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Title	Medical student career choice: an analysis of factors influencing medical student specialty selection
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Reviewer 1	Dr. Lawrence Chew Loh
Institution	University of Toronto, Dalla Lana School of Public Health, Toronto, Ont.
General comments (author response in bold)	Introduction 1. Second paragraph – while selection of a medical specialty undoubtedly impacts the composition of the workforce nationwide I would be hard pressed to state that it is the only factor that is responsible for the trends described. Underemployment, for example, can be related to a number of factors that are more typically a systems issue. E.g. unavailability of fixed resources (e.g. not enough ORs with available OR time). Similarly, the current lack of family medicine physicians may be influenced by demographic factors (e.g. we need more family docs due to population growth and/or again population) rather than solely the choices of medical students. I would be careful not to overstate the role of specialty choice here and perhaps instead indicate that the broad popularity of certain specialties has implications for health workforce planning and leave it at that. If anything, the solution is not solely to have faculty "encourage" people to choose certain specialties, but rather, to have a comprehensive national health human resources strategy that combines many incentives (financial, personal, career, policy etc.) to achieve the right mix of specialties and distribution (rural / urban etc.) that we desire. **• Thank you for addressing this point. We have reworded elements of this paragraph to not overstate medical student career choices as a sole factor in changing health care trends.** 2. In this paragraph I would also rewrite the sentence starting with "A better understanding" to make it clearer what we are trying to have program directors involved with; right now it reads clumsily. **• Thank you, this has also been addressed.** Methods There is some additional clarification that needs to be written into these methods. 3. How was the guide constructed? It says that questions and prompts were informed by the surveys, but were these reviewed by anyone else? Were they piloted on any groups of students? How did the researchers ensure relevance and avoid bias in prompting / questioning? **• Thank you for this comment. This issue has been addressed in the Methods section, as indicated above.** 4. How many times were "several times"? **• Thank you for bringing this to our attention. The transcripts were reviewed a minimum of three times each.** 5. How was the coding system developed? **• This has been updated and elaborated on in the Analysis section of the Methods.** 6. How were discrepancies in coding resolved between reviewers? **• The discrepancies were resolved by consensus in face to face meetings.** 7. A set of themes were identified, but how were the (seemingly arbitrary) categories of major, intermediate and minor identified? What entailed "consistently and frequently" versus "not as frequently?" Was one response considered infrequent? **• This has been addressed, as above.** 8. Was only one theme identified per response, or could a single response generate multiple themes? **• One response could be coded under more than one theme, as indicated above.** Results 9. Again in line with the question above, could a single response end up being multiple themes? E.g. I would imagine some statements that might be "bad mouthing / negative perceptions" could also be considered a critical experience. How were these handled? **• Addressed above.** 10. On Page 7 I believe a subheader "Exposure" is missing as the authors discuss exposure in the first part, but without a label. **• Thank you for bringing this to our attention. The appropriate subheading has been added.** 11. What is "general medicine"? Is this family medicine or general

internal medicine?

• Thank you for bringing up this clarification point. In this case, it was in reference to both family medicine and general internal medicine.

12. On Page 8 I would argue that these results do not support the idea that the general public that posts family medicine at the bottom of the hierarchy but that respondents perceive that the general public does. That's all that can be really said from these results. Besides the family medicine example, were there any other pertinent examples to include in the results (e.g. if you are talking about the respondents' perception of how the general public ranks specialties, what specialties do respondents perceive the general public finds most important?)

• Thank you for raising this point, it is been more carefully addressed in the results. In addition, the sentinel quote for public perceptions/recruitment can be found in Table 2, as opposed to in the text.

Interpretation

13. For the discussion section, I wonder if early exposure could also have the opposite effect – negative resulting in the student deciding not to specialise in that field. Thus in the discussion section should discuss these multiply: exposure / non-exposure, and the fact that exposure can trend both positive or negative and further research is required to really tease this out.

• This is a good point, thank you for bringing it up. Most students referenced exposure with regards to its timing, infrequently commenting on exposure having a negative trend. Because of this, we cannot comment on this as an influencing factor in the discussion. Critical incidents/experiences were used to address pivotal moments that impacted a career choice in a positive or negative direction. The theme of context also related to the 'who, what, where, and when' of a particular specialty experience and also could trend both positively or negatively.

14. Intermediate theme: The quote provided for bad mouthing does not support the finding that the authors state that bad mouthing was mostly directed towards family medicine.

• Thank you for pointing this out. We have added in an additional sentinel quote, which better highlights this.

