

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Global mapping of exercise interventions among COVID-19 survivors: Protocol for a scoping review
<b>AUTHORS</b>	Sinha, Mukesh; Soman, Ajith; k, vaishali; Kovala, Rakesh Krishna; Narayanan, Monisha; Amin, Revati; Verma, Ashwani

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Rinaldo, Rocco University of Milan
<b>REVIEW RETURNED</b>	31-Jan-2022

<b>GENERAL COMMENTS</b>	<p>I thank the Editor for the invitation to review this interesting piece of work and congratulate the Authors. The Authors detail their protocol for a scoping review focused on exercise interventions among covid-19 survivors. The topic is of great relevance and the Authors opportunely anticipate a likely increasing interest in the literature of the next future. Another strength of this manuscript is the neat description of the methodology, which is punctually referenced. Nevertheless, I find there still is room for improvement, and some points deserve to be further explored.</p> <p>Particularly, the introduction lacks of accuracy in defining the issue and could create some confusion in the reader, while the real outcome does not emerge clearly. Due to the peculiarity of the SARS-CoV2 related infection, the post-COVID syndrome is emerging as an highly heterogeneous and unprecedented entity. Thus, as suggested, for example, in the ERS/ATS task force “COVID-19: interim guidance on rehabilitation in the hospital and post-hospital phase” (Eur Respir J 2020) survivors may be of a different age group to the “usual” pulmonary rehabilitation population and supporting a successful return to work will be important. Although Sinha and coll. already state the multiple benefits of exercise as the reason for its use in this scenario for many different outcomes, some of which are far from the usual ones in rehabilitation, these ideas appear to be sparse and mixed in the introduction of the manuscript. COVID-19 survivors are expected to have functional cardio-respiratory residual disfunction (see Phenotyping long COVID by Robert Naeije and Sergio Caravita, ERJ 2021 for a revision of the first papers published on cardiopulmonary exercise testing on COVID-19 survivors) or secondary to prolonged bed-rest as in the Post-intensive care admission in patients with or without a medical history.</p> <p>Nonetheless, in the next years we will have studies on patient reported outcome in subject without any other indication for rehabilitation to whom exercise protocol will be offered, now more than ever. I believe that this heterogeneity of impairment and outcomes should be more clearly addressed in the introduction section of the manuscript, and the difference between more</p>
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	<p>traditional and contemporary indications and populations pointed out. The choice of a scoping review that is supposed to have a wider focus over the issue is understandable, but such a multifaceted background should be defined more accurately, in order to highlight the relevance of the topic and to provide the reader the context to fully appreciate it. Secondly, I believe that the Authors should explain how they will address this aspect in the review of the literature (maybe as an additional research question?).</p> <p>A second important point is the definition of the time frame from SARS-Cov2 infection for the inclusion. Particularly, I found difficult to understand whether the Authors wish to include studies carried out during hospitalization in the acute phase. While the terms “survivors”, which is also referenced in the title of the manuscript, imply a resolution of the acute phase (and a good outcome), the inclusion criteria state: “studies must be conducted among survivors of COVID-19 or those infected with virus”. A vague reference to “acute illness” is present in the introduction too. The search theme and terms do not help discriminating this. I suggest to refer to a widely accepted in literature time frame for the infection such as the one by Nalbandian and coll. (Nature Medicine 2021 volume 27, pages601–615) and clearly specify if they wish to include studies on the acute patient.</p>
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<b>REVIEWER</b>	Abdelbasset, Walid Kamal Prince Sattam bin Abdulaziz University
<b>REVIEW RETURNED</b>	31-Jan-2022

<b>GENERAL COMMENTS</b>	<p>General Comments: Language needs editing. Please check for sentences that are repeated more than once.</p> <p>Specific comments: Abstract: - Add the design of the study. Add the expected period of the study. Introduction: - This section cannot cover all the elements of the study. - Define "COVID-19 and the role of exercise in viral infection" in detail. - Explain the variables measured and included in detail. - The significance and rationale of the study need more details. What do we already know about the topic? What will you add to the topic? - Add a clear hypothesis. Methods: - How and who will administrate the data collection? - How will you achieve the validity and reliability of the outcome measures? - Explain more about the eligible criteria.</p>
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### VERSION 1 – AUTHOR RESPONSE

**Response to reviewer 1:**

We appreciate the reviewer's constructive feedback on the manuscript. We appreciate the time you took to assist us in improving this manuscript. We have modified the manuscript as per the suggestion. The changes are highlighted in the manuscript.

