Author’s response to reviews

Title: Measurement instruments for quantifying physical resilience in aging: A scoping review protocol

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Methods for quantifying physical resilience in aging: A scoping systematic review protocol.

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Systematic Reviews

Reviewer #1:

Dear authors,

You developed a relevant scoping systematic review protocol (SYSR-D-17-00285 "Methods for quantifying physical resilience in aging: A scoping systematic review protocol."). The planned review aims to identify and to analyze "outcome domains" and "measurement instruments" for physical resilience. A synthesis and mapping of key concepts as well as a description of the state of the art is planned.
Considering your whole manuscript, should the title of the review protocol not be adapted? You are predominately looking for "outcome domains" and "measurement instruments". Can it be summarized as "methods"?

Response: We thank this reviewer for the comments and suggestions. The title of the manuscript has been changed to: “Measurement instruments for quantifying physical resilience in aging: A scoping review protocol.”

Abstract:
No remarks.

Keywords:
Please check if "senior" is a suitable keyword. Check also for suitable Mesh-Terms.

Response: Using Ovid MEDLINE, we combined the keyword “senior” with the MeSH term ‘resilience, psychological’, and keyword terms such as ‘resilience’, and retrieved 78 citations. Two citations met abstract screening inclusion criteria; however, these citations were already identified within the current search strategy. We repeated the search in Web of science, and retrieved 184 citations. In total, six citations met the abstract screening stage and were also found to be present within the current search strategy as outlined in the manuscript. The word “senior” is not a MeSH term; the closest MeSH term is “senior center.” Thus, the term “senior” is not a suitable keyword for our aims.

Introduction:
Page 3, line 17: This sentence is unclear. Which development is meant?
Response: During the manuscript revision process, this sentence has been removed from the introduction.

Page 5, line 21: Please concretize and differentiate the concept "coping" in the context of "resilience".

Response: During the manuscript revision process, this sentence has been removed from the introduction.

Please introduce shortly Boers et al. (2014) in the introduction section. What is the role of Boers et al. (2014) in your review?

Response: The framework for the data extraction and data synthesis and gap identification is derived from Boers et al. (2014) and is described on Page 8 and Page 10, respectively. We introduce Boers et al (2014) in the introduction:

“Boers et al. (2014) describe a comprehensive conceptual framework of core areas for outcome measurement for rheumatology and may be a useful template for other areas of health, such as an examination of physical resilience in aging.” (Page 5)

Methods:

Study design

Please motivate the choice for the review design? Why is a systematic scoping more suitable than a systematic review to answer the research question?

Response: Our review question is very broad and not suited for a systematic review. Additionally, the design adheres to the scoping review process. Thus, we changed the
terminology around the review design to “scoping review” throughout the manuscript. Our rationale for a scoping review is outlined on Page 5 and states:

“A wide search strategy is necessary to uncover potential connections between physiological and motor function parameters, as well as outline prospective biopsychosocial factors that may foster physical resilience.”

Search methods for study identification

Page 7, line 13/14: Please describe the Mesh-Terms and keywords separately.

Response: The description on Page 6 now reads:

“To maximize the sensitivity of the search, both Medical Subject Headings (MeSH) and keyword searches will be used. The following MeSH terms ‘resilience, psychological’, ‘aging’, and ‘aged’ will be used, with keyword searches of terms such as ‘resilience’, ‘aging’, ‘ageing’, ‘elderly,’ and ‘older adult’.”

Is it correct that all databases will be searched via Ovid? Please describe it earlier on page 7, line 9/10. If not, please describe why the same search strategy will be applied to all databases? Do you consider that there are specific Mesh-terms per database?

Response: No not all databases will be searched via MEDLINE Ovid. The search strategy will be developed in MEDLINE Ovid and then applied to other databases. MeSH is the USA’s National Library of Medicine's controlled vocabulary or thesaurus of terms used to organise the MEDLINE Ovid and PubMed databases. Each article citation is associated with a set of MeSH terms that describe the content of the citation. It is also used for searching in PubMed, and some other databases, such as CINAHL. As terms are controlled by the National Library of Medicine, MeSH terms are the same for the databases that use them. Considering that not all databases use MeSH terms, and that we want a broad review of the literature on physical resilience, we will include keywords, as described on Page 6. Utilizing multiple databases ensures we are conducting a scoping review as relevant research may be indexed in one database and not another.
To increase clarity, we described our search development in MEDLINE Ovid earlier, and separated the description around MeSH terms and keywords. The section now reads:

