Author’s response to reviews

Title: Factors deterring dentistry, medical, pharmacy, and social science undergraduates from pursuing nursing as a healthcare career: A cross-sectional study in an Asian university

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Author’s response to reviews:

Dear Professor Kerry Wilbur,

Thank you so much for your letter on 08 October 2017 regarding Manuscript MEED-D-17-00366 entitled "Factors deterring dentistry, medical, pharmacy, and social science undergraduates from pursuing nursing as a healthcare career: A cross-sectional study in an Asian university”

We are grateful for the comments and suggestions of the reviewer. I have worked with my co-authors and revised the original manuscript as recommended by the reviewers. Below I have listed each actionable reviewer comment along with our response and location of change within the manuscript. All significant additions and alterations have been included in red font, both in this document as well as the manuscript itself.

The grant funding to support the article-processing charge will be due in December 2017. We would like to request the journal to expedite the reviewing process.

Thank you for the opportunity to submit this revised manuscript for consideration of publication in BMC Medical Education.
Best wishes,

Sok Ying Liaw on behalf of all manuscript authors.

Reviewer 1 (Lingling Zhang, ScD, MS, MPA):

Thank you for the opportunity for reviewing. It is a well-written manuscript that addressed an interesting question.

The authors selected a very unique population: First-year students undertaking medicine, pharmacy, dentistry, and social science courses. This population can certainly reflect some perspectives of this research question. However, in my opinion, this population would not be very convincing. For instance, students who rejected nursing as a career may take other courses than the courses included in this study. I personally think that undergraduates who reject nursing as a career would be more appropriate.

Response: Thank you for the suggestion. We agree that looking at a broader population (i.e undergraduates who reject nursing) would bring about a different perspective and more convincing results. However in this study, we are looking into why healthcare students who tend to have similar interest in helping others did not eventually join nursing. Identifying these factors can provide more specific suggestions to improvement in nursing recruitment as compared to a more general population. I have included more emphasis on this part in the introduction and limitation section (pages 5 & 13)

Background - I would recommend the authors include more details regarding the nursing education/training process in Singapore in the background section.

Responses: A paragraph on nursing education in Singapore has been added to the background section in page 4.

Methods - On Page 7, "One-way ANOVA was used to ... among the five different healthcare groups". Please clarify which groups the authors referred to here. There are only four groups (Medical, Pharmacy, Dentistry, and Social Science).

Response: The word ‘five’ has been changed to ‘four’ different healthcare groups.

In addition, please consider conducting multi-variable regression analyses to control potential confounding factors (e.g., demographics, social-economic status, etc.) among these different groups.
Response: Many studies have looked into the how demographic and socio-economic status may influence perception of nursing. We did not report this as it is not the focus of our study.

Results - On Page 7, Demographics: "most were females (n=280, 62.9%)". If my calculation is correct, the percentage of female should be 47% (280/604 = 47%).

On Table 1, the gender distribution (male: 224 and the female: 280) suggested that the total N would be 504, rather than 604 indicated in the text body. Please double check the calculations throughout this manuscript.

Response: It has been changed to ‘female (n=380, 62.9%)’ for both page 7 and table 1. All calculations were also double checked.

Discussion - Social-economic status could be an important factor that influences students' career choice. Please further discuss its potential impact.

Response: Socio-economic status has been discussed in two different factors in terms of social influences and job prospects.

Limitation - I would suggest the authors further discuss the limitation regarding the population selection (see my comment above).

Response: A sentence has been added to discuss this limitation in page 13.

Reviewer 2 (Kerry Wilbur):

Factor deterring undergraduates from pursuing nursing is an interesting examination of student choice for the nursing profession.

Page 3, line 6: Consider using present tense instead of 'it WAS further estimated...' and 'will' instead of 'WOULD increase by one billion'

Response: This sentence has been removed to include more on difficulty in recruiting and retaining nurses.
Page 3, line 24-26: what data do you have to support the significant challenges in nurse recruitment and retention

Response: Citation has been added to support this in page 3.

Page 3, line 52: I am unfamiliar with the term, "school leaver" and perhaps other readers are. Line 57-58: consider combining these sentences ("their career choice." and "This would”).

Response: An example has been added to explain the term ‘school leaver’ in page 3.

Page 4, lines 23-31: Tell me more about these parallel scales. What is the relevance of the 2nd parallel scale? Why not use just 1?

Response: These scales enable the comparison between the influences of healthcare career choice and perception of nursing as a career choice. More details on why parallel scales were used are included in the section of ‘validity and reliability of instrument’ (page 6)

Page 5, Participants: Were investigators involved with these courses?

Response: Investigators are from the nursing department and hence not involved in the courses where participants were recruited.

Page 5, Ethical Considerations: Is the submission meant to be blinded? The IRB code unblinds it.

Response: IRB code has been removed

Page 7, lines 21-23: I am looking for more information on these "potential participants" and "good representation of the number of students". How many of each are in each discipline's program? I don't have a good sense of the population number.

Response: A breakdown of population from each discipline is included in the ‘participants’ section (page 5) as well as Table 1.
Page 8, lines 1-2: What does it mean when you say nurses were less likely influenced by their personal interests? What are examples of personal interests they ignored? Why would they be more likely to ignore them than others?

