Reviewer’s report

Title: A health systems strengthening intervention to improve quality of care for sick and small newborn infants: results from an evaluation in district hospitals in KwaZulu-Natal, South Africa.

Version: 2 Date: 19 Nov 2018

Reviewer: Hannah Leslie

Reviewer's report:

Dear authors,

Thank you for your efforts in expanding and revising your manuscript, "A health systems strengthening intervention to improve quality of care for sick and small newborn infants: results from an evaluation in district hospitals in KwaZulu-Natal, South Africa." I appreciated the thoughtful and thorough responses to my suggestions and questions, including additional analyses, helpful details in tables and figures, and expanded methods and discussion. I note a few suggestions below for final consideration; most are minor, but I would suggest some additional clarification around to what extent the selected measures speak to health system strengthening.

Best,

Hannah Leslie

Tables and Figures

- The additional detail in the tables is very helpful. I would suggest removing "N=" in describing the number of items, as this may invite confusion since the numbers are similar to the number of facilities in the sample. Instead if Tables 1 - 3 consistently report the number of items in the total score in the last row, as already done in some cases, this would provide sufficient detail for readers.

- Is 29 correct for the number of items in the resuscitation score in Table 3? I see 25 items listed. The text indicates there are 89 total items, though I see 88 (34, 29, 25). Please check and confirm the counts throughout.

- Please report sample size for Figure 3 in text and / or Figure description
Score calculation

- The sentences "Scores were combined from the three domains to calculate an overall score for each hospital. No weighting of scores was undertaken, all variables contributed equally to the final score." Are still subject to misinterpretation - perhaps simply stating 'Variables were combined to calculate an overall score for each hospital' or similar for the first sentence?

Discussion

- The sentence on improvement in knowledge (lines 290 - 292) implicitly assumes similar knowledge at baseline; the results as shown demonstrate that those trained had more knowledge than those not trained, as stated later in lines 385 - 389. Suggest making this explicit or rewording for consistency.

- The revised paragraph on 360 - 374 now seems to address two distinct points - the difficulty in measuring the adherence to guidelines (presumably including timely and correct application of the actions noted in record reviews) and the challenges in using patient outcomes such as length of stay and mortality to evaluate quality of care. These are both important considerations, but not the same, as the substantial literature on the use of process measures vs. outcome measures attests to.[1-3] Consider making the link here explicit: ideally one would measure the timeliness and correctness of care processes as actually applied; given difficulty doing this, outcomes likely to reflect high quality care processes were considered. Decided against using outcomes due to challenges in risk selection and case mix across a diverse set of hospitals ....

- It is essential to situate the measures used here appropriately within the domains of health system quality in order to properly interpret what the results can and can not say. Based on the measures reported and assuming no alternative explanations for improvement, the intervention demonstrated important improvement in inputs to care, including provider knowledge, and in adherence to clinical guidelines as documented in patient records. As noted in the discussion, these measures may not attest to the actual performance of care in terms of consistent, correct, and timely performance of tasks required to improve newborn health. It is further not known if differences in clinical competence would be sufficient to improve newborn outcomes, from length of stay to survival, and the only available data on outcomes not surprisingly shows no difference yet. I would suggest a more nuanced consideration of what the selected measures do speak to as well as the (valid) reasons for selecting these over the two alternatives suggested - more intensive process measures and outcome measures. In keeping with this, please review the statements on improvements in the health system and health system strengthening (e.g., lines 293-296) for consideration as
to what elements can be described as improved and what additional evidence would be necessary to attest to the meaningfulness of the observed improvements in terms of ongoing care processes and newborn outcomes.

- Related to the prior points, where the discussion notes the complexity of quality measurement (lines 347 - 359), it focuses on weighting of indicators. This conclusion is also included in the abstract. While it's a valid methodological question, issues about how indicators are likely to relate to the production of better health are more central to the interpretation of this work. In particular, I would revisit the abstract conclusion and consider emphasizing other outstanding questions that require further assessment, like whether the changes documented are sufficient to affect newborn health outcomes.


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.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

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Acceptable

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