Reviewer's report

Title: A mixed methods quality improvement study to implement nurse practitioner roles and improve care for residents in long-term care facilities

Version: 0 Date: 02 Jun 2019

Reviewer: Jenny Ploeg

Reviewer's report:

This is an important paper that makes a new contribution to our understanding of the impact of implementing nurse practitioners in Quebec, Canada long term care settings on patient outcomes. The authors provide a summary literature review on the state of research related to NPs in LTC settings. The authors indicate use of a conceptual framework for this project but this should be more clearly integrated into the paper, for example, in the discussion of the results. Under study aims, I suggest the authors start with a statement of the aim of this particular paper, and then describe how this relates to the broader study. Under study design, I suggest the authors indicate that the outcomes were monitored prospectively for 12 months after the implementation of the NP role as this was not clear.

The authors indicate that they expected to have access to data for the reference year prior to NP arrival in the LTC homes but that this was not possible. This should be listed as a study limitation and the authors should indicate implications for future research to address this issue. The authors should indicate who entered data for this paper into the system, what training they received, and how data accuracy was determined. The section related to resident’s date of admission and how this was used in the data analysis should be clarified.

For Table 1, it is not clear if the number of medications refers to the end point of the study or earlier. For figures 2 and 3 I suggest the authors indicate which lines represent site 1, 2, etc, and also include a line that combines all results, as the authors do indicate in the text overall changes across sites. The authors discuss other important outcomes but do not provide actual data for these, eg transfers to acute care, falls, pressure ulcers, use of restraints. I suggest the authors include either tables or figures summarizing these results (at least results at the start and end of the 12 month study period).

The discussion section contains a repeat of the main study findings; I suggest the authors clearly outline what is the new contribution of this study and what it means. I suggest the authors include some information about other changes that occurred in policy or practice that may have influenced study results, as they allude to this in the discussion. In the discussion, I recommend the authors more clearly contrast their results to the existing literature; eg in the discussion of Klassen's study, indicate if the current study results were similar, and the type of design used by Klassen et al. The statement at the end of the paragraph starting with Klassen talks about cost savings for Quebec of more than $32 million, but it is not clear what this refers to, please clarify.
In the study conclusion the authors state that these resident participants were similar to other LTC residents in Quebec, the authors need to provide more information to support this statement. The conclusion indicates that a consultative model should be favoured due to the better outcomes, however, given the design limitations of this study and the limited number of NPs studied, I suggest this conclusion should be much more tentative in nature. The conclusion contains a statement that this project fostered a better understanding of the conditions needed to introduce NP in LTC, but this data is not presented in this paper; I suggest this be omitted. I suggest the authors include a statement at the end of the conclusion about the need for more rigorous studies in this area.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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