Exercise & Sport Science
Literature Searching

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Health Sciences Library
Literature Searching: Objectives

Lecture (about 40 minutes)
• How to use PICO to identify **key concepts** in research questions
• Use key concepts to identify **search terms** and construct search strategy

Demo searching in SPORTDiscus, PubMed, Google Scholar

Hands-on Exercise (about 30 min)
• Apply structured search process to your research topic
Boolean Basics

**Boolean AND**

College **AND** High School

Combining search words with **AND** narrows the search.

**Boolean OR**

( College **OR** High School )

Combining search words with **OR** expands the search.

**Tips**

- Use All Caps for AND / OR
- Wrap OR sets in parentheses
A framework called **PICO** can be used to make the process of searching for evidence to answer a question a bit clearer.

<table>
<thead>
<tr>
<th>P</th>
<th>Patient or Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Intervention or Indicator</td>
</tr>
<tr>
<td>C</td>
<td>Comparison or Control (not part of all questions)</td>
</tr>
<tr>
<td>O</td>
<td>Outcome</td>
</tr>
</tbody>
</table>
PICO

• Helps you clarify and focus your question by identifying all the **key** concepts in complex questions
• Organizes words related to the parts of the question
• Guides thinking about how best to combine the words into a logical search process
# Clear Research Question

Does stretching before exercise prevent injuries?

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong></td>
<td>people who exercise</td>
<td>exercise</td>
</tr>
<tr>
<td><strong>I</strong></td>
<td>stretching before exercise</td>
<td>(stretch OR stretching) (warmup OR warm up)</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>no stretching</td>
<td></td>
</tr>
<tr>
<td><strong>O</strong></td>
<td>prevent injuries</td>
<td>(prevent OR preventing OR prevention) (injury OR injuries)</td>
</tr>
</tbody>
</table>
Access via
http://guides.lib.unc.edu/exercisesportscience
SPORTDiscus: Word Search for Main Concepts

Search Results: 1 - 10 of 788

1. The effectiveness of soft-tissue therapy for the management of musculoskeletal disorders and injuries of the upper and lower extremities: A systematic review by the Ontario Protocol for Traffic Injury management (OPTIMA) collaboration.

   Piper, Steven, Shearer, Heather M.; Côté, Pierre; Wong, Jessica J.; Yu, Hainan; Varatharajan, Sharanya; Southerst, Danielle; Randhawa, Kristi A.; Sutton, Deborah A.; Stupar, Maja; Nordin, Margareta C.; Mior, Silvano A.; van der Velde, Gabrielle M.; Taylor-Vaisey, Anne L., Manual Therapy Feb 2015, Vol. 21, p18

2. Acute effects of muscle stretching on physical performance, range of motion, and injury incidence in healthy active individuals: a systematic review.

   Behm, David G.; Blazevich, Anthony J.; Kay, Anthony D.; McHugh, Malachy, Applied Physiology, Nutrition & Metabolism Jan 2016, Vol. 41 Issue 1, p1 (English Abstract Available)

Subjects: JOINTS (Anatomy) -- Range of motion; MEDLINE: MUSCLES; PROPRIOCEPTION: STRETCH (Physiology); BODY movement; DATABASES; DOSE-response relationship (Biochemistry); TIME; SYSTEMATIC reviews (Medical research)
What are Subject Terms?

• Subject Terms are added to each article by indexers to help improve search results.

• Subject Terms use standardized language to describe the specific content of an article.

• Use Subject Terms to find additional relevant synonyms.
Explore: Modify Search Based on Words in Results

13. **Ankle Injuries**: Reduce the Risk by Using a Soccer-Specific **Warm-Up** Routine.
   
   Elliott, Steven; Ellis, Margery; Combs, Sue; Hunt Long, Lynn, Strategies (08924562) 2015, Vol. 28 Issue 5, p34 (English Abstract Available)

   **Subjects**: SOCCER injuries; PREVENTION; WARMUP; ANKLE wounds; SOCCER players; STRETCH (Physiology); PLYOMETRICS; MOTOR ability

   ![Find @ UNC](Search here for UNC holdings)

14. **Effects of Static and Dynamic Stretching on Injury Prevention in High School Soccer Athletes**: A Randomized Trial.
   

   **Subjects**: SOCCER injuries; PREVENTION; EXERCISE physiology; HIGH school athletes; HIGH schools; SPORTS sciences; STRETCH (Physiology); WARMUP; MICHIGAN; CLINICAL trials; CONFIDENCE intervals; POISSON distribution; PROBABILITY theory; REGRESSION analysis; SAMPLING (Statistics); T-test (Statistics); STATISTICAL power analysis; RANDOMIZED controlled trials; PRE-tests & post-tests; DESCRIPTIVE statistics; ADOLESCENCE

