Author's response to reviews

Title: Impact of a Competency Based Curriculum on Quality Improvement Among Internal Medicine Residents

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Author's response to reviews: see over
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Editorial Office
BioMed Central

Dear Sir/Madam,

RE: Impact of a Competency Based Curriculum on Quality Improvement Among Internal Medicine Residents

We appreciate the opportunity to have our manuscript reviewed by the Journal’s reviewers.

We have revised our manuscript extensively to address each of the reviewer’s comments.

Attached please find our response to the reviewers’ comments. We have also uploaded the revised manuscript as per your instructions.

We look forward to your favourable consideration.

Sincerely,

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Impact of a Competency Based Curriculum on Quality Improvement Among Internal Medicine Residents
Mark C. Fok, Roger Y Wong

Responses to Reviewer’s Comments

Response to Comments from Reviewer 1 – our response in plain font.

1. Overall the writing is clear.
   Thank you.

2. Some minor grammatical errors are found in the text, warranting a careful re-read.
   We have carefully reread the manuscript and have several modifications to improve readership and grammar (please refer to revised manuscript with Track changes).

3. Line 50: "Since" should probably be "In"
   The wording has been modified on line 50.

4. Line 119: "scheduled" seems to be missing a word after it
   The wording has been modified to read “Phase 1 consisted of an academic half-day (AHD) didactic curriculum spread over two regularly scheduled academic half-days four weeks apart”.

5. The p values, while showing statistical differences between the populations, probably are less important than what is deemed educationally significant. Please define what you would deem "教育ically significant" in your methods & discussion.
   We concur with the reviewer the importance of differentiating statistical significance versus educational significance, which is one of challenges facing educators of quality improvement. We feel that educational significance should be reflected by milestones, characterized by an ability apply QI knowledge to a real life situation. Residents in our program demonstrated these milestones through their longitudinal experiential projects that each group had to complete. By having several tutorials throughout the academic year, we ensured each group was on track to complete their projects. Each project was successfully presented at the annual QI Project Podium Presentation Day, indicating that these milestones were met. The manuscript has been revised accordingly.

6. Along the same lines, I suggest you calculate and report on QI the Cohen's d score for your results if you can.
   At this time unfortunately we are unable to calculate Cohen’s score for the results.

7. As in many meded research literature, there are numerous threats to validity in the design of this study. While you have listed a number of outcomes, as a
reader I would have liked to hear more about the implementation of the actual QI projects.
We agree that challenges and successes of implementing the QI projects would be very interesting from a qualitative perspective. Unfortunately it fell outside the scope of the purpose of this manuscript, but we will be giving this additional thought for future studies.

8. Most of the measures are truly subjective. The change in QI confidence and QI skills are self-report with several potential biases.
While subjective assessments by participants opens potential bias, we feel it plays an important role in documenting residents’ perspectives on QI as there is very little in the published literature that address this issue. In addition, since all data were anonymized (i.e. no resident identifiers), we hope that residents would answer honestly.

9. While I have not used the QIKAT myself, I did pull the papers and reviewed the related websites. It requires a subjective score by an assessor of the comments, opening up significant bias. Also, using the same 3 cases (readily available on the web) is concerning for introducing additional significant threats to validity. And I would be concerned about test-retest bias with the same cases, even 12 months out. This puts all the results into question, unfortunately.
There are few scores in the literature to quantify QI knowledge, and at the time of the present study, the QIKAT was the one most widely used. For instance, it has been used in several settings to assess QI learning including medical school curricula, internal medicine, psychiatry and family medicine residencies. As the reviewer notes, scores are based on a Likert scale 0-5 which is structured scoring but nonetheless subjective. We tried to mitigate this by having all answer sheets scored by one reviewer (MF), but before the actual scoring occurred we did not mention in the original manuscript that the assessor had a training period whereby one years scores were assessed by two reviewers (MF and RW) to ensure congruence with scores. We have added a sentence on page 10 to reflect this:
“An initial training period occurred to ensure consistency of results by the assessor. Specifically, QIKAT scores from a previous year (not included in the present study) were rated by two reviewers independently, and disagreements were resolved by consensus. One assessor then rated resident performance on the objective assessments using the rating scale described above.”

