

SEARCH SUBMISSION: THIS SECTION TO BE FILLED IN BY THE SEARCHER

Searcher: Thomas Solomon

Email: thomastindlesolomon@gmail.com

Date submitted: 07 February 2022

Date requested by: 11 February 2022

Systematic Review Title:

Does post-exercise heat exposure improve endurance exercise performance? A systematic review of the effect of passive heat acclimation on exercise performance.

This search strategy is ...

My PRIMARY (core) database strategy — First time submitting a strategy for search question and database.

Database

(i.e., MEDLINE, CINAHL...):

MEDLINE, EMBASE, CENTRAL, and clinical trials databases (ClinicalTrials.gov, and WHO International Clinical Trials Registry Platform [ICTRP], EU Clinical Trials Register [EUCTR]).

Interface

(i.e., Ovid, EBSCO...):

Ovid.

Research Question

The purpose of this systematic review is to answer the question: *Does post-exercise heat exposure improve endurance exercise performance?*

PICO Format

(Outline the PICO for your question — i.e., Patient, Intervention, Comparison, Outcome, and Study Design — as applicable)

- P** Healthy male or female adults (≥ 18 years of age) of any race/ethnicity, in any clinical research setting.
- I** Daily exercise under thermoneutral ($< 25^{\circ}\text{C}$) environmental conditions coupled with post-exercise heat exposure (via any method, including but not limited to sauna or hot water immersion etc) for at least 2 consecutive days, with baseline and post-intervention exercise performance tests completed in either hot ($\geq 25^{\circ}\text{C}$) or thermoneutral ($< 25^{\circ}\text{C}$) conditions. The daily exercise must be completed in normal ambient conditions and must include at least 30-mins of aerobic activities (walking, hiking, running, cycling, rowing, xc skiing, swimming, stair-stepping etc) at a moderate intensity or higher ($> 40\%$ heart rate reserve or VO_2 reserve, $> 60\%$ heart rate max; per ACSM activity guidelines). Post-exercise heat exposure must commence within 30-mins of exercise cessation.
- C** Control group must complete the same daily exercise intervention but without the post-exercise heat exposure.
- O** *Primary outcome(s)*: Endurance exercise performance (assessed by time trial, time-to-exhaustion, or a race) in hot conditions in all people.
Secondary outcome(s): Endurance exercise performance in cool conditions. And, VO_2max , economy/efficiency, lactate threshold, RPE, heart rate, sweat rate, and thermal comfort in hot or cool conditions. Plus, examination of all outcome variables in athletes alone (vs. non-athletes).
All outcomes should be measured at baseline and within 7-days of finishing the interventions since effects of heat acclimation have been found to last up to 1-week.

S Randomised controlled trials only.

Inclusion Criteria

Those listed above in addition to English language only publications; peer-review published articles only; any date limitations for searches (e.g., past 10 years, etc – need to provide rationale if so).

(List criteria such as age groups, study designs, etc., to be included) [optional]

We will include full-text English language papers published in peer-reviewed journals.

The studies must include healthy male or female adults (≥ 18 years of age) of any race/ethnicity.

The interventions must include at least 30-mins of daily exercise with post-exercise heat exposure for at least 2 consecutive days. The control group must complete the same daily exercise but without post-exercise heat exposure.

The study outcomes must measure endurance exercise performance by time trial, time-to-exhaustion, or a race.

The study design must be a randomised controlled trial.

Exclusion Criteria

(Any designs that are not RCTs; non-English language peer-reviewed studies).

(List criteria such as study designs, date limits, etc., to be excluded) [optional]

We will exclude the following studies:

Unavailable full-text, non-English language, non-randomised study designs, published in non-peer-reviewed journals.

Was a search filter applied?

Yes ☐ No ☒

If YES, which one(s) (e.g., Cochrane RCT filter, PubMed Clinical Queries filter)? Provide the source if this is a published filter. [mandatory if YES to previous question — textbox]

Not applicable.

Other notes or comments you feel would be useful for the peer reviewer? [optional]

No further comments.

Please copy and paste your search strategy here, exactly as run, including the number of hits per line. [mandatory]

(heat exposure[Title/Abstract] OR post exercise sauna[Title/Abstract] OR post exercise hot water bath[Title/Abstract] OR heat acclimation OR heat acclimatization OR heat acclimat* OR post exercise bath OR heat adaptation OR heat adapt* OR "hot water immersion"[Title/Abstract] OR Sauna OR "heat chamber")

AND (time trial[Title/Abstract] OR performance[Title/Abstract] OR race[Title/Abstract] OR time to fatigue[Title/Abstract] OR athletic performance[MeSH Terms] OR VO2max OR "aerobic capacity" OR exercise[title/abstract])

AND humans

The first line yields 28,109 results. Adding the second line yields 3,532 results. Including all three lines yields 1,977 results.