**Response to reviewer 2:**

We thank reviewer for the critical comments on the manuscript. We do appreciate the time you have spent in helping us to improve this manuscript. We have modified the manuscript as per the suggestion. The changes are highlighted in the manuscript.

**Reviewer and Editorial annotation, Comments and responses#**

Reviewer 1 comments			
Sr. No	Comment	Response	Page number
1	Reviewer Comment:  Introduction lacks accuracy in defining the issue and could create some confusion in the reader, while the real outcome does not emerge clearly.	Thank you for recommending this addition. We agree with this comment and have incorporated the recommendations. We have done changes in the introduction section to define the issue and outcomes are discussed.	Page 3-4; line no. 73 to 87 (highlighted section)
2	Reviewer suggestion:  To refer and make changes as per ERS/ATS task force “COVID-19: interim guidance on rehabilitation in the hospital and post-hospital phase” (Eur Respir J 2020)	Thank you for this suggestion. we have referred and cited ERS/ATS task force “COVID-19: interim guidance on rehabilitation in the hospital and post-hospital phase” as per the reviewer's suggestion.	Page 3  Line no. 108 to 110 (highlighted section).
3	Reviewer comment:  Heterogeneity of impairment and outcomes should be more clearly addressed in the introduction section of the manuscript, and the difference between more traditional and contemporary indications and populations pointed out.	Thank you for this suggestion. We agree and have incorporated the changes in the introduction section of manuscript.	Page: 3  Line no. 81 to 84 (highlighted section)

4	<p>Reviewer comment:</p> <p>Background should be defined more accurately, in order to highlight the relevance of the topic and to provide the reader the context to fully appreciate it</p>	<p>Thank you for this valuable suggestion. We have redrafted the rationale for conducting this scoping review in the background section.</p>	<p>Page</p> <p>Line no. 80 to 96, 102-112</p> <p>(highlighted section)</p>
5	<p>Reviewer comment:</p> <p>Authors should explain how they will address this aspect in the review of the literature (maybe as an additional research question?)</p>	<p>Thank you for this valuable suggestion. We have done changes as per the recommendations</p>	<p>Page 5 and 6</p> <p>Line no. 126 to 132, Page 8- 162 to 163</p> <p>(highlighted section)</p>
6	<p>Reviewer comment:</p> <p>A second important point is the definition of the time frame from SARS-Cov2 infection for the inclusion. Particularly, I found difficult to understand whether the Authors wish to include studies carried out during hospitalization in the acute phase.</p> <p>While the terms “survivors”, which is also referenced in the title of the manuscript, imply a resolution of the acute phase (and a good outcome), the inclusion criteria state: “studies must be conducted among survivors of COVID-19 or those infected with virus”. A vague reference to “acute illness” is present in the introduction too</p>	<p>Thank you for your valuable suggestion. We have incorporated the suggestion in manuscript draft.</p> <p>This review will focus among COVID 19 survivor or Long COVID following 4 weeks of recovery.</p>	<p>Page 3</p> <p>Line no. 85 to 87</p> <p>(highlighted section)</p> <p>Page 7</p> <p>Line No. 152 to 153</p>
7	<p>Reviewer comment:</p> <p>The search theme and terms do not help discriminating this. I suggest to refer to a widely accepted in literature time frame for the infection such as the one by Nalbandian and coll. (Nature Medicine 2021 volume 27, pages601–615) and clearly specify if they wish to include studies on the acute patient.</p>	<p>Thank you for this suggestion and have incorporated the suggestion in manuscript draft.</p> <p>Search strategy has been modified and suggested literature “Nature Medicine 2021 volume 27, pages601–615)” has been referred.</p>	<p>Page 4</p> <p>Line no. 82 to 84</p> <p>(highlighted section)</p> <p>Table 3 on Page No. 8</p>
<b>Reviewer: 2 Comment</b>			
1	<p>Reviewer comment:</p>	<p>Thank you for this suggestion and have incorporated the suggestion in abstract.</p>	<p>Page 2</p> <p>Line no. 48-49</p>

