Author's response to reviews

Title: A cross-sectional pilot study assessing needs and attitudes to implementation of Information and Communication Technology for rational use of medicines among healthcare staff in rural Tanzania

Authors:

Jessica Nilseng (jessica.nilseng@gmail.com)
Lars L Gustafsson (lars-l.gustafsson@ki.se)
Amos Nungu (amosnungu@dit.ac.tz)
Pia Bastholm Rahmner (pia.bastholm-rahmner@sll.se)
Dennis Mazali (dmazali@gmail.com)
Björn Pehrson (bpehrson@kth.se)
Jaran Eriksen (jaran.eriksen@ki.se)

Version: 3 Date: 18 June 2014

Author's response to reviews: see over
Response to referee comments for paper *A cross-sectional pilot study assessing needs and attitudes to implementation of Information and Communication Technology for rational use of medicines among healthcare staff in rural Tanzania*, by Nilseng et al.

**Referee 1:**

**Major Revisions**

1. The authors should review the work of David Labinski in supply chain management as this could provide important insights, e.g.: "HEALTH INFORMATION AS HEALTH CARE THE ROLE OF MOBILES IN UNLOCKING HEALTH DATA AND WELLNESS" Page 39

   How do they propose that the Android based tool described will link into the larger supply chain systems in the country?

**Response:** Thank you for this very useful comment. Discussions including the work of Labinski have been added to the paper in the following sections:

   a) page 17, line 23: “…the current drug distribution system does not include any possibility of tracking drugs to discover potential leaks [3, 8, 34]. Moving from paper-based to electronic systems can help improve transparency, and thereby possibly drug supply management [35]…. Another factor that adversely affects the drug distribution in many low-income countries, is the number of disease specific (e.g. malaria, TB and HIV) vertical programmes that each deliver drugs for their intervention. This leads to a number of parallel systems and a very complex drug delivery chain system [35]. The aim of our app is to make it possible to integrate the supply chain for all diseases in one common delivery system, starting with those that are supplied through MSD."

   b) page 19, line 2: “A previously reported challenge regarding the supply chain management is this lack of communication between the final steps of the distribution system, and between health facilities located close by each other [35]. Our app currently communicates between all the different steps in the supply chain, and could also include communication between health facilities.”

**Minor Essential Revision**

- Add year of publication for reference 38

**Response:** This has been added (Please note that the reference is now number 39).

- Add date of access for all web sites cited

**Response:** According to the *BMC Medical Informatics and Decision Making* reference style, the access dates should not be shown. However, we would be happy to add these if the Editor so wishes.
Referee 2:

Major Compulsory Revisions

1. The conclusions in the abstract read more like a justification for the study, rather than conclusions reached after conducting the investigation. These should be re-written to reflect conclusions drawn from the work completed.

   Response: Thank you for noting this. We have changed the conclusion to the following:
   “The tablet application was easily used and appreciated by health workers, and thus has the potential to save time and effort, reduce transportation costs and minimise drug stock-outs. Furthermore, the android tablet could be used to reach out with CME programs for health care workers at remote health facilities, as well as those in towns.”

2. The authors state that a sample of 20 respondents was considered large enough to capture variability of studied phenomenon, and they cite studies on asthma management and physician perceptions of responsibility of patient’s drug lists. The phenomenon under investigation in this study and the study setting are vastly different from the cited studies. Predetermining sample size is not consistent with phenomenological methodology; instead, it is usual to collect data until saturation is reached. Was saturation reached? If not, a pre-determined sample size of 20 should be acknowledged as a limitation of the study.

   Response: The authors are aware of this limitation of the methodology. We have now added it to discussion (page 21, line 18):
   “Another potential weakness is the predetermined sample size of 20 respondents. Saturation may not have been reached during data collection, but we still think the data from our pilot study give a fair picture of the opinions of the health workers involved in the drug supply chain in the study districts.”

3. The data collection section could be more clearly written. The opening sentence states that 20 HCWs were interviewed. Towards the middle of the paragraph it states that “further participants” (after the first 8) were identified.... This makes it sound as though there were an additional 20 participants after the first 8. This can be corrected by stating: “The additional 12 participants were identified....”

   Response: The authors agree with this comment and have corrected the text accordingly (page 7, line 15): “…at two associated health centres were chosen as the first 8 respondents using judgmental sampling [28]. The additional 12 respondents were identified using....”

Under “2.”, it states that: “Additionally, the person in charge at each of the 13 health facilities was interviewed”. In the results section, it appears that only 20 interviews were
conducted, rather than 33? Consistency between the objectives, data collection section, and results section would bring greater clarity to the manuscript as a whole.

Response: Thank you for bringing this to our attention. We have revised the methods section (page 8, line 2) accordingly: “Among the 20 respondents, 13 were the persons in charge at each of the included health facilities. During the interviews with these 13, additional questions were asked regarding the availability and use of electricity, computers, Internet connection and other relevant components of the infrastructure at the hospital, health centres and dispensaries in Bunda and Serengeti districts.”