PEER REVIEW ASSESSMENT: THIS SECTION TO BE FILLED IN BY THE REVIEWER

Reviewer: Janice Thompson

Email: j.thompson.1@bham.ac.uk

Date completed: 11 February 2022

1. TRANSLATION

- A - No revisions ☐
B - Revision(s) suggested ☒
C - Revision(s) required ☐

If “B” or “C,” please provide an explanation or example:

Does the search strategy match the research question/PICO?

Yes

Are the search concepts clear?

Yes

Are there too many or too few PICO elements included?

No

Are the search concepts too narrow or too broad?

May be a bit too narrow with regards to ‘clinical settings’ only. See my comment above.

Does the search retrieve too many or too few records? (Please show number of hits per line.)

Appropriate numbers as stated above.

Are unconventional or complex strategies explained?

Not applicable

2. BOOLEAN AND PROXIMITY OPERATORS

- A - No revisions ☒
B - Revision(s) suggested ☐
C - Revision(s) required ☐

If “B” or “C,” please provide an explanation or example:

Are Boolean or proximity operators used correctly?

Insert comments here.

Is the use of nesting with brackets appropriate and effective for the search?

Insert comments here.

If NOT is used, is this likely to result in any unintended exclusions?

Insert comments here.

Could precision be improved by using proximity operators (eg, adjacent, near, within) or phrase searching instead of AND?

Insert comments here.

Is the width of proximity operators suitable (eg, might adj5 pick up more variants than adj2)?

Insert comments here.

3. SUBJECT HEADINGS

A - No revisions ☒

B - Revision(s) suggested ☐

C - Revision(s) required ☐

If “B” or “C,” please provide an explanation or example:

Are the subject headings relevant?

Insert comments here.

Are any relevant subject headings missing; for example, previous index terms?

Insert comments here.

Are any subject headings too broad or too narrow?

Insert comments here.

Are subject headings exploded where necessary and vice versa?

Insert comments here.

Are major headings (“starring” or restrict to focus) used? If so, is there adequate justification?

Insert comments here.

Are subheadings missing?

Insert comments here.

Are subheadings attached to subject headings? (Floating subheadings may be preferred.)

Insert comments here.

Are floating subheadings relevant and used appropriately?

Insert comments here.

Are both subject headings and terms in free text (see the following) used for each concept?

Insert comments here.

4. TEXT WORD SEARCHING

A - No revisions ☒

B - Revision(s) suggested ☐

C - Revision(s) required ☐

If “B” or “C,” please provide an explanation or example:

Does the search include all spelling variants in free text (eg, UK vs. US spelling)?

Insert comments here.

Does the search include all synonyms or antonyms (eg, opposites)?

Insert comments here.

Does the search capture relevant truncation (ie, is truncation at the correct place)?

Insert comments here.

Is the truncation too broad or too narrow?

Insert comments here.

Are acronyms or abbreviations used appropriately? Do they capture irrelevant material? Are the full terms also included?

Insert comments here.

Are the keywords specific enough or too broad? Are too many or too few keywords used? Are stop words used?

Insert comments here.

Have the appropriate fields been searched; for example, is the choice of the text word fields (.tw.) or all fields (.af.) appropriate? Are there any other fields to be included or excluded (database specific)?

Insert comments here.

Should any long strings be broken into several shorter search statements?

Insert comments here.

5. SPELLING, SYNTAX, AND LINE NUMBERS

A - No revisions ☒

B - Revision(s) suggested ☐

C - Revision(s) required ☐

If "B" or "C," please provide an explanation or example:

Are there any spelling errors?

Insert comments here.

Are there any errors in system syntax; for example, the use of a truncation symbol from a different search interface?

Insert comments here.

Are there incorrect line combinations or orphan lines (ie, lines that are not referred to in the final summation that could indicate an error in an AND or OR statement)?

Insert comments here.

6. LIMITS AND FILTERS

A - No revisions ☒

B - Revision(s) suggested ☐

C - Revision(s) required ☐

If "B" or "C," please provide an explanation or example:

Are all limits and filters used appropriately and are they relevant given the research question?

Insert comments here.

Are all limits and filters used appropriately and are they relevant for the database?

Insert comments here.

Are any potentially helpful limits or filters missing? Are the limits or filters too broad or too narrow? Can any limits or filters be added or taken away?

Insert comments here.

Are sources cited for the filters used?

Insert comments here.

OVERALL EVALUATION

(Note: If one or more “revision required” is noted above, the response below must be “revisions required”.)

- | | |
|---------------------------|-------------------------------------|
| A - No revisions | ☒ |
| B - Revision(s) suggested | ☐ |
| C - Revision(s) required | ☐ |

Additional comments:

Just two very minor wording changes suggested as highlighted in comments above. But no substantial revisions suggested or required.