

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Empathy variation of undergraduate medical students after early clinical contact: A cross-sectional study in China
AUTHORS	Ye, Xiong; Guo, Haiying; Xu, Zhou; Xiao, Hui

VERSION 1 – REVIEW

REVIEWER	Thelma Quince Department of Primary Care, University of Cambridge, UK
REVIEW RETURNED	08-Dec-2019

GENERAL COMMENTS	<p>Introduction: The contextual literature has been adequately covered and referenced. The section is at times repetitive and could be expressed more concisely. It would be better if the study undertaken were described in the active past tense: “We used”, “We found that” and findings of other studies expressed in terms of “have shown that”. But these are pure stylistic preferences.</p> <p>P3 Line 6 Empathy isof another and includes Line 16 favourable for diagnosis and are likely to display improved treatment compliance Line 18 repetition (impact on doctor patient interaction has already been described) but comment about doctor satisfaction should remain Line 49 medical students declines with increasing academic years Line 53 repetition In addition. Start sentence Gender has also been found to influence undergraduate medical students’ empathy Line 57 confusing “Conflicting results have been found in respect of gender differences, a reason for this may be social-cultural background</p> <p>P4 Line 13 and the role of the health professional which occurs Line 18 early in medical students’ training elicits a positive Line 24 expression However the impact of early clinical contactremains relatively under researched.</p> <p>Last paragraph: please could the authors state concisely the research questions: Eg We sought to investigate whether early clinical contact altered medical students’ empathy And whether there were any differences in this respect in terms of gender and or academic year.</p> <p>Methods Participants P 5 Line 10 214 returned questionnaires were valid.</p>
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	<p>Procedure</p> <p>P5 Line 60 The ECC curriculum took place at. More detailed information about the ECC would be welcome such as whether students worked in groups or individually and the average number of patients they were likely to have seen during the two week period.</p> <p>P6 Line 6 given by a professor Line 16-17 and the psychological and social changes associated with the illness experienced by the patients and their families</p> <p>Results. Fairly clearly described and table clear. There is perhaps need for better alignment</p> <p>Discussion The structure of this section is poor and needs to be improved.</p> <p>Suggestions P 8 First paragraph: recap on importance of empathy as given but removing sentence "Teachers in medical" State simply that studies of the trajectory of empathy among undergraduate medical students have produced conflicting results, then cite the two studies referred to and comment on the fact that both in different ways relate to the impact of clinical contact on medical student empathy. This gives appropriate background and would lead into the rationale of the study reported and the main findings. But all of the main findings would be better presented here</p> <p>A] Improvement in empathy scores in both years and among both genders after the ECC B] No gender differences C] No differences empathy scores between academic years. Then take A and B in turn: A] As described the ECC includes not only early clinical contact but also instruction. Some comment on success or otherwise of empathy enhancing interventions would be useful here. B] The discussion of impact of gender on empathy scores could follow, as given it is repetitive and could be expressed more concisely. The finding that there was no interaction between gender and academic year should be here. The implications for medical education could then be outlined. Followed by implications for medical education research. The strength and limitations of the study: strengths are that a validated instrument with good internal consistency (Cronbach alpha result here) was used.</p> <p>Minor points of expression</p> <p>P 8 Line 23 Clinical contact can deepen medical students' understanding of professionalism especiallyand has a strong Line 52 empathy level of Lines 54-58 What is the relevance of the sentence beginning "Several other studies" line 53 ...have they also produced conflicting results?</p> <p>P9 Line 22 Our students come directly from. The authors are correct in pointing that this is different from medical students in the USA. BUT not necessarily from medical</p>
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	<p>students in European countries. In the UK the majority of students entering medical school will do so directly from secondary school. References.</p> <p>The following references need to be looked at again for typographical issues eg no page numbers and variation in the abbreviation of the journal's title. 1, 4, 11, 12, 29, 43, 44, 45</p>
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REVIEWER	<p>Marco Antonio de Carvalho Filho CEDAR - Center for Education Development and Research - University Medical Center Groningen, The Netherlands</p>
REVIEW RETURNED	10-Dec-2019

