Author's response to reviews

Title: Barriers and enablers to implementing antenatal magnesium sulphate for fetal neuroprotection guidelines: a study using the Theoretical Domains Framework

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Author's response to reviews: see over
Tuesday, 14 July 2015

The Editor

BMC Pregnancy and Childbirth

To The Editors-in-Chief

Re: MS: 1643132621155253

Title: Barriers and enablers to implementing antenatal magnesium sulphate for fetal neuroprotection guidelines: a study using the Theoretical Domains Framework

Authors: Bain E, Bubner T, Ashwood P, Van Ryswyk E, Simmonds L, Reid S, Middleton P, Crowther CA

Please find below a detailed response to the comments from the editors and referees which we found most helpful.

We thank you for consideration of our manuscript for publication in BMC Pregnancy and Childbirth, and we look forward to your reply.

With best wishes,

Emily Bain

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Reply to reviewers’ comments

Relevant extracts requiring responses have been extracted from the reviewers’ reports and responses made, including changes to text (where changes to text (including additions) have been made to the manuscript, we have used track changes to make the alterations for easy identification within the manuscript).

Editors’ feedback and authors’ responses

We thank the editors for their feedback and valuable suggestions.
• Make it clearer earlier in the manuscript that there were different participants at each of the time points
We have amended the Methods text for clarity.

• Specify whether the theoretical domains framework was pre-specified as the framework for analysis
We have amended the Methods text accordingly.

• Reword the conclusions in the abstract and paper for relevant messages to a wider audience (not just within the context of the WISH project).
We have re-worded the conclusions to broaden the relevance of the key messages.

• Provide further justification for why the findings are only useful to health professionals in other tertiary maternity centres with similar characteristics in Australia and New Zealand? If this is truly the case, why are you aiming to publish in a journal with an international audience?
We have amended this sentence to reflect the broader potential usefulness of our findings – beyond Australia and New Zealand – for health professionals involved in implementing this therapy for very preterm infants.

• Please pay particular attention to the points raised by Kristina Edvardsson in relation to: the validity of comparing knowledge and use from the two time points; presenting qualitative data in quantitative terms.
We have addressed Kristina’s points below.

Reviewer 1’s feedback and authors’ responses (Elizabeth McCarthy)

We thank this reviewer for their positive comments and valuable suggestions.

• Minor essential revisions: ABSTRACT: I strongly advise reducing the word count to 250 to improve readability, especially when in PubMed format which may truncate the abstract at this point.
We have reduced the word count of the Abstract in line with the reviewer’s suggestions for improving readability (now 261 words, which is below the 350 word limit specified in the Instructions for Authors).

• Minor essential revisions: BACKGROUND: Please shorten. As submitted, there are 7 paragraphs compared with the 5 in the WISH protocol from the same author group (BMC Pregnancy Childbirth. 2013; 13: 239.) and 3 from the group’s RCT (BJOG: Volume 121, Issue 5, pages 595–603, April 2014).
Thank you – we have shortened the Background to 4 paragraphs.

• Minor essential revisions: Either BACKGROUND or METHODS: Please add the following information (for example as a box): 14 theoretical domains.
We have added a Table, which is referenced in both the Background and Methods outlining the 14 theoretical domains.

• Minor essential revisions: METHODS (Setting): Please rewrite assuming an international reader knows nothing about Adelaide or South Australia. Instead of “the largest tertiary maternity centre in Adelaide, SA”, I suggest a couple of other indicators which readers as disparately sited as in Oxford, Omaha or Orinoco (Brazil, according to Google) might understand.
We have amended this sentence as suggested, to provide further detail.

• Minor essential revisions: METHODS (Data analysis): Please list the 14 theoretical domains e.g. as a box.
As above, we have added a Table.
• **Minor essential revisions: METHODS:** Please provide a copy of the Interview schedule as a supplementary file.

We have provided the interview schedule as an Additional file.

• **Minor essential revisions: DISCUSSION:** Paragraph 1 reiterates the aim which is a little repetitive. Please omit and replace with one or a few summary sentences about the main findings or the most important findings or the most interesting finding... I leave the choice to the authors about what they consider important or interesting.

Thank you we have revised this paragraph.

• **Discretionary Revisions: OVERALL:** shorten the text and use principles of plain English. I find the Plain English websites helpful.

We have made a number of edits throughout (such as to the Abstract, Background, Methods and Discussion), to shorten the text and improve readability.

• **Discretionary Revisions: BACKGROUND** In general, an original research article is different from a review article or literature review which informs a clinical guideline. The authors should be able to summarise known research and what question their study addresses within about 3 paragraphs, for example
  
  o **PARAGRAPH 1:** Brief comment on the importance to preterm birth in general and of its contribution to cerebral palsy in particular and the availability of national guidelines to reduce cerebral palsy with antenatal magnesium sulphate for certain risk groups.
  
  o **PARAGRAPH 2:** That guidelines only work if they are implemented in practice. Some research is already available on what promotes and what impedes guideline implementation. I suggest that many readers will know about CP and MgSO4 but will not be familiar with the term “Theoretical Domains Framework”. This could usefully be listed as a box of the 14 domains to save the lazier (or busier) clinician researcher from looking up the original article. It also makes your results headings grouping easier to understand.
  
  o **PARAGRAPH 3:** What question(s) your study particularly addresses. The interesting reader can be referred to the NHMRC guideline and indeed, the authors’ other publications, for more detailed background (and it won’t do your citation statistics any harm, either!) I estimate that many readers will be very familiar with this field already.

As above, we have shortened the Background to 4 paragraphs.

• **Discretionary Revisions: METHODS:** shorten word count, use principles of plain English discussed above.

As above, we have addressed these suggestions throughout the manuscript.

• **Discretionary Revisions: RESULTS:** Paragraphs 1 and 2 could be shortened by eliminating information already well-illustrated in figures 1 to 4. Active voice will also shorten these paragraphs e.g. Participants in 2012-3 were more likely than participants in 2011 to say they “routinely” or “sometimes” administered magnesium sulphate to women at risk of preterm birth (see figure 1).

We have shortened these paragraphs (with additional detail now provided in the interview schedule), and have removed some of the raw figures/percentages (where presented in the Figures).

• **Discretionary Revisions: RESULTS:** Omit raw figures and % as in the suggested sentence, above. Alternatively, add some or both numeric data back to the sentence or add to the figure. I am not sure the reader really needs this degree of detail, particularly as the sample size of 21 to 24 means there is some error around any % estimate.

As above, we have tried to reduce the length of these paragraphs, and omit some of the raw figures and %s.
- **Discretionary Revisions:** DISCUSSION: Shorten the text and use principles of plain English, as suggested above.

As above, we have addressed these suggestions throughout the manuscript.

- **Discretionary Revisions:** CONCLUSIONS: shorten the text and use principles of plain English. For example, I have retained the authors’ first sentence and then changed the following which results in about 30 fewer words.
  - Respondent health professionals identified difficulty in predicting preterm birth, which is sometimes precipitous or imminent and often requires complex administrative procedures in a short time, as key barriers to implementing antenatal magnesium sulphate. Regarding enablers to implementation of antenatal magnesium sulphate, respondents commonly suggested education, reminders, audit, feedback and decision-support systems, expanding the range of service areas, pre-prepared syringes, and support from colleagues and influential individuals. Results for this study will guide further implementation strategies with the goal of improving neuroprotection of very preterm infants in our local setting. We encourage research into barriers and enablers in different settings: some may prove common and others may be setting specific. Pregnant women’s views of barriers and enablers to magnesium sulphate for neuroprotection are also important to enhance implementation.

Thank you. The Reviewers’ comments regarding plain English, and shortening text have been extremely useful. We have also taken on board many of these suggestions in the Conclusion.

- **Discretionary Revisions:** TABLE 1: The authors may find some useful tips about table presentation in a video tutorial provided by BMJ

We have not amended Table 1 (although thank the reviewer for the video link), as have followed the BMC Pregnancy and Childbirth ‘Instructions for authors’ which specify no shading or colour, and requests that columns and rows of data be made visibly distinct by ensuring that the borders of each cell display as black lines. We would, however, be happy to edit the format, as considered appropriate, and as requested, by the editors.

**Reviewer 2’s feedback and authors’ responses (Kristina Edvardsson)**

We thank this reviewer for their feedback and valuable suggestions.

- **Major Compulsory Revisions:** It is somewhat unclear if the aim of the study also to compare differences in use and knowledge in 2011 and 2012-2013 (differences between the time periods are presented in the results section and figure 1-4). This needs clarification. The study design also needs to be justified if one of the aims was to compare differences between the two time periods.

We have clarified that this was one of the study aims, with the time periods chosen accordingly (i.e. pre and post introduction of WISH implementation strategies).

- **Major Compulsory Revisions:** What was the total number of health professionals from which the samples were selected at the two time points? What determined the size of the study sample (n)? How many potential participants declined participation? (each time period).