“We will conduct a search from inception through to March 14, 2018 that will initially be applied in MEDLINE Ovid and then run in the following electronic databases with no changes to the search terms: Scopus (Burnham, 2006), Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE Ovid, Web of Science, PsychINFO, and AgeLine. To maximize the sensitivity of the search, both Medical Subject Headings (MeSH) and keyword searches will be used. The following MeSH terms ‘resilience, psychological’, ‘aging’, and ‘aged’ will be used, with keyword searches of terms such as ‘resilience’, ‘aging’, ‘ageing’, ‘elderly,’ and ‘older adult’, based on the search terms used in previous resilience reviews (Cosco et al., 2016; Cosco et al., 2017b). If a database does not index citations using MeSH terms, they will not be used, and only keywords will be used.” (Page 6)

Where are the search terms derived from?

Response: The search terms were derived from Cosco et al. 2016, and Cosco et al. 2017, which are systematic reviews within the topic of resilience and aging. We have added these references to Page 6’s description of the search terms.


Selection of studies

Your explanation as to why you had to include "aged animals" is unclear.

Response: We have removed the inclusion of aged animals.
Inclusion/exclusion criteria

The outcomes are also described in the data extraction section. In my opinion it fits better in the data extraction section. Also, describe Boers et al. (2014) in more detail.

Response: We have removed the description of outcomes from the inclusion/exclusion section, and added this information to the data extraction section. We added more information regarding Boers et al (2014) in the introduction:

“Boers et al. (2014) describe a comprehensive conceptual framework of core areas for outcome measurement for rheumatology and may be a useful template for other areas of health, such as an examination of physical resilience in aging.” (Page 5)

As well as added more description of this publication in the Data extraction section in addition to the outline of measurement instrument domains already described in the manuscript:

“Boers et al (2014) suggests that their comprehensive conceptual framework for outcome measurement developed for a rheumatology patient population may be a useful template for other areas of health care.” (Page 8)


Data extraction

Page 10, line 7-9: Describe precisely how you will verify the validity of the outcomes? Please, concretize "minimal clinically important difference (MCID)".

Response: In the revision process, the phrase “minimal clinically important difference (MCID)” was removed. Validity or reliability of the measurement instruments will be verified with a literature search, and we have added a statement to Page 9 outlining this aspect of the protocol.
You could subdivide the data that will be extracted for a first literature overview and the data that will be extracted for quantitative and qualitative analysis and data description. In that section you can differentiate between primary and secondary outcomes.

Response: Thank you for the suggestion. We have incorporated it into the “Data synthesis and gap identification” section as follows:

“The extracted data will first be used to generate a literature overview with a quantitative and qualitative analysis following, in a parallel and integrative manner (Hong et al., 2017). We will differentiate between primary and secondary outcomes with tables and/or charts which will map the data with distribution of studies by study population, outcome domains, and measurement instruments.” (Page 9-10)


Please concretize in more detail the "measurement instruments" and its extraction. What is your focus? Are you interested, e.g., in the validation of the instruments?

Response: Our focus is to extract the measurement instrument used from included studies and to identify instruments that require validity or reliability testing. Some resilience measurement instruments are shown to be valid, such as the Connor Davidson Resilience Scale. Some instruments may not be valid, so we plan to identify these instruments.

“To guide the conceivable scenario where multiple measurement instruments are used to quantify physical resilience for a given study, we will extract all measurement instruments that are highly validated (e.g. using published validity data), such as the Connor Davidson Resilience Scale with acceptable levels of internal consistency, convergent/discriminant validity and theoretical construct validity (Cosco et al., 2016). Measurement instruments without published validity or reliability data will be extracted and noted as such.” (Page 9)

Data synthesis and gap identification

Please concretize the data synthesis. Suggested literature is:


Response: Throughout the data synthesis and gap identification section, information has been added to increase clarity. The Hong et al 2017 reference has been added to further describe our protocol for summarizing our scoping review findings.

Please concretize the gap identification, "methodological gaps".