   Show all 4 images

   ![Cited References: (47)](PDF Full Text (4.5MB) [Find @ UNC](Search here for UNC holdings)
<table>
<thead>
<tr>
<th>Search ID#</th>
<th>Search Terms</th>
<th>Search Options</th>
<th>Actions</th>
</tr>
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<tbody>
<tr>
<td>S7</td>
<td>(Stretching OR Stretch) AND (Injuries OR injury) AND (warmup OR warm up) AND (prevent OR prevention) AND (athlete OR athletes OR exercise OR sports)</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (127)</td>
</tr>
<tr>
<td>S6</td>
<td>(Stretching OR Stretch) AND (Injuries OR injury) AND (warmup OR warm up) AND (prevent OR prevention) AND (athletes OR exercise OR sports)</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (127)</td>
</tr>
<tr>
<td>S5</td>
<td>(Stretching OR Stretch) AND (Injuries OR injury) AND (warmup OR warm up) AND (prevent OR prevention)</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (130)</td>
</tr>
<tr>
<td>S4</td>
<td>(Stretching OR Stretch) AND (Injuries OR injury) AND (warmup OR warm up)</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (175)</td>
</tr>
<tr>
<td>S3</td>
<td>(Stretching OR Stretch) AND (Injuries OR Injury)</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (1,172)</td>
</tr>
<tr>
<td>S2</td>
<td>Stretching AND Injuries</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (788)</td>
</tr>
<tr>
<td>S1</td>
<td>Stretching AND Injuries</td>
<td>Limiters - Peer Reviewed</td>
<td>View Results (1,737)</td>
</tr>
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</table>
Explore: Modify Search
Based on Words in Results

Broaden the search by adding synonyms with OR:
• (Stretching OR Stretch) AND (Injuries OR Injury)
  Finds 1,172 results

Focus the search by adding concepts with AND:
• (Stretching OR Stretch) AND (Injuries OR Injury) AND
  (Warmup OR Warm up) AND (Prevent OR Prevention) AND (Athlete OR Athletes OR Exercise OR Sports)
  Finds 127 results
Acute Effects of Different Agonist and Antagonist Stretching Arrangements on Static and Dynamic Range of Motion.
Amiri-Khorasani M, Kellis E.
PMID: 26715975
Free PMC Article

Acute effects of muscle stretching on physical performance, range of motion, and injury incidence in healthy active individuals: a systematic review.
Behm DG, Blazevich AJ, Kay AD, McHugh M.
PMID: 26642915
Free Article
Query Translation:

Fields]) OR ("wounds and injuries"[MeSH Terms] OR ("wounds"[All Fields] AND "injuries"[All Fields]) OR "wounds and injuries"[All Fields]) OR "injury"[All Fields]) AND (warmup[All Fields] OR (warm[All Fields] AND up[All Fields]) AND ("Prevent"[Journal] OR "prevent"[All Fields]) OR "prevention and control"[Subheading] OR ("prevention"[All Fields] AND "control"[All Fields]) OR "prevention and control"[All Fields] OR "prevention"[All Fields]) AND ("athletes"[MeSH Terms] OR "athletes"[All Fields]) OR ("exercise"[MeSH Terms] OR "exercise"[All Fields]) OR ("sports"[MeSH Terms] OR "sports"[All Fields]))

Result:

75

Translations:

<table>
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<tr>
<th>Injuries</th>
<th>&quot;injuries&quot;[Subheading] OR &quot;injuries&quot;[All Fields] OR &quot;wounds and injuries&quot;[MeSH Terms] OR (&quot;wounds&quot;[All Fields] AND &quot;injuries&quot;[All Fields]) OR &quot;wounds and injuries&quot;[All Fields]</th>
</tr>
</thead>
<tbody>
<tr>
<td>worry</td>
<td>&quot;wounds and injuries&quot;[MeSH Terms] OR (&quot;wounds&quot;[All Fields] AND &quot;injuries&quot;[All Fields]) OR &quot;wounds and injuries&quot;[All Fields] OR &quot;injury&quot;[All Fields]</td>
</tr>
<tr>
<td>prevent</td>
<td>&quot;Prevent&quot;[Journal] OR &quot;prevent&quot;[All Fields]</td>
</tr>
<tr>
<td>prevention</td>
<td>&quot;prevention and control&quot;[Subheading] OR (&quot;prevention&quot;[All Fields] AND &quot;control&quot;[All Fields]) OR &quot;prevention and control&quot;[All Fields] OR &quot;prevention&quot;[All Fields]</td>
</tr>
<tr>
<td>athletes</td>
<td>&quot;athletes&quot;[MeSH Terms] OR &quot;athletes&quot;[All Fields]</td>
</tr>
<tr>
<td>exercise</td>
<td>&quot;exercise&quot;[MeSH Terms] OR &quot;exercise&quot;[All Fields]</td>
</tr>
<tr>
<td>sports</td>
<td>&quot;sports&quot;[MeSH Terms] OR &quot;sports&quot;[All Fields]</td>
</tr>
</tbody>
</table>
A systematic literature review of the relationship between stretching and athletic injury prevention.

Lewis J1.

