Reviewer’s report

**Title:** PRENACEL - a mHealth messaging system to complement antenatal care: a cluster randomized trial

**Version:** 0  **Date:** 10 Aug 2017

**Reviewer:** Collins Chansa

**Reviewer's report:**

**GENERAL COMMENTS**

While the aim of the study is clear, I don't think that the objectives have been achieved. Reading the paper, it seems that the study is comparing "women's knowledge on pregnancy care" vs "no knowledge on pregnancy care." I say this because, under the intervention sub-section (lines 140-182) the authors provide a very comprehensive description of how the intervention PHCU staff were trained, and the messages that were sent to the participants. For example, in lines 162-164, it is stated that participants in the intervention group were sent messages on information about the physiology of pregnancy and childbirth; elements of antenatal care; postpartum care and contraception; and psychosocial aspects of pregnancy and the postpartum period. Furthermore, these messages were sent to the intervention group at each stage of the woman's gestational age. However, this was not done in the control group. The researchers could have provided this information to the women in the control group as well at a never-to-be-repeated (one-off) meeting at the start of the study so that there is certainty that both the women in the intervention group and those in the control group have the same level of understanding on pregnancies and danger signs in pregnancy. Thus, given the way the study is presented, I don't think that there is an incremental analysis of the effectiveness of the SMS vs Routine ANC.

There is potential contamination and researcher bias in the study. In lines 176-179, the authors state that women in the intervention group could send questions, complaints or feedback via the system (SMS free of charge). These questions were answered by health providers who were members of the research team and provided guidance accordingly. My view is that these acts can influence the impact of the intervention on the antenatal care score (ANCs).

The Methods section should be shortened and made much more consistent.

Results and discussion sections are too long and should be streamlined extensively to make the article more focused and concise. For instance, in the discussion section, some of the triangulating evidence is misplaced while the section reads as a repeat of the results section. Furthermore, the discussion section is presented in a way that suggests author bias towards the SMS (mHealth) system. I think the authors should strive to balance the discussion between the
SMS system and the Routine ANC. Aren't there any positives from the routine ANC system considering that the study was an applied research?

SPECIFIC COMMENTS

Abstract is unclear

Line 29, how is adherence defined? Adherence to what?

Line 30, This is just a cluster randomised trail. Why is the word "parallel" included?

Line 42-43, several numbers are presented but not clearly explained. i.e. 157 passively recruited. Does this mean that the balance of 770-157 were not passively recruited? Secondly, only 116/157 received and read all SMS. What is the implication of this on the results?

The Abstract only refers to two study groups but in line 265-269 there are 3 study groups.

Plain English summary

Line 72-73. There is need for consistency in the usage of words. In the Abstract the authors use the word "routine" but in line 72-73 they use the word "standard".

Background

In line 102-104, the authors indicate that previous studies looked at, "decreased perinatal mortality." They then conclude that none of the earlier studies assessed m-Health interventions as a means to improving adherence to recommended antenatal care practices. I argue that by studying the final outcome (i.e. perinatal mortality) the earlier studies would have in fact also indirectly looked at the effect of m-Health interventions on improving adherence to recommended antenatal care practices. Thus, the authors may wish to revise lines 102-107.

Methods

Line 116-117, how were the 4 maternity hospitals distributed between the intervention group and the control group?

Line 130-139, the study period is not clear. The authors present the period April 1st and June 30th, 2015 which I think relates to the characteristics or eligibility criteria for the study population i.e. pregnant women should have a gestational age of 20 weeks or less to qualify for the study. The second criteria for inclusion is contained in line 134-137 which states that, "all
women who gave birth in the participating maternity hospitals between August 3rd and June 30th, 2015, and who had received antenatal care at control or intervention PHCUs, were recruited to participate in the study”. This is not clear and confusing. August comes after June. Furthermore, in line 237, there is also reference to August 2015-March 2016 which further creates confusion on the study period.

Line 227-235, sub-section on intervention cost could be removed. There was no comparison of costs between the SMS (mHealth) intervention with the Routine ANC system. Are the SMS (mHealth) costs incremental to the already existing routine ANC costs?

Results

Line 318-320 are unclear. Please revise.

PRENACEL costs (line 343-356) could be removed. There was no comparison of costs between the SMS (mHealth) intervention with the Routine ANC system. Are the costs presented in the paper incremental to the already existing routine ANC costs?

Discussion

In lines 376 and 446-447 the authors state that the study was conducted in a Brazilian city with a very high HDI and that there could have been more impact if the study was conducted in a lower resource setting. This is not true as it depends on a number of factors including the health seeking behaviour, catchment population, annual growth rate and/or total fertility rate, level of education etc. Therefore, I propose that the authors should remove this limitation. Furthermore, the limitations are too many and some of them could be removed or qualified.

Line 413-415 ….."PRENACEL is a relatively inexpensive intervention that could be replicated in low-income environments, as long as cell phone coverage is present". PRENACEL is inexpensive relative to what? Please remove all information on PRENACEL costs so that the article is concise and focused.

Line 460-462. "Implementing mHealth programs on a larger scale, especially in low resources settings is necessary to determine their real-word impact". This sentence should be deleted.

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