Response: Gap identification includes detecting where no research has been conducted. A scoping review is appropriate to draw conclusions from the literature regarding the overall state of research activity (Arksey & O’Malley 2005). Importantly, since a scoping review does not include an evaluation of the quality of the identified studies, our review will not necessarily identify gaps where research is of poor quality. To acknowledge this potential limitation, we have added the following to the Methods, “Data synthesis and gap identification” section:

“Gap identification will detect areas, such as patient populations or countries in the world, that lack research on physical resilience. Importantly, since this scoping review will not include an evaluation of the quality of the identified studies, the data synthesis will not necessarily identify gaps where research is of poor quality.” (Page 10)

Discussion:

Please check the choice of wording. Is the review focused on "methodology" in general? Page 11, line 18/19: "This scoping systematic review will be the first to summarize methodology for quantifying physical resilience in aging."

Response: The review is focused on measurement instruments so we updated the aims, as well as the manuscript wording with the phrase “measurement instruments.” The sentence on Page 11 now states:

“This scoping review will be the first to summarize measurement instruments for quantifying physical resilience in aging.”

General remarks:

Please be consistent in your wording. Are you looking for "methods", "methodology", "outcomes", "outcome domains", "measures" and/or "measurement instruments"?

Response: We are primarily interested in measurement instruments that quantify physical resilience; thus, we updated the terminology throughout the manuscript and in the title, to “measurement instruments” where appropriate.

Reviewer #2:

Thank you very much the manuscript. The topic is interesting.

The introduction is very long, I recommend abbreviating this section.

Response: We thank this reviewer for the comments and suggestions. We substantially reduced the length of the introduction to approximately 2 pages.
The focus of the scoping review should be described more precisely. The objectives for the review are described as "identify outcome domains and measurement instruments for physical resilience; synthesize and map the key concepts of physical resilience; and identify gaps and make recommendations for future research" (abstract/introduction). However, in the method section, the use of 'statistics' is described "if multiple studies involve older adults with the same pathology, and outcome domains and measurement instruments". This does not fit with the objectives of the review and with the method of a scoping review that does not include a risk of bias assessment etc. I recommend focusing on the description and mapping of the questions described in the abstract/introduction.

Response: We focused the objectives in the main body of the manuscript which now state:

“Thus, the objectives of the proposed review are to: 1) identify measurement instruments for physical resilience based on Boers et al. 2014 (Boers et al., 2014); 2) synthesize and map the key concepts of physical resilience; and 3) identify methodological gaps and make recommendations for future research.” (Page 5)

Similar changes are made to the abstract aims. Regarding the use of statistics, we changed this sentence to clarify that we will only use descriptive statistics to assemble information regarding the nature and distribution of the studies:

“The quantitative or numerical analysis will compile descriptive statistics of the extent, nature, and distribution of studies included in the review including pathology, outcome domains, and measurement instruments.” (Page 9-10)

Reviewer #3:

Thank you for the opportunity to review this manuscript, which presents a protocol for a scoping review addressing an important topic (physical resilience in older adults) that has not yet been the subject of a rigorous review.

The manuscript has numerous strengths:

- The existence of a gap and the rationale for the review are well-justified.
- The objectives are clearly specified and are appropriate for a scoping review.
- The methodology is appropriate for those objectives and is well-described.
- It is for the most part clearly written.

Response: We thank this reviewer for the comments and suggestions.

I believe this article should be resubmitted with Major Revisions for the following reasons.

1. I would not style this research as a "scoping systematic review." This is clearly a scoping review. It is important to clearly distinguish the two signs, which have different objectives and methodologies. Further, an occasional objection to scoping reviews is that they are merely less rigorous systematic reviews; I think the term "scoping systematic review" would invite that (unwarranted) skepticism.

Response: The “scoping review” term has been changed, eliminating the word “systematic” throughout the manuscript.

2. As readers may be less familiar with scoping reviews, I would explicitly lay out Arksey & O’Malley’s Six Stage Process (perhaps as a figure)

Response: As per your suggestion, we added a schematic of the stages of a scoping review based on Arksey & O’Malley’s 2005 paper (Figure 1).

“The stages of this scoping review will follow Arksey & O’Malley (2005) proposed guidelines and are outlined in schematic form in Figure 1 (Arksey & O'Malley, 2005).” (Page 6)

3. Relatedly, did you intentionally omit the sixth stage ("Consultation Exercise")? If so, please state this in the manuscript.
Response: We chose to omit the optional consultation exercise of the sixth stage, similar to other published scoping reviews. We added the following sentence to Page 11:

“Based on Arksey and O’Malley’s recommendations, we will elect to omit the optional consultation stage (Arksey & O’Malley 2005; Ringer et al 2017).”


