

| <b>Article details: 2018-0209</b>          |   |
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| Title                                      | Facilitators and barriers to adopting a restrictive red blood cell transfusion practice: a population-based cross-sectional survey  |
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| <b>Reviewer 1</b>                          | Kerstin Hogg  |
| Institution                                | Emergency and Thrombosis, McMaster University, Hamilton, Ont.   |
| General comments (author response in bold) | <p>1. The main concern I have with the study is that the authors do not show that there is a variation in practice in an ICU setting, or that there is room for improvement. The two papers cited in the introduction refer to a surgical setting. Without this knowledge, it is impossible to know how to interpret the findings. For example, the findings could refer to the fact that the guidelines have already been appropriately and successfully implemented. Or the findings could suggest that there is a gap between the perception of ICU practice and the reality.</p> <p><b>We have edited the beginning of the first paragraph on page 4 to describe the current evidence-based guidelines and clinical recommendations from Choosing Wisely Canada, as well as cite 5 additional studies (Sadeghi et al., 2017; Corwin et al., 2004; Chohan et al., 2003; Surial et al., 2015; Netzer et al., 2010) that report sub-optimal RBC transfusion practices and variations from guidelines in international ICU settings.</b></p> <p>Method</p> <p>2. The Theoretical domains framework (TDF) has many more domains which were not incorporated into your survey. As a result, your survey is unable to report on the full TDF and focuses mostly on knowledge, social normal and beliefs about the benefits of a restrictive strategy. Information on emotions, memory and behavioural regulation is missing. I suggest giving greater detail on how the domains were chosen, and how you ensure that the questions you asked were representative of the domain you wanted to measure.</p> <p><b>As noted in our response to the Editor's Comment #8, we have provided further explanation of the Theoretical Domains Framework (TDF) and justification for designing our survey questions using a subset of the TDF domains on pages 5-7 of the Methods section (under the Survey Development subheading). As indicated, our review of the literature identified two previous qualitative studies that identified behavioural determinants within 7 domains relevant to RBC transfusion behaviours of intensive care physicians in Canada and the UK (Islam et al., 2012 and Francis et al., 2009). In order to develop an efficient and targeted survey, we sought to leverage this existing body of work and developed our initial questionnaire items within this subset of domains already found to be relevant to intensive care physician transfusion behaviours. Through iterative rounds of review to ensure sufficient and non-redundant representation of items and relevance to the care of the ICU context in Alberta, our research team ultimately included survey questions within 6 domains.</b></p> <p><b>To ensure that final questions were representative of the intended domains, we: 1) used the interview questions from the previous qualitative studies' interview guide (Islam et al., 2012 and Francis et al., 2009) and the elicitation questions to investigate individual TDF domains originally developed by the authors of the TDF (Michie et al., 2005) to help inform our initial</b></p> |

questionnaire item development; and 2) obtained and used detailed feedback provided from the six reviewers who participated in the pilot testing of our survey to adapt the final questions appropriately. These details have also been provided in the Methods section on pages 6-7 (under the Survey Development and Survey Pilot Testing subheadings).

3. Page 6, line 33 'understand potential determinants to physicians practicing a restrictive RBC transfusion strategy'. I think that you were measuring physician opinion about potential behavioural influences rather than determinants.

**We have edited this sentence on page 5 of the Methods section (under the Survey Development subheading) clarify this sentiment.**

#### Results

4. I am not an expert in the TDF, but my understanding is that the results should be presented under the relevant TDF domain title.

**For the main text we chose to present the findings under the facilitators and barriers subheadings for ease of reading. If we categorized the findings in the main text under the relevant TDF domains, it would result in an increased number of subheadings and may be confusing as one of the domains (Knowledge) presents as both a facilitator and barrier.**

**Therefore, to address this comment we have included the relevant TDF domain, and related survey question, within brackets after each of the reported findings throughout the Results section on pages 10-12. For example, in the Results section on page 10 (under the Identified Facilitators subheading), we have edited the second sentence of this paragraph as follows:**

**"Almost all respondents reported being aware of the evidence (87.8% strongly agree; 9.8% agree) and over 90% reported that it was strong and sufficient (Knowledge domain; Q1 and Q2)."**

**The results from the Likert scale response options are also grouped by the relevant TDF domains in the revised Figure 1. In addition, we have edited Table 2 to present the identified themes from the open-ended responses under the relevant TDF domains.**

#### Discussion

5. The discussion would be strengthened by including a review of what is known about transfusion facilitators, barriers and implementation. There must be literature because the methods state that the survey was designed after a systematic review. How do your findings add to the body of literature? How could your findings help in the future?

