Author’s response to reviews

Title: Why medical students choose psychiatry - a 20 country cross-sectional survey

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Author’s response to reviews: see over
Covering letter: author's responses to reviewers' comments.

Thank you for giving us the opportunity to revise the above manuscript. We have addressed the reviewers’ comments as follows:

**Reviewer 1:**

**Major Compulsory revisions**

1. Three groups of potential psychiatrists among students are presented in the background. The differences in influencing factors for these groups are not clearly found in your discussion. So, either the 3 groups are not that important (and you could give less attention to the differences in the background), or you point out in your discussion why you did not find notable differences between those groups.

   We have removed the 3 groups from the background and have rewritten this section extensively as follows: “Potential psychiatrists may decide on a career in psychiatry before, during, or after medical school. Factors associated with choosing psychiatric careers include exposure to psychiatrists or mental illness prior to medical school, and subsequent exposure to positive clinical experiences and “enrichment activities” such as electives and research to confirm their interest during medical school [24-26]. The summary of factors already identified as influencing career choice is shown in Table 1. Generally around 3% of students overall select psychiatry as a career [28], and those with positive attitudes towards mental health were around three times more likely to do so [18]. It is useful to understand what factors play a role especially across nations as doctors are global citizens and likely to move around more frequently.

   In this study we focused on medical students because this group reflects medical school selection processes and the effects of psychiatry exposure. This group may also be influenced by factors which medical educators and policy makers can address with sufficient evidence.”

2. The method section presents all important steps in procedures. I only could not follow your last decision, in which initially the ATP-18 score was omitted (with reasonable arguments), but subsequently again added and examined (and for this decision I cannot find any arguments). To me it is not clear why you came to the final decision?

   The ATP-18 was included and excluded because the ATP values were missing for around half of participants due to non-response and technical error addressed in the limitations. If ATP as a variable is included, then the analyses can only be performed on those respondents where this information is available. So we were automatically losing half the data. Hence why the analysis was performed again with this variable omitted so that more respondents could be included in the analysis. We have clarified this in the methods section.
Minor essential revisions

3. In the abstract 6 influencing factors are mentioned, but only 5 are described. Missing is ‘psychiatry elective’ (dedicated to clinical work or study elsewhere).

We have added "psychiatry electives OR 4.28 (2.87-6.38, p<0.001); " to the abstract and made other minor amendments to keep within the word count.

4. In the background you mention the shortage in jobs in psychiatry in the UK (as an example). You could mention this subject in your discussion as a major problem, which could be explored in several countries, even before those countries try to increase the recruitment of students for psychiatry.

We have added in the discussion section:"

As mentioned above, funding, quality and availability of psychiatry training posts varies considerably worldwide, with only 68% of the world's countries offering psychiatry training [7, 8]. Even if adequate numbers of people are interested in psychiatry, their decisions may be influenced by training job availability and prospects. For example, less than 1.8% of new training posts in the UK are for psychiatry and competition ratios are nearly 5 applicant for every 1 post [9]. While outside the scope of this paper, it would be reasonable for countries to ensure optimal training (and specialist) job availability to capture those newly graduating doctors interested in psychiatry.

5. In the result section no table was given on the subject of teaching exposure, attitudes & career choice. I think it would be nice to present this correlation table, because in the abstract especially these findings are referred to.

We have added a table as follows in the Results section (and renumbered Table 6+):

"The association between ATP score and two other factors (quality of psychiatric placement, and number of exposures to psychiatric teaching) was examined using Spearman’s rank correlation (Table 6). Quality of psychiatric placement was significantly associated with career choice and number of psychiatric teaching placements.

Table 6 : Quality & quantity of teaching & ATP-18 scores

<table>
<thead>
<tr>
<th>Factor</th>
<th>Correlation Coefficient</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of psychiatric placement</td>
<td>0.22</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Number of exposures to psychiatric teaching/placements</td>
<td>0.21</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

6. In the discussion you present the unexpected finding that exposure to didactic teaching seems to decrease recruitment to psychiatry. It is not easy to point out an explanation for this finding. So, I would expect a recommendation for further studies on this subject, because teaching is a substantial part of the investments for students.

We have added a recommendation for further studies and that the finding could be Type 1 error.
7. In the abstract and discussion is mentioned that in your findings 4%, respectively 4.5% of the sample was interested in psychiatry. Why are these percentages different? I recommend not to differ on this point.

_We have corrected the abstract and discussion to read “4.5%”._

**Reviewer 2:**

**Reviewer:** Nyapati Rao  
**Reviewer's report:**

1. This is an important study. It examines the factors associated with the choice of psychiatry as a career by medical students in twenty countries. With the increasing global burden of treating mental illness, policy makers are recognizing the need for more psychiatrists and this study attempts to delineate the factors that contribute to the choice of psychiatry as a career by medical students the world over. A related issue is the movement of these physicians to the West seeking training in psychiatry, which is not addressed in this study. Conducting this study must have been a challenge and the organizers must be complimented for pulling this off. The study has the potential to shed light on an important public health issue in many developing countries, but it is not clear whether the study has met its mark.

