Reviewer’s report

Title: Factors associated with health care provider knowledge on abortion care in Ethiopia, a further analysis on emergency obstetric and newborn care assessment 2016 data

Version: 1 Date: 19 Aug 2019

Reviewer: Sarah Rominski

Reviewer's report:

I laud the authors on their revisions. This paper is much improved from an original draft. However, the manuscript is not yet ready for publication.

My main two concerns are about the introduction and the discussion, both of which are too long, repetitive, and lacking in organization and flow. I would suggest the following for the background:

Paragraph 1: Worldwide stats (start with 210 million pregnancies, 80 million unintended. 42 million of those result in abortion, 20 million of which are unsafe. Definition of unsafe abortion. This leads to x deaths, 7.9% of the worldwide deaths)

Paragraph 2: Africa stats (5.5 million unsafe abortions annually, 36,000 deaths)

Paragraph 3: Ethiopia stats

Paragraph 4: Steps taken in Ethiopia to address the high level of maternal mortality and morbidity associated with unsafe abortion

Paragraph 5: Barriers identified to address unsafe abortion

Paragraph 6: This study

For the discussion, I suggest this outline:

Paragraph 1: Summarize findings

Paragraph 2: compare with existing literature

Paragraph 3: Limitations/strengths

Paragraph 4: Conclusion (which should not, as it currently does, contain raw results)
Some smaller comments: be sure to explain an acronym before using it (MVA is presented without saying it's short for manual vacuum aspiration).

There are many references missing (for example, on page 1: "In Ethiopia, although maternal mortality has declined during the past decades, women still die unnecessarily from abortion complications." This needs a reference, and a number, and, "Comprehensive abortion care is critically important in countries like Ethiopia where the estimated number of pregnancies that end in abortion is about half a million annually." needs a reference. Both of these statements need references, "Historically, abortion-related studies conducted in Ethiopia have focused mainly on met need for family planning, reasons for abortion, the estimation of how many are performed, the distribution of abortion services and patient satisfaction. While several studies have examined comprehensive abortion care, they tend to be small studies.) These are only a few examples. The authors need to ensure all statements are referenced.

This sentence is confusing: "Abortion is generally not a complex procedure, and obstetricians or surgeons are not required to provide safe and effective comprehensive abortion care." While I think it means that it is not necessary to have an ObGyn or surgeon perform an abortion to make sure it is safe, as currently written, it is confusing (when I first read it, I thought the authors were saying that ObGyns and surgeons did not need to provide safe abortions).

Who determined that the survey was an appropriate way to measure knowledge? Who decided the number of correct answers to each question? Also, it is stated in the methods that D&C was a correct answer, but in the discussion, it is stated that WHO says either MVA or medication abortion are the appropriate and safe ways to perform an abortion. If D&C is not WHO approved, why was it considered a correct answer?

How were the differences between cadres determined? It is never stated which statistical test was used to determine bivariate differences.

How was a 50% score determined to be "high" knowledge? I see that there is a reference to an OSCE, but it is not stated why the cut-off was set at 50%.

There is repetition in the results section; the questions are repeated from the methods section.
It is not clear what the % in the results section are saying. Is it that 51% of the providers were able to state all 5 complications, for example, or that, on average, providers could name 51% of the complication? This holds for all of the presentation of results.

Why aren't the odds ratios for midwives and nurses presented?

The whole discussion about all levels of providers being able to safely provide abortion services seems to be undercut by the findings of the lack of knowledge among non-physicians. While this is eventually acknowledged, it is not explained, nor was I convinced that these findings support "lower" cadres being able to provide abortion services. Is knowledge associated with poorer outcomes? If so, these findings are troubling.

The discussion section is not a good place for raw results. I recommend removing the paragraph which states the proportion of providers who successfully answered the questions.

This paper is getting closer to being able to be published, but it is still in need of some work.

**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.

Unable to assess

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

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