

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form 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>	What is known about nurse retention in peri- and post-COVID-19 work environments: protocol for a scoping review of factors, strategies, and interventions
<b>AUTHORS</b>	Buckley, Laura; McGillis Hall, Linda; Price, Sheri; Visekruna, Sanja; McTavish, Candice

### VERSION 1 - REVIEW

<b>REVIEWER NAME</b>	Woodward, Kyla F.
<b>REVIEWER AFFILIATION</b>	University of Washington, Child, Family, and Population Health Nursing
<b>REVIEWER CONFLICT OF INTEREST</b>	None to declare
<b>DATE REVIEW RETURNED</b>	31-May-2024

<b>GENERAL COMMENTS</b>	This study protocol meets a critical need to map current knowledge around nurse retention and turnover. In particular, the study will provide an overview of the COVID and post-COVID landscape relating to nurse job outcomes and any initiatives that have been successful in improving retention. I see no technical issues with the methods or plan. I look forward to reviewing the findings!
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<b>REVIEWER NAME</b>	Seifi, Bahar
<b>REVIEWER AFFILIATION</b>	Islamic Azad University
<b>REVIEWER CONFLICT OF INTEREST</b>	None
<b>DATE REVIEW RETURNED</b>	12-Jul-2024

<b>GENERAL COMMENTS</b>	The paper is not accurate, balanced, and complete. The study design, outcomes, discussion, conclusions, and references aren't appropriate.
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<b>REVIEWER NAME</b>	Cummings, Greta
<b>REVIEWER AFFILIATION</b>	University of Alberta, Faculty of Nursing
<b>REVIEWER CONFLICT OF INTEREST</b>	We work in similar fields
<b>DATE REVIEW RETURNED</b>	29-Jul-2024

<b>GENERAL COMMENTS</b>	This scoping review will be an important addition to the health workforce literature. A number of details should be added to the scoping review protocol. 1. The timeframe for study inclusion in the scoping review (peri and post COVID-19 timeframe) should be justified particularly in terms of
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	<p>potential for sufficient included studies. The nursing workforce has experienced issues with retention/leaving for decades, and COVID environments were particularly stressful. How was it determined to look at only COVID environments? Given the time required to conceive a study plan, obtain funding, execute the study and publish, the 4 years since the start of the pandemic may not be enough time to retrieve sufficient published articles for this important work. Are you also suggesting that strategies applied in COVID environments to improve retention/reduce leaving are those needed in coming years post COVID? Are there not things to learn from the leaving/retention issues prior to COVID?</p> <p>2. Research questions for scoping reviews are generally broad in order to summarize the breadth of evidence, which yours is. However, I suggest adding objectives to guide the review strategy and execution after the single research question in the main body of the protocol; then address how you will achieve each objective.</p> <p>3. It would be helpful to define/describe the following, as factors vary across each;</p> <ol style="list-style-type: none"> <li>a. the concepts (e.g. will you analyze or sort by various definitions of nurse retention and/or leaving (job, unit, facility, the greater organization, etc?)),</li> <li>b. target population (all nursing professions? RN, LPN, NPs, etc),</li> <li>c. outcomes of efforts to increase retention and/or reduce leaving, and</li> <li>d. how the search strategy will locate desired studies for inclusion.</li> </ol> <p>4. Report whether a health sciences librarian is assisting in the search strategy.</p> <p>5. Review Outcomes - It would also be helpful to add a section on anticipated outcomes in the included studies, and how intervention effectiveness will be analyzed/tabulated/presented etc. For example, do you plan to report differential outcomes for nurses, units, patients, etc when nurse retention varies, or just whether retention changes?</p>
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<b>REVIEWER NAME</b>	Muir, Jane
<b>REVIEWER AFFILIATION</b>	University of Pennsylvania
<b>REVIEWER CONFLICT OF INTEREST</b>	No competing interests
<b>DATE REVIEW RETURNED</b>	01-Aug-2024

