Reviewer’s report

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.

Version: 0 Date: 27 Jan 2019

Reviewer: Ameyan Wole

Reviewer's report:

Dear Authors,

I have been asked to review your manuscript titled 'Assessing an educational intervention program on sexual abstinence based on the Health Belief Model amongst adolescent girls in Northern Ghana. A Cluster Randomized Trial'.

This was a cluster randomized control trial that sought to assess an educational intervention program on sexual abstinence based on the Health Belief Model (HBM) among adolescent girls in Northern Ghana. The authors found that educational intervention, which was guided by HBM, significantly improved the knowledge and sexual abstinence of adolescent among the intervention group and advocate for the provision of comprehensive sex education guided by behavioural theories to adolescents at Senior High Schools in Ghana. I have the following comments on the manuscript:

Writing style

The general writing style is simple and clear. The authors succeeded in articulating their views in an easy to understand manner.

Title

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….

Reading through the paper shows that this intervention was targeted at girls and not boys. This should be reflected in the title

Abstract
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. 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. For a topic such as this, it would be important to disaggregate the results by age and sex and report any significant differences. Check for consistency of tenses in the abstract, for example line 37 - correct to ….sexual abstinence was the primary outcome….. rather than outcomes

Introduction

* 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.

* 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

Methods

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

* 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

Results

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

* To make the results section clearer, report by primary and secondary outcomes
Discussion

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.

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. 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.

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.

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 randomised trails are known for selection bias issues which needs to be articulated.

Another important limitation of cluster randomised 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.

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.

Conclusions

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.

Level of interest
Please indicate how interesting you found the manuscript:

An article of importance in its field

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published
**Declaration of competing interests**

Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license ([http://creativecommons.org/licenses/by/4.0/](http://creativecommons.org/licenses/by/4.0/)). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal