Author’s response to reviews

Title: Structured on-the-job training to improve retention of newborn resuscitation skills: a national cohort Helping Babies Breathe study in Tanzania

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Author’s response to reviews:

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BMC Pediatrics
Revision 2: Reviewer Comments & Author Responses
Dear Sezin Uzal and entire Reviewer Team,

On behalf of a team of co-authors from Tanzania and the United States, I am pleased to submit the revisions to the manuscript “Structured on-the-job training to improve retention of newborn resuscitation skills: a national cohort Helping Babies Breathe study in Tanzania”. We would like to thank the editor and reviewers for the comments which were very useful. We have listed the reviewer comments and author responses below. We look forward to a positive response and any further feedback is also welcome.

Comment 1:

Table 2: Must be revised as below;
!!! please include the evaluation of the 4-6 weeks later scores between the initial training and modified training groups.

1. row: group names
   Initial training group       Modified training group

(These 2 p values are placed in two separate columns.

2. row: Immediate 4-6 weeks after p-value Immediate 4-6 weeks after P — value

   P*      P**

   ---row names you use ---
   ---row names you use ---
   ---row names you use ---
   ---row names you use ---

   Initial training group  Modified training group
   Immediate 4-6 weeks after p-value Immediate 4-6 weeks after P* P**

   ---row names you use ---
   ---row names you use ---
   ---row names you use ---
   ---row names you use ---

P*: Comparison of immediately post-training scores among the initial training and modified training groups
P**: Comparison of 4-6 weeks after training scores among the initial training and modified training groups

Comment 1 Author response:
A) Thank you for this suggestion to move the ‘Initial training group 4-6 week after training’ column and it’s associated p-value column to before the ‘modified training group’ columns. This makes good sense. We have made this change in the updated Table 2. B) We also appreciate the suggestion for clarifying Rows 1 and 2 (i.e., our column headings) and the p-values. We have now updated Rows 1 and 2 accordingly. We have also used asterices, as recommended, to define the p-values at the bottom of the table. In the suggestions above, it wasn’t perfectly clear to us how the editorial staff preferred us to list our 3 columns of p-values (rather than having just 2 p-value columns), however, we think the revised table reflects these recommendations. Specifically, we put each group’s p-values (i.e., the initial training group’s p-value and the modified training group’s p-value) under their respective group heading. We then put the final column of p-values – the comparison between the two groups – as the last column of the table. We think these suggested revisions have helped clarify the table. However, if the editorial staff suggests additional/different changes, we are happy to defer to any edits they would like.

Comment 2
Beena Kamath-Rayne, MD, MPH (Reviewer 1):
Properly performed neonatal resuscitation is a key intervention that can save newborn lives. Therefore, understanding how birth attendants acquire and retain resuscitation skills so that these life-saving skills can be performed in the appropriate moments is a topic of utmost importance and worthy of study. It is well known that after an initial training, learners lose their skills without ongoing practice, and this was an important lesson learned in the first 5 years after the first edition of HBB was released in 2009-2010. For that reason, the second edition of Helping Babies Breathe (HBB), released in 2016, specifically recommends that a system of ongoing practice should be put into place after an initial training, although no specific recommendations on the frequency of practice are able to be given due to a lack of consensus in the literature. In the initial era after HBB implementation and dissemination, the authors noted that resuscitation skills performed in simulation declined when assessed 4-6 weeks after an initial training and onsite inspection revealed that there was limited self-initiated practice, verbal rather than hands-on facilitation of the HBB content, and no formal ongoing practice. For the reason, the on the job (OJT) intervention was developed to facilitate self-learning and continuous peer-to-peer learning. This OJT provided a more structured format where learners would review 4 key concepts after an initial training, so that these concepts could be reinforced.

Comment 2 Author response:
Thank you for this comment. It summarizes the manuscript very well.

Because HBB 2nd edition does not make recommendations on the exact structure for a system of ongoing practice, having more detailed on exactly what was recommended in OJT would be important so that other sites could replicate this intervention. There have been studies on other methods of ongoing practice, such as low-dose, high-frequency practice (Mduma et al., 2015; KC et al., 2017; Rule et al., 2017; Tabangin et al., 2018) which provide some detail on other methods of ongoing practice, including a bag-mask ventilation checklist, oversight with a master trainer, and peer-to-peer learning. Certain types of ongoing learning may suit different types of workers better than others.

Comment 3
The manuscript also illustrates an even more important point—that a plan for ongoing practice needs to be put into place before the initial workshop is over—and that champions on the ground, in conjunction with supportive supervision from their facilitators and local health leaders—need to continue the efforts
to integrate HBB into the local health care system before the enthusiasm, momentum and energy from the initial workshop wear off. The time period directly after the workshop is one in which this ongoing support is critical, before the newly acquired skills disappear. Future studies should consider following learners for longer than 4-6 weeks to not only learn about mastery of skills, but then ongoing retention.

