Reviewer's report

Title: A survey of factors influencing career preference in new-entrant and exiting medical students from four UK medical schools

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Reviewer: Chris McManus

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This is an interesting paper, which addresses an important problem, since we know surprising little about how career preferences form, change and are influenced. The data though are complex and the presentation of the results is sometimes confused and confusing.

Major points

1. Measuring preferences is never easy, and one can either choose open-ended questions (as here), or provide lists of alternatives (as in my own studies). Both have their problems, and some discussion might be useful. “Top three” has difficulties with the specificity of the answers: Does one count “1: Orthopaedic surgery; 2: Neurosurgery; 3 Urological surgery” as one choice for surgery or three? What does one do with second and third choices which may be very disparate from the first? Are they really equal or not? At the very least the researchers need to provide descriptive information to the reader. It would be straightforward for table 2 to give first, second, third and combined choices, so that the reader gets a real sense of what are the real preferences?

2. How were the specialty choices handled statistically? In table 2 there are 822 year 1 choices for medicine. There are 1329 Year 1 students overall, so 62% chose medicine (as at least one of the three choices). The year 1 percentages here add up to about 270%, so that the three choices are being triple counted. That means therefore that the choices cannot be statistically independent, with presumably many students putting “Medicine, GP, Surgery” and dropping into all three bins. On that basis I think there is much to be said for presenting the analyses also on the basis of first choices (which are independent).

3. I didn’t understand table 3. Consider Anaesthesia. There are four medical schools, and we have an odds ratio (B) for Glasgow, with Aberdeen as the reference category. But in that case what is the p<.001 next to Aberdeen? What hypothesis is being tested there? [That is it is not a typo/repetition is shown by Surgical Specialities where it is .002 for Aberdeen and .008 for Dundee].

4. Following on from the previous comment, the first thing that needs testing for an individual speciality is surely whether there are any differences between the four medical schools (a chi-square with 3 df). And indeed, with first choices only, one could have a 4 x 8 (school x speciality) table with 21 df. If that is significantly different it would provide clearer and more obvious evidence of differences
between the four schools (at entry).

5. The abstract suggests that a key conclusion is that “medical school itself seems to influence career preference”. That is possible but it is not clear that the data presented here actually show clear statistical evidence for it. Just as in the previous comment, a 4 x 8 table would have been of help, so here the primary data (for first choices anyway) consist of a 4 x 8 x 2 table. If medical schools do influence students differently, then there should be a year x medical school x specialty interaction (with 21 df). Is that significant? If it is not, or it cannot be presented, then I need some other compelling evidence that the pattern of Year 5 preferences is different between medical schools, taking Year 1 preferences into account. Ideally of course the data would be longitudinal, but they are not.

6. I presume that table 5 is somehow meant to answer the question in the previous comment. However it talks about “variance” [sic] and then provides a “value”. The latter looks like a chi-square, presumably with 1 df, but it would be nice to be told what it was (and some proper descriptive statistics would be better still). We are told that, “statistically significant differences were identified between year 1 and year 5 students at each medical school” (p.14), and while it seems more than probable that anaesthesia and O&G are increasing in popularity, the key question is whether they are increasing by the same amount at each school; and the fact that the increase was not significant in Aberdeen for O&G doesn’t answer that question. The school x year interaction needs testing.

7. Some clarification would be helpful on how “the analysis was adjusted for demographic [and other things]”. Was this some form of logistic regression? Merely saying that SPSS 20.0 was used is not quite sufficient.

8. P.11. “Due to space considerations and the number of different models in the analysis, only statistically significant results are reported.” BMC Medical Education is an electronic journal, and has barely any limits at all for tables, particularly in the Additional Information. Proper documentation of the findings should be provided.

Minor points


10. Surely a few references to Parkhouse’s work, which shows clear and sustained differences between medical schools in career preference over decades, would have been worth giving. The UKMCRG website cited on p.4 only goes back to 1996, but Parkhouse was publishing at least back to 1976; how about his 1991 book “Doctors’ Careers”?

11. P.6. If one is going to use ‘habitus’ and ‘capital’ (and neither really seems very germane here without a lot of explanation), then at least cite Bourdieu so that the uninformed reader might have some idea where to go next.
12. “No sample size calculation was required as the study was a survey … of the whole population…”. Hmmm…. But it was a survey of two successive years, and presumably a decision was made to use two and not one or three? That sounds rather like a power calculation to me. If however the authors wish to continue with the strong point, then of course they need to continue with it properly, sticking to their guns, and not do any statistical significance tests either (and the Census does not report significance tests for differences – they just “are”). So, discuss power sensibly, or remove all the statistical tests…! Personally I would just remove all reference to sample size unless a journal is insisting on it (which they shouldn’t do).

13. Happy to see a Bonferroni correction, but p<.01 is nowhere near right, as it assumes there are only five statistical tests being carried out. However on p.10 we are told about gender, age, country, ethnicity, SEC, med school (3 df), factors (10 measures), and there are eight specialities. Roughly this is at least 18 x 8 = 144 interesting tests (and some others not considered), meaning that an appropriate alpha level is about .0004. Not all the effects are independent, and this is an exploratory(-ish) study so there might be some room for compromise.

14. I found table 1 and the detailed analysis in the text (and the table is hardly an “outline” – p.12) to be rather irrelevant to the main substance of the paper. It would have been far more interesting were it replaced with a few comments in the text, and instead there were to be a table with first and all speciality choices for each medical school in years 1 and 5. The reader could then actually see the raw percentages on which all of the inferential statistics are being carried out.

15. P.19. “this group was mainly Chinese … or from the Indian sub-continent”. Is this talking about geographical origin/nationality, or is it shorthand for UK students with a particular ethnic background? Either way it could perhaps be better stated.

16. P.21. I agree entirely about the need for a robust, longitudinal study (p.21), and need to publish the extensive data that I have.

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**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests