Author’s response to reviews

Title: Revisiting the Trajectory of Medical Students’ Empathy, and Impact of Gender, Specialty Preferences and Nationality: A Systematic Review

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Response to editor and reviewers:

Dear editor and reviewers,

Thank you very much for your constructive comments. Below we have responded to all your comments and explained the changes we have made to the manuscript. These have been highlighted in red in the revised manuscript.

Editor Comments:

1. Please include a title page as the first page of your manuscript where you list the full names, institutional addresses and email addresses for all authors. The corresponding author should be indicated.

Response:

The title page has been included on the first page of our manuscript together with the full names, institutional addresses, email addresses for all authors and corresponding author.
2. Please provide a list of all the abbreviations used in the manuscript. This list should be placed just before the Declarations section. All abbreviations should still be defined in the text at first use.

Response:
We have now made a list of all the abbreviations used in the manuscript.

3. Please change the Availability of data and materials statement to: "All data generated or analysed during this study are included in this published article"

Response:
The wording has been changed accordingly.

4. Please include a statement in the Authors' contributions section to the effect that all authors have read and approved the manuscript and ensure that this is the case.

Response:
We have included a statement that all authors have read and approved the manuscript and ensured that this is the case.

5. Please add a section "Additional files" (after the References/Figure legends) where you list the following information for each additional/supplementary file in the file inventory:

   - File name (e.g. Additional file 1)
   - Title of data
   - Description of data

Response:
We have now added a section “Additional files” with information for each additional file.

Reviewers’ comments to Author:

Reviewer 1:
Facing a multitude of studies on empathy in medical education, recent review studies focusing on a certain aspect are relevant and therefore worth to be published.
The review points out the present state of research regarding four main foci - change in empathy scores (mainly by self-assessment questionnaires) over time of medical study, gender aspects in empathy (scores), specialty choice and cultural aspects.

The title is suitable.

The Abstract summarizes the work appropriately.

The background section gives a good introduction into the topic. However, in empathy research the definitions are manifold, and this is reflected by the different studies and results. The authors have mentioned this briefly in the background section and also reflect on this ambiguity later on, nonetheless I would suggest to discuss this in more detail in the background section.

Response:

More details concerning the definition of empathy and the possible effect on research findings have now been added to the background section, see page 3 line 18-23.

The method section is well described and comprehensive. Especially the quality assessment and risk of bias in the included studies has to be mentioned positively.

The discussion section links the results summarized over the studies well to possible explanations and former systematic reviews. The overall-results on empathy and specialty choice proved not consistent, however the paper should provide possible explanations why empathy (or what "form"/definition of empathy) might or might not be relevant for specialty choice.

Strength and limitations are well described.

Response:

We have now added possible explanations why empathy might or might not be relevant for specialty choice.

The future research section however points out that mixed-methodologies research should be raised - this seems inconsistent with the limitation that qualitative studies were excluded from the review. I would recommend to rephrase that future research, e.g. reviews, should incorporate qualitative studies.

Conclusions repeat more or less former sections of the paper.

Response:

Thank you for your comment. Our recommendation for future research regarding medical student empathy studies was concerning primary research studies, since it is our impression that
almost no studies exist that employ a qualitative methodology or a mixed-method methodology. Therefore, we have not included a sentence stating the relevance of including qualitative studies in future systematic reviews since they are still to be conducted. We hope that our recommendation makes sense to you.

Reviewer 2:

The review is well-conducted. Appropriate inclusion and exclusion criteria were used to identify the relevant studies and quality of studies were assessed using correct tool. The results were presented systematically and key findings were analysed critically supported by relevant evidence.

Response:

Thank you for your positive comment.

Reviewer 3:

This systematic review of student empathy as a function of training level provides a comprehensive summary of the variable results and conclusions found in previously published studies. While different results might be explained by differences in study populations, study design [longitudinal vs cross section], the instrument used, local culture, etc, this review tells us that we cannot make the often quoted statement that "empathy declines with level of training". By including references to gender, specialty and nationality differences, the variability of results is further demonstrated.

Response:

Thank you for the positive comments.

The methodology seemed sound but only served to show that no consistent pattern could be obtained by looking at the published quantitative studies. Perhaps the more important message of this paper is that future investigators should try other methods to investigate the important role of empathy. These could include qualitative studies and instruments/observations that focus not on self reporting but rather on patient perceptions of empathetic student/physician behavior. The results section sends a simple message: previous studies have shown highly variable results. The Discussion section is useful in that it tells us that more studies of the previous type are unlikely to yield a different result and suggests ways to investigate this problem and find actionable causal relationships. [see page 12 "Future Research"]

There were several instances of typographical errors, English usage or other comments which I found distracting:

1. Abstract line 7-8 "educational" should be education or educational training
Response:

The error has been corrected.

2. Page 1 Background Is the abbreviation GP’s widely understood by an international audience or should it be more specifically defined?

Response:

We have modified the word and added a definition.

3. Page 2 line 16: Is "contrarily" common usage or should it read "on the contrary"? This word is used multiple times in the text.

Response:

Thank you for correcting this error. We have now corrected it to “contrary to”.

4. Why was the Scandinavian language the other language chosen for inclusion? Number of published studies? Other?

Response:

This inclusion criteria were chosen since we are able to understand the Scandinavian language. This includes Danish, Swedish and Norwegian.

5. page 4, line 10 'concord' should be 'concordance'

Response:

Thank you for correcting this error. We have now changed it to “concordance”.

6. page 4, line 23 states that a total of 51 studies were screened but on page 5 in the text and diagram it shows that 53 studies were full text screened.