GENERAL COMMENTS	<p>Review BMJ open - BMJ open-2019-035690 – “Empathy variation of undergraduate medical students after early clinical contact.”</p> <p>General Comments:</p> <p>This is an interesting study investigating the effect of an early clinical placement targeting empathy development in self-reported empathy levels of medical students. The research is methodologically sound, but the authors should contextualize their findings by acknowledging the limitations of the approach and the recent findings regarding empathy measurements.</p> <p>Introduction:</p> <p>1 - In the first paragraph, the authors state that self-reported empathy levels are related to clinical outcomes. Recently, Chaitoff et al. (Physician empathy is not associated with laboratory outcomes in diabetes: A cross-sectional study. J Gen Intern Med 2019;34:75–81.doi:10.1007/s11606-018-4731-0) showed that self-reported empathy levels were not related to the clinical outcomes of patients with diabetes. So, the authors should also mention that there is still a debate going on whether self-reported empathy is related to clinical outcomes. This paragraph also has a lot of information, from showing that empathy is important to the relevance of providing students with opportunities to develop it. The authors should divide this paragraph into two or three to facilitate comprehension.</p> <p>2 - Also, there is literature showing the self-assessment is not always accurate and often does not correspond to the reality as observed by others (Eva KW , Regehr G . Self-assessment in the health professions: a reformulation and research agenda. Acad Med 2005;80:S46–S54.doi:10.1097/00001888-200510001-00015). Specifically, in the empathy field, Bernardo et al. showed that self-reported empathy is nor correlated with patients` perspectives during clinical encounters with medical students (Investigating the relation between self-assessment and patients` assessments of physicians-in-training empathy: a multicentric, observational, cross-sectional study in three teaching hospitals in Brazil - BMJ Open 2019;9:e029356. doi: 10.1136/bmjopen-2019-029356) and with graduated medical doctors (Physicians' self-assessed empathy levels do not correlate with patients' assessments. PLoS One 2018;13:e0198488.doi:10.1371/journal.pone.0198488). These limitations of self-reported measurements should be acknowledged in the introduction and limitation sections of this study, as well as the lack of correlation between self-reported empathy and patients` perspectives. This acknowledgment helps the reader to make sense of the observed change reported in this study.</p> <p>Methods:</p> <p>3 – Several initiatives were developed to nurture the empathy of medical students. Although the authors made it clear that their initiative is related to early clinical contact, I found it challenging to understand what they mean by clinical contact. They should make</p>
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	<p>it more explicit (how many patients they saw, what was the kind of supervision, did they have to deal with the workload, how much time they had to reflect, did they become responsible for the patients, or were they shadowing a doctor?). In other areas of the world, Brazil, for instance, we also have early contact with patients, since the first year. This contact can be from visiting families at home to map the territory, to shadowing a doctor in clinical activities, to work together with social workers, or to do real consultations at hospitals or primary care facilities. So, I think the authors should explain a little bit better what they actually have done.</p> <p>Discussion:</p> <p>4 – The first paragraph of the discussion is a repetition of the first paragraph of the introduction, and in the way it is right now, it should be excluded. The authors could focus on exploring the differences they had encountered. For instance, the authors judge that the lack of distinction between gender could be related to cultural differences, but they did not give arguments or examples to justify that. And this is a topic that could be very interesting: the cultural differences regarding empathy. The fact that students come directly from high school is also true for Brazilian students, and, IN Brazil, we still see the difference between genders. Even after interventions to increase empathy, the gender difference stays.</p> <p>Limitations</p> <p>5 – The authors did not mention that self-reported scales suffer the influence of socially desirable behavior, which means that after the training, students become aware of what is the desirable answers in the questionnaire. And only that can explain the differences observed. So, this substantial limitation should be explicitly acknowledged.</p> <p>I hope these suggestions can improve the paper and facilitated the reader to understand the results.</p>
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REVIEWER	Hitomi Kataoka Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, JAPAN
REVIEW RETURNED	17-Dec-2019

