Reviewer’s report

Title: Development of an education campaign to reduce delays in pre-hospital response to stroke

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Reviewer: Lisa Mellon

Reviewer's report:

This is a novel and important piece of research, and has great merit in the area of emergency response to stroke. The authors show an extensive knowledge of the literature, and the depth of planning a stroke awareness campaign is commendable. The use of survey data to identify mode of message delivery and communication channels is novel and commendable.

My overall issue with this paper is that a lot of the decisions for inclusion into the education campaign are taken at the discretion of the steering committee, with a loose association to the literature and theory, e.g., "the committee decided that the message should include the concept of..." This should be based on scientific evidence, not a common consensus. Although it is commendable that the authors have considered the importance of guiding theoretical principles for behaviour change, I'm struck by the lack of translation of the theoretical components into the ingredients of the campaign. In the introduction the authors refer to the lack of theoretical basis in previous stroke awareness campaigns, however in this paper the link to theoretical components of successful behaviour change seem vague.

It is stated that psychological constructs were taken into account when developing the message, but how they were taken into account is unclear. For example, knowledge, self-efficacy and outcome expectation were identified as key concepts in delayed response to stroke symptoms - how did the designed campaign specifically intervene to modify these concepts?

There is a huge literature on the science of behaviour change, and the importance of transparency and specification of behaviour change techniques in any type of intervention to change behaviour, including population behaviour via educational strategies and mass media campaigns. The following literature may be useful to the authors for clearly linking theory to the campaign:


A final point: Thrombolysis is a time-limited treatment, and an ongoing issue with most stroke awareness campaigns is that they specify that time is important, but they are not specific. A rapid response to one individual may be perceived as a slow response to another - how was the issue of time urgency conveyed in the awareness campaign?

Abstract

Minor typo - explain EMS acronym

Introduction

1. Although the authors describe the current state of the literature quite well, and highlight the lack of correct intervention development according to MRC Guidelines, the link between the current gap in the literature and the proposed research question is unclear - this could be further clarified. Also, Intervention mapping isn't explained well in the introduction or Methods - why is this approach novel/useful?

Line 44: The rationale for implementing the specified education strategy in general practice isn't explained, or supported with citations.

Methods:

1. Line 29: Why was 2 hours picked as a cut-off? Other studies have used 3 hours, 3.5 hours - rationale for 2 hours, plus supporting citations, would be useful here, given that thrombolysis treatment can be administered up to 4.5-6 hours - 2 hours seems restrictive?

2. Line 41 - what were the 'occurrence of events'?
3. Population survey: More detail on the recruitment process for the survey would be useful - the paper states that the questionnaires were administered by a neurologist or an ALICe representative, but the recruitment locations are diverse (e.g. theatre, shopping mall, etc.). How were participants identified? Was data collected as part of a semi-structured interview, or were questionnaires self-completed and returned to the recruiter in person/by post? Exclusion criteria? Were other data collected - (e.g. personal experience of stroke, level of education?)

4. Line 53: it would be useful to list the 5 groups of warning signs, as presented in the STAT.

5. In-hospital survey: More detail on the rationale for question selection is needed, in addition to citation #9. What were the exclusion criteria?

6. Line 31: if the intervention is to be delivered in primary care, was a representative from primary care included on the Steering Committee?

7. How did the findings from Phase 1 inform Phase 2? This link isn't clear in the Methods section, and in particular, how the data from phase 1 influenced the development of matrices of change.

8. Section 2.2. This section requires more detail - how was the theoretical model "derived from theory and research"? This is a substantial piece of work in itself to identify theory relevant to educational campaigns. Also, it is unclear to the reader what is meant by the term 'proximal programme objective', in this context.

9. Page 7: What were the 'creative resources'?

10. Page 7: Please explain 'demographic official data'.

11. Page 7, Line 10: an explanation for the assumption of 25%-35% population mean score for STAT would be useful here

12. Page 7, Line 17: Is there any citation for this 30% rate arising from hospital administrative data?

Results:

13. Line 5: Figure 1 is illegible in uploaded version.

14. Line 27: Why were recurrent strokes excluded? The context of symptom onset may be different in a recurrent stroke, therefore these participants would provide useful information?
15. Line 39. Based on the >2 hour definition of delay, over 50% of the sample were delayed presentations. As stated earlier, a clear rationale for this 2 hour cut-off is needed, given its highly restrictive nature.

16. Lines 45-56: The wording of this paragraph needs to be edited. From descriptive analysis (chi square tests), it is difficult to infer causality (e.g. 'influenced' or 'directly associated'). Additionally, from the text it appears that those with hypertension were faster responders, however those with LACI were slower responders - this presentation is confusing - either present factors associated with earlier, or later arrival, not both?

17. Table 5; suggest presenting 'Lives alone' as a binary variable - presentation of stats for both yes and no responses is confusing - these are essentially the opposite of each other!

18. Line 57 - Barriers are reported for arrival after 3 hours, yet your definition of delayed arrival is >2 hours? This seems contradictory.

19. Page 9, first paragraph. A lot of this text is descriptive and repetitive, as it is evident in Table 6. Table 7, the regression model, isn't well interpreted in the text. For example, how were variables selected for model inclusion?

20. Line 6: why was the model by Andersen et al. selected?

21. Line 26. The Self regulatory model of illness was considered by the SC - what was the evidence that this model would be appropriate above other models, aside from the SC selection? Additionally, the SRM refers to positive/negative illness representations such as consequences, timeline, identity, etc. - in order to provide transparency, it is important to specify which type of illness representation the campaign aims to modify.

Line 48-51. The regression model in Table 7 doesn't support these assumptions. If assumptions from the literature are used to guide intervention development, the link between Phase 1 data and Phase 2 becomes rather tenuous, given the findings of Table 7. A stronger rationale and demonstration of the Phase 1-Phase 2 link would be useful.

Page 10, Line 36. The fear arousal appeal needs a citation, and perhaps a brief explanation.

Page 10, Line 1. Why wasn't knowledge of thrombolysis assessed? Given the topic, this seems like a significant exclusion.

Page 11, Line 44. In relation to the focus groups, how was 'judged to be clear' actually defined? Were participants asked about their understanding of the key message, the appropriate response if this situation occurred, etc? The outcome of the focus groups is important, and should therefore be expanded on in the text.
Discussion:

Line 1: Why is SQUIRE guidelines used here, when IM and MRC guidelines are referred to elsewhere earlier in the text? Continuity in guidelines would be useful.

General point: in the Introduction, it is stated that the education strategy will be implemented in primary care. The authors describe a very comprehensive implementation strategy which includes more than just primary care - perhaps rephrase this in the Introduction?

General point: The following citations may be useful as evidence to suggest that the FAST message is limited in its ability to impact on faster response to stroke.


**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.

Yes

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Yes

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