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review bmjopen-2024-087948 . This manuscript is a protocol for a scoping review focused on the factors, strategies, and interventions to support nurse retention that can be leveraged by healthcare leaders, organizations, and policymakers. The scoping review addresses an important gap in the literature by focusing on nurse retention in in the peri- and post-Covid period. The authors have included the necessary elements for reporting a scoping review. Overall, the review is timely and will provide valuable information on nurse retention in recent years. I provide areas that should be addressed below:</p> <p>General</p>
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	<ul style="list-style-type: none"> <li>• Throughout the paper there is a mix of past and present tense—pick one and apply throughout the paper.</li> <li>• Is the focus on Canadian nurses or all nurses? The introduction mentions Canadian nurses. If so, please specify in the search -Paper is missing foundational papers on nurse turnover and retention (e.g., Aiken and colleagues; Jones and colleagues).</li> </ul> <p>Introduction</p> <ul style="list-style-type: none"> <li>• Lines 43-47: Need citations for the first two sentences of this section</li> <li>• Line 47: Do you mean specifically in Canada? A substantial literature presents potential factors that would improve nurse retention internationally</li> <li>• Line 49: reword to not say “we”</li> <li>• Regarding the worsening of working conditions in the pandemic—many nursing researchers do not believe that the Covid-19 pandemic worsened conditions, but rather highlighted already-existing conditions. You may want to temper this language and at the very least provide citations to these statements.</li> </ul> <p>Methods</p> <ul style="list-style-type: none"> <li>• Line 30- cut “focus on qualitative data” because it is repetitive. Rephrase to something like “Qualitative studies using a range of methodologies such as phenomenology, etc.”</li> <li>• Please specify what is meant by “before and after” studies—a trial could be lumped into this category—do you mean pre/post observational studies?</li> <li>• Please expand on the hand screening process for systematic reviews</li> <li>• It would be helpful to expand more on the MMAT appraisal tool and how the quantitative considerations will differ from qualitative considerations</li> <li>• It’s not until the search strategy table that the reader learns you are excluding nurse managers. Specify in the methods what types of nurses you will include (RNs or all RNs? Non-admin RNs?)</li> </ul>
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**VERSION 1 – AUTHOR RESPONSE**

Reviewer Comment	Response
Reviewer 1 Comments	
<p>This study protocol meets a critical need to map current knowledge around nurse retention and turnover. In particular, the study will provide an overview of the COVID and post-COVID landscape relating to nurse job outcomes and any initiatives that have been successful in improving retention. I see no technical issues with the methods or plan. I look forward to reviewing the findings!</p>	<p>We thank you very much for your kind review and comments. Our team believes this study will provide an important collation of literature to inform the field of nurse retention.</p>

Reviewer Comment	Response
Reviewer 2 Comments	
<p>The paper is not accurate, balanced, and complete. The study design, outcomes, discussion, conclusions, and references aren't appropriate.</p>	<p>Thank you for your review of our protocol manuscript. We hope the revisions made, in line with the detailed comments of all reviewers, has strengthened the paper and made it more accurate, balanced and complete.</p>

Reviewer Comment	Response
Reviewer 3 Comments	
<p>1. The timeframe for study inclusion in the scoping review (peri and post COVID-19 timeframe) should be justified particularly in terms of potential for sufficient included studies. The nursing workforce has experienced issues with retention/leaving for decades, and COVID environments were particularly stressful. How was it determined to look at only COVID environments? Given the time required to conceive a study plan, obtain funding, execute the study and publish, the 4 years since the start of the pandemic may not be enough time to retrieve sufficient published articles for this important work.</p> <p>Are you also suggesting that strategies applied in COVID environments to improve retention/reduce leaving are those needed in coming years post COVID? Are there not things to learn from the leaving/retention issues prior to COVID?</p>	<p>We agree that the timeframe is limited to what studies could have been executed, reported on and published. We have elaborated on the rationale for focusing on COVID environments in the 'Introduction' section on Page 2. In addition, we have added an item to the "Limitations" section to reflect the potential impact of the limited timeframe on available studies. We will also include this point in the "Discussion" section of the main manuscript of the completed scoping review. We thank you for this insightful addition that will greatly improve this protocol and the quality of the following scoping review manuscript.</p> <p>Thank you for highlighting this important point of clarification. We agree there is a large body of excellent research on turnover from the last two decades. It is widely acknowledged in research and grey literature that COVID has led in contextual changes to nursing workplaces and nurse perceptions of work and work environments. We do not know if the previous body of research on turnover is applicable to this new context. We hope that our scoping review will provide some insight on what factors are currently impacting nurse turnover as well as what strategies are being suggested and implemented. We have added this point of clarification to our introduction (Page 3) and will certainly address it in both the introduction and discussion of the scoping review manuscript.</p>

