Reviewer's report

Title: Improving post-partum family planning services provided by female community health volunteers in Nepal: A mixed methods study

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Reviewer: Blair Darney

Reviewer's report:

Overall comments to author

This is an interesting and useful study that triangulates data from Female Community Health Volunteers (FCHVs) and women delivering and uses quantitative pre/post design and focus groups. I think this paper provides interesting insight into community volunteers as health educators in Nepal. The intervention to expand PPFP knowledge and education is important and admirable.

I encourage the authors to do more analysis and synthesis with their qualitative data. The results list a very long list of themes. Perhaps present all the themes in the Table then highlight the most salient ones? The analysis and synthesis feels underdeveloped.

The analysis section of Methods needs to be substantially revised and expanded to fully describe the analysis. See below for comments.

A lot of space is devoted to the Introduction and not a lot to the methods - the different sources of data, the timing of data collection, analysis. It is hard for a reader to understand the study.

Authors need to emphasize the scope of the study better - conclusions to scale up seem to go beyond the data. Reference to the fact that this is an initial exploratory step in looking at FCHVs and their role in the community should be made.

Title: Please shorten the title

Abstract

Line 56: clarify these are multivariable results

If FCHVs counseled 83% of pregnant women, how come only 18% of women report they were counseled? I found this result confusing in the manuscript and the discrepancy is not addressed in the discussion. How to interpret this?

Line 38-41: "Despite the importance of Female Community Health Volunteers (FCHVs) in improving community health in Nepal, their knowledge of PPFP and role in improving the
community-based services on PPFP methods remains unclear especially when there is an increase in institutional deliveries."

Would reword as "Female Community Health Volunteers (FCHVs) have improved XX community health needs in Nepal. However, their knowledge of PPFP and impact on community based services related to PPFP remains unclear. The need for strong PPFP services is critical, especially when institutional delivery rates have increased."

Line 45-46: Would reword as "The intervention involved training FCHVs on PPFP methods."

Line 46-47: Would reword as: "We collected quantitative data via a survey of FCHVs, assessing their knowledge before and after the intervention. We conducted six…"

Line 52: " for quantitative results and content analysis for qualitative data."

56: Is it necessary to report the B here? The p value should suffice? Are we specifically describing the mean knowledge scores before and after and finding a significant difference? It is unclear here what exactly we are comparing for differences.

Line 57-58: The key takeaways from the qualitative analysis need to be more clear. They can simply be stated in summary form but should be addressed.

Line 60-61: The impact of just getting access to the counseling from FCHVs does not seem clear re importance. What did this really mean for women --did they understand their PPFP options more? Where is the impact?

Introduction

Line 78: "often neglected by users" - why? Describe?

Line 79: "various factors" - such as? Describe?

Can the use of "orientation" in the paper be changed to "intervention"?

Line 79: The copper IUD is only one possible postpartum IUD, language here should be changed to reflect that this is one option. Since this is the sole PPIUD option available in Nepal, this should be made clear.

Line 86: IUDs are often considered long acting and not "temporary", I think you are referring to the fact that IUDs are reversible, would reword this to indicate is reversible nature.

Line 88-89: Some background information related to the preponderance of home births and new trends leading to institutional delivery in the tis paragraph might help the reader follow along. I assume institutional delivery refers to hospital delivery, however I am not familiar with all the
possible delivery locations in Nepal and a few sentences to clarify this can help set the stage for this hospital based PPIUD intervention.

Line 109: Is it referred to as "The FCHV" or just FCHV (this should be consistent throughout)

Line 112-113: Would reword to: "FCHVs are not certified health providers, instead, they are married women of different educational levels...."

Line 119: "meeting" should be plural

Line 121: should be reworded as "communities related to FP, birth preparedness and advantages of institutional delivery"

Line 127-128: Can the positive effects of the FCHV be described with some numbers here? Has there been quantitated impact on maternal or neonatal outcomes?

Line 134-138. It is not immediately apparent how the political climate influences the interventions. These sentences should be restructured to describe the ways in which the new government design impacts and is related to the FCHVs.

Line 144: 9-10 should be spelled "nine to ten"

Line 147: add "the after using "using the FCHV User's Guide..."

Line 161-162: The aims of the study are unclear from this description. Is the primary outcome knowledge increase on behalf of the FCHVs and the number of individuals counseled by them? Some specifics related to the outcomes would be helpful here.

Methods

Lines 165-167: Study design: Please describe the study a bit more in broad terms to clarify that the study consists of 2 quantitative pre/post 1 group samples (FHCW and women delivering) and 1 qualitative sample (FCHW). This will help prepare the reader for the methods section.

Line 170: Ensure that FCHV is made plural where appropriate (as it is here)

Line 172: What were the purposeful criteria by which the six facilities were selected for the qualitative study? A brief reference should be made here or this can be excluded for now if it will be addressed later.

Line 177: The use of "triangulate" here may not be appropriate. It appears that you are trying to validate the FCHV reported number of women counseled and trying to verify that with the report by women of how many received counseling from FCHV. Using the terms triangulate with linkage is confusing.
Line 181: Remove redundant language, eg this should be reworded as: "The study participants were comprised of FCHVs from the communities..."

Line 183-187: Delineate inclusion and exclusion criteria more clearly. With one sentence describe that women were selected through random sampling and had to be willing to participate in the survey. Then elucidate the reasons why women were excluded from the survey.

