Reviewer's report

Title: Applying the Theory of Planned Behaviour to explain HIV testing in antenatal settings in Addis Ababa- A cohort study

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Reviewer: Festus Ilako

Reviewer's report:

General comments
Thank you for asking me to review and comment on your manuscript titled’ applying the Theory of Planned Behavior to explain HIV testing in antenatal setting in Addis Ababa- A cohort study”

I would like to congratulate the authors for well written and structured paper, which I thoroughly enjoyed reading.

The study and the topic is relevant because it addresses HIV testing in antenatal care settings in Addis Ababa, Ethiopia one of the African countries with a big HIV problem. Moreover, HIV testing at ANC is an important entry point for prevention of vertical transmission of HIV from mother to child (PMTCT) linking both HIV infected mothers and their babies to care and treatment. Is a cohort study design the most efficient way to evaluate a psychological tool?

Specific comments

Abstract
The abstract provides a good summary of the paper. However, minor grammatical edits are needed.

Introduction
The authors justify the study by alluding to that opt out HIV testing approach is modified by health interventions and probably power relationship between the client and provider; which although true the relevant literature to support this argument is not adequately cited. Furthermore, it is unclear why a study on applying TBP tool to change proximate cognitive determinants of health seeking behavior is important for changing HIV testing and counseling policy or practice.

The paper would have been made clearer by omitting parts of paragraph 2. The authors have explained the concept of TBP very well in paragraph 4. In paragraphs 5, 6&7 the authors alludes to the limited value of TBP (7% and 13%), which make a strong justification of the study questionable. The limitations of TBP should have alerted the researchers about the need for further exploratory qualitative studies on HIV testing intentions in ANC settings using the standard qualitative methods instead of an epidemiological method which is more problematic in studying people’s attitudes, knowledge, behavior and practice.

The last paragraph, describes “a cohort of women attending public and private ANC”. In fact, I think these are two cohorts and not one and this has major
implication on methodology and study findings.

The study question is not clear, did the researcher wish to explore or explain intention and HIV testing behavior comparing public and private sector and/or opt out and opt in approaches?

Methods

Study settings.

The introductory paragraphs 1&2 in the methods section should be part of the introduction and literature review. I have commented on the opt-out versus opt –in debate in the paragraph below. The first two paragraphs in the methods section should be moved to the introduction.

It is unclear whether a comparison between public and private ANC facilities was intended and if so, the sampling of the facilities should be clarified, it begs the question whether or not the selection of ANC facilities based on convenience? In the paper, the authors allude to a dichotomy between the public and private health facilities where HIV testing is based on two different strategies of “opt out” and “opt in” respectively. To my knowledge, and many years of clinical practice, no private service providers have used an “opt in” approach. HIV testing in the private sector has been routine and provider initiated for nearly a decade. The difference between the two study settings should be taken in consideration in data collection, analysis and presentation the study results. Since the two settings are not balanced 12v.3) this is untenable.

Study design and participants

It is noted that the study was conducted between January and February, 2009, yet it is prospective.

I think qualitative study would have been more appropriate, as it would have entailed involving the women directly to measure their intentions to test, fears, misconceptions and knowledge of HIV and AIDS. How the researchers measured the predictors (age, socioeconomic status and (TBP) tool etc and the outcomes (intention to test and actual HIV testing could be made clearer.

The authors conducted this study in three phases starting with a formative study using focus group in phase one, which is very good, an intervention was done using TPB tool in phase two, and measuring outcomes by linking data to study participants in phase 3. In fact there is not phase 3. What the authors call phase 3 is actually part of phase 2(linking questionnaire data with HIV test results)

I opine that the study design is unclear and could be called a mix methods consisting of a qualitative study or a quasi experimental study design/cross sectional design, and does not meet criteria and robustness of a prospective cohort study.

Sampling methods

Since there are only 54 health facilities providing PMTCT services in Addis Ababa. I random sampling would have minimized selection bias and an inclusion
of the 54 ANC facilities would have strengthened the study. Only 12 public and 3 private health facilities were sampled purposively and this would also lead to additional bias in the measurement of social economic bias.

