results highlighted.

### Analysis of subgroups or subsets:  
Subgroup analyses will depend on comparator (e.g., males, uninjured women).

### Review general information

#### Type of review  
Select one of the following:  
- **Review Type**  
  - Scoping review  
  - Rapid review  
  - Systematic review  
  - Other: ______________

#### Language  
English

#### Country  
Canada

#### Other registration details  
None.
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<tr>
<th>32</th>
<th><strong>Reference and/or URL for published protocol</strong></th>
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<tr>
<td></td>
<td>The protocol will be posted to Open Science Framework once it is finalized.</td>
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<tr>
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<th><strong>Dissemination plans:</strong></th>
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<td>Results will be provided to the knowledge users. We are currently waiting for our primary end users (Adamo, Seminiuk) to complete a discussion with their funders from the Canadian Department of National Defence to establish any other dissemination plans of specific interest to them to suit their needs.</td>
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If there are sufficient funds, we intend to publish the results in an open-access peer-reviewed journal.

**Do you intend to publish the review on completion?**

- Yes ☑️
- No ☐

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<thead>
<tr>
<th>34</th>
<th><strong>Keywords</strong></th>
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<td>Musculoskeletal injuries, females in the military, anthropometric measurements, physiology, biometric measurements</td>
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<th><strong>Details of any existing review of the same topic by the same authors.</strong></th>
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<th><strong>Current review status</strong></th>
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<tr>
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<td>The review has not begun, though preliminary search strategies have been developed.</td>
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<th><strong>Any additional information:</strong></th>
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