Author's response to reviews

Title: Mapping barriers and intervention activities to behavior change theory for guide for adapting a multisite educational intervention: Mobilization of Vulnerable Elders in Ontario (MOVE ON), a multi-site implementation intervention in acute-care hospitals

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Version: 2
Date: 6 October 2014

Author's response to reviews: see over
Dear Prof. Signe Flottrop,

Thank you for the reviewer comments. Please find attached a revised version of the manuscript that addresses the reviewer comments. The comments were helpful and we believe these changes strengthen the quality of the manuscript. See below for a point-by-point response to each reviewer comment. Reviewer comments are presented in italics.

**Reviewer 1:**

- **While the current title is short and catchy, it does not adequately reflect the topic of the study (i.e. tailoring the MOVE ON intervention to multiple hospital contexts). The current title seems to suggest that MOVE ON (a tailored multi-faceted quality improvement intervention) was entirely an educational intervention.**
  - We agree that the title did not adequately reflect the study; therefore we have revised the title to: Mapping barriers and intervention activities to behavior change theory for Mobilization of Vulnerable Elders in Ontario (MOVE ON), a multi-site implementation intervention in acute-care hospitals.

- **The rationale for the choice of the three recommendations is unclear and requires further clarification. In addition, it’s unclear how these three recommendations were used to promote ‘fidelity to the implementation intervention’. Appears the three were used as ‘tracer recommendations’ to ‘standardize’ the tailoring process across study hospitals?**
  - The reviewer is correct that the three recommendations were not used to “promote fidelity to the implementation intervention”, but as core components used to standardized the tailoring process. We have revised the wording to reflect this and included 4 references supporting the use of these three recommendations: “The core components of the intervention included: completing a mobility assessment and mobility care plan within 24 hours of admission of any patient aged 65 years or older; mobilizing patients at least 3 times per day; and ensuring that mobilization was scaled and progressive. Early mobilization strategies using these recommendations have demonstrated benefits on length of stay, duration of delirium, depression, and discharge to home for older patients admitted to hospital [21,22,23]. Sites were then encouraged to tailor intervention activities to the local context, without changing these core recommendations.” (p5).
Prioritization of barriers and intervention activities is crucial for enhancing implementation of interventions. This aspect of tailoring is not mentioned in the paper and needs to be addressed.

Based on our findings and experience, we agree that prioritization of barriers and interventions activities is critical. This was not explicitly part of the focus group process, but since it was clear that sites would not be able to address all of the barriers, they were asked to identify key barriers. Moving forward we plan to include this more explicitly for the next wave of implementation, MOVE ON+. We have added a description of this to the discussion section (p17-18): “Given the scarce resources, competing demands, a large number of barriers, prioritization of barriers and intervention activities is critical to effectively implement intervention. For the MOVE ON+ intervention, focus group participants will be asked to rank barriers in order to prioritize intervention activities. Since we have developed a large pool of barriers, they will be asked to select the most significant barriers. Once barriers have been prioritized, they will use the mapping guide to select appropriate intervention activities.”

Reviewer 2:

Document study aim(s) in the abstract and main body of the paper (page 7).

This is an excellent point. We have added the following study aim to page 7: “The aim of the current study is to develop a mapping guide that maps identified barriers and intervention activities (suggested and adapted) to behaviour change theory; the purpose of the mapping guide is to aid sites in selecting intervention activities that appropriately address context-specific barriers.”

Additionally, we have included an abridged version to the abstract, “To facilitate the spread the Mobilization of Vulnerable Elders in Ontario (MOVE ON) intervention, the aim of the current study is to develop a mapping guide that links identified barriers and intervention activities to behaviour change theory.”

Include a summary of key messages/findings in the first paragraph of discussion.

We have added a summary of findings to the first paragraph of the discussion section (p 15) and believe this improves the flow of the discussion section. Specifically, “Through focus groups with 261 front-line clinicians across 14 hospitals, we identified barriers to behaviour change at three levels: health care providers, patients, and hospital units. We then documented all implementation activities that were delivered across sites. The barriers and implementation activities were mapped onto the COM-B behavior change theory with a high level of agreement between raters (88%). Results of the mapping exercise were used to create a mapping guide to assist future sites in selecting intervention activities that appropriately target the underlying behaviour change construct of identified barriers.”
• **Discuss more about the process of ranking barriers, and identifying the root causes (perhaps that is 'methods’ rather than discussion?).**
  o We have added a description of how data on root causes was collected (through probing during the focus group and at the analysis phase). This information was added to the methods, results, and discussion sections:
    o Methods: “Facilitators probed participants to consider the underlying factors related to suggested barriers.” (p 9)
    o Results: To understand the root causes of barriers, during the coding phase, analysts coded barriers into larger themes to understand the commonalities across sites. (p 11)
    o Discussion: “For this study, understanding root causes was done on 2 levels: during focus groups and during qualitative coding. Through focus group discussions, participants were asked to provide feedback on their initial thoughts about barriers; facilitators then probed participants to consider the underlying factors related to each barrier. During data analysis, these barriers were coded into larger themes (e.g., “time constraints” were coded as a resource issue) to understand the common threads across sites.” (p 16).
    o The comment about ranking barriers is similar to Reviewer 1’s comment about prioritizing barriers. Unfortunately this was not explicitly conducted as part of the current study, but is described as a next step (p17-18).

• **Consider adding a word or two into the title to reflect inpatient/hospital population as the target patient group**
  o We agree that the title did not adequately reflect the study; therefore we have revised the title to: Mapping barriers and intervention activities to behavior change theory for Mobilization of Vulnerable Elders in Ontario (MOVE ON), a multi-site implementation intervention in acute-care hospitals

Sincerely,

Julia E. Moore