	<p>Abstract:</p> <ul style="list-style-type: none"> <li>- Add the design of the study. Add the expected period of the study</li> </ul>		(highlighted section)
11	<p>Reviewer comment:</p> <p>Introduction:</p> <ul style="list-style-type: none"> <li>- This section cannot cover all the elements of the study.</li> <li>- Define "COVID-19 and the role of exercise in viral infection" in detail.</li> <li>- Explain the variables measured and included in detail.</li> <li>- The significance and rationale of the study need more details. What do we already know about the topic? What will you add to the topic?</li> <li>- Add a clear hypothesis.</li> </ul>	<p>Thank you for this suggestion and have incorporated the suggestion in introduction section of manuscript draft.</p>	<p>Page 3</p> <p>Line no. 73- 79</p> <p>(highlighted section)</p> <p>Page 4 and 5</p> <p>Line No. 102-107</p> <p>(highlighted section)</p> <p>Line No. 108-112</p> <p>(highlighted section)</p> <p>Research question is highlighted in Table 1.</p>
12	<p>Reviewer comment:</p> <p>Methods:</p> <ul style="list-style-type: none"> <li>- How and who will administrate the data collection?</li> <li>- How will you achieve the validity and reliability of the outcome measures?</li> <li>- Explain more about the eligible criteria</li> </ul>	<p>Thank you for your valuable suggestion and have incorporated the suggestion in manuscript draft.</p>	<p>Page 10</p> <p>Line no. 186- 187</p> <p>Line No. 198-199</p> <p>Page 7</p> <p>Line No. 152-153</p> <p>(highlighted section)</p>

In addition to the above comments, all spelling and grammatical errors pointed out by the reviewers have been corrected. The manuscript has been revised as per recommendations. We look forward to hearing from you in due time regarding our submission and to respond to any further questions and comments you may have.

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Rinaldo, Rocco University of Milan
<b>REVIEW RETURNED</b>	27-Apr-2022

<b>GENERAL COMMENTS</b>	<p>I appreciate the chance to read this revised version of the manuscript.</p> <p>I think the Authors brilliantly adressed the comments and criticism.</p> <p>However, I have an additional consideration. I understand I suggested to make reference to a definition of Long COVID</p>
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	<p>acknowledged in literature, such as the Nabaldian's paper one. Although, it was then pointed out to me that the World Health Organization Clinical Case Definition Working Group on Post-COVID-19 Condition published the results of a delphi consensus, in order to harmonize the definition of Long Covid as many definitions (including Nabaldian's) are present in literature. The document can be accessed here:  <a href="https://www.who.int/publications/i/item/WHO-2019-nCoV-Post_COVID-19_condition-Clinical_case_definition-2021.1">https://www.who.int/publications/i/item/WHO-2019-nCoV-Post_COVID-19_condition-Clinical_case_definition-2021.1</a>          and was later published on Lancet infectious diseases (Lancet Infect Dis 2022; 22: e102–07 - <a href="https://doi.org/10.1016/S1473-3099(21)00703-9">https://doi.org/10.1016/S1473-3099(21)00703-9</a>).</p> <p>While I still believe that the definition chosen by the Authors is fitting their scope, as they are going to analyze studies published prior to the WHO consensus, a consideration on this new definition, that could become the reference in the future, should be added to the manuscript.</p>
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### VERSION 2 – AUTHOR RESPONSE

#### Response to reviewer 1:

We appreciate the reviewer's constructive feedback on the manuscript. We do agree with the reviewer that our definition is in line with the study objective. Therefore, we wish to adapt the same definition as given in Nabaldian's paper. However, we will include the WHO's definition in the final scoping review.

#### Reviewer and Editorial annotation, Comments and responses

<b>Reviewer 1 comments</b>			
Sr. No	Comment	Response	Page number
1	Reviewer Comment:  Post Covid definition recommendation	Thank you for recommending this addition. We do agree with the reviewer that our definition is in line with the study objective. Therefore, we wish to adapt the same definition as given in Nabaldian's paper. However, we will include the WHO's definition in the final scoping review.	NA
2	Editorial suggestion:  - Please include the dates of the search and the names of the databases	Thank you for this valuable suggestion. We have incorporated the changes as per your suggestions.	Page No. 2  Line No. 49-51.

	<p>searched in the abstract.</p> <ul style="list-style-type: none"> <li>- Please end the paper with an Ethics and Dissemination section, as per our guidelines for protocols.</li> <li>- Reference citations with squared bracket — for example, [1], [2], [3].</li> </ul>	<p>Reference citation with squared bracket done.</p>	<p>Page No. 12</p> <p>Line No. 228 and 229</p>
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In addition to the above comments, all spelling and grammatical errors pointed out by the reviewers have been corrected. The manuscript has been revised as per recommendations. We look forward to hearing from you in due time regarding our submission and to respond to any further questions and comments you may have.