GENERAL COMMENTS	<p>This is the manuscript to clarify the effects of early clinical contact (ECC) on empathy in undergraduate medical students. ECC increased students' empathy regardless of gender or academic years. This is important and valuable study to reveal the importance of ECC. However, several points would be addressed to improve the manuscript.</p> <p>Major points</p> <p>1 Please explain about ECC training more clearly. How many patients the students would contact in two weeks? How teaching staffs at university contribute during students would be in community or affiliate hospitals? How doctors contribute at community or affiliate hospitals?</p> <p>2 Please show the overall curriculum of the university. In the end of first or second year, what is the difference in their medical knowledge or readiness to have experience in clinical situation?</p> <p>3 Authors should evaluate the long-term effects of ECC, for example 6months or 1-year later. If authors can add these data to show the long-term effects, it can improve the quality of the manuscript much better. If you could not present the additional data, please add several comments about longitudinal analysis.</p>
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	Minor comment P5 L32 Hoja should be corrected to Hojat.
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Thelma Quince

Institution and Country: Department of Primary Care, University of Cambridge, UK

Please state any competing interests or state 'None declared': I have no competing interests.

Please leave your comments for the authors below

Introduction:

The contextual literature has been adequately covered and referenced. The section is at times repetitive and could be expressed more concisely. It would be better if the study undertaken were described in the active past tense: "We used", "We found that" and findings of other studies expressed in terms of "have shown that". But these are pure stylistic preferences.

P3

Line 6 Empathy isof another and includes

Line 16 favourable for diagnosis and are likely to display improved treatment compliance

Line 18 repetition (impact on doctor patient interaction has already been described) but comment about doctor satisfaction should remain

Line 49 medical students declines with increasing academic years

Line 53 repetition In addition. Start sentence Gender has also been found to influence undergraduate medical students' empathy

Line 57 confusing "Conflicting results have been found in respect of gender differences, a reason for this may be social-cultural background

P4

Line 13 and the role of the health professional which occurs

Line 18 early in medical students' training elicits a positive

Line 24 expression However the impact of early clinical contactremains relatively under researched.

Last paragraph: please could the authors state concisely the research questions:

Eg We sought to investigate whether early clinical contact altered medical students' empathy

And whether there were any differences in this respect in terms of gender and or academic year.

Methods

Participants

P 5

Line 10 214 returned questionnaires were valid.

Procedure

P5

Line 60 The ECC curriculum took place at.

More detailed information about the ECC would be welcome such as whether students worked in groups or individually and the average number of patients they were likely to have seen during the two week period.

Each student completed independently interviews with at least 3 patients.

P6

Line 6 given by a professor

Line 16-17 and the psychological and social changes associated with the illness experienced by the patients and their families

Results. Fairly clearly described and table clear. There is perhaps need for better alignment

Discussion

The structure of this section is poor and needs to be improved.

Suggestions

P 8 First paragraph: recap on importance of empathy as given but removing sentence "Teachers in medical"

State simply that studies of the trajectory of empathy among undergraduate medical students have produced conflicting results, then cite the two studies referred to and comment on the fact that both in different ways relate to the impact of clinical contact on medical student empathy. This gives appropriate background and would lead into the rationale of the study reported and the main findings.

But all of the main findings would be better presented here

A] Improvement in empathy scores in both years and among both genders after the ECC

B] No gender differences

C] No differences empathy scores between academic years.

Then take A and B in turn:

A] As described the ECC includes not only early clinical contact but also instruction. Some comment on success or otherwise of empathy enhancing interventions would be useful here.

B] The discussion of impact of gender on empathy scores could follow, as given it is repetitive and could be expressed more concisely.

The finding that there was no interaction between gender and academic year should be here.

The implications for medical education could then be outlined. Followed by implications for medical education research.

The strength and limitations of the study: strengths are that a validated instrument with good internal consistency (Cronbach alpha result here) was used.

Minor points of expression

P 8

Line 23 Clinical contact can deepen medical students' understanding of professionalism especially ...and has a strong

Line 52 empathy level of

Lines 54-58 What is the relevance of the sentence beginning "Several other studies" line 53 ...have they also produced conflicting results?

P9

Line 22 Our students come directly from.

The authors are correct in pointing that this is different from medical students in the USA. BUT not necessarily from medical students in European countries. In the UK the majority of students entering medical school will do so directly from secondary school.

References.

The following references need to be looked at again for typographical issues eg no page numbers and variation in the abbreviation of the journal's title. 1, 4, 11, 12, 29, 43, 44, 45

Reviewer: 2

Reviewer Name: Marco Antonio de Carvalho Filho

Institution and Country: CEDAR - Center for Education Development and Research - University Medical Center Groningen, The Netherlands

Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below

Review BMJ open - BMJ open-2019-035690 – "Empathy variation of undergraduate medical students after early clinical contact."

General Comments:

This is an interesting study investigating the effect of an early clinical placement targeting empathy development in self-reported empathy levels of medical students. The research is methodologically sound, but the authors should contextualize their findings by acknowledging the limitations of the approach and the recent findings regarding empathy measurements.

Introduction:

1 - In the first paragraph, the authors state that self-reported empathy levels are related to clinical outcomes. Recently, Chaitoff et al. (Physician empathy is not associated with laboratory outcomes in diabetes: A cross-sectional study. *J Gen Intern Med* 2019;34:75–81.doi:10.1007/s11606-018-4731-0) showed that self-reported empathy levels were not related to the clinical outcomes of patients with diabetes. So, the authors should also mention that there is still a debate going on whether self-reported empathy is related to clinical outcomes. This paragraph also has a lot of information, from showing that empathy is important to the relevance of providing students with opportunities to develop it. The authors should divide this paragraph into two or three to facilitate comprehension.

2 - Also, there is literature showing the self-assessment is not always accurate and often does not

correspond to the reality as observed by others (Eva KW, Regehr G. Self-assessment in the health professions: a reformulation and research agenda. *Acad Med* 2005;80:S46–S54.doi:). Specifically, in the empathy field, Bernardo et al. showed that self-reported empathy is not correlated with patients' perspectives during clinical encounters with medical students (Investigating the relation between self-assessment and patients' assessments of physicians-in-training empathy: a multicentric, observational, cross-sectional study in three teaching hospitals in Brazil - *BMJ Open* 2019;9:e029356. doi: 10.1136/bmjopen-2019-029356) and with graduated medical doctors (Physicians' self-assessed empathy levels do not correlate with patients' assessments. *PLoS One* 2018;13:e0198488.doi:10.1371/journal.pone.0198488). These limitations of self-reported measurements should be acknowledged in the introduction and limitation sections of this study, as well as the lack of correlation between self-reported empathy and patients' perspectives. This acknowledgment helps the reader to make sense of the observed change reported in this study.

Methods:

3 – Several initiatives were developed to nurture the empathy of medical students. Although the authors made it clear that their initiative is related to early clinical contact, I found it challenging to understand what they mean by clinical contact. They should make it more explicit (how many patients they saw, what was the kind of supervision, did they have to deal with the workload, how much time they had to reflect, did they become responsible for the patients, or were they shadowing a doctor?). In other areas of the world, Brazil, for instance, we also have early contact with patients, since the first year. This contact can be from visiting families at home to map the territory, to shadowing a doctor in clinical activities, to work together with social workers, or to do real consultations at hospitals or primary care facilities. So, I think the authors should explain a little bit better what they actually have done.

Discussion:

4 – The first paragraph of the discussion is a repetition of the first paragraph of the introduction, and in the way it is right now, it should be excluded. The authors could focus on exploring the differences they had encountered. For instance, the authors judge that the lack of distinction between gender could be related to cultural differences, but they did not give arguments or examples to justify that. And this is a topic that could be very interesting: the cultural differences regarding empathy. The fact that students come directly from high school is also true for Brazilian students, and, IN Brazil, we still see the difference between genders. Even after interventions to increase empathy, the gender difference stays.

Limitations

5 – The authors did not mention that self-reported scales suffer the influence of socially desirable behavior, which means that after the training, students become aware of what is the desirable answers in the questionnaire. And only that can explain the differences observed. So, this substantial limitation should be explicitly acknowledged.

I hope these suggestions can improve the paper and facilitated the reader to understand the results.

