Author's response to reviews

Title: Correlates of STI-testing among vocational school students in the Netherlands

Authors:

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Author's response to reviews: see over

August 31th, 2010

Dear Editor,

Thank you for your response and the comments from the reviewers on the manuscript titled 'Correlates of STI-testing among vocational school students in the Netherlands'. We highly appreciated the thorough feedback from the reviewers, and have incorporated most of their suggestions and reconsidered the issues raised by the reviewers carefully.

We have also adjusted the manuscript in accordance with the editor's request, regarding the acknowledgement of Herman Schaalma in the acknowledgement section; including the abstract in the manuscript document and we have included a copy of the survey as an additional file.

Here below we send you a document with point-by-point responses to the concerns of the three reviewers. We have uploaded a revised version of the manuscript on the website.

We hope this revised paper is acceptable for publication in BMC Public Health,

Sincerely yours,

Mireille Wolfers,
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Reviewer: Rebecca Swenson

Introduction

Overall, the introduction is well written. However, authors could provide a stronger rationale for examining testing intentions among vocational education students in the Netherlands. Further discussion of the high proportion of immigrant students enrolled in vocational schools, the rates of STIs/HIV from students' countries of origin, and especially the potential psychosocial reasons for low testing rates and intentions among these populations (as compared to students of Dutch origin) would be more compelling and interesting.

Answer:

Thank you for the positive comments on the introduction. However you suggest to provide a stronger rational for our study by elaborating more on the immigrant background of the students enrolled in the study.

We have tried to strengthen the rational for our study in the introduction. At page 4 we added more about the ethnic composition of the group, who have different STI-risk, and about dissasortive mixing between the students in order to have stronger arguments for prevention programs to prevent transmission of STI between adolescents. We also tried to explain why most studies on HIV testing are not really applicable to our target group (5th para introduction, page 5-6)).

1. Authors do not clearly distinguish between past STI testing behavior and future intentions to be tested in the introduction. Past behavior does not necessarily equal future intentions. This distinction is important and should be discussed, as well as the author's rationale for examining both past behavior and future intentions. (MC)

Answer:

According to Fishbein and Ajzen's reasoned action approach (to which the Integrative Model belongs) intention is predicted by its 3 proximal determinants (attitude, perceived norm and perception of control), and that background variables have influence on these 3 variables. Past behaviour is considered to be a background variable. We did mention this in the introduction (5th para) . [1].It is shown that by adding past behaviour to the prediction equation for the prediction of intentions, more variance can be explained [1]. That past behaviour is not entirely mediated by the theorie's three major predictors shows that intentions and past behaviour have some variance in common that is not shared by attitude, perceived norm and perception of control. So it is not our message that past behaviour equals future intentions, but they have some variance in common, and past behaviour is added for the accuracy of the prediction of intention. In the methods section page we did write that past testing behaviour was significanty predicting intentions univariate, and was therefore added to the equation.

It is not uncommon to add past behaviour to the equation to better predict intentions, also for sti-testing , for example [2]. For clarity we have added a line in the introduction at page 7 about the special role of past behaviour in relation to intention.

2. The authors briefly discuss the Invention Mapping (IM) protocol implemented in vocational schools in Rotterdam, but do not provide much description of it. Dis authors assess whether participants in the present study were exposed to an IM STI testing intervention prior to completing the survey? If so, what impact would this be expected to have on their testing intention? Can this be statistically controlled for?

Answer:
In this article we describe a survey that is conducted in the needs assessment phase of the development of an intervention using Intervention Mapping. Intervention Mapping is a protocol for developers, that guides intervention planning and the needs assessment phase is the first phase. This means that in this phase the intervention is not yet developed, and the participants in the present study have not received this intervention. For clarification we have added some extra explanation on Intervention Mapping at page 5

Why do authors propose that the current interventions are not working to increase testing rates (if this is indeed the case)? (MC)

Answer:
At the time of the study no interventions to promote testing were aimed at vocational students. We state in the introduction that risk behaviour is high and test rates are low, and that prevention activities are therefore warranted, this being the reason for developing a new intervention. We have added a sentence in the introduction about the lack of interventions on sti-testing aimed at vocational students on page 5.

3. Is the Precede-Procede Model being used by authors to guide the current study? If so, authors may wish to describe the Precede-Proceed Model in more detail. In general, the purpose of this paragraph is somewhat unclear to me. Do authors wish to highlight determinants of testing that have previously been examined or point out that current STI testing promotion interventions in the Netherlands may not contain important psychosocial determinants of testing behavior? (ME)

Answer:
No, the Precede-Procede Model is not used, as we tried to explain on page 3, last sentence of the third paragraph, it is only mentioned in the fourth paragraph as another planning model that also elaborates on the needs assessment as an essential first step in intervention development. We regret that the purpose of the paragraph is unclear, but we have tried to explain why we need to study behavioral determinants of testing among our target group, because no relevant data is available that

we can use. Others have studied testing in relation to HIV, or in other target groups, such as homosexual men, and the use of a comprehensive behavioural model is also scarce. In sum this is not sufficient as a base for an intervention to promote testing for our target group. For clarity on the purpose of this paragraph we have now added a few lines at page 5-6 to emphasize why we think that the available research into determinants of testing among homosexual men is not entirely relevant for our target group,

4. It is great to see that the authors based their study on a theoretical model. That said, the research question could be more clearly defined. Authors may wish to include a figure of the Integrative Model as it relates to their specific hypotheses. Authors' hypotheses should specify expected directions of relationships between proposed factors and STI testing. (ME)

Answer:
We have added a figure with the Integrative Model which served as a theoretical framework on which the analyses are based.

Method
1. Participants –
a. What were the inclusion/exclusion criteria? Why were only 1st & 2nd year students selected? Table 1 indicates four levels of education in the sample of 501 sexually active participants. (ME)

Answer:
Yes, this is correct and we have described this at the methods section in the 4th sentence. In the footnote of table 1 an application is given on the educational levels.

b. Can authors provide a source citation for data on the gender and ethnic distribution of the general student population? (ME)
c. Authors state that 29% of students in the full sample of 756 were non-Dutch, but that 62% in the sexually experienced subset of 501 were non-Dutch. This is a large shift. Can authors explain why levels of sexual experience were so disparate across nationality? The distinction between Country of Origin and Ethnic Background is unclear in the methods section. A better distinction between these measures/constructs in the manuscript body (as opposed to in Table 1, only) is warranted. (ME)

Answer to b and c:
We have added the source citation. We have also changed the comparison for ethnicity, since the use of 'country of birth' as well as 'ethnicity' was not very clear, we acknowledge this was rather confusing:
The 29% of non-Dutch respondents in the full sample of 756 the referent is referring to was based on country of birth of the students while the 62% of non-Dutch in the sexually experienced subset of 501

was based on the definition of ethnicity as it is used by the Dutch government (based on country of birth of the parents).

We now have used only one definition: the definition of ethnicity as it is used by the Dutch government (Based on the definition of Statistics Netherlands: a person whose parents were both born in the Netherlands is classified as ethnic Dutch, a person of whom at least one parent was born abroad is classified with a non-Dutch ethnic background).
As a consequence we are now comparing ethnicity from our sample versus ethnicity from the whole vocational school population in the area. (page 8) We also see that the ethnicity of the subset of 501 is not very different from the whole sample of 756. We already had stated this at page 8, first sentence of second paragraph of methods, subsection participants.

2. Measures –
a. I have some concerns about the measurement of behavioral intentions for STI testing in this study. In the Theory of Planned Behavior, intention is measured by asking participants if they intend to be tested in the future and in Stages of Change models, readiness to change is assessed by asking participants about testing now, in the near future, and in the more distal future (e.g., 1 month, 3 months, 6 months, etc.). In the present study, authors present hypothetical situations and then ask participants if they would get tested in a similar situation. It is not clear that this really measures intention to test or a different construct altogether. (MC)

Answer:
Regarding to the theory of Fishbein and Azjen, the behavior of interest should be clearly defined, in terms of the action performed, the target, action, context and time. Those 4 elements should be defined as narrow as possible within the framework of the study. Also, a high degree of compatibility between measures is fundamental [1].

In our study, the behavior of interest - STI-testing- is not a behaviour that all students will need to perform. To define the target behavior within a time frame will be of little value in this target group simply because they are not sexual experienced, or they have no reason to go for a test, and it is difficult to define a specific time frame for when they are developing risk behaviour. The most common reasons why they are advised to take an STI-test are: after they had unsafe sex, of before they start unprotected sex with a new partner. This is the contemporary prevention message that is used for young heterosexual people in the Netherlands. So for our study purpose defining the context in which students should go for a test serves the research purpose best. We are not unique in using this context for measuring testing intentions and behaviour (f.e. [2]). We have now added a sentence on to explain the reason for the use of the context in the methods at page 11 at the 2nd para of the subsection psychological constructs.

b. Several measures were developed by the authors for the present study and thus have unknown reliability/validity for this very diverse sample. For those measures that were previously developed, can

authors provide internal consistency estimates among Dutch and (if available) the other ethnic populations sampled for the present study? If reliability/validity data are not available for the specific measures, authors should include this as a limitation. (ME)

Answer: We have added the internal consistency for those scales (Crohnbach's Alpha) in the methods section.

c. Authors may also consider conducting factor analyses of the newly developed measures and testing for cultural invariance. (DR)

Answer:
When designing the study, we decided not to perform factor analyses, since this is not necessary to answer our research question: finding most relevant and changeable behavioural determinants to inform intervention development. This study was not intended to do rigorous testing of a theoretical model.

d. The measures section would be easier to read if authors had subheadings for each construct or construct category that mapped onto the Integrative Model. In addition, I would suggest putting the demographics first, followed by the outcome measure (testing intention), and then the predictors. (ME)

Answer:
We have adapted the measures section according to the referents advice.

e. Did all participants receive the survey in the same language (Dutch) or were there different versions? (ME)

Answer:
All participants indeed received the survey in Dutch. We have added this information at page 9 in the procedure subsection.

3. Procedure – The recruitment and assessment procedures are adequately described and scientifically sound. The authors pilot-tested the survey instrument to determine it's appropriateness for the sample and conducted analyses to assess test-retest reliability. One question remains regarding incentive. Did participants receive course credit for their participation or another form of compensation (e.g., gift card, cash)? (ME)

Answer:
The participants did not receive credit of compensation, they were only offered a small incentive, such as a pen and a condom. We have added this in the procedure subsection at page 9.

4. Data analysis – How do data analyses map onto authors' hypotheses? Stating the specific hypotheses either in the introduction or here, and describing the analyses used to test each hypothesis would clarify this question. As it is, the description is hard to follow in a sequential manner. (MC)

Answer:
We described a common procedure to investigate determinants of behavioral intention, using a lineair regression model. In the methods, we have described step by step how we performed the analyses. In the introduction we have described the theoretical model. To our opinion this is clear and in line with the literature, also the two other referents have not commented on this procedure and its description in the methods and introduction.

Results
1. Again, the results should map onto the hypotheses and proposed data analyses. Given that the main outcome measure appears to be behavioral intentions to test, this objective gets lost in the description of sexual behaviors and determinants of past STI testing.

Answer:
In order to understand the behaviour and the importance of the problem under study (namely sexual risk behaviour in adolescents, promoting sti-testing to prevent and treat sti among adolescents) it is important to describe the sexual behaviour in this group, and their experience with testing. And we did describe 'to assess sexual risk behavior' in the study purpose (last part of the background). For clarity we have now added to the purpose at page 7 that we also assess the behaviour STI-testing.

It is unclear at times if authors are referring to actual or intended testing. (MC)

Answer:
When we mention 'the intention to test", this is intended testing, but we describe their past experience with testing in the paragraph "STI-testing". For clarification we have renamed this paragraph at page 15 into "Past STI-testing".