**We have edited the second and third paragraphs of the Interpretation on pages 13-15 to discuss what is known in the literature and compare our findings to this. We have also edited the Conclusions on page 17 to discuss how our findings could help in the future.**

6. I would reduce the volume of text which reviews your findings.

**We have edited/reduced the text in the second and third paragraphs of the Interpretation on pages 13-15 to address this comment and Comment #5.**

7. Page 11, line 22 Suggest rewording 'perceived optimism of practice' because

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|  | <p>grammatically, this phrase does not refer to physicians believing that all ICU physicians adhere to transfusion guidelines. I think this should be re-phrased. <b>We have rephrased this sentence on page 13 of the Interpretation section (end of first paragraph) to clarify this barrier.</b></p> <p>8. Page 11, line 30 Your survey did not measure transfusion behaviours, rather, it measured ICU physicians' attitudes to using a restrictive transfusion strategy. <b>As noted in the response to the Editor's Comment #17, we have deleted this sentence from page 14 of the Interpretation section.</b></p> <p>9. Page 11, line 31 'We found that key determinants to practicing a restrictive RBC transfusion strategy in 5 out of the 6 TDF domains explored.' Should be edited. <b>We deleted this sentence from page 14 of the Interpretation section. We have also revised Table 2 and categorized the facilitators and barriers with the relevant TDF domains. In doing so, we identified behavioural determinants in additional TDF domains not previously characterized (that is, in addition to the 6 TDF domains we developed survey questions for). These findings have been reflected throughout the Results section and the second and third paragraphs of the Interpretation section on pages 13-15.</b></p> <p>10. Page 12, although I have not seen the text responses from the survey, I wonder whether your survey is unable to conclude that trainees require more education on transfusion practices. For example, if other specialists ask trainees to transfuse at a higher threshold, it may simply be that trainees expect the ICU physician do the same. They may be well aware of the evidence and guidelines. <b>We have edited the discussion concerning this potential barrier on page 14 of the Interpretation section (start of third paragraph) to factor in such considerations.</b></p> <p>Conclusion</p> <p>11. This should be shortened to at most, two focused sentences. <b>We have edited the Conclusions on page 17 to include only two sentences.</b></p> |
| <b>Reviewer 2</b>                          | Jennifer Murray   |
| Institution                                |   |
| General comments (author response in bold) | <p>1. First, the Choosing Wisely Canada campaign (<a href="https://choosingwiselycanada.org/transfusion-medicine/">https://choosingwiselycanada.org/transfusion-medicine/</a>) on transfusion is not referenced. In order to better place this manuscript in the context of the literature, the authors would be wise to mention this campaign as a part of their introduction or discussion section. The authors could also comment on whether Choosing Wisely Canada has conducted an analysis of facilitators and barriers to uptake of safer transfusion practices.</p> <p><b>Thank you for this comment. We have added a reference for the Choosing Wisely Canada recommendation that refers to the use of the restrictive hemoglobin threshold for ICU patients on page 4 of the Introduction. From our search of the literature, we did not identify any evidence to indicate that the Choosing Wisely Canada campaign itself has completed any analysis of facilitators and/or barriers to help optimize RBC transfusion practices. Therefore, in our manuscript we have cited the only two studies that we have identified that explored potential facilitators and/or barriers to changing RBC transfusion practices in the ICU (Francis et al., 2009 and Islam</b></p>   |

et al., 2012).

2. Second, the authors could clarify their focus on RBC transfusions but not on restrictive practices for blood products (e.g., fresh frozen plasma, platelet).

**We have clarified that the focus is on RBC transfusions and not other blood products on page 5 of the Methods section (under the Survey Development subheading).**

3. Finally, more detail on the quantitative content analysis is advised, including a reference (page 7, line 49).

**As noted in the response to the Editor's Comment #7, we have provided a more detailed description of the conventional qualitative content analysis methodology applied to the open-ended response data on page 9 of the Methods section. We have also cited a reference (Hsieh et al., 2005) for this method.**