Sample size

It is unclear how the study size of 3082 was determined to predict behavior, and yet this is not taken into account in when calculating the study size.

Study duration

HIV Testing and Counseling occurs during the entire pregnancy (first to third trimesters). Attitudes, moods, knowledge evolves continuously during pregnancy and depending on the gestation of pregnancy. Therefore, it is inconceivable that within 2 months, all these factors would have been explored. Perhaps following a cohort study of first or second trimesters throughout the gestation from mid trimester would have been more useful and provided less biased results.

Data management

Data collection

3 FGD were conducted to pre-test the questionnaire and to identify barriers to HIV testing and counseling which is good. In the second paragraph under study design and participants in the middle, the researchers forwarded the questions to FG participants, how this was done should be better described.

The second phase consisted of face–to-face interviewer administered structured questionnaire, which was back translated and validated, which is good. 17 research assistants were trained, and they were college students, which is excellent. Moreover, the RA were trained and supervised by the principal investigator.

There is a minor contradiction in the middle of the paragraph 3, under study design and participants. It is written that, the interviews were conducted in the maternity waiting area and in another line interviews were conducted in private. The author should check the manuscript to ensure consistency.

Why did 49 women refuse to participate?

The third phase follow up data was collected by PMTCT counselor from PMTCT log books. Is two hour training for the counselors adequate? When was linking of the questionnaire data with HIV test results done and was it done on the same day? Paragraph 4, the issue of unique identifiers is repeated.

Having two groups of data collectors and having varied training has the potential to introduce measurement errors and information bias. The last sentence in paragraph 4 implies that data for phases 2&3 was either collected on the same day of within a week, increasing making a case that the study design is cross sectional.

I think the paper should describe study variables before the data collection. The exposure and outcome variables and potential confounders/effect modifiers should be defined a priori to enable more systematic statistical analysis.

In the first paragraph under the subheading study variables, it is clear how the
data on exposure outcome variables was collected and categorized

Statistical Analysis

It is implied that a comparison was made between study participants in public and private health facilities, but it is unclear whether exploring the difference between public and private healthcare settings was one of the research questions?

If indeed, it is settled that whether this is indeed a prospective cohort study, or cross sectional, the statistical analysis would be fundamentally different. If the study is indeed a cohort design, risk and rates of intention to test and actual HIV testing and counseling should be calculated. In cohort studies time factor must be taken into account in the analysis that is why a better measure of effect in a cohort is a rate. On the other hand, if this is indeed a cross sectional study which looks more likely, odds or risks and appropriate ratios, 95% CI would suffice. Similarly, appropriate multiple regression analyses (Logit for cross sectional and either Cox or Poisson regression analysis done for cohorts). Multiple linear regression analysis would not be most appropriate for categorical variables. Did the researchers consider the possibility that intention to test is on the causal pathway for actual HIV testing?

Results

It is still unclear to me what constituted a follow in this study. Is a follow being able to link a participant with actual HIV testing which was done on the day of the interview?

In table 1, there is an attempt to compare characteristics of the participants by the type of the health facility. If indeed this was one of the research questions, and then it would be fine. Otherwise, this might be construed to be data drenching!

The rest of the results would be entirely different is the appropriate statistical data analysis tools for the study design are used.

Discussion

The discussion of the results is quite comprehensive and good. On page 20, third line from the bottom. It is implied that unborn child should be consulted before making decisions about HTC. The opening line on page 21 states the obvious that actual HIV testing was significantly associated with intention. Is this what is expected? I suggest to the authors that intention to test for HIV is on the causal pathway for actual HIV testing and counseling and not an outcome.

Any important limitation of this study is study design. On page 21 the second last paragraph the authors report that the time interval between measuring intention and actual HIV testing was short. There was no time interval.

The authors report that physical activity and false positives were associated with the gap between intention and behavior. What is the relevance of this to the current study?

The authors should discuss the implications and limitations of the study and not focus too much of theoretical assertions.
Conclusion
This is well captured, it is implied therefore, that the study findings don’t have further implication for further studies or policy, or practice change on the subject.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**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.