_You are right in that there were many challenges in the logistics of conducting this study. We debated long and hard at the outset about whether we could somehow capture physician movement globally as a factor, but made a decision that as this is a post-graduate factor and our sample was going to be made up of medical students that it was beyond the scope of our study._

2. The literature quoted is mainly from the United States, whose relevance as a model or template for the current study on the international medical students is not too clear, given the vast differences between the US and the rest of the world in the organization and practice of medicine. This reviewer wonders whether it would have been more useful to have built a survey addressing more culturally sensitive (non-Western) topics like the influence of local healing traditions, plans to migrate after medical school, the stigma about psychiatry, language of instruction, and such other topics. On the other hand, not including the US in this study is a major shortcoming because the methods have been deeply influenced by previous studies done in the US. The form of psychiatry that is practiced in the US is uniquely a product of that culture. It is suggested that the reason why psychiatry is not too popular has to do with its infirm identity as a medical specialty, its lack of financial appeal, and prejudice against mental illness. It is unclear how these factors manifest their prevalence in a wide spectrum of cultures differing in social orientation and economic strength from the US.

_We have reflected the origin of the literature and noted the USA predominance as follows. “Reasons for low recruitment levels are varied. Studies of psychiatry career choice have generally been conducted at national levels [10-23], but not yet at a multinational level. The vast majority of literature identified in our systematic review was from the United States (36%) and UK (25%). These studies have examined personal and experiential factors as reasons why medical students may or may not choose psychiatry as their first career option.”_
We did give national investigators the option of adding extra questions to the ends of their surveys to reflect local culture, and one or two countries have gathered additional data, which will be reported separately from the multi-national results.

The intention was to include the USA, but unfortunately our USA investigator opted out at the last minute without a replacement.

3. Also, the reasons for choice of a specialty vary over a period of time. For example, in the US, anesthesia was once a poorly subscribed specialty, but now it has become more desirable. So comparing studies from the past with current world-wide factors is a problem.

We have added the following paragraph to clarify the time-period of studies included: “The summary of factors already identified as influencing career choice is shown in Table 1. Our literature search to identify these factors took included papers from 1999 onwards to try to reduce the impact of variation over time.”

4. The methodology appears confusing and may be problematic. That the choice of the countries was opportunistic is understandable. But then, the manner of combining paper and electronic methods may contaminate the results. For example, there may be issues of privacy, and consequently honesty of responses, arising due to the different administrations of the survey. The study does not address how these may have been accounted for or possibly impacted the internal validity of the results.

We have reflected this as a limitation in the discussion section: “Different methods of administration of the questionnaire were unavoidable due to restricted internet access in some countries, and lack of support for Japanese script on the online tools available. It is possible that this might have introduced bias, as reminders could be targeted at non-responders more easily using the online tools.”

5. There also appear to be ad-hoc steps taken to increase sample size. Why not take the lack of response as data in itself? Why should any attempt be made to expand the numbers? Furthermore, given its complexity, would a combined qualitative and quantitative approach have made more sense? This is especially significant given that the study did not identify any reasons given by medical students for an ‘unlikely’ response in choosing psychiatry.

We developed a standardised international protocol to increase the response rate after the pilots to ensure the study had adequate power. We were not resourced to analyse qualitative data for the international study, but several of our national investigator colleagues have done this to complement the quantitative results, and this will be reported elsewhere.

6. The study reported using a cross-sectional design but was conducted over a span of two years. This issue would likely impact the internal validity of the cross-sectional design as two years are long enough for countries to undergo major social,
economic, political and institutional changes. For example, the implementation of new health care laws in the US in 2014 could impact the choice of psychiatry as a specialty by medical students within a short span of a few months.

We have clarified the duration of the sample period as follows:
“The questionnaire was piloted in the UK in November 2009, using a sample drawn from student members of the Royal College of Psychiatrists, and is available on request. The study was performed in different countries between March 2010 and June 2011 taking into account large variations in the timescales of ethics applications, and different timings between Northern & Southern hemisphere term-times.”

7. There is a significant issue with the coding of the binary variable of ‘likely/unlikely’ from the Likert scale in the actual survey. The Likert scale value of ‘possible’ was coded as ‘unlikely’ in the binary variable. While the coding of ‘seriously consider’ and ‘definitely’ as ‘likely’ has a strong theoretical basis, the same cannot be applied to the coding of ‘possible’ as ‘unlikely’, when the concepts overtly are antonyms. The fact that this survey was translated into various languages further complicates this issue and the methodology for addressing this problem should be highlighted.

This question was based on the Feifel instrument (new reference 29), which has been widely used in past studies, (sometimes reported numerically and scored 1-5). Most of the studies which have used this instrument have reported their results in groups divided into likely and unlikely, so we have followed this precedent to enable comparison.

8. The startling finding of didactic training in psychiatry leading to a higher ‘unlikely’ response rate puts into question the theoretical basis of the hypotheses and the applicability of the logistic regression. Without a satisfactory explanation this finding gives an ad-hoc flavor to all the results. The current explanation that students prefer clinical experiences over didactic training underscores the importance of the former but do not explain the impact found for the latter variable.

