Author’s response to reviews

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

Authors:

Tefera Tesema (tefetes@gmail.com)
Theodros Zemedu (tedi.getachew@yahoo.com)
Girum Zeleke (girumt2000@yahoo.com)
Misrak Beyene (misrakg81@gmail.com)
Atkure Deghebo (atid1999@yahoo.com)
Geremew Eba (geremew2013@gmail.com)
Habtamu Wubie (habtamutekli2@yahoo.com)
Sheleme Chibssa (mhexpert14.mh@gmail.com)
Aster Woldkiros (mhexpert1.mh@gmail.com)
Zenebe Tilaye (zenebe.akale@moh.gov.et)
Kassahun Bedasso (KMormu@packard.org)
Abebe Belayneh (Abebe1277belay@gmail.com)

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POINT BY POINT RESPONSE for “Factors associated with health care provider knowledge on abortion care in Ethiopia, a further analysis on emergency obstetric and newborn care assessment 2016 data” manuscript

Response for reviewer 1 (Sarah Rominski):

1. In the abstract:” Associated with lower knowledge levels were...being male…”
Thank you for your thorough review. Associated with lower knowledge levels were...being male was totally wrong. It should be female associated with lower knowledge score. As per your valuable comments, it was corrected. You can see the change on page 2 line 51 and 53. The conclusion was right based on the finding. Hence, the conclusion sentence was left as it was.

2. Based on a multivariate model, independent predictors of knowledge were: providers’ professional qualifications, sex, training and practice of manual vacuum aspiration (MVA) and and, "Associated with lower knowledge levels..." in the results section of the abstract are very repetitive.

This is the right comment. Hence, we have rewritten it into as “Associated with lower knowledge levels based on multivariate model were the professional cadres of midwives and nurses (compared with health officers), being female, and absence of training or practice of MVA. We have rewritten and removed the repetitive sentences. You can see the changes made on page 2, lines 52 to 53.

3. Introduction: "The pregnancy termination reform" is mentioned. What is this? This needs to be described.

Thank you for again for your valuable comments. We missed the description about the revised abortion law. Now the description on pregnancy termination reform included. You may see about this on page 3 and lines 81 to 88. Also the references required for these information were cited (references 8 and 9)

4. Results: It is stated on line 182 that knowledge score at 5% significance level will be considered significant. However, on line 184, an 80% CI is referenced. Which was used?

To identify the potential factors we used bivariate logistic regression using 80% confidence interval first. But on multivariate logistic regression, we used 5% level of significant. The two analyses are totally distinct. See the description on page 6-7 from line 144 to 145 for bivariate and 146 to 148 for multivariate logistic regression.

5. Were regions entered into the regression as dummy variables? This needs to be described in the methods section.
Yes, region, Provider qualifications, provider’s sex, trained to perform MVA, availability of internet and Performed manual vacuum aspiration (MVA) in the last 3 months were entered as dummy variables and all are statistically significant for 5% level of precision. Your comment is well taken and addressed in the methods section as per your suggestion. You can see it on page 6, line 123 to 125.

6. Is there collinearity between sex and cadre? I am curious what the gender breakdown is between midwives and health officers, for example. I would not be surprised if the difference in sex is actually a difference in cadre:

Thank you for raising critical point on collinearity between sex and professional qualification. As you know that both sex and qualification are categorical variables, it is not possible to test collinearity. For regression to test collinearity, both variable should be numerical. To investigate knowledge of cadres, it is good to see the gender difference impact on the outcome. We have run Pearson chi2 (Pearson x2) test between the two variables and got that Pearson chi2=277, pr <0.001, which shows that there is association between the two variables. For example, the number of female midwives are 2,205 and male midwives are 988 who involved in the study.

7. Discussion: It is not clear to me why the authors bring up attitudes and beliefs, as they have no data to speak to this. Also, attitudes and beliefs towards abortion can be assess quantitatively (the authors write, "we did not have qualitative information to explore these aspects."). There are many validated scales to assess attitudes towards abortion for providers that could have been used. This information belongs in the limitations section.

Your comment is truly accepted. We took out the attitudes and beliefs from discussion section. In this particular study, we did not have qualitative information to explore these aspects. We have already put this as one of the limitation of the study. You can see it on page 11, lines 245 to 247.

8. Conclusion: This section is currently very long, and repetitive. It needs to be much shorter, and not just reiterate what has already been said multiple times in the results and discussion sections.

Yes, there are repetitive sentences in the manuscript. We took out the following from the paper: “The study finding showed, less than half of nurses identified shock as immediate complication of unsafe abortion; and less than 3 in 10 midwives and nurses, and 4 in 10 health officers provided a response of Genital injuries as an immediate complications of unsafe abortion” from lines 253 to 255 in the previous version;
“By statistically controlling for multiple factors, the factors that demonstrated an independent effect on knowledge were the following: both nurses and midwives scored significantly lower than health officers; female providers were less knowledgeable than their counterparts; providers who had been trained to provide MVA and those who had performed MVA in the last 3 months were more knowledgeable than those without training or who had not been trained; providers who worked in facilities with access to the internet were more knowledgeable as were providers working in Somali, Benishangul-Gumuz and Addis Ababa compared to providers in Tigray” on page 11 lines 254-261 in the previous version.

”Providers working in Gambella, on the other hand, were less knowledgeable.” From lines 261 to 262 on page 11 in the previous version.

In last revised version that we have submitted, the above three paragraphs were excluded.

9. Overall, there are many grammatical errors, especially in the newly added (highlighted) sentences. A full copy edit will be required.

We gave the last revised manuscript for Dr. Della Berhanu, who is fluent in English for editorial service. She revised the language and grammatical errors.