Author’s response to reviews

Title: Study-Related Behavior Patterns of Medical Students compared to Students of Science, Technology, Engineering and Mathematics (STEM): A Three-Year Longitudinal Study

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Point-to-point protocol of editors’ and reviewers’ recommendations

Manuscript entitled ‘Study-Related Behavior Patterns of Medical Students compared to Students of Science, Technology, Engineering and Mathematics (STEM): A Three-Year Longitudinal Study’ submitted to BMC Medical Education (MEED-D-18-01047R2).

Dear Derek Choi-Lundberg,

we are glad to hear that once we have carried out some essential revisions the manuscript is potentially acceptable for publication in BMC Medical Education now. The authors wish to thank you and the reviewers again for a second look and your very valuable and friendly comments and suggestions. We revised the manuscript along the indicated lines. Here is a summary of the changes made. Actual changes are also marked green in the text.

Sincerely on behalf of the authors

Edgar Voltmer

Technical Comments:

Editor Comments:

Dear Prof Dr med Edgar Voltmer and co-authors,
Thank you for your manuscript MEED-D-18-01047R2, Study-Related Behavior Patterns of Medical Students compared to Students of Science, Technology, Engineering and Mathematics (STEM): A Three-Year Longitudinal Study.

Two reviews were received; Reviewer 1 is satisfied with the manuscript while Reviewer 2 recommends some minor additions to the Abstract, Strengths & Limitations, and Conclusions sections. In my role as associate editor, I also suggest a number of minor changes to improve clarity or English language usage. Please address these recommendations in your revised manuscript, and I will then recommend acceptance of your manuscript.

Although the title is rather long already, perhaps add ‘cross-sectional and’: Study-Related Behavior Patterns of Medical Students compared to Students of Science, Technology, Engineering and Mathematics (STEM): A Three-Year Cross-Sectional and Longitudinal Study. This recommendation aligns with the recommendation from Reviewer 2 to mention in the Abstract that both cross-sectional and longitudinal data were generated and analysed. Also please specify in the Abstract that the numerical results presented there are from the cross-sectional analysis.

- we felt that “A Three-Year Cross-Sectional … Study” might be perceived as a bit contradictive. Therefore we suggest to stay with the title but added the information about cross-sectional and longitudinal analyses in the abstract as kindly suggested.

Page 3 Line 21 (P3 L21) – Delete ‘in’ (last word on the line), so change to ‘…spent significantly more hours in class, laboratories, on wards, or studying than…’
- deleted

P3 L 27-28 – Reorder this sentence as follows for greater clarity: ‘However, in this study, medical students had lower levels of distress compared to law or engineering students.’
- revised as kindly suggested

P6 L31 – ANOVAs rather than ANOVAS.
P6 L35 – medical students rather than medical student.
- revised/corrected

P6 L57 and P7 L53 – Use STEM rather than MINT (Mathematik, Informatik, Naturwissenschaft und Technik).
- oops, corrected, thank you

P7 L4-5 – Delete ‘a)’ and ‘b)’, as Figure 2 does not have separate graphs (a) and (b).
- corrected, thank you

P7 L26 – text states Med n = 207 but Figure 3 states Med n = 206. Please correct one of these.
- harmonized

P8 L1 – Move ‘only’ and change ‘the’ to ‘these’: ‘In these analyses only students who responded…’
- revised, as kindly suggested

P8 L1-2 – I think the sentence ‘This is the reason why…’ could be deleted; I don’t think it is necessary to explain this.
- deleted
P9 L1-2 – I am unclear on the meaning of the sentence ‘The fraction with the healthy pattern was about the same amount smaller in STEM students compared to their medical peers.’ Smaller than what? e.g., than burnout (which was mentioned in the previous sentence, but health pattern isn’t smaller) or compared to t0 (more likely)? It might be good to put some of the numbers in this sentence to clarify its meaning. Also say ‘…compared to medical students’ rather than ‘…compared to their medical peers’.
- we amended the suggested numbers and revised the wording as kindly suggested. (The meaning is: the proportion with the burnout related pattern at t2 and t3 is about 10 percent points higher in STEM students compared to medical students, the proportion with the healthy pattern about 10 percent points lower.)

P9 L34 – University, not university
- corrected

P10 L38 – This paragraph might be clearer if it began with ‘A strength of our study…’ and then next sentence ‘Limitations include…’. Perhaps add more strengths, e.g., analysed both longitudinal and cross-sectional data, and there was good alignment between these data (Fig 2, Fig 3).
- revised as kindly suggested

P10 L41042 – add ‘the estimated response rate’: ‘The response rate of medical students was better than the estimated response rate of STEM students…’
- added as kindly suggested

P10 L42-45 – This sentence is unclear. I suggest: ‘Similarly, a higher percentage of female medical students participated in the study than the estimated percentage of female STEM students.’ (if that is the intended meaning)
P10 L50 – add STEM and broader context beyond Germany: ‘…German medical and STEM students, or to other nations’ or similar.
P10 L56 – delete second ‘the’: ‘The wealth of information to be learnt and frequent testing also…’
- revised as kindly suggested

P14 Ref 31 – Write out the author EUC.
P15 Ref 41 and 42 – Use sentence case rather than title case for journal article titles, e.g., When doctors struggle…
P15 Ref 43 – BMJ, not Bmj.
P15 Ref 49 – check author: delete first ‘TK’ or write out?
P15 Ref 50 – PLoS One, not PloS ONE. The former is the NLM title abbreviation.
- revised as kindly suggested

Figure 2 – add ‘n=’ under each column, as per Figure 1.
- complemented (as always there are minor variations in the n’s compared to figure 1 due to different pathways of analysis – that was the reason why we initially abstained from presenting n’s in both figures)

Reviewer reports:

Pascal Burger (Reviewer 1): Thank You for the amendments and corrections. The tables and clarification particularly to the cohorts are very helpful, the amendments to the text sections well
Thelma Quince, PhD (Reviewer 2): The authors have gone a considerable way towards meeting the issues raised by the reviewers. In particular the numbers of students involved in the study and the differentiation between cross-sectional and longitudinal analyses and results are now far clearer. My only criticisms relate to the Abstract, Strengths and Limitation and Conclusions.

Abstract: Given that abstracts tend to be more widely read than full papers the abstract does not do justice to the paper. It would enhanced if it included short statements "We used the AVEM to assess" "Both cross-sectional and longitudinal data were generated and analysed."
- revised as kindly suggested

Strengths and Limitations: It should be acknowledged that the study is based on a self-report instrument.
- amended

Conclusions: The study set out to compare medical and STEM students. Given that there has been much research into and comment about the impact of medical education on the mental health of the former, within the context of the duration of this study medical students did not appear to be more negatively affected than their STEM counterparts.
- conclusions revised as kindly suggested.