We have addressed these points in the Methods, and at the beginning of the Results.

- **Major Compulsory Revisions:** Some discussion about why doctors and midwives were included in the same sample would be of value in this paper. It seems possible that knowledge and use differs between doctors and midwives. Furthermore, the proportion of doctors (obstetricians and neonatologists) in the sample differed between 2011 and 2012-2013. Thus, is it possible at all to compare knowledge and use in 2011 to 2012-2013, considering this?
We have now removed reference to ‘obstetric’ staff (where doctors and midwives were grouped together). In regards to presentation of results, the three groups have been presented together in the text and Figures regarding self-reported use/knowledge, as there were no apparent differences across groups—we have now mentioned this in the Methods text for clarity. Though proportions of different staff groups differed slightly from 2011 to 2012-13, when professional groups were compared individually, similarly, no apparent differences were observed, and thus the decision was made to present these results in combination.

- **Major Compulsory Revisions:** The set of open-ended questions used during interviews should be presented more clearly, particularly since some of the results are presented quantitatively. Did all interviews include exactly the same set of questions, or could probing questions be different in different interviews?

We have provided the interview schedule, as requested by Referee 1, as an Additional file. We have also provided further detail regarding the process and content of the interviews in the Methods for clarity.

- **Major Compulsory Revisions:** Quantifying qualitative data is problematic, particularly when the data has not been collected in a completely structured manner. The same base question may generate different responses depending on the probing as well as other factors during interviews. How is this accounted for in the presentation of the results (quantified data). Also, five different researchers conducted the interviews. How much variation were there in the way the interviews were performed? It is stated in the discussion (row 566-7) that ‘individual questions were not framed in order to explore each domain of the framework individually’. Please clarify this.

As above, we have now clarified that the questions/answers which have been presented as quantified data (e.g. regarding self-reported use) were more closed-ended – all interviews included the same set of questions. As presented in the interview schedule, questions relating to barriers and enablers were not framed to explore each domain of the framework individually.

- **Major Compulsory Revisions:** Did the authors use an established method for qualitative data analysis? Please clarify and provide references if applicable.

The analysis of barriers and enablers followed a framework approach, which has now been cited in the Methods.

- **Major Compulsory Revisions:** Information about the length of the interviews is lacking.

We have commented on interview length at the beginning of the Results section.

- **Major Compulsory Revisions:** The authors argue that they reached data saturation (row 558). However, the manuscript lacks information that supports this statement, i.e. how, and why the authors thought that data was saturated.

We have addressed this point in the Discussion.

- **Major Compulsory Revisions:** 10) Participants’ statements were coded using the 14 conceptual domains of the Theoretical domains framework. Even though a reference is provided, it would be valuable to have these domains presented in a table or in text. Some clarification about the structure of the results presentation would also be valuable.

As above, we have now included a Table of the domains (referenced in the Background and Methods).

- **Major Compulsory Revisions:** In the beginning of the results ‘Knowledge and use of antenatal magnesium sulphate’ and ‘Benefits and adverse effects of antenatal magnesium sulphate’: These results are presented as they are derived from a structured interview, not a semi-structured interview. Please clarify this. Were some parts of the interviews more structured than others? The process and content of interviews need more detail in the manuscript.
As above, we have now provided the interview schedule as an Additional file, and have clarified that the some questions were closed-ended, and others more open-ended. We have provided further detail providing the process and content of interviews.

- **Major Compulsory Revisions:** The figures should benefit from including ‘n’. We have revised figures to include ‘ns’.

- **Major Compulsory Revisions:** Please check the levels of the heading in the results section. For example, should the heading ‘Barriers and enablers’ (row 222) be on a higher level than the theoretical domains to which the barriers and enablers were related? Thank you, we have italicised the theoretical domains sub-headings in the Results for clarity.

- **Major Compulsory Revisions:** The authors claim that the study shows an increase in self-reported use over time (row 477-9 and abstract). The study design (qualitative) does not allow for such comparisons to be made and this statement is thus questionable. As above, we believe we have now provided clarity in regards to the more closed-ended questions related to use/knowledge (as provided in the interview schedule) which allowed for quantification and narrative comparison.

- **Major Compulsory Revisions:** Limitations of the study need to be addressed and discussed. One limitation is mentioned (row 546), but there are several issues that need attention in this study, particularly in relation to the study methods. We have discussed a number of limitations of the study/study design throughout the Discussion, such as in relation to the pre-specified number of study participants, the restriction of staff interviews to one site and three professional groups, and that we did not use the TDF at the design phase of the interview.