Reviewer’s report

Title: Implementation of a large-scale simulation-based cardiovascular clinical examination course for undergraduate medical students – a pilot study

Version: 0 Date: 01 Jul 2019

Reviewer: Jaime Yu

Reviewer's report:

First overall comment - although the paper adequately describes implementation of this new simulation curriculum to a large number of students, it does not provide adequate evidence that the educational outcome of this large scale and resource intensive endeavor is worth the major investments in infrastructure, finances, and time. The primary outcome of Kirkpatrick level 1, or essentially student satisfaction and teacher satisfaction, shows acceptability of use of simulation within the curriculum, but this is widely accepted and does not add to the current evidence regarding clinical skills teaching or use of simulation in medical education. It would have been very helpful, instead, if there was a more objective outcome measure to compare, such as performance on an end-of-training clinical skills examination, or some type of objective evaluation of student skills as a result of this educational modality.

Second overall comment - The use of the term "semiology" is not common in English language literature regarding this topic and is problematic. I would suggest the authors consider switching this to either "clinical examination" or "physical examination" teaching program, whichever they feel suits the objectives of the curriculum best.

Specific manuscript comments:

- line 95, methods - change 1h15 to 75 minutes

- line 115, methods - What is the definition of "senior clinicians" who were the educators? Is this based on years out in practice? Rank in academic institution? Years of teaching experience? This needs to be clarified, and perhaps a bit of rationale as to why more senior rather than junior clinicians were chosen. With high clinician resource needs, many institutions may rely on a variety of clinicians to teach in clinical skills sessions, including resident physicians, junior staff attendings, senior staff attendings, etc.
- line 154, methods - authors specify that they used either Wilcoxon test or chi-squared "as appropriate", and then later in results it does not specify which test provides which p-value. Strongly suggest this is clarified - which data is subjected to which test? What significance is being reported

- line 174, results - "Students' overall appreciation improved" - which measure is the "overall appreciation" - this is not listed as a separate variable in the methods or in table 1. Need to specify - is this the mean score or sum score across the other 6 measures? How is this value determined? Also, this indicates change between the 2016-2017 cohort and the 2017-2018 cohort. Need to specify what is different between the two groups and why improvement occurred? This was not clear at this stage of the paper. The specific results listed next in lines 176 through 178 are subject to same question. "appreciation" for session 1 and 2 by students is listed, but yet this is not listed in methods or in table 1 as a specific outcome variable. Also, not clear then what test would be used to provide the significance listed in line 177 for the between group differences noted

- lines 182-190, results - this section discussed a logistic regression. However, I am not clear what the question is that the regression is supposed to answer? Does this section imply that quality of simulation equipment WAS related to all evaluation measures EXCEPT educator-student interactivity? Need to be more clear on why logistic regression was chosen and what problem this was meant to solve

- line 191, results - "the analysis of the free response area" - how did this analysis occur? Was this by pre-determined categories or themes? How many authors analysed the free responses? This is not described in the methods and should be, as it is an entirely separate analysis from the quantitative measures described thus far

- line 210, discussion - "observed a significant improvement from the first to second year" - why is this change observed? what was different between the years, and why is this change the most significant finding of this program evaluation? There is some discussion later in the paper about change in timing of sessions, and it is repeated throughout that the simulators themselves were changed. These details need to be part of the discussion earlier so that this finding can make sense.

- line 218, discussion - "their learning considerably improved after training" - how was this shown? The paper discusses primarily student and educator satisfaction, and has some program evaluation information and shows a responsive program with changes to the simulators and changes to timing made. However, there are no objective measures in the paper to show that students improved in their knowledge or skills compared to prior to this program, or compared to prior years where simulation of this type was not used.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

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

No

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

No

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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