Author's response to reviews

Title: What elements of the work environment are most responsible for health worker dissatisfaction in primary care rural clinics in Tanzania?

Authors:

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Author's response to reviews: see over
Response to reviewer comments
15 May 2014

Dear Editors,

Thank you for giving us the opportunity to revise this manuscript. The reviewer comments have helped us to strengthen this paper. We have addressed each point below and included corresponding changes highlighted in the manuscript. Please let me know if you have additional questions.

Best wishes,

Godfrey Mbaruku

Reviewer comments & authors’ responses
Reviewer's report #1

Reviewer: Melkiory Masatu
Reviewer's report:
Major compulsory revisions
1. Adequate literature to elucidate the determinants of dissatisfaction from previous studies need to be given in the background section

   We have added references and the following sentences to the background section to provide information from prior research on health worker satisfaction: “Prior research has identified both intrinsic and extrinsic factors associated with health worker job satisfaction, including pay, management, availability of equipment, staffing and workload, and health worker age and cadre. Recent literature has stressed the importance of the local context on the determinants of health worker satisfaction.”

2. Strong justification for the study need to be given

   This study is needed, because there is very little literature that explores the structure of health worker satisfaction in rural, primary care clinics in Tanzania and other sub-Saharan African countries. On page 5, we have written that “this study seeks to assess the current level of satisfaction with aspects of the work environment among health workers in primary care clinics in rural Tanzania and identify areas where improvements may substantially affect general job satisfaction. Improving satisfaction may in turn lead to greater retention of rural providers.”

3. Data analysis section is mixed up with variables measured during data collection, such as Health workers’ demographics and health facility resources. These should be placed under data collection
We have created a new sub-section in the methods section called “Measures” which details the variables collected during data collection and the categorizations made to these variables during data analysis.

Minor essential revisions
1. The word healthcare on the last line under background and last line of paragraph 3 of the discussion is redundant. It should be deleted
   Thank you for noticing this typo. We have made the correction.

2. The 11th word, line 3, para 1 of discussion is mispelt. It should read THAN Level of interest:
   Thank you for noticing this typo. We have made the correction.

An article of importance in its field
Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:
I have no any competing interest

Reviewer's report #2
Reviewer: Linda Fogarty
Reviewer's report
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This manuscript was well-written and generally of good quality. The authors do not clearly distinguish satisfaction and motivation as drivers of behavior and about also confuse performance quality and retention.
Please number your comments and divide them into:
- Major Compulsory Revisions
The author must respond to these before a decision on publication can be reached. For example, additional necessary experiments or controls, statistical mistakes, errors in interpretation.
Background
1. Background second paragraph. I don’t understand the point of the paragraph related to the manuscript. The manuscript is not about motivation or quality. If there is an implication of the link between motivation or quality and worker satisfaction, that case needs to be made here. The authors should understand the difference between “satisfiers” and “motivators”. These are very different constructs with different predictors.
   We agree and have taken out the text on quality and re-written this paragraph.
   Thank you.

2. The (quite substantial) literature on the link between satisfaction and retention is missing from the background.
   We have expanded our discussion of the link between satisfaction and retention in the final paragraph of the background section and added citations to support this link.
Methods
3. I don’t quite understand the index development. Was the index always 17 items, or was it reduced to 17 items based on findings (e.g., loading on main factors)? I ask this because it is referred to in one place as “the ‘final satisfaction index’ and results of some questions NOT included in the 17 items but appearing to be satisfaction questions, are included in results. (such as “most people in your job are very satisfied” and “they would like to continue working for their current health facility for quite some time”). Perhaps these questions came from someplace else, but it’s not clear.

   We have added three sentences to the second paragraph of the “data analysis” section to clarify the index development. All 17 questions related to the work environment were included in the final PCA. The additional three questions that the reviewer is referencing here, were related to overall satisfaction and intent to stay, rather than specific aspects of the work environment, and were thus not included in the PCA. We have added a sentence to the first paragraph of the “measures” section to describe these additional questions.