Response: This is a comparison between the HCC and NCC scores. The difference in the mean scores suggest that healthcare students such as medical students see themselves as being more likely influenced by their personal interest to join medicine as compared to the influence of personal interest on the nursing career. The sentence has been changed in page 8 to make this point clearer.

Page 12, line 28. "perceived as gays" - this is an inflammatory way to write about sexual orientation. Please try something like "linked to a perceived sexual orientation".

Response: The word ‘gay’ has been replaced with being effeminate.

Page 12, lines 36-38: What are the references for these studies?

Response: References were added to for these studies.

Page 13, Limitations: Are there other tools that could have been used in this study? Is this the first time using the tool in a study (sorry if I overlooked this elsewhere).

Response: Yes this tool has been used in another published paper cited in page 4 of the manuscript.

Reviewer 3 (Peter Johnston):

General -I like the idea of this paper and I see the message. In addition there is I think an interesting social and cultural narrative that is present in the data however the authors do not point this out which in the context of world literature, they might do to good purpose. I think that unfortunately there are some problems that preclude its publication in the current form. These are specified below.
Introduction - I would suggest reorganisation of the introduction with more emphasis on the gap in knowledge and the insights the study brings. For example, we see on lines 24-25 a sentence about the difficulty in recruiting and retaining nurses. This seems to me to be an international issue and might better be couched in those terms. Further, I would like to see this at the top of the introduction rather than in the second paragraph.

Response: More emphasis has been placed on ‘difficulty in recruiting and retaining nurses.’ It has also been shifted to the first paragraph of the introduction.

There could also be more clarity about the research question addressed in the study. This is not spelled out and usefully could be. Linked to this is the question about what the study brings.

Response: A paragraph was added at the end of the ‘background’ section to ensure clarity of the research question to this study (page 5).

The selection as a study population of people who have already decided they will not be nurses yet will work in the health professions must surely apply some bias - these are first year students and so is it not likely they will be more positive about their own choice than a career they did not enter? In that regard and in the light of the quoted evidence, is a negative result not inevitable? This conclusion may be wrong but I think it could be addressed to add more depth to the consideration of the results.

Response: It is understood that the participants will be more positive about their own career choice. However, our study aims to identify the differences in factors influencing healthcare career choices and nursing as a career choice. A sentence has been added to address this limitation and suggestions made for future studies (page 13).

Methods - Helpful if the term "convenience sampling method" could be explained briefly and referenced.

Response: The term ‘population based sampling’ has been used instead. This has been explained and referenced in page 5.

Data collection - This and the following section could be compressed into one - I respect the cultural requirement to seek approval of a departmental head however in this context, the ethics is more important. That heads agreed could be added after as a single sentence.
Response: Data collection and ethical considerations has been compressed into one paragraph in page 6.

It would be helpful to outline the HCC-NCC parallel scale measure. I accept that this is well described in the paper by Liaw et al 2015. None the less, having that reference at the start would be useful and then a summary of what the scale actually tells us. The need for the bulleted list that follows may then be removed and thus save space. Alternatively, it might appear in a short table, referring to the Liaw paper.

Response: More details on the HCC_NCC parallel scales were included in this section to ensure clarity and suggest the need to use the HCC_NCC parallel scales (pages 6-7).

Data analysis - Likert scores are ordinal numbers, not linear, and thus converting to a linear scale may be an issue. Do we know, for example, that the difference between a score of say agree and neither agree nor disagree is the same distance as difference between agree and strongly agree? Generally, we do not. And so, the data are not normally distributed and thus it is argued that using paired t-tests is not appropriate. Rather, non-parametric tests (Chi square, for instance) would be more appropriate.

The methods also note the use of a p value of <0.05 as the threshold for "significance" and then proceeds to do multiple t-tests. The likelihood of these producing random answers less and 0.05 is one in 20. I would expect to see the p value being corrected (eg Bonferroni correction) to reduce the likelihood of spurious significance.

One of the other points is that t-tests tend to imply that the data groups compared are of equivalent sizes. The numbers here suggest this is not the case, again questioning the data handling design.

With these observations in mind, the data analysis is in my view flawed and would need to be reworked justifying the use of t-tests as opposed to non-parametrics and adjusting for multiple tests.

Results - With the methodological concerns outlined above, the interpretation of the results is thus uncertain and what is described may need to change as results and their differences or lack of difference become apparent.

Response: We do understand your concerns. However, we do have adequate sample size in this study which qualifies for parametric test with Likert scale ordinal data as according to Jamleson (2004). Norman (2010) has provided evidence to suggest that parametric tests can be used in
ordinal data such as Likert scales, and tend to be more robust than non-parametric tests. A sentence has been added in page 7 to support the use of parametric test in this study.

References:


Discussion - The discussion is on the long side, has a tendency to be speculative and makes some leaps of faith.

P10, line 36: "A lack of nursing exposure primarily be the main reason…." This may be the case however the study does not provide evidence this is the case.

Response: The study results suggest that prior healthcare exposure strongly influence a career in nursing. The word ‘primarily’ has been removed and the sentence has been rephrased. (page 11)

P10, line 56: "This may in turn help adolescents…” Again, it may be right but we are not given evidence to support this statement.

Response: Suggestions on future study have been added for consideration.

P11 line 15 et seq: There is no evidence about courses in the data. Social influences may be part of the issue - in fact, the insights to the social and cultural influences could be compared as I think the data (for example as regards parental approval) are interesting and might not have come out in a European study.

Response: A sentence has been added to consider this comparison.