Reviewer's report

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

Version: 0 Date: 19 Nov 2019

Reviewer: J. Kevin Dorsey

Reviewer's report:

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.

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

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

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.

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

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

7. Page 6, line 21 usage of the term 'applied': should this read 'employed'? See also page 7, lines 7 and 8.

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.

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. 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.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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