4. Authors say where data were missing for a month, they substituted the average of contiguous months. That’s fine, but please report how frequently this happened.

   This occurred for 2.3% (13/574) facility-months. We have added this to the methods section.

5. Authors calculated a score for the two satisfaction subscales. But they don’t describe how.

   The subscale score was created using the eigenvalues (i.e. regression weights or factor loadings) multiplied by the health worker’s response for each question. We added the following sentence on page 9 to clarify: “We created scores for each of the subscales using the sum of the subscale regression weights (factor loadings) multiplied by the health worker’s response for each question.” This is consistent with how wealth indices and other PCA summary measures are constructed.

6. Authors should report Cronbach’s alphas on their scales so readers know the extent to which the items are internally consistent.

   We have added Cronbach’s alphas (last paragraph of the methods and fifth paragraph of the results section.) We found good internal consistency with alphas of over 80%.

Results
7. In third paragraph, of the five numbers mentioned in the text, only one is the same as the number in table 2.

   Thank you for catching this translation error. The numbers in the table were correct and the text has been updated to match the tables. We have had external analysts double-check all numbers in the manuscript.

Discussion
8. The discussion lacks depth in general and a deeper connection to the HRH literature. There doesn’t seem to be a strong understanding of the satisfaction literature. For
example, the finding that general satisfaction is quite high is very common (and I wouldn’t say indicates positive response bias). This should be noted with references. Also, the distinction between satisfaction and motivation is lacking. We have added more discussion about the relevance of our findings vis a vis the broader literature. Thanks for pointing out this deficiency.

9. Authors state “in-service training was closely associated with general job satisfaction.” Where is this reported in results section? I must have missed it. This was the result of an additional exploratory analysis. We have taken it out of the text to maintain focus on our primary analyses.

10. Third paragraph: I don’t understand the point. Are authors saying that pay for performance won’t work unless something is first done about the infrastructure? If so, this should be stated explicitly. (also, pay for performance schemes are expected to influence productivity and performance, but they may not influence satisfaction. This distinction is missing.)

   We agree that we had not made a strong enough link between health worker dissatisfaction with pay and the pay for performance scheme. We have therefore added the following sentence to this paragraph: “Although health workers are dissatisfied with their pay and the pay for performance scheme is a potential opportunity to increase their pay in addition to motivate them to meet specific targets, this will not work if improvements to infrastructure (also associated with health worker satisfaction) are not first improved.”

11. Fifth paragraph: Reasoning related to why clinical officers might be less satisfied is not clear to me. Also, neither reason is relevant to the infrastructure scale (as far as I can understand). We have rewritten this paragraph to highlight reasons for dissatisfaction with infrastructure.

12. Seventh paragraph: I don’t understand the point made about signal functions. We agree that this point was not made clear. We have re-written the first half of the paragraph to clarify: “Health workers in facilities performing more deliveries were less satisfied with supportive interpersonal relationships, as were health workers in facilities performing more BEmONC signal functions. BEmONC signal functions are an indicator of the scope and complexity of delivery services a facility provides. As these primary-care facilities get busier and provide more complex services, health workers may become more stressed and less happy with their team.”

13. Limitations: please discuss the data quality issues related to using routine facility service statistics. We agree that a number of data quality issues arise when using routine facility service statistics and have added the following sentence: “Two of the variables measuring provider workload, number of facility deliveries and number of outpatient visits, were routine facility service statistics which are often subject to higher missingness and inaccuracy than data collected directly by researchers.” Fortunately, the majority of
our analysis does not rely on routine facility service statistics.

14. I understand choosing the primary care clinics with the highest volume of deliveries, but this should be mentioned in the discussion as a limitation to generalizability of findings to all dispensary-level facilities.