We have expanded the discussion as follows:

“However, students’ ratings of the quality of their teaching were not associated with career choice, except for the unexpected finding that exposure to didactic teaching (lectures) appears to decrease recruitment to psychiatry. This may reflect that fact that this was the commonest method of delivery of teaching, with 1334 of the sample endorsing it. Students who were exposed to problem based learning or e-learning were no more likely to choose psychiatry, but there was a trend [p=0.07] towards simulation teaching. It may also be that clinical exposure is rated more highly by students [58] than didactic teaching, but this finding may also represent Type 1 error. Because this finding is not easily explained, and because teaching is a substantial part of the investment in the training of medical students, we recommend further studies on this subject.”
9. There does not appear to be an organizing thread or theme in the Discussion section. The study classifies countries by income levels but does not provide sufficient results based on these criteria. There are other social variables that have not been given their apparent due in this work. Given psychiatry’s widely varying popularity, and the predominance of local healing traditions such as shamans, mystics and differing attitudes towards doctors, it is somewhat disingenuous to treat psychiatry as a universally accepted discipline. Well-known factors influencing cultural perceptions of psychiatry and mental health have not been accounted for by this study. For example, the pervasive impact of stigma on the choice of psychiatry as a specialty is likely to play a significant role in such a cross-cultural analysis. The study measures personality variables but does not provide measures of internalized and societal stigma that are likely to strongly impact the dependent variable. A related question would be what are the reasons for higher interest in psychiatry in Europe and Canada than in Africa? Is the reason for lack of popularity in Africa the draw of local healing traditions? What is the influence of poverty on choice of specialty?

We agree with the reviewer on the importance of socio-economic variables, stigma and culture, and the variable acceptability of psychiatry/Western medicine compared to traditional healing. This complex subject was not examined in this study and would be worthy of further investigation. However these aspects were not explored in our method and it is beyond the scope of our study to comment on this.

10. The paragraph on personal motivation on choice of psychiatry is not clearly written.

This has been amended as follows:

“There was a significant difference for strong internal vocation, and personal or family experience of physical or mental illness confirming previous findings [10, 49, 50]. There may also be an impact of stigma, as those choosing psychiatry placed less emphasis on the portrayal of doctors in the media on their choice of medicine as a career. Assessment of personal motivation for the career during interview and other selection procedures to medical school may select for students with these characteristics, so the importance of these factors for psychiatry recruitment should be recognised. “

11. The paragraph on “Decision Stability” is not clear. What is conversion rate to psychiatry? The writing in this section needs to be improved.

This has been amended as follows to provide more clarity:

“2.7% our sample entered medical school with a desire to become a psychiatrist, and 78% of this group remained committed at year 5. This group of early-deciders made up 12% of the total of those who were interested in psychiatry by the final year of medical school. Thirty percent of those choosing psychiatry in year 5 had entered medical school with any speciality choice, and 70% did not have a preference. This is a lower figure than the 40% deciding before medical school found by Galeazzi [36]
in a retrospective sample of psychiatry interns. The emphasis is different for the two groups: for early deciders it is ensuring a high conversion rate to psychiatry internship; and for those who develop their interest during medical school it is about psychiatry standing out against other fields. This question warrants further exploration.”

12. Overall, the Discussion lacks depth and it repeats observations made in the earlier sections. It does not add much new information to the extant literature. Important pieces of information related to the outcome such as reasons for not choosing psychiatry, as well as perceptions of stigma related to psychiatry and mental illness, have not been explicitly accounted for by this research. It would be helpful to outline an in-depth discussion to account for the results reported in the study, such as the adverse impact of didactic training on the choice of psychiatry as a specialty.

In conclusion, the paper under review addresses an important issue. While it is impressive in the effort expended in conducting the study, it is disappointing in reporting the study for all the reasons cited.

We have made numerous amendments to the Discussion section addressed in the points above which we hope improve its relevance. However aspects such as stigma were not explored in our methodology. There were many worthy factors which could have been explored. The research group considered each carefully, weighed against questionnaire length, country differences, and pilot questionnaires in different countries. The final method was a compromise which we hoped would provide useful responses and add to the scientific literature.

Level of interest: An article of importance in its field
Quality of written English: Needs some language corrections before being published
Statistical review: Yes, and I have assessed the statistics in my report.

Reviewer 3 (Andrew Brittlebank):

1) The authors must address the issue of making multiple comparisons in their data analysis. The statistical method section says that the significance level was set at 5% and the results tables record that around 30 comparisons were made between the two groups of students. Without correction, it would be expected that this will lead to the authors making type 1 errors. This study may represent a situation in which it is quite reasonable to not use a correction for multiple comparisons, but this should be made clear in the text and discussed as one of the limitations of the study.

We discussed this issue with our statistician before submission and again post review. His view was that whilst there is often disagreement about this whenever multiple tests are done, it is not usual to employ this method in these situations where you argue that you were examining the effects of separate variables. We have added an explanation in the methods and limitations section as follows:
"We considered carefully whether to correct for multiple testing. We concluded that it was not necessary to employ this method in this situation where we were examining the effects of separate variables."