Comment 3 Author response: 
Thank you for this comment. The Conclusions section has been updated to emphasize the need for future research on retention longer than 4-6 weeks after training.

Comment 4
I absolutely feel it is essential that they properly cite the 2nd edition of Helping Babies Breathe.

Comment 4 Author response
Thank you for this comment. We have included the updated reference in the Methods section.

Comment 5
I also am curious at the oversight of this recent paper that specifically discusses drop off in skill retention.

Comment 5 Author response
Thank you for this comment. We have incorporated the reference into the Discussion section.

Comment 6
Could the authors explain why they felt the need to adapt and validate a different version of the already existing OSCE?

Comment 6 Author response (Brett):
Thank you for the question. We have updated our Methods section to now address this. A) In the third paragraph of the Methods, we have clarified that the OSCE tool used in this study was previously validated (i.e., not validated as a part of this current study), as described in the provided Reference 14. B) We have also updated this section to concisely summarize the reasoning for using this single-scenario OSCE instead of the AAP’s traditional two separate OSCEs. (Additional reasoning for the single-scenario OSCE is included in the original study, Reference 14.) We have added the following: “In place of the AAP’s two separate HBB OSCEs A and B, the MoH chose to utilize this single-scenario OSCE to streamline implementation and longitudinal evaluation of this at-scale HBB program in a resource-limited setting.” We then removed some of the redundancy that had thereby been created in the ninth paragraph of the Methods. C) Lastly, in the sixth paragraph of the Methods, where we discuss the two patient scenarios used in the on-the-job training, we have clarified the wording by using “two patient scenarios” rather than “two OSCE scenarios” – so as not to confuse readers with our OSCE evaluation tool.

Comment 7
I am still unclear on what is included in OJT. Will the authors provide the tool as supplemental material?
Comment 7 author response
Thanks for this suggestion. We agree with this suggestion that attaching a copy of OJT tool as supplemental materials will enhance understanding of the concept by readers. Accordingly, we have included the OJT guide used during implementation (S1), and referenced it in the Methods section. Since the final OJT tool was in Kiswahili, the authors have included translation text within the tool to facilitate understanding by non-Swahili speakers.

Comment 8
What was the adherence to OJT? Do the authors have data they can provide on the feasibility of implementing this?

Comment 8 author response
Thanks for the question. The design of the OJT initiative included monitoring for adherence through documentation of all facility-based OJT plans and activities in the designated register placed in the labor ward. OJT Champions (in most cases in-charge of the labor ward) coordinated implementation and recording of OJT activities. These registers were then being reviewed together with HBB supervisors/mentors when visiting a facility on regular basis. We have updated the Methods section to make this clear.

Despite that the study did not collect systematic data for feasibility, there were no documented issues of programmatic concerns during implementation of OJT initiative. Nevertheless, this would make an interesting area for further research. Authors have updated the Conclusion section to reflect this.

Comment 9
Another thing to consider mentioning in the limitations--that ongoing practice beyond 4-6 weeks may increase skill retention (i.e. reverse the skill drop) so studies which follow learners for a longer period of time to really understand the timeline of mastery of skills in the first place and then ongoing skills retention would be important for the future.

Comment 9 authors response
Thank you for the comment. We have included the need for future study on mastery of skills and retention beyond 4-6 weeks in the Conclusion section.

Comment 10:
Johan Wrammert (Reviewer 2): I believe my comments from the first review has been adressed properly. After reviewing the manuscript once more I have a comment about suctioning that I think needs to be adressed in the discussion.

Is a "retention of skills" in suctioning really relevant or could it even be a weakness if the method described (OJT) support retention of suctioning skills?

Several previous studies has demonstrated a reduction of suctioning after HBB training (e.g KC et al, 2017) as attendants move more quickly to ventilation which is the most important step in the protocol (Niermeyer, 2016). This is especially true when using the 2nd edition where suctioning is proposed only if there is an obstruction of the airway after re-positioning to clear the airway to align with latest evidence. Suction is never indicated unless there is a clear obstruction of the airway (ILCOR 2015), not
even in meconium stained liquor as stated in the 1st HBB edition. As this change was one of the most
important differences between the 1st and 2nd edition I think it would be proper to discuss the results
regarding suctioning in the manuscript, especially since the authors used the 1st edition in the training.

Comment 10 Author Response

We agree with the Reviewer that recommendations for bulb suctioning have evolved since this study
was implemented and that suctioning is only necessary when obstruction is suspected. We agree with
the Reviewer that this subsequent change in the HBB curriculum is a very worthwhile clarification to
make for readers. Therefore, at first mention of bulb suctioning in our article (in the ninth paragraph of
the Methods), we have included the following: “Of important note, this study was conducted prior to
the second edition of the HBB training program, in which bulb suctioning is now recommended only in
the event of suspected airway obstruction” and we have included a reference to the second edition of
HBB.

Kind regards,

Mary Drake