10. I think the conclusion is overstated in the abstract. The emphasis should be on perceived change in QI skills, in my opinion.
We have modified the conclusion to read as follows:
“The competency based curriculum on QI improved residents’ QI knowledge and skills during residency training. Importantly, residents perceived that their QI knowledge improved after the curriculum and this also correlated to improved QIKAT scores. Experiential QI project work appeared to contribute to sustaining QI knowledge at twelve months.”

11. I believe much of the narrative results in the "Performance" section should be moved to the Discussion since it seems to represent the opinion of the authors. We have moved this section to the Discussion, page 16.

12. Overall, I do think this is worth publishing, in order to allow others to build on this work.
Thank you.
Response to Comments from Reviewer 2 – our response in plain font.

Quality Improvement is of itself a topic of great interest. This paper investigates whether teaching of Quality Improvement to residents through dual interventions (Didactic workshop and then a project) has a lasting effect extending to 12 months after completion of the project.

This is a very commendable study. The authors do not make a comment on the fact that the increase in self reported confidence in making changes to improve health increased to 69%; and but remained at 72% one year after the project.

We thank the reviewer for pointing this out. We have added a sentence on page 14 to reflect this.

The authors do not make any comment on the quality of the QIKAT scores in interpreting real improvements in practice—what does literature say and what do they think/what is their experience. Comment on the validity and the power of the QIKAT tool to detect real differences would add much of interest to the discussion.

The assessment of QI knowledge is challenging. The QIKAT is a validated tool to assess QI knowledge by providing a stem based on a clinical scenario and having residents recommend an aim statement, a measurement intervention and a change to solve the quality issue. Scores are assigned based on a Likert 5-point scale. The literature suggests that when used by experts who resolve discrepancies and agree on a final score, it has good construct and predictive validity. However, how QIKAT scores relate to interpreting real improvements in practice has not yet been studied, and since we anonymized data we had no way to correlate QIKAT scores to specific QI projects. Nonetheless, we feel the improvement in QIKAT scores has contributed to improving quality of care as several resident QI projects have been published in some form in the literature. We have added a paragraph in the discussion section to acknowledge these comments (page 18).

In the Conclusion section of the abstract, why do the authors use the adjective ‘promising’ to the word impact? What makes them use a (vague?) predictive adjective, instead of saying it had an impact? Can the authors clarify in the discussion section regarding their doubts?

We have removed the word “promising” and replaced it with the sentence “The competency based curriculum on QI improved residents’ QI knowledge and skills during residency.
training.”

Would it be possible to include in the text, perhaps in the form of a table, the definitive specific improvements in patient health outcomes that resulted from the projects worked on during the study.

We agree with the reviewer as one would hope that projects would translate into improved care and patient safety. Each project in and of themselves had specific outcomes that they reported e.g. an increase in the number of COPD patients vaccinated at the end of the study, but reporting on each of the projects was outside the scope and purpose of the present study.

The Authors might wish to consider a distinction between the words competence and competency; using the word 'competence' to indicate the attribute/quality an observable ability of the health professional to integrate multiple components such as knowledge skills values and attitudes into a definitive outcome) and competency to indicate the demonstrated competence. ( "The individual's competency is tested for each designated competence.")

We utilized the same language as described in the competency based framework for medical education accreditation in Canada known as CanMEDS, which defines a competency as “an observable ability of a health professional, integrating multiple components such as knowledge, skills, values and attitudes.”

The authors might wish to make a comment on whether it could be possible that the improvement in scores for 'reasonably confident or confident' could be just from general confidence that a resident gains from experience, and having dealt with.

We agree it is possible that at 12 months, residents have gained in knowledge and experience from their residency experience to help them feel more confident in making changes to improve health care. This is a limitation in our results. However, we note that confidence increased right after the curriculum in the post-curriculum test time period, and all residents participated in a longitudinal QI project which involved them being active members to carry out their project. Thus, we have to recognize that the improvement at 12 months could be due to clinical experience, or the QI project they had to carry out, or both.

This is an interesting paper; and the authors have highlighted the bottom line: It is difficult to recruit teachers over time; and interest of resident might flag-all because the residency is too intensive. Perhaps that point needs to be spelt out more clearly.
We agree. We have added this emphasis to the last paragraph in Discussion (page 20).