Author's response to reviews

Title: Undergraduate medical student perceptions and use of Evidence Based Medicine: A qualitative study

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Author's response to reviews: see over
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Dear Editor,

MS: 3347786553683644 – Undergraduate medical student perceptions and use of Evidence Based Medicine: A qualitative study

Thank you for your comments and that of the reviewers for the above titled manuscript.

We have read through the comments and have amended the manuscript accordingly. Please find enclosed below our point-by-point responses to the comments.

Please let me know if you need anything further. I look forward to your future correspondence.

Kind regards,

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EDITORS COMMENTS

ABSTRACT
Par. 1, L. 4: change the word ?on? to ?of?.
This has been corrected.

Par. 2, L. 1: ?Criterion-based volunteer sampling?: Here and later in the principal Methods section, this comes across as jargon that does not contribute to reader understanding of what you did and how you did it. Does this mean simply that you asked for volunteers among the third-year students who had taken the EBM course? If so, state it, if not explain your sampling methodology in even more detail.  Par. 2, L. 3: ?homogenous to hospital setting?: this wording is awkward. Can you simply say ?students within each of (how many) metropolitan or rural hospital setting were interviewed as a group.? The number of students taking part in the interviews is a ?Result? and belongs in the third paragraph. You should also state the percentage of eligible hospitals that were represented in your sample in the Results section.
Wording of the Methods and Results section has been amended as suggested.

Par. 3, L. 1-2: Better wording would be: ?Five key themes emerged from the analysis of transcripts: Rationale and???.., Current use of EBM????? etc. As noted above, the number of students enrolled in the study belongs in this section. Please also state what percentage of the eligible student population were included in the study.
This section has been modified as suggested.

Par. 4: Some of the contents of this segment of the abstract, particularly the results of the interviews and theme analysis, would be better placed in the Results segment. In this, ?conclusions? section, consider summarizing the overall findings with respect to medical students? perceptions of relevance and usefulness of EBM training in conjunction with their initiation of clinical studies.
This section has been modified as suggested.

BACKGROUND
P. 3-5: This segment needs substantial reworking in such a way as to establish and develop the focus on the issue of EBM teaching and learning for undergraduate medical students, the precedents for your study, the need for your study and the principal objective of your study.
Par. 3, L. 1-2: This statement introduces a theme that is not developed or elaborated in a fashion that serves the purpose of the intro. Are you trying to get at the issue that the need for clinical relevance of EBM is particularly challenging in the context of undergraduate learners (who may have little to no clinical experience at the time of training)? If so, state this. Your citation #3 is incongruous here. It has to do with competency assessment in internal medicine residents (not medical students), has nothing to do with training in EBM and is also entirely obsolete in that the entire framework of resident competency assessment in the US was radically redefined by the ACGME Outcomes Project that was released a year later, did address EBM skills and currently dominates graduate medical education in the US.
This paragraph has been removed.

P. 3, Par. 1, L. 8-12: This statement introduces a theme that is not developed or elaborated in a fashion that is at variance with your identification of skills sets in the preceding paragraph. The paragraph has been removed.

P. 4-5: Here you begin to develop the problem that your study seems to address-the issue of clinical relevance of EBM to students who have, at best, just embarked upon their clinical training and experience. In reviewing the relevant literature, please distinguish between concepts pieces and primary studies and please state directly whether primary studies of medical student attitudes and perceptions regarding EBM training have previously been published. If the answer is ?yes?, please quickly summarize them in a way that makes the need for your own study apparent. If the answer is ?no? please directly state this and announce your own study accordingly.
This section has been modified as requested.

METHODS
P. 6, Par 1: you might consider changing the header of this section to ?Population and Setting?. You then need to elaborate several relevant aspects: What is the class size across all of the hospital training sites?
What is the content of the 10 week course? How is its emphasis divided across the skill domains you identified at the beginning of your Background section? What is the learning mode used in the course, and specifically, how is emphasis on clinical application introduced, developed and reinforced? Was there a uniform time interval between the end of the 10 week course and the focus group participation? The header has been changed as suggested. Class size has been included along with greater detail about the EBM course. Also included are details on the integration of the EBM course with the clinical workload, and the time interval between focus group participation and course completion.

P. 6, Par. 2: Reviewer #3 has asked for a more precise and detailed description and categorization of your research methodology. Please address this reviewers' comments carefully in this regard.

We have amended the sentence to read “Focus groups were guided by a grounded theory approach, which allowed participants to interact and provide direct opinions and experiences on the issue.” Grounded theory adopts an inductive approach to generating data and theory on a phenomenon. We performed a survey prior to the focus group discussions to inform the development of the interview schedule. This approach also forms a method of triangulating the data, thus providing greater rigour to the study. We have amended the relevant paragraph to clarify this.

