Title: The medical students' perspective of formal and informal mentors: a questionnaire study

Authors:

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Author's response to reviews: see over
This single-center cross-sectional study, despite the obvious limitations intrinsic to its design, deals with an important issue of differences between formal and informal mentoring, which has not been extensively studied in the context of academic medicine. I would recommend the editors to consider publishing this article after some revisions, which I would consider as minor, but essential.

1. One of the main threats to validity in studies of mentoring that use self-reported outcomes is in the ambiguous terminology. If the questionnaires do not define the terms such as “formal” and “informal” mentors, it is not sure what kind of relationships was actually assessed or reported by the respondents. The authors of this manuscript should clarify their working definitions of the key terms and let the readers know if they have provided definitions in their questionnaire to avoid ambiguity among the study participants. If that hasn't been done, the authors should comment on how this may have affected the internal validity of the study.

Authors’ response: In the study questionnaire, “formal mentors” were defined as the faculty advisor who was assigned to each student by the University of Calgary; “informal mentors” were defined as “mentors who were not formally assigned to [the students] during medical school.” To clarify the types of mentorship assessed in this manuscript, the term “formal mentors” are replaced with the term “faculty mentors.” Moreover, the working definitions of faculty mentors (Line 102-104) along with informal mentors (Line 104-106) are now mentioned in the methods section.

2. The Background section of the manuscripts states the purpose of this study was „to further explore the impact of formal mentors and informal mentors on undergraduate medical students.” First, I would advise the authors to avoid the terms „impact” and „influence“ throughout their manuscript, as their study design allows them to draw some conclusions about „associations”, but not about the „impact” and „influence“ (which implies the causality and direction of the effect). Second, I think the authors should be more specific about the purpose/aim of their study and align their stated purpose/aim more closely with what they actually did.

Authors’ response: We have changed the study objective as the following, “to report the experience of undergraduate medical students in a faculty mentorship program of their faculty mentors and if applicable, their informal mentors” (line 82-84).

3. I would advise the authors to provide a short description of their formal mentoring program (either in the Background or in the Methods section), so that the readers can
better understand the context of the study. It should be made clear that all the study participants participated in this program (if they did).

**Authors’ response:** We have added the description of the faculty mentoring program in the Methods section (Line 87-92).

4. The discipline (specialty?) of the mentors, as well as the students' intended residency, is categorized as „Family Medicine or Royal College“. This is not understandable for the international readership of BMC Medical Education, so it would be helpful if the authors could explain what they mean by „Royal College“ as opposed to „Family Medicine“.

**Authors’ response:** The description of Family Medicine and Royal College has been added in line x-xx.

5. Description of the 5-point Likert-type scales (1 – not at all to 5 – extremely) should be provided not only in the tables, but also in the Methods section.

**Authors’ response:** The description of the 5-point Likert scales has been added (see Line 124).

6. I would suggest the authors to provide the exact p-values (except the ones lower than 0.001) throughout the article, and not to report only „p>0.05“ or „p<0.05“.

**Authors’ response:** This comment has been address in the revised manuscript.

7. line 125 – provide an exact number together with the percentage.

**Authors’ response:** This has been addressed in the revised manuscript (see Line 139).

8. Lines 153-157 and 160-167 – please, check the accuracy of the denominators (number of students in each group) or explain the apparent inconsistencies in the numbers in the text and between text and the tables. The number of students with informal mentors is sometimes 47, sometimes 53, while in the table 2 and in the line 168 of the text the count is 54 (with the explanation in the table that „two students did not report whether they had and informal mentor or not“, which just adds to confusion).

Also, in line 163 it is stated that there was 24 students with Family Medicine as their first choice in CaRMS (this probably relates only to the group with informal mentors, but that’s not clear from the text), whereas the number derived from the Table 3 (15+8) is 23, rather than 24. Similar inconsistency appears also for the students intending on a Royal College specialty.

**Authors’ response:** In this manuscript, pairwise exclusion was used to handle our missing data to maximize the data available. Pairwise exclusion was justified, as the survey was anonymous and did not contain sensitive information (e.g. sexual preferences, income and etc) and there were no indications that the missing data was dependent on other factors (thus not “missing not at random”).

The combination of the missing data on the outcome and explanatory variables have led to the inconsistencies in the numbers reported in the text and in the tables. To address this comment, we have indicated the use of pairwise exclusion in the methods section (124-125) and in the Tables. Also in the
Tables, we have indicated in the parentheses the total number used in each category of analysis.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:** I declare that I have no competing interests
Date: 16 March 2015

Reviewer: D. Robert Siemens

Reviewer's report:

Well written and easily understandable report of cross sectional survey. The introduction justifies nicely the need for looking at this issue.

The Discussion is well written and highlights the limitations of the study, including most of this reviewers concerns below.

Briefly, this study attempts to ask a question around the attitudes and experiences of medical students of their mentors, evaluating a formal program at the university of Calgary and using this to compare to some students that self identified also having informal (bit obviously more aligned) mentors.

The authors make some conclusions that are likely too confident for the study design.

Minor correctable issues:

1) The authors use some confusing terminology that could be cleaned up to make readability easier and that specifically is the use of the terms informal and formal mentorship groups while at the same time using this categorization to describe the experiences with formal or informal mentors. One can work through this but it is confusing at first. I think the authors are likely measuring arbitrarily assigned mentors (so-called formal mentors) to those that the students and staff have become "aligned" in some fashion (they found each other). Different terminology may make reading this easier.