<p>2. Research questions for scoping reviews are generally broad in order to summarize the breadth of evidence, which yours is. However, I suggest adding objectives to guide the review strategy and execution after the single research question in the main body of the protocol; then address how you will achieve each objective.</p>	<p>Thank you for the suggestion – the study objectives have been added under the review question to enhance clarity and to guide the review strategy. In this section, we also described how our analysis strategy will achieve the objectives (Page 3).</p>
<p>3. It would be helpful to define/describe the following, as factors vary across each;</p> <p>a. the concepts (e.g. will you analyze or sort by various definitions of nurse retention and/or leaving (job, unit, facility, the greater organization, etc?)),</p> <p>b. target population (all nursing professions? RN, LPN, NPs, etc),</p> <p>c. outcomes of efforts to increase retention and/or reduce leaving, and</p>	<p>Thank you for the suggestion!</p> <p>a. We have kept the definition of turnover/retention intentionally broad in order to include all forms of turnover (i.e. unit, job, organization, profession) This concept has been further defined under the “Eligibility criteria” section (Page 3)</p> <p>b. We have further defined our target population under the “Eligibility criteria” section (Page 3), including why we are excluding nursing students, nurse leaders, and advanced practice nurses as their duties and responsibilities differed from the general nursing population which may impact their experience of retention.</p> <p>c. Thank you for bringing up this important point. We have not specifically defined outcomes of efforts to increase retention as we do not know what they are specifically until we actually conduct the review. However, in the main scoping review manuscript, we anticipate there being a broad definition of measurements used (e.g. actual staff turnover, intention to leave, intention to stay). We will collate and map this information (see Appendix B where we provide our extraction tool that will collect if retention is measured in some form and, if so, how it was measured). This information can be found under “Data Extraction” on Page 5. We anticipate this being an important discussion point in the main scoping review manuscript as there are a variety of ways this outcome is</p>

<p>d. how the search strategy will locate desired studies for inclusion.</p>	<p>defined and measured, making comparisons across studies challenging.</p> <p>d. Thank you for identifying the need of this further clarification. The expanded “Eligibility criteria” better explains how relevant studies will be targeted (Page 3). Additionally, our comprehensive search strategy (revised on Page 4), was pilot tested for accuracy, and is designed to systematically identify and include all relevant studies by utilizing a combination of specific keywords, Boolean operators, and multiple databases, ensuring the retrieval of both published and unpublished literature pertinent to our research question and objectives.</p>
<p>4. Report whether a health sciences librarian is assisting in the search strategy.</p>	<p>Thank you for this suggestion – our health sciences librarian was an integral part of the development of the search strategy. We have added a statement in the “Search strategy” section (Page 4) reflecting this.</p>
<p>5. Review Outcomes - It would also be helpful to add a section on anticipated outcomes in the included studies, and how intervention effectiveness will be analyzed/tabulated/presented etc. For example, do you plan to report differential outcomes for nurses, units, patients, etc when nurse retention varies, or just whether retention changes?</p>	<p>Thank you for the feedback. We have added a section outlining Anticipated Review Outcomes and how they will be categorized and synthesized according to our scoping review objectives (Page 5).</p> <p>As this is a scoping review, meta-analysis of the intervention outcomes will not be conducted in this study. Correlational factors, presented strategies, and tested interventions will be presented descriptively in tables and in written narrative. As you thoughtfully mentioned in a previous comment, it is unlikely that we will get a large volume of interventional studies due to the timeframe.</p> <p>We anticipate that various turnover and retention measurement approaches will be employed across different studies, which may impede direct comparisons of interventions. Despite these variations, we will strive to accurately represent the outcomes by synthesizing the data using standardized metrics where possible and by qualitatively assessing the impact of each intervention</p>

