Author’s response to reviews

Title: Assessing the impact of an educational intervention program on sexual abstinence based on the Health Belief Model amongst adolescent girls in Northern Ghana. A Cluster Randomized Trial.

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Dear editor,

Please, find herein point-by-point responses to the critique by the reviewers of our manuscript entitled “Assessing the impact of an educational intervention program on sexual abstinence based on the Health Belief Model amongst adolescent girls in Northern Ghana. A Cluster Randomized Trial.”.

Our responses are organised and presented here, addressing each reviewer’s comments. Reviewer #1 comments are addressed before reviewer #2 then reviewer #3. Comments of the reviewers are numbered and authors’ responses are dubbed “response”.

Reviewer #1:

1. The title needs to be clearer. Rather than assess an educational intervention program on sexual abstinence…. I would suggest assessing the impact of an educational intervention program on sexual abstinence….

Response: the suggestion is accepted and effected
2. Reading through the paper shows that this intervention was targeted at girls and not boys. This should be reflected in the title

Response: we indicated in the title that the intervention was conducted on only girls.

3. The abstract though succinct is not detailed enough. The methods section needs more information on who delivered the additional intervention (CSE); what are the main components of the additional intervention and HBM.

Response: We have included the main components of the intervention in the methods section of the abstract.

4. If sexual abstinence was the primary outcome, it would mean that there are secondary outcomes which would need to be reported on in a concise manner in the abstract.

Response: sexual abstinence was measured in the short term (three months) and that is what is reported. We did not get enough data on use of contraceptives in both groups. Secondary outcome was pregnancy prevention but it was not measured in the short term. Therefore, we have revised the sentence to “sexual abstinence was the outcome variable”

5. For a topic such as this, it would be important to disaggregate the results by age and sex and report any significant differences.

Response: we conducted the study on only females that is why we couldn’t report differences between sexes. Indeed, it is one of the limitations of the study.

6. Check for consistency of tenses in the abstract, for example line 37 - correct to ….sexual abstinence was the primary outcome….. rather than outcomes

Response: we have corrected this. Thank you.

7. The introduction still reads quite rigid and an aggregation of statistics. There lacks a narrative pattern to the introduction and there needs to be more flow and fluidity as the authors transit from one statistic to another.

Response: we have made some revision to the introduction section as suggested.
8. Since the primary outcome is on sexual abstinence, it would be useful to have some more review of the literature on abstinence programs. Keep in mind for instance that abstinence only programs have been shown to be ineffective, stigmatizing and unethical. Other counter arguments to this needs to be presented in a paper of this nature.

Response: this is a valuable suggestion and it has been incorporated in the introduction and discussion section of the manuscript. It is worth noting that we conducted a comprehensive sex education program and not abstinence only education. However, because we measured the outcome variable after three months of the intervention for MSc graduation, we didn’t get data on contraceptive use. We hope to measure abstinence, contraceptive use and pregnancy prevention at 12 and 24 months post intervention.

9. This study targeted adolescent girls only. Please explain why this is the case and the rationale for excluding boys.

Response: the burden of adolescent pregnancy at high school is on adolescent girls with its immediate effect being withdrawal from school, at least for the period of the pregnancy and childbirth in this study setting. The pregnancy may serve as the end of the adolescent’s formal education. However, most adolescent males continue their high school education even if they impregnate someone. Therefore, the rationale for targeting adolescent girls in this study was to empower them to either abstain, use contraceptives or insist that their partners use contraceptives. Self-efficacy was emphasized in all lessons.

10. Cluster-randomized controlled trials are especially prone to selection bias. Provide more details on how this was mitigated and if not, how this is acknowledged as a limitation.

A multi-stage sampling method was used. six (6) out of 12 mixed SHS were randomly sampled. We grouped the six schools into two clusters based on their locations. The two clusters were randomly allocated as an intervention and control group respectively. In each school, one class was selected by simple random sampling from each grade (SHS are in three grades) in both intervention and control groups. All adolescent participants in the class were considered a cluster and they were included in the study.

Although we used probability-sampling method in this study, we would also acknowledge selection bias as a limitation.
11. There needs to be more distinction between the results sections and the discussion section. As is, the results section only contains the respondent characteristics rather than any major results of the study.

Response: the results section is separated from the discussion section. However, the tables were not presented in the main work. We have now brought the tables into the main work in the revised manuscript.

12. Advise to move some of the content of the results as depicted in the discussion section in to the results section.

Response: the advice was taken and effected in the revised manuscript

13. To make the results section clearer, report by primary and secondary outcomes

Response: As stated in critique number four, we measured only abstinence in the short term. Secondary outcome was not measured.

14. The discussion section needs a lot of work. As is, it makes little use of the vast literature on interventions to reduce adolescent pregnancy with different risks and benefits.

Response: we have explore more literature on interventions to reduced adolescent pregnancy.

15. This study focused on sexual abstinence as its primary outcome. It is unclear if this outcome is intended to be promoted as a standalone intervention or in combination with other interventions. This is critical and needs to be made clear.

Response: we conducted comprehensive sex education, emphasizing sexual abstinence or contraceptive use to prevent pregnancy. However, we measured sexual abstinence after three months of the intervention, which is what we are reporting. We intend to measure abstinence, contraceptive use and pregnancy prevention at 12 and 24 months post intervention.

16. Line 58 of the discussion section could be deemed erroneous. I will rephrase that the ultimate goal should be a combination of all outcomes to not only abstain but to be provided with the needed information should abstinence fail as it so often does.
Response: the said sentence has been rephrased.

17. The import and significance of the main finding on sexual abstinence, how they differ or agree with similar studies in similar settings could have been more robustly debated.

Response: unfortunately, after exploring literature, I did not find similar interventional studies in the study setting. I indicated in the introduction of the manuscript that most studies conducted in the study setting explores factors that contribute to adolescent pregnancy but not testing interventions.

18. The limitations of this study need to be better discussed. Social desirability bias is a severe limitation of a having a questionnaire-based approach for an outcome that could be considered socially desirable. Limitations in the methodology also needs a better mention. Cluster randomized trails are known for selection bias issues which needs to be articulated.

Response: these limitations are duly acknowledge in the revised manuscript.

19. Another important limitation of cluster randomized designs which would apply to this study is the issue of interdependence when comparing differences in outcomes. For instance, participants from a school are more likely to be similar (in terms of outcomes) compared to other schools which could affect the results.

Response: this limitation is duly acknowledge in the revised manuscript.

20. It must be highlighted that abstinence was measured in the short term (after only 3 months), long term abstinence is a different topic and should be highlighted.

Response: This is highlighted throughout the manuscript

21. This section needs to be better developed. There needs to be a better summary of concluding statements that link the stated objectives to the results and discussion sections.

Response: the conclusion has been revised in the manuscript.
22. Reviewer #2: A good study in the Field of interest. I recommend that the study method be reviewed taking into cognizance/linking the final outcome/result with the intervention introduced to the study group (Intervention group). Since there were significant changes both among the Control and Study Groups and that school is not the only source for CSE (i.e other sources include communities, home, radio, peer clubs, etc), the study needs to established whether the result achieved among the study group was as a result of the intervention (exposure/introduction to CSE in the school).

Response: In both the intervention and the control groups apart from their normal school classes, there was no other intervention program on adolescent pregnancy prevention. After conducting a multivariate analysis, we think that the educational intervention program has an impact on sexual abstinence.