We have added a sentence to the limitations section highlighting this limitation to generalizability: “The study took place among health care workers in the six eligible dispensaries per district that had the most deliveries; health workers in dispensaries with even fewer deliveries per month may have different determinants of workplace satisfaction.”

- Minor Essential Revisions
The author can be trusted to make these. For example, missing labels on figures, the wrong use of a term, spelling mistakes.
1. Do we know if there are any differences between those (70) who were interviewed and those (30) who were not? If so please report. If not, this should be in limitations section.

   Data on the providers were not interviewed is not available. We have added the following sentence to the limitations section: “Data on the eligible providers who were not present for interview are not available and these providers may differ from those interviewed.”

2. Discussion, Sixth paragraph: Related to the bivariate relationship between time in facility and satisfaction with infrastructure: there may be confounding between age and time in facility (since there is also a relationship between age and satisfaction with infrastructure.) This should be explored analytically.

   It is true that age and time worked in the facility are positively correlated. We have edited the fifth paragraph of the discussion to include both the review of age and time in facility. We have also added the analytic results of this correlation to the results section and included the following sentence in paragraph 5 of the discussion: “Although other researchers have found a similar positive association between health worker age and job satisfaction, the cross-sectional design of this study does not allow us to determine the direction of causality for the positive correlation between age and time worked in the current facility that we found. Future research should explore this relationship further.”

- Discretionary Revisions
These are recommendations for improvement which the author can choose to ignore. For example clarifications, data that would be useful but not essential.
1. Data analysis: creating a binary indicator with strongly agree vs. all others obligates the authors to be very careful about how they word their findings. Just because respondents do not strongly agree doesn’t mean they disagree. For the reader to understand the findings (and the claims made by the authors) it is important to also know the frequency of agreement. For example authors claim “in this study health workers were very dissatisfied with their level of pay.” I know that only 12% strongly agreed that they were satisfied with their pay, but I don’t know how many agreed. I’m just guessing it would bring the percentage up to around a third? If so, the authors could no longer say
“in this study health workers were very dissatisfied with their level of pay.” I suggest changing Table so reader can see at least both % strongly agree and % agree.

As recommended, we have added a second column to Table 2 so that the reader can see both % strongly agree and % agree. We have also edited the discussion on pay on page 12 to be more specific and say “In this study almost half of health workers were dissatisfied with their level of pay.”

2. The reader does not know the frequency and other basic statistics for items related to facility characteristics. This limits the reader’s ability to understand the context for the bivariate results. I suggest adding these.

We agree that these statistics would be helpful for readers to place the study facilities in context. We have added the statistics to table 1, and highlighted a few in the text of the results section.

3. What authors sometimes refer to as “interpersonal relationships” for short (short for Supportive Interpersonal Environment) seems like a very interesting set of items reminiscent of the demand-control-support constructs in occupational health literature (the idea that high demand jobs create stress, but this can be mitigated by high control of the environment and also social support). This is more interesting than just interpersonal relationships. I think a shortened label such as “supportive environment” or “supportive relationships” is more reflective of the factor than “interpersonal relationships”

Thank you for this recommendation, we agree and have changed the abbreviated term to include “supportive”.

Level of interest: An article of importance in its field
Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:
I declare that I have no competing interests

Reviewer's report (3)

Reviewer: Sarah Rominski

Reviewer's report:
Overall, this is well-written and interesting paper. I very much enjoyed reading it and I believe it offers important information to the literature. However, I do believe there are some issues which need to be addressed.

Introduction: Paragraph 1, sentences 1, 2 and 3 have no references and need them.

We have added citations for the first two paragraphs. The citations for sentence 3 are in the subsequent two sentences where the data are presented.

Sentence 6 (“Rural areas were particularly underserved.”) needs a reference, as well as a number. What is the urban-rural discrepancy in Tanzania?

