Reviewer’s report

Title: A Novel Design Process for Selection of Attributes for Inclusion in Discrete Choice Experiments: Case Study Exploring Variation in Clinical Decision-Making about Thrombolysis in the Treatment of Acute Ischaemic Stroke

Version: 1 Date: 22 Dec 2017

Reviewer: Hareth Al-Janabi

Reviewer's report:

This paper describes the process of designing a discrete choice experiment to look at the clinical decision of whether to thrombolyse a patient after a stroke.

DCEs are increasingly used in healthcare research and -as the authors describe - the process of designing the task is often rather opaque (although this is improving).

The authors have gone through an admirably thorough process in selecting attributes for their DCE and it is useful to see this. However, the paper fails to properly follow through on 2 of the 3 research aims (see below) and I have a number of questions about the third aim. With some serious restructuring and rewriting the paper could be useful to other DCE researchers. However, at present I feel it neither presents an optimal approach (as this will differ depending on the study context and constraints) nor even very clear guidance as to the methods choices other researchers might use. The latter requires the authors to more clearly communicate how the lessons from their own DCE can be transferred to other contexts.

MAJOR GENERAL ISSUES

1. The first aim seems to largely duplicate that of a recent review (Vass (2017) Med Dec Mak) - not referenced. So it is unclear why a review is needed. Furthermore, the review is insufficiently executed as the authors state e.g. "...this was not intended to be a comprehensive or systematic review". The review findings are also not obviously connected with the second aim of designing a process for developing DCEs. There is some interesting information produced from the review but - given a recent review has been conducted and the review is not comprehensive - it might be better off as part of the general literature/background section at the beginning of the paper.

2. The second aim is to specify a development process for the optimal design of a DCE and presentation of choice sets. If this is a research objective, then the methods for the design process need to be specified i.e there ought to be (i) a method to explain how the five stage process was designed; (ii) and clear rationale for how it is 'optimal' for DCEs. At the
moment the final 5-satge process is described but no evidence is provided as to how it was designed nor that it would be transferable (much less optimal) for other clinical settings.

3. In summary, I don't feel the paper follows through on two of the research aims and would be better specifically focusing on the third research aim of describing the discrete choice experiment design for specific case study and maybe drawing out some general lessons for researchers in designing DCEs in the discussion.

BACKGROUND SECTION

4. The literature review does not clearly explain the various methods that have been used to develop attributes in other studies - e.g. the reader needs to know how DCEs/attributes are typically developed, beyond just saying literature, interviews etc. While some review studies are referred to, we as readers need to know more about the specifics in the background section (and thus it would help if the review for aim 1 was incorporated here, rather than later).

METHODS

5. The paper focuses to a great degree on the selection of attributes. Other issues like the selection of levels and design of the task are not explored in detail. So for example, the paper is not clear on how the final set of levels were determined from the survey responses or whether alternatives for designing the DCE (e.g. pairwise choice sets, BWS etc were considered). While I can clearly see the rationale for an accept reject scenario in this case, this would not be appropriate in other contexts and there is no guidance for the reader as to how to decide this. Either the paper needs to cover issues to do with level selection and design of task in more detail or it needs to be very clear throughout that the focus is on describing a process for selecting attributes.

6. A key issue is going from 22 to 9 attributes. I can see how the ranking process helps with this. And this is a nice idea that others may want to borrow. However, it is unclear how it was determined that an attribute was fixed or variable. If it is fixed across all scenarios (e.g. 6mmol) - how is it a factor that determines clinical decisions?

7. Why 9 interviews? Why telephone interviews? Who are experts in stroke research? Furthermore, stating that coding and analysis of data used framework does not convey information to the reader as to how the coding was done. How were codes generated? Were they combined? I appreciate that there are a number of stages in the research and limited
space, but without more clarity on the application of the methods or justification of choices in this study it is hard to use this as guidance for another study.

8. What is a structured prioritisation exercise? Is it a Delphi survey? Can you explain and reference methods?

9. Figure 1 could do with more clarification on the numbers at each stage and detail on whether they are same or different groups of experts. Eg on page 15 it sounds like a separate expert panel considered factors not raised by the exploratory work or SPE. Is this right?

10. One of the objectives in reducing the factors down was to provide a DCE that could feasibly be delivered to a smallish (150 or so?) sample of clinicians. However, the final set of attributes is large (9) and the design so large it needed to be blocked - does this mean the strategy was not ultimately successful?

11. Stage 5 - if this is part of the methods, more detail is needed e.g. on the composition of the group, nature of discussions etc.

DISCUSSION

12. It would be helpful if this drew out more clearly the transferable lessons from the case study for other DCEs. How can researchers decide what sort of exploratory work to do and how many interviews etc to conduct? How should the SPE be run effectively? How much think aloud is needed and what sort of probing is need afterwards? In general I feel that quite a lot of work has into thinking about a process that works in this specific clinical context and constraints but much more needs to be done to think about transferability. In particular, as mentioned at the beginning few DCE studies will have the financial and time resources to conduct all 5 stages properly for a one-shot DCE so some guidance as to the most important elements (based on the stroke study) would help.

13. Linked to this point it would be helpful if the discussion could more clearly outline the perceived strengths and weaknesses of the approach and areas where further work would be useful.

MINOR ISSUES

1. Suggest 'factors' is replaced by 'attributes' as the latter is the more common term for DCEs
2. Careful proof read needed - e.g. a number of references appear more than once in bibliography

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.

Yes

Are the conclusions drawn adequately supported by the data shown?
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No

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