Reviewer’s report

Title: Mentored peer review of standardized manuscripts as a teaching tool for residents: a pilot randomized controlled multi-center study

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Reviewer: Sara Schroter

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Mentored peer review of standardized manuscripts as a teaching tool for residents: a pilot randomized controlled multi-center study

This paper describes a pilot study to evaluate the effect of mentored peer review with neurology residents. This is an important area as appropriately described by the authors. An interventional study design is a useful addition to the literature as there are very few. The authors have taken what appears to be an original approach. Whilst the manuscript is clearly written it would benefit from some restructuring, a better description and ordering of outcome measures, improved reporting in line with CONSORT and rephrasing.

General comments

1) This study is described as a pilot study but it is not clear why it was not conducted as a full RCT? Was the intention to conduct a full RCT and then the attrition was too high so you decided to report it as a pilot study? If so, this should be made clear. You say on p4 line 85 that participation interest was high, so it is not clear why this was a pilot study.

2) The reporting of the study could be improved throughout in line with CONSORT eg eligibility criteria, description of intervention, how blinding was done, description of primary and secondary outcome, justification for sample size, etc. More use of subheadings would make this easier to follow.

3) There are several mentions to the “feasibility” of mentored peer review, yet it is not clear how feasibility is being tested? Considering the attrition rates and results, one might question its feasibility. Even with "strong encouragement" to complete the test review, only 56% completed it (page 11 lines 194-6). There was no difference in change in knowledge or review quality.
4) Throughout the manuscript jumps around when describing the outcome measures and the focus tends to be on the positive results first rather than the planned outcome measures eg Abstract lines 61-62 on p3.

5) The key assessment points are baseline and manuscript 5, however this is not immediately clear. In some ways the description of the additional reviews of other study designs is distracting. An improved description of the intervention under its own subheading and another on the outcome measures would help make this clearer.

6) You have inconsistently used different terms to describe some of the outcome measures and it can be difficult to follow which is being discussed at times eg page 4 line 77 "satisfaction" is mentioned, but there's no mention of satisfaction again. Line 141 "residents perception of biostatistics" versus Table 1's "impression of biostatistics"...... etc

Specific comments

Abstract

7) Tone down the conclusion - see my comments in Conclusion below

Methods

8) Was number of errors reported an outcome measure? If no, why not?

9) There were nine study sites but it is not clear how many mentors there were? This number of sites and mentors for a small study is likely to have introduced some noise and inconsistencies in what was delivered. This should be discussed in the Discussion.

10) Page 6, line 108 - how were residents randomised?

11) Pages 5-8 are quite difficult to follow. The use of more subheadings would be helpful and ensure that all the necessary detail is reported. I would suggest at least the following: intervention, blinding and allocation concealment, primary outcomes, secondary outcomes, sample size calculation, etc

12) Page 6, line 115 - the meetings were not mandatory (or they would have happened) . Perhaps "highly encouraged" would be more appropriate?

13) Page 6 - the five manuscripts included a range of study designs and as such any learning effect many have been diluted than if they had all been randomised controlled trials. This should be acknowledged in the discussion.
14) Page 6, lines 126-7 - Manuscripts 1 and 5 were both of the same design not just to allow comparison of RQI scores.

15) Page 7 line 129 - state how many deliberate errors were introduced into the manuscripts.

16) Were mentors encouraged to use reporting guidelines in their sessions with residents?

17) Lines 134 to 155 - split this into different paragraphs for each assessment. Some of this will have occurred already eg the pre-test and post-test questions will be reported under primary outcome section - see my comments above.

18) Line 141 - "residents perception of biostatistics" - I'm not sure what this means? Do you mean perceived knowledge? In fact lines 141 to 144 are not clear.

19) Line 146 - RQI is not an "objective" instrument

Lines 157 - 167:

20) It is not correct to perform a statistical tests on the baseline data. If randomised properly, any differences should have occurred by chance.

21) only now is the primary outcome mentioned as change in knowledge

22) You have not adjusted for baseline knowledge scores. It would have been more appropriate to use ANCOVA methods to do this

23) not all the secondary outcomes are listed (lines 161-3)

24) line 166 - It is inappropriate to use Cronbach's alpha for inter-rater reliability. This is a test for reliability but it tests for internal consistency. You should use an Intraclass correlation coefficient (ICC) for inter-rater reliability.

Results

25) When reporting the results it would be clearer to report under the subheadings seen in the Methods eg primary and secondary outcomes.

26) Line 172 - remove reference to statistical differences

27) Line 174 "having previously had a mentor" would be clearer

28) Table 1 - remove last column (p value)
29) Table 1 - not clear what is meant by "impression of biostatistics"? There are several constructs thrown in here and I would break them down.

30) Scoring details for Likert scales should be stated in the text for clarity in the sections on outcome measures.

31) Line 185 "Baseline perceived knowledge and self-reported confidence in …." Might this be clearer terminology?

32) Line 206 page 12 - what is "mentorship impression data"?

33) Lines 208 - 210 - why were mentored residents more indifferent? I don't recall an outcome measure assessing indifference?

34) Page 13 Table 3 - add the relevant column headings for each section.

  Report primary outcomes first.

35) Page 14 - Lines 219- 224 - this is the reporting of the primary outcome measure and should come much earlier not thrown in at the end.

36) Line 225 - report the ICC not Cronbach's alpha.

37) Figure 2 - what does "active" manuscript review mean? Completed?

  Indicate baseline review.

38) Was intention to treat analysis done or per protocol?

39) How was missing data handled?

Discussion

40) Line 229 - I am not sure that it does demonstrate feasibility? See comments above.

41) Lines 230-233 - put the primary outcome results first not perceived knowledge.

42) Line 251 - the sample size may not have been large enough to show an effect.

43) Line 273 - how long were residents given to review each paper?

44) Line 270 - not clear how adding several study designs allows for a more balanced evaluation of review quality. You have stated that review quality was assessed at Manuscripts 1 and 5 which were both RCTs. I suggest you delete this statement.
If anything the introduction of several designs may have weakened any mentoring effect rather than concentrating on just RCTs.

Conclusion

45) Lines 289 - 291 - this is an over statement and needs modifying (and in the abstract). See earlier comments.

46) Lines 291 to 295 - there is no mention of the primary outcome which did not show an effect.

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