Author's response to reviews

Title: Role of SimMan in teaching clinical skills to preclinical medical students

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Author's response to reviews: see over
Hello

I have attached point by point response to the reviewers’ comments and made appropriate changes in the manuscript. (page numbers and line numbers are attached for reference).

Reviewer’s report
Title: Role of SimMan in teaching clinical skills to preclinical medical students)
Version: 1 Date: 6 September 2012
Reviewer: kristin fraser

Reviewer’s report:
• Major Compulsory Revisions
  1) Unfortunately, many details of this experiment are missing; therefore, it is difficult to interpret the relevance and importance of the results. Please describe:
     - Student groups: you describe 3 students per group with an MD as facilitator. Was this for both the “SimMan” and the “peer” portions of the experiment? Yes – page 8, line1-4
     - The students were divided into two groups of twelve (A and B). They were then further subdivided into subgroups of 3 students who were facilitated by a tutor (medical doctor) for one hour with thirty minutes spent on examining each other and the other thirty minutes on SimMan.

     Please describe the nature of the facilitator role for each session.
     Page 8, line 4-6,
     During this session, every student performed respiratory or cardiovascular system examination for five- seven minutes on each other or on SimMan and received feedback after their performance from the tutor for 3-5 minutes.

     Page 8, line 20-22(2nd paragraph)
     The students were observed and scored by the tutor individually in the subgroup while performing examination on SimMan or on each other using a scoring scheme which is used to assess them during OSCE.

     Were there stated learning objectives available to the students and/or facilitators for the session?
     Yes – last 2 lines of page 7
     The learning outcomes were stated for the students and the tutors.

How much time was allowed for each session and was the full time used?
Page 8, line1-7
The students were divided into two groups of twelve (A and B). They were then further subdivided into subgroups of 3 students who were facilitated by a tutor (medical doctor) for one hour with thirty minutes spent on examining each other and the other thirty minutes on SimMan. During this session, every student performed respiratory or cardiovascular system examination for five- seven minutes on each other or on SimMan and received feedback from the tutor for 3-5 minutes. In majority of the cases, complete time allocated was utilized.
- In the student group did each student get the opportunity to examine another student or did they miss out on the experience if they were the “patient” for that session?
Yes every student got the opportunity to examine another student,
Hence every student performed either cardiovascular or respiratory system examination on each other as well as on SimMan.

- Please provide the 10 item evaluation tool so we can see what knowledge items were tested and if they matched the learning objectives for the sessions.
Provided (CVS and RS examination scoring sheets attached).
Learning outcomes of the session were – to perform the clinical skill of examination of the respiratory and cardiovascular system in a systematic manner, to apply recently acquired theoretical knowledge to the relevant aspects of respiratory and cardiovascular system examination.

- Describe the “performance exam” (also referred to as “formative”) in more detail please. Specifically, was this done after all teaching in the session had concluded or was there ongoing feedback during the exam?
During this session, every student performed respiratory or cardiovascular system examination for five- seven minutes on each other or on SimMan and received feedback after their performance from the tutor for 3-5 minutes.

Who did the assessment of performance? Was each student assessed individually or as a group?
The students were observed and scored by the tutor individually in the subgroup while performing examination on SimMan or on each other using a scoring scheme which is used to assess them during OSCE.

Could you provide the checklist or at least comment on some of the expectations of the performance on Sim Man vs. peer assessment (for example, JVP cannot be seen on “SimMan” and diaphragms cannot be percussed on “SimMan”).
Checklist provided (Questionnaire- pre, mid, post-test attached). At this stage students are assessed for their technique and hence students performing percussion with correct technique in the intercostals spaces were given the mark. Also parameters like JVP cannot be seen on peer unless there is increased JVP. Hence we gave them the mark if they said there was no rise in JVP on SimMan.

Finally, it would help if the performance exam was added to the flow sheet in figure 1 along with some indication of timing for each phase of the study.
A table of the performance scores at each stage would be useful, similar to what is in Table 2 for the knowledge test.

Provided (Table 4 - Formative exam scores).

-Clarify: did the feedback questionnaire refer to just the ‘SimMan” portion of the study or to the entire teaching session? Was it administered at the end of the entire teaching session?

Questionnaire provided (SimMan feedback questionnaire attached)

At the end of the session, 23 students (96%) completed a feedback questionnaire about the entire session.

2) Discussion: There needs to be an interpretation of the increase in confidence in differentiating normal from abnormal sounds after using “SimMan”. Specifically how does this relate to clinical practice and the examination of real patients (or does it)?

Page 12, last 5 lines (3rd paragraph) and page 13, first 5 lines.

It is essential at this stage of their medical school training, that students perform clinical examinations on each other to become familiar with normal findings so that they recognise any deviation from the normal in patients in their clinical years. SimMan when used as an adjunct provides students with an opportunity to differentiate normal from abnormal findings in a simulated safe environment repeatedly without any harm to the patients and thus can aid in reinforcing normal findings. We found that students’ confidence increased significantly for differentiating between normal and abnormal clinical signs after simulation as they have had an opportunity to appreciate both normal findings and deviation from normal which is what they are likely to encounter in clinical practice.

Given the expense of SimMan, are there other options to consider?

What are advantages of “SimMan” over standardized patients, the ventriloscope, or Harvey, the cardiopulmonary simulator?

Page 14, line 11 - 21

There are other options like Harvey’s simulator, ventriloscope and standardised patients available for the students to appreciate and practice examination of various systems. Each of them have their own pros and cons. SimMan while being expensive, has the advantage of providing the students with a more realistic and holistic experience of examining and treating a patient in a safe simulated environment with repetition at their own convenience. It has the benefits of wireless connectivity, ability to replicate chest movements/cyanosis, monitors showing parameters like oxygen saturation/ respiratory rate which respond to the interventions, etc. Standardised patients probably provide the best replication of a real case scenario but have the problems of availability, accessibility, feasibility for a large group of students to practice and expenses in the long run.

3) Formative Exam Interpretation: The finding that Group B scored better on the “peer examination” could be explained by the fact that they had had more training (“SimMan” and “peer”) than Group A (they had only been exposed to “peer” at
The finding that Group B scored better on peer examination could be explained by the fact they had more training (SimMan and Peer examination) than Group A which had been exposed only to peer examination at the time of the formative exam. However, when the results are analysed in further detail, the scores of the students in Group B who performed examination on SimMan first were higher when compared to Group A who performed peer examination initially. After midtest, there was no statistically significant difference between the two groups suggesting the scores of Group A improved vastly to match Group B at the end of the session when both had completed cardiopulmonary examination on SimMan.

- Minor Essential Revisions
  I recommend using one term consistently for the OSCE-type examination. You have referred to it as a performance exam and also as a formative exam. I have changed it to formative exam.

- -exciting is misspelled in conclusion section – corrected spelling

Level of interest: An article of limited interest
Quality of written English: Acceptable
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.
Declaration of competing interests:
I declare that I have no competing interests.
Reviewer's report
Title: Role of SimMan in teaching clinical skills to preclinical medical students
Version: 1 Date: 20 July 2012
Reviewer: Max Field

Reviewer's report:
This cross over pilot study purports to show that medical students benefit from clinical skills teaching of the respiratory (RS) and cardiovascular systems (CVS) using SimMan simulator.

There are a few issues that you as BMC Medical Education editor may wish to consider:

a) the student numbers are small (n= 2 groups of 12) and while this is a pilot study it would be of interest to know why this number were used and whether a power calculation was undertaken to get to these figures.

As this was a pilot study, no power calculation was undertaken because no information on the likely effect size (“PRIORS”) was available. 24 accelerated students volunteered for the session.

b) the students in this analysis are ‘fast track’ entrants to a four year course and are therefore not standard medical students - extrapolation from one group to another might be inappropriate and should probably be avoided.

Page 15, line 2-7
This study involved the students who were fast track entrants of the four year Accelerated MBBS programme and not the standard medical students. However, the session was conducted at the end of their preclinical year and just before entering clinical years, by which stage the level of knowledge and skills acquired are similar to the standard medical students of the five year programme.

c) the students in the study are not learning naive with regard to RS and CVS teaching - indeed the paper states that all have received teaching covering the generic clinical skills. It is assumed that attendance in initial training has been 100% and that no student in the study groups is learning naive. It is not completely clear exactly what generic training does cover (but it does look similar to the training offered in the cross over study) and perhaps this should be explained in more detail.

Page 7, last 3 lines
All the students had been previously taught the clinical skill of respiratory and cardiovascular system examination on each other.

Page 4, 2nd paragraph lines 12-16
They are introduced to generic clinical skills in such a way that they are able to recall, apply and integrate the relevant theoretical knowledge. The students practice clinical skills under direct supervision, receive immediate feedback on their
performance and thus acquire clinical skills required of them in order to subsequently be able to perform them on patients.

Page 5, 3rd paragraph, lines 19-21
Preclinical medical students at Newcastle University practice clinical skills on each other and become familiar with what is normal in a safe and supportive environment, the clinical skills laboratory, which is a simulated ward.

d) if all the students have been taught the generic clinical skills just on one another, then the results could be read in a different manner. If group A are just getting what they have already received then the first part of the analysis shows that repetition fails to improve their clinical skills knowledge using mid point scores. Having had two (presumably similar teaching sessions) the novel clinical teaching (detecting abnormal clinical signs) delivered in the third teaching session with SimMan improves the end of study scores for group A. However students in group B who have already had generic training and get the new form of clinical signs teaching with SimMan do statistically better and this does not improve when repeating initial training that was given before the study commenced.

If this study is read this way, then the results of the second part of the study might not be as relevant and might reflect the effect that initial training has on the two groups of selected ‘fast track’ students’ exposure to the SimMan. Could the effect be the result of the novelty of seeing clinical signs in SimMan after initial training of just examining one another? This might be addressed in more detail in the analysis and discussion.

Page 10, line 8-10.
Thus students scored higher in the knowledge test after examining SimMan when compared to students who performed the examination on each other.

Page 12, 2nd paragraph, line 10-16
It was found that students’ knowledge required to perform cardiovascular and respiratory system examination did not improve by repetition of peer examination but their knowledge improved considerably after they performed examination on SimMan when compared to peer examination. This could be because SimMan provided the students with an opportunity of learning to identify abnormal findings and thus reiterating the knowledge required to identify normal findings.

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests: I have no known competing interests