Reviewer’s report

Title: The link between mental health and safe drinking water behaviors in a vulnerable population in rural Malawi

Version: 0 Date: 17 Jul 2018

Reviewer: Robert Dreibelbis

Reviewer's report:

The link between mental health and safe drinking water behaviours in vulnerable population ur rural Malawi

This article presents the results of a mediation analysis assessing the relationships among behavioural determinants of safe water practices, mental health, and self-reported behaviours. While the article presents an important contribution to the field, I think it could be significantly improved by restructuring the introduction, providing more details in the methods, and providing more details in the results.

Introduction: The introduction goes back and forth between presenting the overall argument for the study, presenting details of the study, and presenting the background of the conceptual models underlying the analysis. The challenge, however, is that details of the study are presenting intermittently throughout the entire introduction. For example, line 54 presents details on the aims of the study - but sentences before and after are all focused on the burden of mental health illness. Study is again presented at line 81, and then information on the links between mental health and behaviours in the same paragraph. Would strongly recommend streaming and re-organizing to present on 1) the background and scope of the problem, 2) how the current study will address the issue, and 3) the conceptual background of the study.

Methods

Details on sample characteristics are more appropriately presented in the results section (perhaps this a PH convention and psychology works differently)

Please specify how variables such as hunger, diarrhoea, anxiety, wealth index, etc were all collected as part of the study, analysed,

Please make sure that your primary outcome measures are clearly defined and described in this section. For example, drinking water collection is not well defined and it's not clear how this was defined in relation to general water collection, how it was collected, etc. Make clear what is self
report and what is a primary outcome that was observed. Safe transport and storage with a lid seems to be a composite variable of both self report and observed data?

As a mediation analysis, please provide more details on the methods used here. It's difficult to understand how the methods can be interpreted without adequate description of what the mediation analysis actually does. Even if this is provided as an annex, more details are needed beyond just a macro.

When the authors say that the cut off point for validation was >7, does that mean you defined a binary variable for good and poor mental health based on this score? If so - suggest just making the variable definition explicit.

Results

Water collection: why is the N different for each of the variables in Table 3? It's unclear why there would be a different number of respondents for each of the questions here. If collection is self report, this looks like a potentially skewed distribution. While I understand that ANOVA is an easy approach with Lichert type variables - have the authors considered alternative approaches that more appropriately reflect the categorical / count nature of the data.

Suggest a more quantitative discussion of the results from RQ1, rather than just higher and lower. Your betas would be average increase in the self-reported water collection practices, correct? Results are described as collecting more safe drinking water - however, this is a bit tricky since more could be defined both in terms of quantity and frequency. Rather than "collect more" would it not be more appropriate to say they report collecting more often from a safe source?

For RQ2: what was the actual observed difference here? Why was a different modelling strategy used than RQ1 since it was the same outcome measure, correct?

RQ3: results from the mediation analysis are not fully articulated. Please provide a more quantitative description of what these results mean and how they should be interpreted. Please double check that the factors described in the text align with the factors presented in the table (for example - severity for table 7 has the information associated with other's approval). In general, I'm not sure if there is a need for more information on the methods earlier or more information here to make the results here a bit more digestible.

**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.

Yes

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

Unable to assess

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 recommend additional statistical review

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/). 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