15. The authors state that it's difficult to assess how influential context is in career choice decisions. Given the qualitative nature of this research, it's difficult to assess how influential ANY of these themes are. I would also highlight that the nature of the major – intermediate – minor seems somewhat arbitrary at this point and without further clarification about what constituted a cut-off it's tough to assess whether context should be more influential than lifestyle, say, or bad mouthing. It's also difficult to assess one factor against another given that each medical student has a different set of factors. For example, saying "lifestyle" is an influential driver for all medical students and their career choice would almost empirically be false, because then one would expected that most poorly-balanced lifestyle specialties would not be considered.

• Thank you for your comment, and you do raise a valid point. This study is assessing factors that influence medical student career choice from a sample group. As with both qualitative and quantitative data, you often cannot generalize the results to a broader population. Each medical student does in fact have a different set of factors, as you mentioned, and this was part of the rationale behind holding so many focus groups.

• The major, intermediate, and minor themes have been further clarified. See above.

16. The present discussion rehashes a lot of the results. From the conclusions, the authors talk about tailoring curriculum, extra-curricular programs, student-counselling, etc. I would like to see them in the discussion use their results to build the basis for that, preferably from extant literature. (e.g. "If context is a potential factor – should we perhaps find the "one true curriculum" that would expose everyone to every specialty perfectly all the time? Is this even feasible? If it isn't, what is the end goal, the ideal way to mix these factors? And to what end? What do we hope to accomplish – more specialists? More family doctors? More informed students making decisions?) – THIS I think is the biggest value of these findings, not simply just saying one seems arbitrarily major more than minor. I find the findings interested, but I am very interested in the "So What" question here.

• You have raised an excellent point here. Some additional comments

	have been added to the Discussion section. 17. On the topic of the "So What", the paper starts out by pointing out that specialty choice is related to health human resource planning. If the authors are making this contention, then they should tie that back into the discussion – how is what they found relevant to human resource planning? Should we be revamping medical curriculum to increase and broaden exposure? Should we be pushing to make some specialties more lifestyle accessible? Should we be trying to improve the reputation of certain less popular specialties? And how does this fit into planning for residency slots / staff physician posts / as the authors allude to in the beginning of the paper?? **• Thank you for addressing this issue. Some additional comments have been added to the Discussion section.** General comment 19. I would revisit language and phrasing. For example on page 8 – "Students felt that a few specialists tried to actively recruit them to their programs making positive recruitment efforts enticing" – I know what the authors are trying to say, but it is poorly written. For this sentence I would propose a statement like "Some students felt enticed to pursue specialty training as the result of positive recruitment efforts by preceptors / mentors / specialists." **• This has been clarified.** 20. Also – "These interactions framed their possible career trajectory should they choose that specialty, and had a major role in swaying their choices." – The sentence is also quite unclear. Perhaps the authors meant to say "these interactions outlined" or "these interactions highlighted" a "possible career trajectory within that specialty" and "played a major role in their decision." **• This phrasing has also been adjusted.** 21. Finally, as another example on page 9 – "Passion" – is this one or two thoughts? Could this not be summed up in one thought as: "Many students who had identified a specific passion pursued training in that specialty, regardless of perceived/potential drawbacks." ? Or are these two thoughts: most students pursued the specialty which they were passionate about (one very specific result) and some did so despite notable drawbacks (second result)? **• Thank you for this clarification point. The text has been adjusted to read that passion played an influential role, despite perceived drawbacks about a particular specialty, or advice from others against it.**
Reviewer 2	Dr. Mary Chiu
Institution	Mount Sinai Hospital, Psychiatry, Toronto, Ont.
General comments (author response in bold)	I commend you for conducting 16 focus groups with 70 medicine fresh grads, and through the analysis process, gave rise to interesting data which allow us to take a glimpse into some of the important factors influencing med students' decision-making RE: specialty. This is a huge undertaking and there isn't much research that explores these factors the way it was carried out in this study. I have these specific comments: 1. Title: I would give the title some more thoughts - may be this is not a qualitative study but a study employing qualitative methods. (I have further comments on this below) **• We have taken this suggestion into consideration and modified the title.** 2. p.4, line 31: "The questions and prompts were informed by the longitudinal survey of these student cohorts" - I believe it would be beneficial for the readers to see the semi-structured FG guide. **• Addressed above. The guide will now be in the Appendix.** 3. p.4, line 38: "qualitative analysis was guided by the principles of GT". I would respectfully argue that grounded theory is a research tradition with a very specific focus in "Developing a theory grounded in data from the field" (Creswell, 1998), not simply to build "an understanding of a subject from 'the ground up'". Also, the GT paradigm should guide the whole research study, from initial research question to data collection, analysis and theoretical development based on findings. One can argue that things need to be adapted for clinical research, like how you claimed to be "using principles of grounded theory to perform analysis". Even in that case, you may want to describe the analysis process better with terms specific to GT (e.g. open, axial, selective coding). Also, in GT, typically, categories and subheadings are identified (not themes) and one of the main goals of GT is to illustrate the relationship between the arising categories. Subsequently, the researchers can start to explore emerging theoretical formulations.