Line 190: You had previously described that all FCHVs were eligible for the study and that it was requested that they participate in the sampling. This is followed by a reference to convenience sampling. These suggest two different methods. If you simply had a reduced response rate from all your FCHVs please indicate this. If you did in fact only sample a portion of these FCHVs this should be made clear. If methods varied for the qualitative and quantitative portions, please make this clear here. In addition, please make clear if the same FCHVs were sampled before and after the intervention or if it was two different groups.

Line 191: be clear about what the intervention under study is - the orientation program, I think, but it was not clear.

Data collection: when was the pre-test? The post-test? Were the immediately before and after the intervention? Please clarify.

What is the FCHW logbook like? How did they assess PPIUD uptake?

Line 210-212: I think this repeats what is in study setting line 171

Line 211-213: sample size: what effect size/magnitude of difference are you powered to detect? Line 211 says "statistically significant result" which is not clear. Move the sample size information below variables so they reader already knows your dependent variable/outcome and independent variable/intervention. Then state them clearly here as well so we understand what you are powered to detect.

Line 218: "provide statistical significance" - but about what? What difference? This is not clear.

Line 222: Reword as: for "the" quantitative portion of the study". Also it is still unclear what exactly was measured, was it the percent of questions on the survey? Specific details are needed.

Lines 224: please reduce the number of acronyms. I got lost.

Line 225: specify how many items are on the knowledge survey. Be explicit that the outcome is each response and also a sum of correct responses - and the possible range for that outcome (0-5, I think)

Line 29: the main independent variable is the intervention. Clarify this, then also list other covariates.
Line 231-234: Timing of the survey with women delivering in hospitals? How long before and after the intervention? Was the pre period at least 9 months prior so no women were pregnant after the intervention?

Lines 235-241: Analysis: Please expand the analysis section to describe more fully what you did with your data. When I looked at the tables I understood, but the analysis section did not prepare me for what I read in results. Use the analysis section to prepare readers for what will follow I results. Start by describing what you did with the data to get Table 1, for example.

Model: what is the distribution of the summed scores? I am wondering is most respondents are clustered up at 4 and 5 - if this is not really a continuous variable or has very sparse data down at 0, 1, 2. Did you try collapsing (say score of 4 or 5 vs not) and running a logistic model? I'm not sure linear regression is really appropriate for the distribution of the outcome.

Line 237: state how many individual items/key messages about PPFP

Line 238: state the range of overall knowledge score

Line 242-244: qualitative analysis. Were all these emergent or did you have a priori themes? "generated 5 major themes " sounds more like results to me, unless you had 5 a priori themes you organized the data into. I got confused about the qualitative analysis. If there is any more detail about the methods used for the qualitative analysis, eg grounded theory etc this should be described here

Results

Line 257: Does this mean that the participants had no understanding of PPFP generally or specifically the ways in which FCHVs should message PPFP

Line 274: Interpret the beta estimate for the reader - what does a beta=0.56 mean in terms of the units of your outcome?

Line 306-Line 311: The text of these paragraphs repeats the Table 5 information. Either the table should be left with summary statements in the paragraph or the table is unnecessary.

Line 346-347: This paragraph on misconceptions seems to conflict-- the quantitative data that suggested that there was significant change in the way FCHVs understood PPIUD (via the 3 survey question re c/section and IUD insertion). If you are trying to convey that there were some FCHVs who had misconceptions re c-section and IUD, this should be made clear.

Table 1. What does the distribution of years working as a FCHW look like? Large range. Was it skewed? Would median be a better metric than mean?

Table 3: add N for the model. Any missing data?
Table 5: would this be better as a graph/figure? Timing of data collection for the pre and post surveys?

Table 4 & 5: I am struck by the discrepancy between the 83% of mothers that were counseled per the FCHW report and the 23% of mothers who report an interaction with a FCHW. Are these different settings? Is there overlap? How to interpret this difference?

The qualitative results feel underdeveloped. The tale is a useful way to show all he major and sub-themes. But the results present too many themes - it is hard to see the forest for the trees with so much detail - what is the story here? Please do more synthesis and analysis of results and revise this section.

Discussion

Line 480-482: here you say within 2 months of the intervention - clarify timing of data collection in methods. And the percent reporting they were counseled went up but was nowhere near the % of pregnant women the FCHW say they counseled. Comment on this/explain why these are different?

Line 485: your data do not support what you say about the qualitative data here (that PPFP was a new concept). Many FCHWs knew about PPFP prior to the intervention and 26% had already received training. It feels like you are using a one-off qualitative quote to draw large conclusions that your own data contradict.

Is a 5% PPIUD rate high or low for Nepal?

Discuss changes in in-facility birth rates in Nepal over time to provide context for the potential to scale up PPIUD?

Please put your results in the context of any previous literature, even if there is no literature in Nepal. Are there other studies of community health worker interventions? Even if not for PPFP? Reading the discussion, I have no idea how this experience you report on is similar or different to other community healthworker interventions or other types of interventions designed to improve PPFP. Possible outline for the discussion:

1) Summarize key finding

2) 3-4 key points. Each a paragraph - State each key point in terms of your findings and then what we know in the literature

3) Limitations

4) Conclusion
Overall, the discussion goes beyond the data - this is a great exploratory initial study to show that training FCHWs about PPIUD is feasible and can change knowledge and has the potential to reach women. Recommendation to scale up: based on this study is it premature to scale up this program?

**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.

No

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

No

**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.

I am able to assess the statistics

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