Reviewer: 3

Reviewer Name: Hitomi Kataoka

Institution and Country: Okayama University Graduate School of Medicine, Dentistry and
Pharmaceutical Sciences, JAPAN

Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below

This is the manuscript to clarify the effects of early clinical contact (ECC) on empathy in undergraduate medical students. ECC increased students' empathy regardless of gender or academic years. This is important and valuable study to reveal the importance of ECC. However, several points would be addressed to improve the manuscript.

Major points

1 Please explain about ECC training more clearly. How many patients the students would contact in two weeks? How teaching staffs at university contribute during students would be in community or affiliate hospitals? How doctors contribute at community or affiliate hospitals?

2 Please show the overall curriculum of the university. In the end of first or second year, what is the difference in their medical knowledge or readiness to have experience in clinical situation?

3 Authors should evaluate the long-term effects of ECC, for example 6months or 1-year later. If authors can add these data to show the long-term effects, it can improve the quality of the manuscript much better. If you could not present the additional data, please add several comments about longitudinal analysis.

Minor comment

P5 L32 Hoja should be corrected to Hojat.

VERSION 2 – REVIEW

REVIEWER	Thelma Quince Primary Care Unit Department of Public Health and Primary Care University of Cambridge UK
REVIEW RETURNED	14-Jan-2020

GENERAL COMMENTS	Thank you for addressing the issues I raised. I suggest a small number of minor issues of expression which would further improve the paper: Page 6 into page 7: The ECC curriculum: In the patient interviews students were required.. Each student completed interviews independently with at least 6 patients and wrote 2 ... Students shadowed a doctor each day but had no responsibility for...
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	<p>Page 9: Line 45: During the ECC we emphasized the importance of empathy and students were required... Line 55: We have unified the requirements of the patient interview... Page 10: Line 20: Our students come directly from high school after passing a ... Line 30: Future research should use... Line 36: One limitation of our study is that empathy was measured... Line 42: , future research should consider the patients' perspectives as well. Line 51: The main purpose of this study was to observe the short-term impact of the ECC on medical students' empathy.... You might also want to check the abbreviated titles of the journals for the following references: 12, 37, 38.</p>
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REVIEWER	Marco Antonio de Carvalho Filho University Medical Center Groningen; The Netherlands.
REVIEW RETURNED	10-Feb-2020

GENERAL COMMENTS	The authors have incorporated most of the suggestions but one. In my opinion, to deny the discussion about the correlation between self-reported empathy and patient outcomes does not help the field to develop further. All the studies that addressed this issue until this moment, the ones published by Hojat and the one published by Chaitoff have limitations. And this is the reason, we still need to investigate it. Anyway, I am satisfied with the review and think the paper should be accepted.
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Thelma Quince

Institution and Country: Primary Care Unit

Department of Public Health and Primary Care

University of Cambridge

UK

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

Thank you for addressing the issues I raised.

I suggest a small number of minor issues of expression which would further improve the paper:

Page 6 into page 7: The ECC curriculum:

In the patient interviews students were required...

Each student completed interviews independently with at least 6 patients and wrote 2 ...

Students shadowed a doctor each day but had no responsibility for...

Page 9:

Line 45: During the ECC we emphasized the importance of empathy and students were required...

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Line 36: One limitation of our study is that empathy was measured...

Line 42: , future research should consider the patients' perspectives as well.

Line 51: The main purpose of this study was to observe the short-term impact of the ECC on medical students' empathy....

You might also want to check the abbreviated titles of the journals for the following references: 12, 37, 38.

Response:

We thank the Reviewer for these important suggestions, which we of course have followed. We collectively apologize for all these mistakes in grammar and the incorrect abbreviated titles of the journals of some references, and have made amendments accordingly.

Reviewer: 2

Reviewer Name: Marco Antonio de Carvalho Filho

Institution and Country: University Medical Center Groningen; The Netherlands.

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

The authors have incorporated most of the suggestions but one. In my opinion, to deny the discussion about the correlation between self-reported empathy and patient outcomes does not help the field to develop further. All the studies that addressed this issue until this moment, the ones published by Hojat and the one published by Chaitoff have limitations. And this is the reason, we still need to investigate it. Anyway, I am satisfied with the review and think the paper should be accepted.

Response:

We greatly appreciate the Reviewers' valuable comments and agree to the publication of our paper.