4. On a similar note to #1 above, please clarify what you mean under "Data Synthesis & Gap Identification" in the sentence "If multiple studies involve older adults ... statistics may be used to compile the data." Are you suggesting that you would perform an ad hoc quantitative synthesis/metaanalysis? If so, I would advise against it. I think this goes beyond the scope of this review and would necessitate a fully-fledged systematic review with critical appraisal. An abbreviated/partial data synthesis would dilute the paper’s impact.

Response: We have changed the wording of this section to increase clarity of our intended data synthesis using descriptive statistics, and not meta-analysis.

The section now states:

“The extracted data will first be used to generate a literature overview with a quantitative and qualitative analysis following, in a parallel and integrative manner (Hong et al., 2017). The quantitative or numerical analysis will compile descriptive statistics of the extent, nature, and distribution of studies included in the review including pathology, outcome domains, and measurement instruments. We will differentiate between primary and secondary outcomes with tables and/or charts that will map the data with distribution of studies by study population, outcome domains, and measurement instruments. Classification will be based on consensus among the authors.” (Page 9-10)
5. Did you consult a reference librarian in developing the search strategy? If not, consider having it reviewed by one (and providing credit if indicated).

Response: The co-authors have completed multiple reviews under the broad topic of resilience so consultation with a reference librarian was not deemed necessary.


6. Have you considered a broader search strategy using terms adjacent to or synonymous with "resilience" that may describe a similar concept? For instance, you mention that physical resilience embraces such domains as "body function or structure," "activity and participation," etc. A potentially relevant study might use a term like "preserved activity" or "preserved function."

Response: The aim of this scoping review is to identify measurement instruments of physical resilience. Citations categorized under other terms, such as preserved function or activity, may not be included under the current search strategy. However, similar phrases or terms may not capture the positive response to adversity that is present within the construct of resilience. In the interest of capturing measurement instruments intended to measure the construct of physical resilience, only studies that specifically use the term “resilience” are included.

7. Please consider:

- Reaching out to experts to suggest additional sources for review
Response: Thank you for these suggestions. Current world experts on this topic (Cosco, Wister, and Mackey) are co-authors on this manuscript. Their work developed conceptual frameworks that inform this scoping review protocol (Cosco et al. 2017; Cosco et al 2016; Wister et al. 2016).

Our search strategy contains the database “Scopus” which includes indexing of PubMed (Burnham 2006), thus we did not add a separate search of the PubMed database. We added the Burnham 2006 reference to the manuscript (Page 6).

During development of our scoping review question and aims, a preliminary search without grey literature retrieved > 9,000 citations. Our current search strategy includes electronic databases, hand searching reference lists and hand-searching of key review articles. Considering the large scope of the question, we decided to limit our search to published studies for practical reasons.


8. Please explain what you mean by "subjective appraisal" and when you think it might be "required" in the course of this review. Critical appraisal is not normally a part of scoping reviews; if you do intend to do any for whatever reason, it should be done rigorously and with the aid of commonly accepted instruments (e.g., Cochrane Risk of Bias Tool).

Response: The phrase “subjective appraisal” was unclear and not intended to convey that we were undertaking critical appraisal. There is likely a range of study designs and methods we will come across, thus, outcomes may be identified during the review process that we did not consider at the protocol development stage. To increase clarity, the sentence now reads:

“If initial disagreement is present between two reviewers regarding outcomes, consensus will be attained between two reviewers with a third reviewer consulted if agreement is not achieved initially.” (Page 11)

9. Please explain why you intend to exclude non-English language studies from your search.

Response: We do not have resources to translate non-English language studies so we decided to exclude these studies from our scoping review.

10. I suggest you consider & make reference to Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology, Implement Sci, 2010, vol. 5 69, the other seminal article on scoping reviews which expands and comments upon Arksey & O'Malley.

Response: The reference for Levac et al 2010 has been added throughout the manuscript.

11. Please shorten the introduction to 2 sides maximum.

Response: We reduced the length of the introduction section substantially. It is now approximately 2 pages in length.