The Tanzanian National Bureau of Statistics estimated the rural population to be 70.4% in 2012. We have added this to the background and added two citations. In
addition, we were able to update the number of healthcare workers by population to the 2012 statistics.

Paragraph 2, sentence 1 needs a reference. Sentence 2, how is motivation defined? There are many definitions of motivation, and that term needs to be unpacked.

We have rewritten paragraph 2 to focus on satisfaction rather than motivation.

Paragraph 3: what is the training of clinical officers versus nurses versus medical attendants? Are some of them medically trained (as in, have gone through medical school)? Which of these cadres has the most training?

We agree that it is important to distinguish between the training that these providers have received, and therefore added the following sentence “Clinical officers are nonphysician clinicians who receive three years of clinical training post completion of four or six years of secondary school. Nurses have completed four years of secondary school and a subsequent three years of professional training. Medical attendants have the least training: they are generally primary school leavers (7 years of education) who receive a one year of basic nursing training.”

Paragraph 4, sentence 1 (“Given the difficulties in recruiting and retaining rural health workers...”) needs contextualization. There is nothing before this sentence indicating that there is a problem recruiting and retaining health workers to rural areas.

We have added the link between health worker satisfaction and retention to give contextualization and have added citations for this sentence.

Sentence 2 needs a reference. Sentence 3, “starting with previously identified..”; where were these previously identified? What are they?

We have added references to sentence 2. In addition, we have added a sentence outlining factors that have previously been identified as associated with satisfaction: “Prior research has identified both intrinsic and extrinsic factors associated with health worker job satisfaction, including pay, management, availability of equipment, staffing and workload, and health worker age and cadre.”

Method. I think it would be helpful to have a figure of Tanzania and note where in the country the study population is located. How were eligible primary care clinics identified? What was the final number included (the paper states, "from the eligible facilities, primary care clinics with the highest volume...")? What proportion of eligible clinics does this include?

We have added a map of the study facilities as “figure 1.” Eligible facilities are described as: “government-managed, have at least one medically trained staff member (e.g. clinical officer or nurse), and be actively providing delivery services.” This included 24 out of 62 eligible clinics, or 38.7%. We have added the number of eligible clinics to the methods section.

Data collection: The paper notes that a clinic-level survey was conducted. Who answered these questions? The same people as who were surveyed about their motivation?

We have added a phrase to the methods section (first paragraph under “data
Data analysis: I am not personally familiar with PCA. Perhaps a little more explanation of the method and how the results are interpreted could be helpful.

PCA is a method used to identify underlying components that are described by the index by identifying questions that strongly correlate. We have elaborated our discussion of PCA in the second paragraph of the ‘Data analysis’ section to further clarify our methods.

"Signal functions" needs a reference, as does the Tanzanian government guidelines noted on page 8.

We have added the references for the “signal functions” and the Tanzanian government guidelines used to construct the equipment, supplies and drugs index.

Results: It would be helpful to bring some of the information from Table 3 into the text.

"Tools to get the job done" such as...

Thank you for this suggestion. We have added two sentences to the fifth paragraph of the results section, bringing in some of the information from Table 3.

Discussion: A reference for the point made about top-up pay is needed, as is something to support the statement, "cadres who are not given pre-service training and authorization to provide basic emergency obstetric and neonatal care are providing most of the delivery care." I wonder also how the authors know that, "health workers may recognize in-service training as an opportunity to close this gap between their pre-service training and the expectations when they arrive at clinic."

We have added references and edited this paragraph for clarity, removing the two phrases the reviewer addresses here.

"There is currently a pay-for-performance scheme underway in the region under study and initial evidence demonstrates that this may help motivate staff." This needs a reference, and also a deconstruction of what is meant by "motivate staff". Motivate them to do what? Stay in rural locations? Better performance? Less absenteeism?

