Author’s response to reviews

Title: Can a multi-component multidisciplinary implementation package change physicians’ and nurses’ perceptions and practices regarding thrombolysis for acute ischemic stroke? An exploratory analysis of a cluster randomized trial

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Version: 2 Date: 05 Sep 2019

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Reviewer reports

Reviewer #1:

Minor Comments

Comment: Line 138: 11% of all clinical presentations of AIS? Please clarify.
Response: The rate of thrombolysis was 11% among all the stroke cases. This line has now been revised and please see Page 5 Line 138.

Comment: Line 140: Who’s knowledge? All health care providers? Physicians specifically?
Response: According to Shiffman et al; the knowledge of the physicians on the desired behavior could
improve the quality of emergency care. This information has been added to make the line clearer. Please see Page 5 Line 140.

Comment: Line 154: Space between 'found significant'
Response: The line has been corrected. Please see Page 6 Line 155.

Comment: Line 156: "After the end of the implementation package"... At what time point was this?
Response: "After the end of the implementation package" includes the time period of 12 months post-intervention period. This information has been added and please see Page 6 Line 157.

Substantive comments

Comment: Background: Objective 1 "Assess the validity of the staff survey measure" - provide more details.
Response: The “Objective 1” is revised to make it more clear and please see Page 7 Line 171-172.

Comment: Design and setting-include study design in this paragraph
Response: The current study included two cross-sectional surveys during the pre- and post-intervention period and relevant information have been added in Page 7 Line 183-184.

Comment: Suggest including a paragraph in the discussion that speaks to objective #1 (assess the validity of the staff survey measure).
Response: Thank you. We have added additional information in the discussion section describing how the validity and reliability of the survey items under each domain were maintained. Please see Page 12 Line 314-319.

Comment: One of the main findings was that the TIPS intervention increased staff perceptions relating to hospital performance indicators, feedback, and training. Only the feedback is discussed in the discussion section. Please expand what this means for hospital performance indicators and training.
Response: Thank you. A detailed discussion related to hospital performance and training has been discussed in the revised version. Please see Page 12 Line 328-332.

Comment: Lines 323-327: Suggest expanding on the findings that TIPS changed the perception of nurses but not physicians. I challenge the argument that it can be challenging to change physicians' clinical practice because they are long-standing and widely held, as a very similar argument can be made for nursing practice. This is an important contextual finding that speaks to the "one size fits all" approach that is often taken during implementation - It warrants further discussion.
Response: The TIPS intervention did not use a ‘one size fits all’ approach. Physicians and nurses had separate training suited to their own distinct roles. A further detail explanation has been added to clarify the non-significant change in physicians’ perception. Please see Page 13 Line 344-347.

Comment: Discussion section - tie the discussion back to the theoretical framework that guided this work.
Response: Thank you. The theoretical framework has been noted in the discussion sections. Please see Page 12 Line 319-320.

Comment: Implications: What are the implications for implementation of scientists? What are the next steps or future research recommendations?
Response: The study highlights to explore the experience of the staff involved in TIPS intervention execution in more depth with additional forms of assessment (eg mixed methods). Please see Page 13-
Reviewer #2:

Comment: Additional information on how the intervention theory was related to the survey would be helpful. Were the components of the behavior change wheel assessed in the survey?
Response: Survey items were selected from the previously published literature on behavior change and the implementation of evidence-based practice. In addition, the National Stroke Foundation’s Clinical Guidelines for the management of Stroke and its recommendation for hospital facilities and evidence for intravenous thrombolysis were also considered to finalize the survey items. However, the survey factors were not designed to match the central components of the behavior change wheel (ie capability, opportunity, motivation). Please see Page 8 Line 213-217.

Comment: Do you think there was a ceiling effect in your measures? Particularly for personal stroke skills and hospital stroke care policies.
Response: The possible ceiling effect for personal stroke skills was raised in the discussion (Page 13 Line 352-354). A ceiling effect for hospital stroke care policies was not considered likely, given the low-moderate (35%-78%) proportions.

Comment: While I understand the principal factors method was conducted and final factor structure required it to make conceptual sense. I am wondering how conceptual sense was defined. For example, a factor that addresses personal stroke skills and hospital stroke care policies would seem to have very different strategies for improvement based on whether the barrier was at the personal or hospital level.
Response: Confirmation of the conceptual sense of the items which loaded on each factor were made by the authors as a group via discussions of the coherence across items within each proposed factor. The definition of the conceptual sense for each of the identified domains has been added in Supplement 3 in the revised version of the manuscript.

Comment: Likert scales were analyzed linearly. Was their consideration of ordinal regression?
Response: Likert responses were allocated a score of: strongly disagree=1, disagree=2, agree=3 and strongly agree=4. Thus, we converted the value of Likert scale into a linear one and then did the linear mixed model analysis. Therefore, we did not consider ordinal regression.

Comment: The fact that there were only 74 physician responders should be included in the results section. I also think the non-response rates for physicians and nurses should be reported separately. It might be this was the majority of physicians invited to participate given there are fewer physicians than nurses.
Response: The total numbers of nurses and physicians (ie denominators) were not available separately for all study sites, therefore the response rates were not reported separately.

Comment: tPA decision making occurs in the ED rather than the stroke unit. If possible it would be important to assess for changes in the domains by whether provider worked in ED or stroke unit.
Response: Thank you. We have checked the result based on ED and stroke unit physician, however, the result was also non-significant. Please see Page 11 Line 301-302.

Minor:

Comment: I am surprised that individual and hospital performance indicators are in the same domain? Are there any theories on why this might be the case?
Response: The items under the domain “Hospital performance indicators, feedback and training” highlights the activity and policy set by the hospital leaders and administrators to supervise and
monitor the process of stroke care. The conceptual sense for the identified domains has been added in Supplement 3 in the revised version of the manuscript.