

**CASP Checklist:** 10 questions to help you make sense of a **Systematic Review**

**How to use this appraisal tool:** Three broad issues need to be considered when appraising a systematic review study:

- ▶ Are the results of the study valid? (Section A)
- ▶ What are the results? (Section B)
- ▶ Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

**About:** These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

**Referencing:** we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

©CASP this work is licensed under the Creative Commons Attribution – Non-Commercial-Share A like. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/> [www.casp-uk.net](http://www.casp-uk.net)

Paper for appraisal and reference:

Reid SA, Farbenblum J, McLeod S. Do physical interventions improve outcomes following concussion: a systematic review and meta-analysis? *British Journal of Sports Medicine* 2022;**56**:292-298.

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: An issue can be 'focused' in terms of

- the population studied
- the intervention given
- the outcome considered

Comments:

1. What is the effect of incorporating subthreshold aerobic exercise, cervical therapy, vestibular and/or oculomotor therapies into concussion management, for acute and ongoing symptoms?
2. What is the effect of incorporating such physical therapies as individually tailored, presentation-specific multimodal interventions into the acute and ongoing management of concussion?

Participants: individuals who suffered a concussion/mTBI, all age groups, both sexes

Intervention: aerobic exercise, cervical therapy, vestibular therapy or oculomotor therapy

Outcomes: symptom severity, days recovery/clearance to resume work or sport, measure of balance or gait, and physical activity

2. Did the authors look for the right type of papers?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: 'The best sort of studies' would

- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

Study design: randomised controlled trials (looking at interventions)

Method: Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines

Eligibility criteria: RCTs evaluating effects of physical therapies on recovery following concussion/mTBI, either acute or ongoing. No abstracts were included. Human trials only.

Quality: the quality was assessed using the PEDro scale it helps discriminate between high quality and low-quality trials; trials were compared for homogeneity, grouped according to intervention type

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>

HINT: Look for

- which bibliographic databases were used

No

- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

Databases: Medline, CINAHL, SportDiscus, PEDro, Cochrane Library, Embase and Scopus – major databases and databases specifically able to sort out RCTs. Looked for RCTs from the start of publication to sept 5<sup>th</sup> 2020. Research librarian helped with search. Published only human studies in English only.

4. Did the review's authors do enough to assess quality of the included studies?

Yes

Can't Tell

No

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments:

The authors used the PEDro scale which is an 11 item scale designed specifically for rating the methodological quality of RCTs to be able to tell the difference between high quality and low quality RCTs. The items on the scale look at internal validity based on factors such as random allocation and concealment, baseline variables, blinding, outcomes obtained at baseline and intention to treat analysis, and finally whether there was enough information in the article to repeat the statistical analysis. PEDro score of 0 poor to 10 excellent.

\*12 RCTs

1 study – poor quality

4 studies – fair quality

7 studies – good to excellent quality

5. If the results of the review have been combined, was it reasonable to do so?

Yes

Can't Tell

No

HINT: Consider whether

- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments:

The study tried to utilize appropriate statistical calculations to be able to compare results across studies.

Meta-analysis was performed when more than one study could be grouped together for type of intervention and outcome measure. When there was only one study in a group, they only reported the statistics from that study. Pt's who received a shaw or no intervention were made the control. Standardized means and confidence intervals were used when outcomes were measured on difference scales for continuous data. Risk ratio or confidence intervals were used for dichotomous variables. They used an  $I^2$  statistic (used during small meta-analysis) helps determine the level of heterogeneity in studies, it was calculated to see the variation across studies because of heterogeneity than by change. A random effects model was used for outcomes where studies used different outcomes. A fix effect was used when outcomes were the same.

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider

- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments:

-Effects of subthreshold exercise on days to symptom recovery/return to activity: The meta-analysis (2 trials) indicated there was no evidence of difference in days to symptom recover between those getting exercise and controls.

-Effect of subthreshold aerobic exercise on symptoms scores (PCSS, Post-Concussion Symptom Inventory, the Rivermead Post-concussion symptoms questionnaire, and Health Behaviour Inventory): The meta-analysis (5 trials) favoured exercise with a SMD of .43 (95% CI .18 to .67, p.0001,  $I^2$ : 0%)

-Cervical Therapy: 1 study, considered fair methodology quality, manual therapy group had a significant difference after 6 weeks on VAS with decrease pain.

-Vestibular therapy: Good quality in methodology, found a significant difference favouring vestibular therapy over no interventions for the DHI, but not for the vertigo symptom scale-short form. They used the BESS and found a mean difference of -3.7 (95% CI -7.8 to -.5, p=.09) between those getting group vestib rehab to no treatment.

-Effect of individually tailored multimodal therapy on symptom scores: 3 studies tailored multimodal interventions (cervical, vestibular, and oculomotor); symptom outcomes included PCSS; DHI; VAS for neck pain, headache and dizziness; 2 trials used for meta-analysis showing a significant moderate effect (SMD=.63, 95% CI .11-1.15, P=.02,  $I^2$ =0%)

7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments:

The confidence intervals were large when looking at controls vs intervention for each area of effect. Wider confidence intervals indicate more instability or lessen our confidence in the findings because more room for error. The study did use the appropriate statistical analysis to determine the precision of the results.

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider whether
- the patients covered by the review could be sufficiently different to your population to cause concern
  - your local setting is likely to differ much from that of the review

Comments:

The review did include articles looking at populations that are relevant to individuals who would be seen in a clinic. They also used interventions that could be replicated by a clinician.

9. Were all important outcomes considered?

Yes	<input type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

- HINT: Consider whether
- there is other information you would like to have seen

Comments:

The articles used outcomes that are accessible and able to be applied in the clinic. There are outcome measures related function or participation that were not utilized that could give better insight into recovery.

10. Are the benefits worth the harms and costs?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider
- even if this is not addressed by the review, what do **you** think?

Comments:

The intervention provided did not make symptoms worse in those with acute or persistent symptoms. The benefit out ways the cost at this point implementing aerobic exercise, cervical therapy, vestibular therapy, and oculomotor therapy.