P. 7, Par. 1: See earlier comments under the Abstract. Avoid jargon and describe the actual recruitment and selection process in detail. The statement regarding the number of hospitals in the two categories represented in the study might better be placed in the Results section for consistency. In that section, and also under the request Limitations subsection of the Discussion, you might make clear that only 4/12 = 33% of possible hospital sites were represented. Here, in Methods, you should explain more about the process through which you not only recruited participants, but grouped them into focus groups. E.g., was there a quota? - i.e. if you had less than 4 recruits in a specific hospital training site, and you were committed to keeping students in a single site together, did you exclude otherwise eligible volunteers if there were not enough from their site to make a quorum? Jargon regarding the recruitment process has been eliminated. We have placed the sentence referring to hospital participation in the results section. We have clarified that the 12 teaching hospitals reflect participation of four clinical schools. Therefore, the four focus groups reflect 100% participation from all four clinical schools, as each clinical school has between 2-3 teaching hospitals associated with it. This ensured that each focus group represented a clinical school. Further explanation is detailed on pages 7 and 9.

P. 8, Par. 1, L. 3-4: There is major confusion among several reviewers regarding your description in this section, and particularly your explanation of your use of saturation methodology. The wording of the targeted lines implies that somehow, either the number of focus groups or even the duration of the individual focus group session(s) was determined by your assessment of saturation. Furthermore, here you refer to a saturation of data? What was the unit of saturation? One assumes it was themes, please clarify and be consistent in the text. Please clarify the relationship between the focus group process, the theme analysis and the process of suspending further interviews.

We have used the term ‘saturation’ to indicate that no new ‘themes’ could be generated from the focus group discussions. Preliminary analysis of the focus group transcripts was conducted following each focus group. It was decided after the fourth focus group that proceeding with further focus groups would not generate discussion on any new themes. We have modified the text to represent this.

RESULTS

P. 9, Par. 1: Please expand the full elaboration of percentage of targeted sites and the percentage of targeted students included in the study. The percentage of eligible sites is already clear as 33%, which is low. The percentage of eligible students is not currently ascertainable from your report. Please include any analysis you have done (or can do) that might convince the reader that your sample was representative with respect to, 1. student population, and 2. site population.

We have inserted in this section that all the focus groups had student representatives from the four Clinical Schools. We have also included the number of participating students and eligible students.

P. 9, Par. 2-P. 14: This is the guts of your report. As written, it reflects 95% interpretation and 5% direct reporting of responses. Please consider being more generous to the reader with respect to the basis of your interpretations. Ways of doing this might be: 1. To include multiple example responses under each theme category, 2. To include responses NOT directly in line with your global interpretations, and, 3. To give some
qualitative idea of the amount of emphasis on the different themes within the focus group transcripts. I.e. which issues did the students REALLY feel strongly about? You might consider a Table in which the themes were listed in one column and representative responses in a second column. You might also number the themes and consider identifying a rationale for their ordering (most relevant responses at the top, least at the bottom?) Consider numbering them identically in both Table and Text. The identification of the most emphasized themes across the transcripts would itself constitute a ?result? of your study!!! Table 2 has been constructed to illustrate the themes that were identified from the focus group discussions and those that were deemed ‘minor’. Re-ordering the themes from ‘top to bottom’ is not reflective of thematically analysing data, rather this would constitute a content analysis and deductive analysis. We have utilised thematic analysis, using the Grounded Theory framework, and adopting an inductive approach to analysis. We have numbered the themes within the table and text as requested. We have also included multiple examples responses under each of the categories as suggested.

DISCUSSION
This section is, with the Background section, in most need of radical reworking. Reviewer #3 has noted extraneous elements including the discussion of journal clubs and other issues that have nothing to do with the purpose and methods of your inquiry. Please concentrate on those aspects of your findings, as reported in your Results section, that you find most important and compelling, and relate those findings to current literature. Avoid blanket, ?self-evident? statements such as:
P. 15, Par. 2: ?Clinical maturity will dictate how relevant medical students perceive the use of EBM principles?; ?Teaching EBM in a year where students can actually integrate EBM principles may promote their view that EBM is a worthwhile approach to adopt in clinical practice.? These statements have little if anything to do with what you studied, and many of the publications you cite in these contexts are likewise tangential in relevance.
We have amended the discussion as suggested by comments from the editor and Reviewer #3.
P. 17, Par 2: Some of the material in this paragraph belongs, with even additional elaboration, in your Methods section. Reviewer #3 challenges your proposal that your methods, in unconditional terms, define the framework for future inquires. You imply that you somehow have established a ?theoretical framework?. However, you have elaborated no such framework in your Methods section. The editor suggests that you consider abandoning this line of elaboration in favor of a focus on the specific themes that emerged, the RELATIVE WEIGHTING of those themes as detected within your transcripts, and suggestions regarding the implications of those themes for future teaching practice and inquiry. At the end of this paragraph, you introduce what ought to become your fully developed LIMITATIONS SECTION. See previous comments in this regard.
This paragraph has been removed, with the limitations of the study further highlighted as requested.