Response:

Thank you for directing our attention to this error. We have now corrected the number.
7. page 6, line 21 usage of the term 'applied': should this read 'employed'? See also page 7, lines 7 and 8.

Response:

Yes, we do agree, and we have now corrected the word.

8. page 7, lines 18 & 19: The sentence "Chatterjee found a low, stable and high level............" confused me and I am unable to know what the author is trying to say.

Response:

We do agree that the sentence was unclear, why we have chosen to leave it out.

9. page 10, lines 7-9: It is not clear to me what "trying to protect the students against critical illness and to safeguard their professionalism in the clinical setting" means.

Response:

We have now changed the sentence and hopefully it appears more comprehensible.

‘Chen et al. (37) explained the development towards lower levels of empathy during clinical training as a result of an acculturation process in which superiors and mentors try to protect their students against psychological distress by cultivating a climate of cynicism, emotional distance and detachment among medical students in their contact with patients and at the same time try to safeguard “professionalism” in the clinical setting’

I feel that the Discussion section of this paper is potentially the critical part and needs to be clearly written. Bottom line is that lots of speculation exists without anyone demonstrating a clear causal relationship.

Response:

We do agree and we also believe that by listing a lot of different explanations for lower and higher levels of empathy it shows that there is not a causal relationship. We have rephrased the first sentence in the section ‘Possible explanations for lower and higher levels of empathy’ by using your choice of words.

‘In the literature, several explanations for a decline in empathy have been discussed without demonstrating a clear causal relationship’
Detailed comments

The title is slightly misleading since although relative comparisons are made (e.g., females versus males) there are few results about the actual levels of empathy (particularly given that most of the reported studies have used the JSPE) The review is about the trajectory of medical students' empathy, and impact of gender, specialty preference and nationality.

Response:

Thank you for your comment. We do agree and we have changed the title to the following: “Revisiting the Trajectory of Medical Students’ Empathy, and Impact of Gender, Specialty Preferences and Nationality: A Systematic Review”

Background:

"Describe the rationale for the review in the context of what is already known." This has only been done with respect the importance of empathy and the conflicting findings concerning the trajectory of medical student empathy. The rationale for looking at gender, specialty choice and nationality in the context of what is already known has not been set out.

Response:

We have now added more details concerning the rationale for looking at gender, specialty choice and nationality in the background section.

P1 ls 22 and 23 GPs' plural or the GP's singular?

Response:

We have changed it to singular.

P2 l 22 additional reference to studies relating to communication skills training etc.

Response:

Thank you for this precision. We have now added references to the missing part.

Method:

Search strategy
The lack of discussion in the background about the impact of gender, specialty choice is mirrored in the search protocol which appears to focus on the trajectory. This is likely to have caused bias, this is acknowledged as a limitation by the authors.

Response:

Thank you for your comment. We considered that the search strategy would be too narrow if it included specialty and gender. The effect of including further search words would have increased the likelihood of excluding relevant studies.

Similarly the search appears to have been restricted to what are albeit the major databases but there are others.

Response:

We acknowledge that other databases could have been employed, however we are of the opinion that our search in PubMed, PsycInfo and Embase is sufficient and fulfils the requirements for a systematic review.

Selection of data:

A little more detail is needed here: briefly background and or experience of researchers/reviewers, indication that the titles and abstracts were screened independently and some comment on interrater reliability? (IRR is a general issue here: how the quality assessments were made and by whom and again how potential differences were resolved.)

Response:

Background of researchers/reviewers have been added to the author contributions section.

Title, abstract and methodological quality assessment tools were all screened independently and comment on inter-rater reliability. This has now been added to the ‘Selection of data’ section.

The quality "scores" for cross sectional studies are given in the supplementary materials: was quality appraisal a selection criterion?

Response:

No, it was not a selection criterion. We applied quality assessment tools for both cross sectional and longitudinal studies which would strengthen our investigation.

Results:
P5 1 1 aim or aims? As suggested above there may have been bias in the search procedure focusing on the trajectory of medical students’ empathy.

Response:

The word has been changed to ‘aim’.

Country.

Whilst the list of countries is acceptable it might have been useful to have grouped them up, particularly in the light of the comments made in respect of "Western and Non-Western" countries.

Response:

We do very much agree, and they are now grouped up into two groups: “Western and Non-Western”.

For all of the results some indication of the size (absolute or relative) of differences would have been helpful.

Response:

Thank you for your comment. We have chosen not to include the size of the differences. We have made this choice because our review does not include a numerical data analysis therefore absolute and/or relative differences are not indicated.

(I should just point out that on table 1 the authors have stated in respect of multi-centre study published in 2016 that there was a low response rate among final year students in New Zealand. This is incorrect, the response rate was 52%.)

Response:

We are not sure where the number 52% appear in table 1 under the mentioned study. We have stated that there is a low response rate of 15,2 % among first year students. This percentage also appears in the abstract of the study.

Overall view: This is really an issue for the editor.

A] Most of those interested in empathy among medical students will be familiar with the literature and know that there is a debate about the trajectory and gender differences.
B) There is a huge "so what"? The article does not really advance the understanding of empathy among medical students. There are more pressing questions which need to be answered concerning how medical schools can develop and or select empathetic doctors, the duration and impact of interventions and most importantly the lack of association between medical students' and or physicians' self reported empathy and patients' assessment.

Response:

Thank you for your comments. We agree that further questions regarding empathy among medical students need to be investigated. We hope that this present review can form the basis for future studies which investigate these questions.