Authors’ response:

To clarify the types of mentorship assessed in this study, the term “formal mentor” is now replaced with the term “faculty mentor.” In this study questionnaire, these mentors were defined as faculty formal advisors who were assigned to the undergraduate medical students of the University of Calgary at the start of the medical program (Line 102-104).

The term of “informal mentors” will be kept in this study. The working definition of informal mentors is included in the Methods section (Line 104-105). The “informal mentors” were defined as the mentors not assigned by the University during the students’ medical program.

2) The authors present their Likert scores solely as mean, mode and SD. Although correct they do miss then a good deal of richness in their data. For example, there may be a good proportion of students who felt their formal mentors were very engaged (scored 4 or 5 on their Likert scale) but we miss this by just giving an average. There may be types of students or programs where formally assigning mentors may be more than fine but others where this approach doesn't work at all. Just looking at means doesn't help.
A Likert score is by definition not continuous data (ordinal) and a T test would not be an appropriate choice for their inferential statistics. (Mann Whitney?)

Authors’ response: All of the decisions on our reporting (mean, SD and mode) and analysis (t-test) of the data was chosen a priori.

We are aware of the controversies and the potential downfalls for using parametric-like reporting and analysis such as t-test on Likert scale data. A Likert score by definition is not continuous but is ordinal. However, even the ordinal assumption can be problematic because there is no way to guarantee that difference between “1 = strongly disagree” and “2 = disagree” is the same as the difference between “4 = agree” and “5 = strongly agree.” Within the context of how ratings were made in our study, we did not feel strongly to quantify the strength of the students’ engagement (disengagement) with their mentors, as they would have been more suitable in qualitative research. Rather we felt we could conclude that there was a difference in the students’ reporting of their mentors.

In addition, we felt parametric analysis was warranted for the following reasons. Our data was sampled from a normally distributed and representative sample, as we achieved 86% response rate from the entire graduating class of 2014. Our sample size of 93 and 54 (for the subgroup analyses in Table 2) were adequately large enough for the t-test.

For the simplicity of the interpretation, we strongly felt the reporting of the mean, SD and mode and t-test results would be sufficient and could arguably be better. We also feel our conclusion from the t-test is warranted, not only because sensitivity analysis using Mann-Whitney test showed the same result, the mentors’ demonstrated attributes and the discussed topics with the students support the students’ rating of their mentors.

We highly appreciate your concern and comment about the depth and the richness of our data and analysis; however, for the stated reasons above, we still standby our decisions on using parametric reporting and analysis in our study.

3) The authors ignore there one difference in the question of whether there was perceived difference in their mentors (general interest) and interpret that both groups generally felt there formal mentors were engaged. I would tend to lean the other direction.

Authors’ response: In the lines 147 to 151, we acknowledged that higher number of students in the faculty mentor group had reported their faculty mentors demonstrated general interested compared to the students of the informal mentor group (71% vs. 47%). While this may suggest the difference in the students’ perception of the faculty mentors, it is important to recognize that there are no differences in the topics discussed, the students’ perception and other demonstrated attributed of the faculty mentors (Table 1). Additionally, the satisfaction of the faculty mentorship program between the faculty (mean of 3.1, SD of 1.4) and informal mentor (mean Likert score of 3.0, SD of 1.0) groups of the students were very similar (P-value of 0.78). Assessing the results collectively, we concluded that the students had neutral perception of the faculty mentors and the mentorship program.

Major issues:

4) Many of the limitations of the study are described in the paper. It is from a single centre from a single year just prior to making their decision to rank Carms. There are many
reasons therefore why these responses may not be representative of the mentorship program and experiences of medical students in general.

If one were wanting to understand the best way to develop a mentorship program in medical school, this cross sectional survey with its inherent biases of the students that did or did not attain informal mentors is not sufficient to answer this question and may be/potentially mis-representative. For example, there is no description in the manuscript about how the programs formal mentorship program is set up and run. What lessons should we learn from there experience? These are good questions to ask, the authors may learn more from a more systematic survey of the students as they transition over the years.

Authors’ response: We acknowledge that this study is potentially limited in its generalizability (Line 215 - 218), and the current findings do not fully answer how one could “best” develop a mentorship program for a medical school.

However, it is not unlikely that a large number of students in a faculty mentorship program pursue and/or rely on other forms of mentorship (i.e. informal mentorship) in other settings. While causative relationships cannot be assessed in this study, we still believe that potential influence of the informal mentors on the medical students are significant and is well deserving of future investigation.

The significance of the current work should not be devalued by the cross-sectional nature of the study, as the exploration of faculty and informal mentoring in academic medicine has been limited. This study is one of the first to explore the students’ experience with faculty and informal mentors; the findings identify the current gap in the literature, which we attest is the real important lesson learned from this study. Using longitudinal approach at multiple institutions may be a critical initial step to illustrate when mentorships are established, and how these relationships evolve over time (Lines 229-234). However, it is likely that a combination of efforts by multiple investigators are required, rather than a single study, before one can answer on how to develop the “best” mentorship program.

To address the comment on the lack of description on how the formal mentorship programs are established and run, we have added a brief description in our Methods section (Line 87-92).

Level of interest: An article of limited interest

Quality of written English: Acceptable

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

Declaration of competing interests: None