CONCLUSIONS
P. 19: This section, as noted by Reviewer #3, wanders and traverses concepts, such as journal clubs, that appear entirely extraneous to the design and results of your study. Please condense this substantially into 2-3 sentences that draw appropriate inferences based upon what you have explicitly observed.
This section has been modified as requested.
Reviewer #1

Major compulsory revisions:
1. How many students comprise the 3rd year class at your institution.
A total of 220 students were enrolled as third year students. We have included this in the Methods section.

2. Were the volunteers for this trial representative of the class as a whole.
All of the volunteers were 3rd Year medical students, who had completed the EBM course. Beyond this, it is impossible to generalise how representative the participants are of the entire group. We have listed this as a limitation of the study.

3. It may be reasonable to discuss the potential for selection bias in this trial as the participants were self-selected. Do you have any data on those that did not want to participate and/or why?
It is impossible to determine data on non-participants, as students volunteered to participate in this study. We note the potential for selection bias, and address it in the limitations section of the discussion.

4. Can you provide some details about the 10 week course in EBM procided to the students. I brief understanding of the background education provided would help the reader guage the generalizability/applicability of these findings.
Greater details about the EBM course is provided in the Methods section and Table 1.

5. Do you have some measure for the effectiveness of EBM practiced by the teaching attending MDs as it pertaind to patient care. It is possible that while they may have a very good understanding of basic EBM principles, the clinical application as viewed by the students may not be entirely valid. There are examples of this when clinical decision rules are evaluated for impact analyses.
We do not have any measure of the effectiveness of EBM practiced by the teaching attending MDs. We have listed this as a potential limitation of the study.

Minor revisions:
1. Page 14, change autonomy "is" to autonomy "to"
This has been modified.

Reviewer #2

Minor essential revisions
Under the background section in paragraph 4, the authors refer to a prior study of third year medical students’ self-perception of EBM skills. It would be helpful to the authors to clarify whether those were 3rd year medical students in the Australian system, US system, or some other system of medical education, so that the reader easily understands the level of students in that study, literature citation 12.
We have amended the sentence to clarify that students are in the Australian system.

Reviewer #3

Minor essential revisions
methods; methodological approach; 3rd sentence: you stated that focus groups were guided by grounded theory. I agree that part of your study resembles grounded theory, but I’d rather call it a grounded theory approach where your interview schedule for the focus groups is also guided by previous research. In methods; format; last sentence, you stated that “The facilitator was guided by the same interview schedule, which was informed by a previous survey on the topic.” Using this combined approach allowed you to use previous research (providing a structure) and allowed you to probe for responses and to elaborate on other relevant issues raised (providing unstructured exploration).
We have amended the section as requested, and addressed the issue under ‘editor comments’.

Discretionary revisions
abstract; conclusions; ’and application to clinical disciplines’: what do you mean here? Do you mean that medical students need to integrate their newly acquired knowledge and skills on EBM into practice during their internships? If so, then the term ’clinical disciplines’ is confusing, because in the article you describe differences between medical disciplines that could have impact on the practice of EBM. So, to me you could also be referring to how to these differences and how to deal with these.
We have amended the conclusions of the abstract to reduce confusion.
background; first paragraph; last two sentences: (1) Competency in EBM ... to the construct. Why did you add 'to the construct' at the end of this sentence? It seemed superfluous to 'in a construct' used earlier in this sentence and it confused me on what you meant. (2) "Therefore,.." Here you refer to earlier passages that provide arguments for linking achieving competency in EBM to promoting lifelong learning in practice. To me it is not clear which arguments you are referring to.
This paragraph has been removed.

background; third paragraph; first three sentences: (1) what do you mean with 'the effectiveness of teaching EBM to students'? I guess you mean easy to measure aspects like improving EBM knowledge and skills. To me, effectiveness of teaching EBM also comprises attitudes, beliefs and uptake, but these aspects have been paid less attention to. A suggestion would be: "The majority of studies to date have focused on the effectiveness of teaching EBM to students, in terms of improving EBM knowledge and skills, across...post-graduate). However, few have explored other aspects of effectiveness of teaching EBM, like student attitudes, beliefs and actual uptake of EBM principles."
We have amended the paragraph as suggested.

Methods; data analysis; 5th sentence: "Focus groups were conducted until the data reached a point of theoretical saturation." Does this mean that you cancelled the other upcoming focus groups or that you upfront estimated that four focus groups would be likely to render theoretical saturation as your sample was rather homogenous and already comprised 23 participants (only differing in rural/urban hospital)? We have inserted a paragraph stating the preliminary analysis of focus group transcripts was completed following each focus group. Adopting such a process allowed the researchers to identify when no more new themes were being achieved within the focus group discussions.

discussion; 6th paragraph; 3rd sentence: ".., but also provides a framework on which future quantitative evaluations may be based on." I do not understand what you mean by this. Why and how could this framework be of use for future quantitative evaluations?
We have removed this sentence.

Conclusions; 4th&5th sentence: "Journal clubs have the potential to bring together...". To my knowledge, journal clubs were not mentioned earlier in this article. Why do you mention them here? Is this based on literature or own experiences that support the use of journal clubs to progress EBM? In addition, you have not explicitly linked journal clubs to your findings in this study?
We have removed these sentences.