2. Authors appear to have assessed behavioral characteristics of males and females separately. What is the rationale for doing so? Would it then make sense to conduct the regression analyses for intention to test separately by gender, rather than simply controlling for gender? (ME)

Answer:
We have decided not to conduct the regression analyses separately by gender. The reason is that we have explored whether there was significant interaction between psychosocial correlates and gender, which was not the case (described in methods-subsection data analyse and in the results-subsection

intention to participate in STI-testing) It was therefore better and more transparent to perform one analysis for the whole group. However it might be interesting for the reader to see what differences there are in the behaviour and scores on behavioral determinants because girls were more likely to have been tested in the past. This is the reason we show the behavioral characteristics and determinants scores for males and females separately in tables 1-3. We have added some lines about this issue in the discussion at page 19.

3. I would also be interested in seeing comparisons across country of origin, in particular, Dutch-born versus immigrants or Dutch nationality versus non-Dutch nationality. (DR)

Answer: We had already used ethnicity in our regression model, and we have seen that this was not an independent predictor of intention to testing the multivariate model. We agree that comparisons Dutch-born students versus students migrant background are interesting, so at page 15 and 16 we added information about this in the results at the para on sexual- and test- behaviour.

In answer to this question we have also made comparisons between 1st and 2nd generation migrants: students with a non-Dutch ethnicity born in versus outside the Netherlands. However no differences exist in test-history, test location, sexual risk behaviour, intention to test and other behavioral determinants (only 2nd generation migrants score less on knowledge and score slightly higher on severity). We think it is not useful to perform separate further analyses. It was also not a research question or a hypothesis that we made for this study.

4. Given that test site characteristics are a significant determinant of testing intentions, authors might consider spending more time discussing this in the introduction so readers are not surprised to find this measure in the analyses.(DR)
Answer:
We agree with the referent, so we have given some examples from the literature regarding the test characteristics that facilitate the acceptance of testing.

Discussion
1. The conclusions are clear and appear to be supported by the data. However, it is not clear from the discussion what new findings the present study adds to the STI testing literature. Authors could do better at highlighting the differences between this study and others. (MC)

Answer: We have tried to improve this giving more explaining on why we think that our study adds to the STI-testing literature in the background section at page 5 and 6.

2. A particular strength would be a greater discussion of the uniqueness of the sample – a predominantly non-Dutch sample (62% non-Dutch and 31% immigrant) enrolled in vocational schools. What impact might being a first-generation or immigrant adolescent in the Netherlands have on sexual

behavior and awareness of or access to sexual health services? What is the prevalence of STIs in the countries of origins and are there assortive mating patterns among the teens (i.e., do non-Dutch adolescents date or have sex with Dutch adolescents or are STIs perpetuated more within minority ethnic groups)? Again, ethnic group or immigrant status analyses would allow for more discussion on this topic. (MC)

Answer:
We agree that more discussion on the migrant background of the sample, and the impact on sexual health would be interesting. This is why in the background at page 4 we added a paragraph on the ethnic composition of our sample and sexual mixing between the different ethnic groups in the Netherlands. We also discuss the implications of our findings for the future intervention development with respect to ethnic diversity in the discussion at page 19.

Reviewer: Winnie Luseno

Reviewer's report:

Major Compulsory Revisions

1. Background, fifth paragraph: From my review, I believe that the authors need to rewrite the purpose of their study because I do not think they assessed environmental factors prediciting STI-testing among adolescents.

Answer:

The concept of environment in social cognitive theory refers to factors that are physically external to the person, such as social support and providing opportunities [3]. In our study such environmental factors are included, such as the test-site characteristics, and social support, so we believe that mentioning it in our purpose is correct.

Minor Essential Revisions

1. Background, fifth paragraph: the authors need to provide reference citations for the various theories on which the Integrative Model is based that they list.

Answer:

We have added the reference citations.

2. Background, fifth paragraph: the last sentence "The Integrative Model functioned as our theoretical framework" is a repetition of the second sentence of the same paragraph.

Answer:

We repeated this because belongs to the purpose and hypotheses used for this study. We hypothesize that constructs in this theoretical framework are able to predict the intention to test among our target group.

3. Methods, second paragraph: please spell out ICT.

Answer:

We have spelled it out

4. Methods, fourth paragraph: add the following "Socio-demographic characteristics of the final sample..."

Answer: we have added this

5. Methods, Measures sub-section, first paragraph: delete "Prior experience with testing was also assessed". This is already stated in item # 6 above.

