Reviewer’s report

Title: How staff and their working contexts influence implementation of person-centered dementia care in nursing homes. A mixed method study of an education intervention to reduce use of restraint.

Version: 0 Date: 10 Apr 2017

Reviewer: Souraya Sidani

Reviewer's report:

This paper appears to report on a mixed method sub-study, done within the context of a large cluster RCT, to identify multi-level factors that could have influenced the implementation and effectiveness of an educational intervention aimed to promote patient-centered care and reduce use of restraints among persons with cognitive impairment residing in nursing homes. The sub-study was guided by the PARIHS model, which is an appropriate framework for informing the selection of factors and the interpretations of the findings.

The sub-study has the potential to contribute to our understanding of the interrelationships among the influential factors, the fidelity of intervention implementation, and the outcomes. However, it was difficult to discern: 1) what exactly the educational intervention consisted of, who delivered it, how and under what context; 2) what prompted the sub-study; 3) what methods were used in the larger trial and what were the main findings; and 4) what methods were used in the sub-study. Further, it is hard to follow the presentation of the quantitative and the qualitative findings, and to understand how they were integrated (if any) to identify what influenced the implementation and effects of the educational intervention.

To minimize the potential confusion, the authors may want to consider:

1) Streamline the introduction to highlight two key points: the importance of reducing restraint use and promoting patient-centered care, and the reason for designing and rolling out the educational intervention despite previous governmental initiative (i.e. what were these initiatives and what could explain their limited effectiveness), and 2) present all information about the larger trial in a separate section. The latter information could clarify: the educational intervention (goals, components, activities), describe its implementation (who delivered it in what format and dose), explain the design of the trial (i.e. how many nursing homes participated, how many were randomized to the intervention and the control groups, when exactly were outcome data collection), guided by the information that was nicely and meaningfully summarized in the table; last, summarize the key findings of the larger trials that prompted this sub-study.
2) In a separate section, the authors can introduce the sub-study and justify it i.e., why was it done / its significance within the context of the large trial and of implementation science. The aim may have to be re-worded to clarify the type of factors investigated, as some were related to the contextual structure and leaders within the nursing homes, in addition to those related to staff.

The Methods section could then focus on only those pertaining to the sub-study. The following points require clarification:

1. Sample: how many sites were selected for the sub-study and how many nursing staff participated (these numbers were not consistently presented)? What criteria and sampling strategy were followed to obtain the sample for the sub-study (in particular, the interviews and the observation)? Why was heterogeneity sought? On what basis were the dimensions for heterogeneity selected? Shouldn't heterogeneity be based on the outcomes only?

2. Intervention characteristics and implementation can be described when presenting the large trial to clarify what the intervention was about, who delivered it and how. It is important to explain what the control group was exposed to and whether the sites were stratified on key contextual characteristics before randomization.

3. It would be useful to clarify the variables of interest to the sub-study prior to mentioning the instruments used to assess them quantitatively, and to explain the type of factors that were explored qualitatively.

4. The rationale for the two methods to gather qualitative data and for conducting the focus groups prior to the intervention is not presented. What would the pretest data inform about factors that influenced the implementation and effectiveness of the study? Why were focus groups, rather than individual, interviews done?

5. Focus group interviews: who exactly participated? How many persons attend each group interview? How many group interviews were held within and across sites? When were the interviews stopped? What topics were covered? What "reflection notes" guided and informed the interviews?

6. Ethnographic fieldwork: more details are required to understand what exactly was observed, by whom, for how long, in what context, within and across sites, and how data were documented.

7. There is limited explanation of how quantitative and qualitative data were analyzed separately, and how the findings were integrated. There is no justification of the statistical tests planned / performed in light of the fact that across-site differences are likely and should have been accounted for when analyzing the data to determine the effectiveness of the
intervention and for describing the characteristics of the staff and contextual factors. There is no explanation of how rigor was maintained in analyzing the qualitative data.

The Results section does not present and/or explain the specific themes that emerged from the ethnographic observation and the group interviews. It is hard to follow the presentation of the findings - it may be meaningful to have subsections that identify staff and context factors that contributed to the implementation and the effectiveness of the intervention.

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

No

**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.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

**Declaration of competing interests**
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare I have no competing interests.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal.