Author's response to reviews

Title: Could clinical experience during clerkship enhance students' clinical performance?

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Author's response to reviews: see over
We thank the Reviewer for his/her thoughtful and expert review of our manuscript and for their valuable and insightful comments. We have responded to each of the Reviewer’s comments and have incorporated all modifications suggested by the reviewer into the revised manuscript. The changes within the revised manuscript were highlighted (underlined and in blue). Our responses to the Reviewer’s comments are as follows:

**Reviewer 1 (Dale Sheehan) Comments:**

1. **Reviewer’s comment:** The question posed by the authors is well defined but I believe it is naive in the context of the existing literature. This has led to a lack of balance in the conclusions and discussion.

   **Author’s Response:**
   According to the Reviewer’s comment, we have reviewed more literature and added the sentence “Although much effort has been made to find correlations between the number or variety of patients seen during clerkships and clinical performance at the end of the clerkship, evidence regarding the educational value of patient encounters is still limited. The nature of the examinations given, such as the written knowledge-based examinations and the variety of quality of clinical experiences, were reasons for the observed lack of correlations [1-3]. Additionally, the quality of the clinical supervisor was important for developing clinical competence [4, 5]. Although the influence of clerkship experiences on clinical competence yielded contradictory results, medical students evaluated the exposure to real patients as very important [3]. Real-life contextual experience by clinical exposure added value in acquiring clinical competence, whereas paper-based case tutorials also provided students with clinical knowledge [6].” on page 3, lines 64-74, and “This could be explained by students’ under reporting their experiences with patients. Previous studies reported variable accuracy in logbooks, which usually involved significant under-reporting but little over reporting [7-9]. That is to say, students do not seem to overestimate exposure to patients or core problems, but they may not report every exposure.” on page 8, lines 153-157 within the revised manuscript.

2. **Reviewer’s comment:** There are also unstated limitations linked to difference in context and supervision etc. In other words the relationship between length of experience and numbers of patients seen is overstated without due consideration to other variables.

   **Author’s Response:** According to the Reviewer’s recommendation, we have added the sentence “Our study suggests that clinical experience during clerkship is weakly associated with student’s clinical performance. Although only small correlations were present between them, the amount of clinical experience cannot be overlooked. We analyzed only the amount of clinical experience, without considering the variety of experiences or the quality of the supervision. Teaching quality and a supportive house staff were regarded as important elements for improving student performance during clerkships [3, 10]. All of these should be considered when designing a clinical clerkship program.” on page 9, lines 173-179 within the revised manuscript.
3. **Reviewer’s comment:** I have summarized some of the relevant previous literature by author and date making them, I hope, not too hard to find.

**Author’s Response:** According to the Reviewer’s comment, we have reviewed the relevant previous literature and applied them in the revised manuscript and references.

**Reviewer 2 (Jennifer Mary Weller) Comments:**

1. **Reviewer’s comment:** A major problem with this manuscript is the inadequacy of the literature review. The most recent reference is 2000. A much more comprehensive review of the literature of the last 10 years is required to put this study into the current context.

**Author’s Response:**
As the Reviewer pointed out, we have reviewed much more relevant literature and applied them in the revised manuscript and references.

2. **Reviewer’s comment:** The results report student opinion on the value of different approaches to preparing for the OSCE. This should be included in the aim of the study and the methods.

**Author’s Response:**
According to the Reviewer’s comment, we have changed the sentence “We investigated whether the amount of clinical experience during clerkship correlated with students’ clinical competency.” to “We investigated whether the amount of clinical experience during clerkship correlated with students’ clinical competency and students’ perception of effectiveness of their clerkship on it.” on page 2, lines 30-32, “In this study, we tried to determine whether the amount of clinical experience during clerkship correlates with the clinical competency of students based on the outcome of the OSCE.” to “Because it is important that we understand how students benefit from clinical experience and what types of experience are most beneficial, we tried to determine whether the amount of clinical experience during clerkship in each department correlates with the clinical competency of the students and evaluated medical students’ perceptions of the effectiveness of their clerkships on their clinical performance examination.” on page 4, lines 75-79 and added the sentence “The questionnaire also has items for students’ perceptions of the effectiveness of the clerkship on their clinical performance examination (see Appendix 2 for items)” on page 6, lines 107-109 within the revised manuscript.

3. **Reviewer’s comment:** The conclusion does not align with the study question and the final sentence does not make any sense.

**Author’s Response:**
According to the Reviewer’s comment, we have changed the sentence “Clinical competency is complex and could be developed through multiple training aspects plus the quantity of patient encounters during clerkship. Both qualitative and quantitative reinforcement of clinical clerkship is needed.” to “The amount of clinical experience during the students’ clerkship had a small but positive relationship with students’ clinical performance. Further research to elucidate the influence of clinical experience on clinical competency is needed.” on page 2, lines 45-47 within the revised manuscript.

4. Reviewer’s comment: The introduction, while succinct and logical, requires referencing and contextualising in within the current literature on clinical clerkships. For example, page 3 line 56, the claim that “nowadays, early clinical exposure is…” is supported by a reference from 1999. Other claims in that paragraph need supporting references. Page 3 line 65 – considerably more evidence on OSCEs has been published since 1975. This section should describe the current evidence (i.e. last 5-10 years) on clinical clerkships and the current debates in the literature on clinical clerkships.

The aim of the study should include all the aims. The authors also report on student perceptions of the value of different ways of preparing for the OSCE and this should be included.

Author’s Response:

According to the Reviewer’s comment, we have added the sentence and references “Nowadays, early clinical exposure is warranted by experts in medical education [11-14],” on page 3, line 58, “Although much effort has been made to find correlations between the number or variety of patients seen during clerkships and clinical performance at the end of the clerkship, evidence regarding the educational value of patient encounters is still limited. The nature of the examinations given, such as the written knowledge-based examinations and the variety of quality of clinical experiences, were reasons for the observed lack of correlations [1-3]. Additionally, the quality of the clinical supervisor was important for developing clinical competence [4, 5]. Although the influence of clerkship experiences on clinical competence yielded contradictory results, medical students evaluated the exposure to real patients as very important [3]. Real-life contextual experience by clinical exposure added value in acquiring clinical competence, whereas paper-based case tutorials also provided students with clinical knowledge,[6]” on page 3, lines 64-74, “We used the Objective Structured Clinical Examination (OSCE) as a tool for assessing clinical performance because measuring medical students’ clinical competency using OSCEs has become increasingly widespread, and evidence of the validity of the test is mounting.[15-18],” on page 5, lines 90-93 and “Evaluating performance by trained SPs using checklist is regarded as reliable methods and this has been verified by many previous reports [17, 19, 20].” on pages 5-6, lines 103-104 within the revised manuscript.

As for the aim of the study, we have added the sentence “Because it is important that we understand how students benefit from clinical experience and what types of experience are most beneficial, we tried to determine whether the amount of clinical experience during clerkship in each department correlates with the clinical competency of the students and evaluated medical students’ perceptions of the effectiveness of their clerkships on their clinical performance examination.” on page 4, lines 75-79 within the revised manuscript.
5. **Reviewer’s comment**: The methods section needs further specification. While the OSCE itself is described, the data collected needs further specification. It is somewhat surprising that the only scores were from the Standardized patients, and not from an external assessor. The justification for this and the evidence that these scores are valid needs some supporting material. The format of the scoring rubric could be presented in an appendix.

**Author’s Response**: According to the Reviewer’s recommendation, we have added the sentence and references “The current undergraduate curriculum of Seoul National University College of Medicine (SNUCM; Seoul, South Korea) includes two years of preclinical study followed by two years of clinical study. The third year course is run by the departments of internal medicine, surgery, pediatrics, psychiatry, obstetrics and gynecology etc. The fourth year course is composed of elective clerkships during which each student can choose his or her own clerkship schedule. During clinical clerkship, students learn key components of clinical practice by encountering patients, practicing clinical skills, and attending tutoring sessions. The students are required to maintain a logbook that lists of their experiences with patients and exposure to core problems in each department.

We used the Objective Structured Clinical Examination (OSCE) as a tool for assessing clinical performance because measuring medical students’ clinical competency using OSCEs has become increasingly widespread, and evidence of the validity of the test is mounting.[15-18].” on page 5, lines 81-93 and “Evaluating performance by trained SPs using checklist is regarded as reliable methods and this has been verified by many previous reports [17, 19, 20].” on pages 5-6, lines 103-104 within the revised manuscript.

The format of the scoring rubric is presented in an appendix 1.

6. **Reviewer’s comment**: When exactly was the questionnaire administered to the students? Please specify what questions were asked and what format the answers took. Please provide a copy of the questionnaire as an appendix.

**Author’s Response**: According to the Reviewer’s comment, we have added the sentence “At the end of the exam, the students were asked to complete a questionnaire inquiring about the number of patients for whom they took a medical history and physical examination based on the logbook that each student kept during their clerkship. The questionnaire also has items for students’ perceptions of the effectiveness of the clerkship on their clinical performance examination (see Appendix 2 for items).” on page 6, lines 104-109 and added copy of the questionnaire as appendix 2 within the revised manuscript.

7. **Reviewer’s comment**: Page 4 line 84 – what were “baseline characteristics”? What was the purpose of collecting this data and what was done with this data? Is it of relevance to the results or discussion? Please clarify how the information on the number of patient encounters in each of the disciplines was collected i.e. was it all from a log book which students used to complete the questionnaire or was it from students’ memory. It is crucial that the readers can determine how reliable this information is. Please describe the log book fully and if it was available to students when filling in the questionnaire and any information on its accuracy.
Author’s Response: According to the Reviewer’s comment, we have deleted the word “baseline characteristics”. Baseline characteristics have no relevance to the results of our study. As for the clarification of the way of collection the number of patient encounters in each discipline, we have changed the sentence “At the end of the exam, the students were asked to complete a questionnaire inquiring about the number of patient for whom they took a medical history and physical examination based on the medical records that each student keeps during their clerkship.” to “At the end of the exam, the students were asked to complete a questionnaire inquiring about the number of patients for whom they took a medical history and physical examination based on the logbook that each student kept during their clerkship.” on page 6, lines 104-107 within the revised manuscript.

8. Reviewer’s comment: Page 5 lines 97-99 Please clarify what is meant by “total number of patients examined during clinical clerkship” and “number of patients encountered during clerkship” and how this relates to the headings in Table 1. The numbers need more description – e.g., SD. It seems outstanding that some students examined 0 patients or saw only 5 patients over an entire year.

Author’s Response: According to the Reviewer’s recommendation, we have changed the sentence “The total number of patients students examined during their clinical clerkship showed a wide variation according to the department and individual student, ranging from 0 to 30. The number of patients encountered during clerkship per year ranged from 5 to 85” to “The number of patients that students examined during their clinical clerkship varied widely by department and individual student, ranging from 0 to 30. The total number of patients encountered during clerkship per year ranged from 5 to 85 (Table 1)” on page 7, lines 121-124 within the revised manuscript and added Table 1.
The former “number” means the number of patients encountered during clerkship in each department and the latter “number” means the sum of patient numbers encountered during whole third year.

9. Reviewer’s comment: Table 1 is problematic. Actual data (i.e. numbers of patients) need to be included. A bonferroni correction would be required for multiple analyses but it’s unclear to me why each discipline is analysed separately, especially with such low numbers of patient encounters. A statistician should be consulted, but I would suggest analysing only the total numbers. The legend for the table needs to include the meaning of r and p.
Where numbers are provided in a table they don’t need to be repeated in the text.

Author’s Response: According to the Reviewer’s comment, the actual numbers of patients students encountered during clerkship were described in Table 1.
According to the Reviewer’s suggestion and advice from statistician, we have analyzed only total numbers, and have revised Table 2. We presented adjusted p-value by Hochberg's step-up method according to statistician’s advice.
In addition, we have added the meaning of r and p “r=correlation coefficient, p= adjusted p-value by Hochberg’s step up method” in the revised manuscript in Table 2 and deleted the numbers in the text.
10. **Reviewer’s comment**: Lines 118-129 are merely a repetition of the introduction with the addition of two equally out-of-date references. This could be deleted. The discussion should begin with a summary of the main findings, show how the findings add to the current (i.e. recent) body of knowledge, discuss limitations and the say what the take-home message is.

**Author’s Response**: According to the Reviewer’s comment, we have deleted the sentence “Clinical clerkship is a major program at medical schools. Students participate in real clinical practice and learn from patient encounters. A recent trend in medical education emphasizes early clinical exposure.” and added the sentence “In this study, we show that the amount of clinical experience during clerkship has a small but positive relationship with students’ clinical performance.” on page 8, lines 139-140 within the revised manuscript.

11. **Reviewer’s comment**: Page 6 line 130 The claim that the number of encounters with patients is opportunistic / depends on student attitudes is not supported by the data given or by a reference. The basis of this assumption needs to be supported. While it is certainly astonishing that the data shows such low numbers, this actually casts some doubt over the reliability of the data, which needs to be more firmly supported in the methods section.

**Author’s Response**: According to the Reviewer’s recommendation, we have changed the sentence “However, the wide variation in the number of patient encounters during clerkship showed that clinical clerkship is still opportunistic, not systematic, and depend mainly on the attitudes of students.” to “However, the wide variation in the number of patient encounters during clerkship showed that clinical clerkship **is not yet standardized, and we can assume that there is some qualitative variation in clinical clerkships as well as quantitative ones**.” on page 8, lines 149-152 and added the sentence “This could be explained by students’ underreporting their experiences with patients. Previous studies reported variable accuracy in logbooks, which usually involved significant under-reporting but little over-reporting.” on page 8, lines 153-157 within the revised manuscript.
Reference