Abstract
Athletic-related injuries are a major cause for healthcare visits and financial burden for an otherwise healthy population of adults. The purpose of this article was to investigate the effects of stretching on injury prevention and to determine whether current stretching guidelines are beneficial for athletes. A systematic review of the literature was conducted through searching MEDLINE and CINAHL on topics related to stretching and injury prevention. Current belief is that stretching reduces injury incidence and that it should be performed prior to athletic activities. An examination of 11 articles provided inconclusive outcomes regarding the positive effect of stretching on injury prevention. A sport or activity-specific tailored stretch and warm-up program yielded the best outcomes in relation to preventing injuries. Direct negative effects of stretching were not identified; therefore, the application of stretching should be performed on an individual basis.
Google Scholar

What is Google Scholar?
Google Scholar is a subset of Google Web Search that enables you to search specifically for scholarly literature, including papers, theses, books, and reports.

Why should I access Google Scholar from the library website?
By starting your Google Scholar search from the Library website, you will automatically have direct access, both on and off campus, to subscription articles already paid for through the library.

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Google Scholar often links to commercial publisher websites that may ask you to buy a subscription or pay to access an article… Do not pay for articles! Look for the Find article @ UNC link. The UNC Libraries already provide access to many journal articles indexed in Google Scholar.

What should I do if the full text is not available?
Any time you have trouble accessing full text, Ask a Librarian for help. The Libraries also provide access to materials not owned by or available through UNC through Interlibrary Loan.

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Search Tips

Get the most out of Google Scholar with some helpful tips on searches, email alerts, citation export, and more.

Finding recent papers

Your search results are normally sorted by relevance, not by date. To find newer articles, try the following options in the left sidebar:

1. click "Since Year" to show only recently published papers, sorted by relevance;
2. click "Sort by date" to show just the new additions, sorted by date;
3. click the envelope icon to have new results periodically delivered by email.

Locating the full text of an article

Abstracts are freely available for most of the articles. Alas, reading the entire article may require a subscription. Here’re a few things to try:

1. click a library link, e.g., "FindIt@Harvard", to the right of the search result;
2. click a link labeled [PDF] to the right of the search result;
Google Scholar: Word Search for Main Concepts

Did you mean: (Stretching OR Stretch) AND (Injuries OR injury) AND (warmup OR warm up) AND (prevent OR prevention) AND (athletes OR exercise OR sports)

Warming-up and stretching for improved physical performance and prevention of sports-related injuries
FG Shellock, WE Prentice - Sports Medicine, 1985 - Springer
... Maintaining good flexibility also aids in the prevention of injuries to the musculoskeletal system. ... Physical Therapy 52: 725–735 (1972).PubMed, Weber, S. and Kraus, H. Passive and active stretching of muscles: Spring stretch and control group. ...
Cited by 510 Related articles All 7 versions Web of Science: 212 Cite Save More

Warm-up and stretching in the prevention of muscular injury
K Woods, P Bishop, E Jones - Sports Medicine, 2007 - Springer
Abstract Muscular injury is one of the major problems facing today's athletes, both recreational and professional. Injuries to skeletal muscle represent > 30% of the injuries seen in sports medicine clinics. As a result, it is imperative to utilise the most effective ...
Cited by 235 Related articles All 7 versions Web of Science: 75 Cite Save

Prevention of running injuries by warm-up, cool-down, and stretching exercises
W Van Mechelen, H Hlobil, HCG Kemper - Journal of Sports Science, 1993 - ajs.sagepub.com
Abstract The purpose of this study was to evaluate the effect of a health education intervention on running injuries. The intervention consisted of information on, and the subsequent performance of, standardized warm-up, cool-down, and stretching exercises. ...
Cited by 190 Related articles All 7 versions Web of Science: 73 Cite Save

sagepub.com [PDF] Find article @ UNC
Think About: How to Track Your Searches & Manage References

Keep a document that tracks the databases and search strategies that you use.

- Helps you return to a useful search strategy
- Helps you identify modifications that can improve your results

A reference management tool like Mendeley, F1000W, Zotero) is worth taking time to learn to use.

- Help you keep track of the articles you find
- Help you cite accurately when you write
## Exercise and Sport Science: Library Resources for Research: Mendeley, F1000W, etc

### Comparing reference managers

<table>
<thead>
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<th></th>
<th><strong>Endnote</strong></th>
<th><strong>Mendeley</strong></th>
<th><strong>Zotero</strong></th>
<th><strong>F1000Workspace</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>HSL Online Guides</strong></td>
<td>Endnote</td>
<td>Mendeley</td>
<td>Zotero</td>
<td>F1000Workspace</td>
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<tr>
<td><strong>Classes at HSL</strong></td>
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<td>See here</td>
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<td><strong>Cost</strong></td>
<td><strong>Full</strong>: Under $100 through UNC–CH</td>
<td>Free to everyone UNC–CH Add-ons</td>
<td>Free to everyone</td>
<td>Free through UNC–CH</td>
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<td><strong>How is it used?</strong></td>
<td><strong>Full</strong>: Your Computer</td>
<td>Your computer and the Web</td>
<td>Your computer and the Web</td>
<td>Web</td>
</tr>
</tbody>
</table>

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