4. What criteria did the authors use to inform judgmental sampling?

Response: The eight initial respondents were selected so as to include all persons at the district hospitals involved in filling in and receiving drug orders (4 persons), and the person in charge of filling in the drug order forms at 4 health facilities that were linked to the hospitals. As the persons at the hospital level are very few in this district, we decided not to specify this further in the methods section.

5. The objectives of the study (as stated) were to assess current approaches to and use of ICT among HCWs, and to assess the feasibility of a tablet intervention. The results then delve into other areas such as access to continuing medical education (note: not continued) and access to essential medications etc. The results should focus on the stated objectives of the study.

Response: Thank you for noting this omission in the stated objectives. This has been changed in the abstract and the background section page 6, line 2: “This study aimed to assess current approaches to and use of ICT among health care workers in two rural districts of Tanzania in relation to the current drug distribution practices, stock of essential medicines and continuing medical education (CME), as well as to assess the feasibility of using modern but simple ICT-technology integrated into the health-care system to improve the quality of drug chain management and CME in rural parts of Africa.”

6. The authors state that they used qualitative research methods, but it is unclear that they have done so from the title. I think there needs to be some consistency here. Is it a qualitative study, a cross-sectional study, a pilot study, a feasibility study? Although several of these terms may apply, the authors should define their study consistently.

Response: Thank you for this comment. Several of the terms the reviewer mentions apply to this study. It is a pilot study conducted cross-sectionally, and using both qualitative and quantitative methods. “Cross-sectional” and “pilot” are already mentioned in the title. It would be possible to change the title to “A
cross-sectional, **mixed methods** pilot study assessing needs and ...” but the authors do not feel that this adds much information for the reader.

7. Given that assessing the feasibility of the tablet-based tool was one of the primary objectives of the study, I feel like the results relating to this aspect of the investigation are not comprehensive enough. What were the additional perceived limitations of using the tablet etc?

**Response:** We have reviewed this point, but apart from the limitation mentioned in the results section, the respondents were very positive to the table. The authors do of course see limitations to the tool, which have been discussed in the discussion section of the paper. We have also added a section regarding this on page 20, line 25:

“Our respondents were generally very positive about the android tablet, and saw few limitations to its use. However, as with many ICT tools in this setting, providing access to support services and hardware repair is a challenge. New staff also needs to be trained in the intervention and follow-up is needed.”

**Minor Essential Revisions**

1. The methods section in the abstract: “They were showed a potential....” This sentence should be further developed to indicate what happened after they were shown the tablet i.e. and participants were interviewed to assess their acceptability of the intervention.

**Response:** Due to the limited number of words in the abstract, this section has been kept short, but has now been changed to “They were also shown and interviewed about their thoughts on an android tablet application prototype...”

2. The authors indicate that they transcribed the interviews verbatim but later state “redundant words” were left out. If words were excluded from the transcription process, the transcription was not verbatim.

**Response:** Thank you for noting this. The word “verbatim” has been removed from the methods section.

3. Was any analytical software used for the qualitative analysis? If so, this should be stated.

**Response:** No analytical software was used for the qualitative analysis.

4. Acronyms should be spelled out on first use (CME in abstract). Throughout the manuscript, there are other instances where acronyms should be spelled out on first use.

**Response:** Thank you for noting this. We have gone through the manuscript carefully and hope that we have managed to spell out the first use of all acronyms.
5. In the results section, numbers should be presented alongside the percentages.
   **Response:** Numbers have now been added alongside the percentages where applicable.

6. The manuscript is generally well-written; however, there is room for improvement. I recommend having somebody who is proficient in English edit the manuscript. There are several small language errors and typos throughout. For example, in the conclusions, “health care worker rather” should be health care workers. In the discussion, “Our study participants were positive to using....” should instead be “Our study participants were positive about.”
   **Response:** Thank you for spotting this. The paper has been reviewed by a native English speaker and a number of typos and grammatical errors have been corrected.

7. In Table 1, it is preferable to present the median (range) of ages rather than the mean, or you could present both. To improve readability, I would avoid the use of acronyms.
   **Response:** The figures for age presented in Table 1 were in fact the median with the range. This has now been corrected in the table text. All acronyms have been spelled out.

8. Several of the figures are missing axes titles.
   **Response:** These have now been added.

**Discretionary Revisions**

1. Since this was in part a feasibility study, in the discussion, can the authors expand on the next steps regarding their application -- will changes be made as a result of the study? I still do not understand how feasible it would be to implement this tablet-based system. There is a minimal amount of attention devoted to the application in the discussion, which could be expanded upon to enlighten readers.
   **Response:** This is a pertinent comment. In fact, modifications to the application have been made and work is ongoing to test the updated application with live data. A comment about this has been added to the discussion (page 21, line 12): “The findings from our pilot study have led to updates of the tablet application and work is ongoing to test it with live data in Bunda and Serengeti districts.”