	• Thank you for raising these excellent points. The use of grounded theory, and how this study uses that methodology, has been clarified in the Methods section. 4. You may consider looking into adopting content analysis or thematic analysis of focus group data and reframe your manuscript title, and discussions accordingly. **• Addressed as above.** 5. p.5, Results: Although not mandatory, it may be helpful for the reader to see descriptive/demographic data of focus groups participants. I'm particularly interested in seeing the representation of chosen specialties by the participants (e.g. if there would be a heavy representation from fam med and thus focus group discussion biased and skewed that way), as well as a breakdown of # of participants in each of 2002, 2006, 2007, 2008. I wonder if there would be "time difference" (pardon me for the quantitative jargon) in the discussions 2002 vs 2008 for example due to curriculum changes (natural history). **• No major curriculum changes occurred at Memorial University Faculty of Medicine between 2002-2008. The number of participants has been provided. We are not able to report participant characteristics.** 6. For future directions, I would challenge the authors to think beyond the educational trajectory and to perform in depth interviews with physicians working in different specialities in academic settings and have them look back retrospectively (i.e. if you could choose again, would you be in the same specialty and why?). **• Thank you for this comment, you have made an excellent suggestion. This has been included in the final section of the manuscript.**
Reviewer	Dr. Ian M. Scott
Institution	University of British Columbia, Department of Family Practice Vancouver, BC
General comments (author response in bold)	Abstract 1. I am not sure you actually used grounded theory by the strictest sense. See one of the seminal papers on grounded theory: Charmez (5oc. Sci. Med. Vol. 30. No. 11 pp. 1161-l 172. 1990) **• Thank you for this comment, more thorough explanation of the use of grounded theory has been included.** 2. The word context in the interpretation is not specific and may need a word or two in substitution **• Thank you for this clarification. It has been addressed in the abstract and results.** Introduction 3. Ref 8 is a paper on emergency career choice yet you cite it as evidence regarding family medicine career choice. **• Thank you for bringing this error to our attention, it has been addressed.** Methods 4. The second sentence graduating medical students in the classes 2002, 2006....are these years the students entry or graduating years--I assume graduation years but they could be entry years. Also when in their ug education were the foscus groups carried out as this could be a powerful influence on the findings. I may have missed this but I think it needs to be very clear as focus groups carried out in pre-clinical vs clinical vs prior to graduation would be expected to significantly influence the results. **• Thank you for this point. Both of these comments have been addressed above and in the manuscript.** 5. I didn't see any reference dependability of the final themes (through checking your themes via a presentation to participants where you seek feedback) as well as trustworthiness of the coding scheme (where you present to non-participants in the research process followed by a group discussion). This can be a helpful step in qualitative studies. **• This is valid point. Audience review and reference dependability can be valuable for qualitative studies. This did not occur for this study, due to the de-identification of participants in transcripts. A statement has now been added to the Methods section.** 6. I would have liked to see a statement of the range of focus group size. **• Addressed above.** Results 7. Some background on how the medical school is structured including how clerkship rotations are chosen or assigned as the comment "many students felt as though thee were not exposed to particular specialties until the end of their undergraduate training, if at

	all." Also since the study was carried out over 6 years at one school were there major changes to the curriculum that we should know about. **• Thank you for commenting on this. Information about the curriculum has been added to the Methods section.** **• No significant changes in the Memorial University Faculty of Medicine curriculum occurred from 2002-2008.** 8. A diagram might be helpful with grouping of the themes and showing them as a bundle with relationships if they exist. **• The few relationships present between themes were addressed in text. There were not enough relationships between themes to create a bundle diagram.** Discussion 10. Top of page 8--"posted" feels like an awkward word and is not clear. **• "Posted" has been changed to "rank."** 11. The last sentence of the next paragraph is also awkward. **• This has also been changed, as above.** 12. Page 9--badmouthing section---"negative perceptions could be seen in regards"...it feels like voiced is more accurate but this is being a bit picky. **• Reworded.** 13. Page 9 context: The last sentence on the page starting "Career choices were..." is not as clear as the quote that supports it. I would suggest clarifying. **• An additional statement has been added for clarification.** 14. Page 10 the section on information gaps--this feels like it could fit under residency issues since CaRMS is in the residency issues section. This section and the timing of decision making section feel like issues related to a larger theme of "Process". **• Information gap refers to lack of information provided about specialties and the residency match, and the lacking information was more in relation to preparing for the CaRMS match, not about issues specific to a specialty (as is the case with the "residency issues" theme)** **• These themes did appear distinctly different in the dataset** 15. page 14 second paragraph--the comment that uncertainty was still a minor theme is unclear to me. **• Thank you for bringing this up, it has been clarified.**