Answer: we have deleted the sentence

6. Discussion and Conclusion, third paragraph: Add a reference citation following the sentence "...; according to theory, the beliefs should be multiplied by their outcome evaluation."

Answer:
We have added the reference citation at page 18

7. In general the authors need to carefully read through the paper for minor editorial and grammatical errors.

Answer: we have done this

Discretionary Revisions
1. Background, second paragraph, third sentence: the authors need to clarify whether the national study referred to followed individuals until they 25 years old (i.e., a longitudinal study) or if the study surveyed 25 year olds. If the former, the authors need to indicate at what age participants were recruited.

Answer: it was a crossectional study among young people from 12-25 years old, we have changed the sentence for more clearity.

2. Background, fifth paragraph: a diagram depicting the proposed model would be instructive.

Answer:
We have added a figure with the Integrative Model

Reviewer: Esther Sumartojo

Reviewer's report:

Major Compulsory Revisions

1. Abstract - Please develop an abstract for the manuscript; there was not one included in the submission.

Answer:

We have in included the abstract in the file of the manuscript.

2. Methods, Participants, para.2 - Please spell out ICT here and in Table 2 as a footnote. Explain if needed.

Answer:

ICT means Information and communication technology, we have spelled it out now in the text and added an explanation in a footnote in table 1.

3. Methods, Procedure, para.1 - Please explain how students provided consent.

Answer:

Students were asked consent at the first page of the interactive online questionnaire, before they could precede. We have added this information in the methods section, in the subsection about the procedure.

4. Methods, Data Analysis - Did you consider multiple comparisons? If so, please explain.

Answer:

No, we have not considered multiple comparisons. We have used multivariate linear regression which is in our view the most appropriate approach.

5. Discussion and Conclusion, para.4 - You state that the negatively skewed distribution may have affected the measure of severity to prevent it from predicting intention to test. Clarify this statement.

Answer:

We have clarified this.

6. Discussion and Conclusion, para.7 - Expand on the limitation of the validity study. Here or in the methods section, provide additional information on how the validity study was done. Also, include a discussion of the implications of multiple comparisons on study findings.

Answer: We have provided extra information on the validity study in the method section on page 10

7. Table 1 - Define or spell out "ICT". Also spell out "CBS" in footnote 2.

Answer: we have done this

Minor Essential Revisions

8. Methods, Procedure, para.2 - Instead of "different cultural backgrounds", I suggest you say "a variety of cultural backgrounds" for clarity.

Answer: we have changed this

9. Methods, Psychosocial Constructs, para. 2 - In "Testing behavior and perceived norm of partner were both assessed..." , the word "each" instead of "both" would be more clear.

Answer: we have changed this

10. Discussion and Conclusion, last para. - Replace "similar variances" with "similar variations" for clarity.

Answer: we have changed this

Discretionary Revisions

11. Methods, Participants, para. 1 - Provide information on how the convenience sample was selected.

Answer: we have added one sentence with extra information in this para on page 7.

12. Methods, Participants, para. 1 - Consider this rewording: "Of the 972 students approached for participation, 918 (94.4%) agreed to participant and of those, 778 (84.7%(completed the survey."

Answer: we have reworded this.

13. Methods, Participants, para. 2 - The sample sizes for each calculation are not clear. Since space is not limited, I suggest you show this information in a table so that readers can more easily understand how you calculated the chi squares and t-tests.

Answer:
In the text, test statistics,with sample sizes and degrees of freedom are reported completely. So we decided not to add an extra table.

14. Methods, Procedure, para. 1 - It appears that teachers supervising the students might influence their responses. Explain in more detail how supervision was done.

Answer: we have added some information in the procedure at page 9 on the supervisory done by the teacher.

15. Methods, Procedure, para. 2 - How did you deal with language proficiency among the study participants? Were all participants sufficiently proficient to complete the questionnaire?

Answer: we have added some extra information on the adaptations made as a result of the pretest.

16. Results, Psychosocial Determinants, para 1. - You mention "sample scores" and "scale means". How were the scale means derived? I did not see this discussed in the methods.

Answer:
We did describe this in the methods section
(at page 11 1st para psychosocial constructs: "When measured with multiple items, the mean score for each construct was calculated but only after internal consistency was established").

17. Results, Psychosocial Determinants and Intention to Participate - I suggest a diagram to display the correlations among variables. This would also give you the opportunity to demonstrate graphically the theoretical relationships among factors in the TPB.

Answer: We have added a figure with the Integrated Model which we have used.

18. Discussion and Conclusion, para.3 - Define "outcome evaluations" and how they fit into TBP.

Answer: we have added an explanation and a example.

19. Discussion and Conclusion, para.5 - There are other relevant papers that you may want to review - at your discression. One is our paper on correlates of HIV testing: Sumartojo, E., Lyles, C., Choi, K.H., Clark, L., Collins, C., Guenther Grey, C., Lin, L.S., Peterson, J., Remafedi, G., CITY Study Team. (2008). Prevalence and correlates of HIV testing in a multi-site sample of young men who have sex with men. AIDS Care, 20(1), 1-14. Several papers are cited in the discussion on reasons for not testing and making testing more comfortable; I suggest you see these citations, including: Mutchler, M. G. (2000). Making space for safer sex. AIDS Education and Prevention, 12(1), 1-14.

Answer:

We have reviewed these papers. However these papers are about hiv-testing among homosexual men, and their situation and context is quite different from that of heterosexual adolescents with respect to STI testing in the Netherlands. We have added some lines on this in the background section at page 5 and 6 and we have added two of these papers as a reference.

20. Discussion and Conclusion, para.6 - Define "priming strategies".

Answer: we have added an explanation and an example of the application of such a strategy in our program at page 20.

21. Discussion and Conclusion, para.7 - In order to shore up their limitation sections, authors typically mention that their cross-sectional studies can not establish causation, but it seems that you are really trying to test the usefulness of a theoretical approach in order to determine covariates of testing rather than measuring causation. You may still want to make the point about causality, but it would be good to see a cogent argument about why we aren't always looking for causality.

Answer: we have changed this, and have reformulated it for clarity at page 20.

22. Discussion and Conclusion, para.7 - Include again a discussion of the implications of multiple comparisons.

Answer:
See our earlier answer to 4.

23. Conclusion - Note that you say "that interventions" twice.

Answer: we have removed it the second time.

24. Conclusion - I would really like to see more about possible public health interventions in this section. A number of researchers have used Fishbein's excellent theories - see the literature on HIV for example - some cited among your references of course. You might try to put your findings in the context of the broader literature on prevention of risk behaviors using the the TBP.

Answer:
We think that our research fits in the context of the literature on the prevention of risk behaviors. Especially because we work according to the Intervention Mapping protocol. [4] IM makes a broad use of behavioural change- and prediction theories, and a next step in the intervention development after the task of research into behavioural determinants (as described in this article) is defining the exact behavioural changes, and learning objectives that are needed. Subsequently theories will be selected that will guide the selection of methods and strategies that can best be used to achieve this behavioral

change. In the introduction of our article, we have tried to explain in short that we used IM and how this model emphasizes the use of theory in interventions development. We are now also including IM in our concluding paragraph to show that our research fits into a broader context of theory and evidence based intervention development.

25. Table 4 - Title, I suggest you say ",,,with intention to test and standardized...".

Answer: we have changed this

References

1. Fishbein M, Ajzen I: *Predicting and changing behaviour; the reasoned action approach*. New York: Taylor & Francis; 2010.
2. Vermeer W, Bos AE, Mbwambo J, Kaaya S, Schaalma H: **Social and cognitive varables predicting volutary HIV counseling and testing among Tanzanian medical students**. *Patient Educ Couns* 2009, **75**:135-140.
3. Baranowski T, Perry CL, Parcel GS: **How individuals, environments, and health behavior interact. Social Cognitive Theory.** In *Health behavior and health education Theory, research and practice*. third edition. Edited by Glanz K, Rimer BK, Lewis FM. San Francisco, CA: Jossey-Bass; 2002:165-184.
4. Bartholomew LK, Parcel GS, Kok G, Gottlieb NH: *Planning health promotion programs. An Intervention Mapping approach.* 2nd edition. San Francisco, CA: Jossey-Bass; 2006.