	<p>within its respective context. Our aim is to provide a comprehensive overview of the effectiveness of different strategies while acknowledging the limitations posed by diverse measurement techniques – we have added this to our “Data Analysis and Presentation” section on Page 5.</p> <p>We have also added a “Conclusion” section to address anticipated outcomes of the scoping review (Page 6).</p>
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Reviewer Comment	Response
Reviewer 4 Comments	
General	
Throughout the paper there is a mix of past and present tense—pick one and apply throughout the paper.	Thank you for noting this. You are correct, there are a mix of tenses throughout the paper. The tense changes represent work that has already been done (ex: the search strategy development) and work that will happen in the future (ex: data extraction). We have reviewed the entire manuscript to ensure the tense matches the activity.
Is the focus on Canadian nurses or all nurses? The introduction mentions Canadian nurses. If so, please specify in the search	We agree that the use of a specifically Canadian data point was confusing as this scoping review aims to look at factors, strategies, and interventions for nurses globally. We have revised the “Introduction” and removed the specifically Canadian data point to avoid this confusion (Page 2).
Paper is missing foundational papers on nurse turnover and retention (e.g., Aiken and colleagues; Jones and colleagues).	Thank you for this suggestion – we completely agree! Professors Aiken and Jones have produced highly relevant, foundational work on the topic and works from both have been included in the “Introduction” to support the background and rationale of the scoping review.
Introduction	
Lines 43-47: Need citations for the first two sentences of this section	We have substantially revised the “Introduction” and have added multiple new citations to support our background and rationale. We feel that the manuscript is much improved with these additions – thank you! (Page 2).

<ul style="list-style-type: none"> <li>• Line 47: Do you mean specifically in Canada? A substantial literature presents potential factors that would improve nurse retention internationally</li> </ul>	<p>We agree- we have revised this line of the “Introduction” to clarify the global context we were originally intending to address.</p>
<ul style="list-style-type: none"> <li>• Line 49: reword to not say “we”</li> </ul>	<p>Revised.</p>
<ul style="list-style-type: none"> <li>• Regarding the worsening of working conditions in the pandemic—many nursing researchers do not believe that the Covid-19 pandemic worsened conditions, but rather highlighted already-existing conditions. You may want to temper this language and at the very least provide citations to these statements.</li> </ul>	<p>Thank you for noting this important distinction. We have tempered our statements to reflect that this was a previously existing issue, that COVID has intensified these pre-existing issues and that we may or may not find new factors, strategies and interventions that impact nurse retention in the peri- and post-COVID time period in the introduction.</p>
<p>Methods</p>	
<ul style="list-style-type: none"> <li>• Line 30- cut “focus on qualitative data” because it is repetitive. Rephrase to something like “Qualitative studies using a range of methodologies such as phenomenology, etc.”</li> </ul>	<p>Thank you, this has improved the readability of the section. We have revised accordingly on Page 3.</p>
<ul style="list-style-type: none"> <li>• Please specify what is meant by “before and after” studies—a trial could be lumped into this category—do you mean pre/post observational studies?</li> </ul>	<p>Revised accordingly to reflect “pre and post observational studies (Page 3).</p>
<p>Please expand on the hand screening process for systematic reviews</p>	<p>More detail was added to the hand screening process for reference lists of reviews and meta-syntheses under “Types of Sources” found on Page 3.</p>
<ul style="list-style-type: none"> <li>• It would be helpful to expand more on the MMAT appraisal tool and how the quantitative considerations will differ from qualitative considerations</li> </ul>	<p>Thank you for this feedback; we agree that further information on the MMAT would improve this section. Further details on the MMAT evaluation pathways have been added under the “critical appraisal of individual sources of evidence” section on Page 4.</p>
<ul style="list-style-type: none"> <li>• It’s not until the search strategy table that the reader learns you are excluding nurse managers. Specify in the methods what types of nurses you will include (RNs or all RNs? Non-admin RNs?)</li> </ul>	<p>We agree – this was not clear in the original draft and was also pointed out by another reviewer. This information has now been included in the abstract and the text of the methods section. We have expanded on this explanation in the “Eligibility criteria” section to better describe our study population and the rationale for our choices (Page 4).</p>



**VERSION 2 – REVIEW**

<b>REVIEWER NAME</b>	Cummings, Greta
<b>REVIEWER AFFILIATION</b>	University of Alberta, Faculty of Nursing
<b>REVIEWER CONFLICT OF INTEREST</b>	None
<b>DATE REVIEW RETURNED</b>	05-Sep-2024

<b>GENERAL COMMENTS</b>	I appreciate the authors' work to revise the protocol using the reviewers' recommendations.
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<b>REVIEWER NAME</b>	Muir, Jane
<b>REVIEWER AFFILIATION</b>	University of Pennsylvania
<b>REVIEWER CONFLICT OF INTEREST</b>	none
<b>DATE REVIEW RETURNED</b>	26-Aug-2024

<b>GENERAL COMMENTS</b>	The authors have sufficiently addressed reviews.
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**VERSION 2 – AUTHOR RESPONSE**