We agree that this section needed clarity. The reference is the same as the following sentence, and we have added it again to clarify. We have edited the paragraph to make clear that the motivation referred to in the reference is to motivate staff to meet targets. We have further made the connection that although the pay for performance scheme is not designed to increase job satisfaction, it does provide an opportunity to improve an aspect of health workers’ jobs that we found they were dissatisfied with: pay. We have added the following sentence: “Although health workers are dissatisfied with their pay, and the pay for performance scheme is a potential opportunity to increase their pay in addition to motivate them to meet specific targets, this will not work if improvements to infrastructure (also associated with health worker satisfaction) are not first improved.”

I believe that one of the overall findings may be an artifact of bias rather than a true
finding: "as providers get older they become inured to working in low-resource environments, which may explain why their increased satisfaction with infrastructure compared to their younger colleagues." This study is cross-sectional. You cannot make these sorts of causal arguments. You note later in the discussion, "this may in part be because satisfied health workers stay longer." I agree completely with this. With this sort of cross-sectional design, there is no way to disentangle those two phenomena. There is a relationship between older age and more satisfaction, but you do not know which way the causality goes.

We agree that it is difficult to determine which direction the causality goes, we have therefore presented both possibilities. To make this clear we have re-arranged the discussion so that these two points are next to each other (paragraph five). We have also added the following sentence to make this point clear: “Although other researchers have found a similar positive association between health worker age and job satisfaction, the cross-sectional design of this study does not allow us to determine the direction of causality for the positive correlation between age and time worked in the current facility that we found. Future research should explore this relationship further.”

Conclusion: although I agree with the first sentence of the conclusion, "health system improvements should target areas that will most improve health worker’s general job satisfaction", I do not see how this study addresses this.

In order to clarify we have added a sentence that makes the connection between job satisfaction, intention to stay, and the provision of high quality health care.

Overall, I am not clear as the objective of this paper, other than to describe current health worker's motivation. The overall aims of the paper need to be more clearly laid out. The last sentence of the Introduction tries to lay this out, but the last part "identify areas where improvements may substantially affect general job satisfaction..." does not tie into the important part of this. I.e., why do we care about job satisfaction? I believe it is because we want to have more health workers in rural areas as the rural areas are particularly under-served when it comes to workers. However, this link it not made by the authors and needs to be.

Thank you—we agree with the reviewer’s comment. We have clarified the aims of the paper in the introduction.

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Acceptable
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.
Declaration of competing interests:
I declare that I have no competing interests

Reviewer's report (4)

Reviewer:Sandra Cole
Reviewer's report:
The research question, what are the satisfiers of dispensary workers in a rural area, is not
new or novel, but is well-defined in the abstract and the article. This question is important because when workers are satisfied with their jobs they are more likely to remain with their current employer. In this case, retaining workers in busy clinics in rural Tanzania is to the benefit of the population. The problem is well supported in the literature. The methods are explained sufficiently so that the research could be replicated. The problem was defined. Inclusion criteria for the clinics that were selected and for the participants were explained, IRB approval for the research was sought and obtained, and consents were signed prior to personal interviews. The authors used a modified survey tool previously used in similar research in 30 countries worldwide which lends credibility to the instrument. Data was gathered by data collectors who had been trained in ethical data collection and conduction of interviews. The response rate of 70% of eligible participants was an excellent response rate. Demographic information was gathered on the participants and the data was analyzed using Cattell’s Scree Test/Factor Analysis. The manuscript adheres to acceptable reporting standards. The article postulated some reasons for workers satisfaction and dissatisfaction, and limitations to the research were described. The results accurately reported the areas of dissatisfaction of the participants and were reported in the results and discussion. The title reflects the findings of the authors. The writing is acceptable. Tables 1-4 enhanced and supported the findings.

I noticed a type-o on page 10 where then is used instead of than.

Thank you for noticing this typo. We have made the correction.

It is my opinion that this article would be of interest to readers who are concerned with the factors of job satisfaction of rural healthcare workers and requires little revision.