Reviewer’s report

Title: Application of Four-Dimension Criteria to Assess Rigour of Qualitative Research in Emergency Medicine

Version: 1 Date: 26 Oct 2017

Reviewer: Francesca Brundisini

Reviewer's report:

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Reviewer Recommendation and Comments for Manuscript Number BHSR-D-17-00651R1 - Application of Four-Dimension Criteria to Assess Rigour of Qualitative Research in Emergency Medicine

Comments to the Authors:

Thank you for the opportunity to review this interesting methods paper, which systematically assesses the rigor of a large-scale qualitative research study in the emergency medicine context in Australia.

Qualitative research is a complex and evolving field of inquiry, and rigor and robustness in such field is still a open to debate. This methods paper contributes to this ongoing debate by providing a framework to systematically approach large-scale qualitative studies. This work provides very interesting insights and methodological contributions to the relevance of assessing rigor in qualitative studies in mixed-methods projects, contributing to the field of health service research.

Overall the paper is clear and well written. The use of the tables is informative and useful for the readers. I particularly liked Table 3, which outlines and explains the criteria of the framework used to assess the rigor in qualitative research. Also the other tables and figures provide additional relevant information useful for the audience.

The authors organized the paper in a nice way by using headings, which easily guide the reader through the different components of the 'Four-Criteria Framework' they apply. They clearly
describe how they implemented these criteria in their large-scale qualitative study, outlining each step of the assessment process in a clear and structured way.

However, there are some concerns that need to be addressed by the authors.

General comments:

1. The objectives of the paper are not clear and ambiguous. The authors should make the objective of this work clearer, especially in the introductory 'Background' section. First, they should define the nature and goal(s) of this paper, that is, a methods paper to define and apply a framework to systematically assess rigor in qualitative research. Only after defining the goals of the paper, they should describe the type of research and the objectives of the study they use to establish methodological robustness of qualitative research studies, that is, the qualitative large-scale study part of a mixed-methods project in the emergency medicine context. Defining the objectives of the paper will inform and guide the readers and will not induce the readers to expect the "results" of the qualitative study at the end of the paper.

2. Similarly, the authors should define the objectives of the study in the abstract.

3. The discussion section appears incomplete. Defining the aims of this study would also help the authors develop the discussion section more thoroughly. If the objective of this study is to add methodological contributions to the ongoing debate about rigor in qualitative research studies, then they should clearly address this aspect in the discussion section. For example, is there a debate about rigor in qualitative studies that are part of mixed-method research projects? And, why did they apply a systematic method to assess rigor? What guided the selection of this approach? Are there other approaches they could have used? Answers to these questions should be addressed in the discussion section to fully contribute to the debate on robustness in qualitative research. If delving into the debate on rigor in qualitative research is not the main objective of this paper, I would reframe the whole paper as a checklist for assessing rigor in qualitative work as part of a mixed-methods study. The checklist could be a guideline for other researchers doing similar qualitative work in mixed-method research.

4. Related to the previous comment - at page 2, line 50 - the authors define their approach as "adapted" from Lincoln and Guba's original work. How did the authors do so? And why? I would suggest to add a column in Table 3 to explain which aspects were "adapted" from the original work, what changed and why.
Minor Comments:

1. Background/Methods section: it is not clear which qualitative method the authors used in the large-scale qualitative study (part of the mixed-method project). In the introduction of the paper, they mentioned Lincoln and Guba's work. However, from that section I infer that they used Lincoln and Guba's framework for the assessment of rigor and not for the original data collection and data analysis of the qualitative study. And later at page 7, line 37, they mention "conceptual analysis framework". What do they mean by that? The authors should specify which analytical method they used for the qualitative study they are assessing. Here are some suggestions to consider:
   a. In order to explore the perceptions and perspectives of the participants of the large-scale qualitative study, did the authors use a descriptive or interpretative analytical approach? And why?
   b. How did the authors develop the concepts they mention (deductively, inductively, or abductively)? And how does the way they develop these concepts relate to the different rigor criteria? Can these criteria be applied to different analytical methods? The definition of the analytical approach would explain how the rigor criteria in this assessment ensures robustness. For example, why prolonged and varied engagement with each setting is important for data collection and analysis? The authors mention familiarity. What do the authors mean by familiarity? A reasonable explanation would be that familiarity with both the settings and participants (aspect that the authors do mention) is important because of the co-construction of meaning between the researcher and the participants (aspect that the authors do not mention). Prolonged engagement acknowledges this co-creation of meaning, which can be guaranteed with long exposure to the settings and study participants, therefore supporting the credibility of the data collected and of the subsequent results. This implies that the authors have used an interpretative analytical approach to the study of the data. Hence, the relevance of specifying the type of analytical approach.
   c. Was their analytical approach informed by theoretical frameworks? If yes, at what stage, and which ones. (They mention theoretical triangulation at page 10, line 36, however it is not clear whether these theories contributed to the original approach to the data collection and analysis or such theories were used in a second moment to maintain rigour in the study).

2. Instead of just describing how each criteria were implemented, the authors could describe how applying these criteria in the study enhanced rigor by providing specific examples. For example, how does methodological triangulation - page 10, line 9 - ensures confirmability and credibility of the findings in this study?

3. Finally, I would remove the subheading "Limitation" in the discussion session. If the authors do so, they should use it throughout all the discussion section when addressing
other aspects (such as contributions of the study and recommendations for future research). They can either delete that subheading, or leave it and add the other subheadings in the discussion section.

**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.

Unable to assess

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

Unable to assess

**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.

Not relevant to this manuscript

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Acceptable
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