Author's response to reviews

Title: A New Implicit Review Instrument for Measuring Quality of Care Delivered to Pediatric Patients in the Emergency Department

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Author's response to reviews: see over
Dear Ms. Makri,

Please find the attached revised manuscript (1540390211074966) titled "A New Implicit Review Instrument for Measuring Quality of Care Delivered to Pediatric Patients in the Emergency Department." We have made many changes in the manuscript to fully address the thoughtful comments and helpful suggestions made by the two reviewers. Below is our detailed response to the reviewers’ individual comments and suggestions. We hope that you find these changes acceptable. Thank you for your consideration.

Response to reviewer: David Thom

General:

1. We agree with the reviewer that it may be difficult to generalize the results based on the reliability of having just two reviewers and have included this point as a limitation in the fifth paragraph of the discussion. As the reviewer points out, medication errors may not be an ideal measure for validity as it has the potential to be included in the measurement of quality, although we do not think that this was a large driver in the measurement of quality by our reviewers. Nevertheless, we agree with the reviewer’s comment and now explain the reason and limitations of using medication errors as a means of validation in the “major compulsory changes” section, and included this as a limitation in the Discussion. As recommended by the reviewer we have made changes in reporting the association between quality of care and medication errors.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. We agree with the reviewer that medication error is not the perfect validation measure as it may play a role in the quality of care assessment by physician reviewers. Of note, medication errors would likely only alter some of the aspects of physician reviewers’ assessment of quality of care, and pharmacists did the overall assessment of medication errors independently. Further, medication errors noted by the pharmacists include errors such as “medications given but not ordered, wrong dosage form, and wrong administration technique” which is unlikely to have influenced the physicians’ assessments of quality of care. As recommended, we have added this fact as a limitation in the Discussion.

2. As suggested by the reviewer, we looked at the variation of quality of care among patients without medication errors compared to all patients. We found that the ranges and standard deviations were identical, suggesting that medication errors did not contribute significantly to the assessments of quality of care (range 14-35, SD=4.1 overall and for the group without medication errors).

3. As recommended by the reviewer, we have provided the actual numbers for the medication errors when comparing children with unacceptable care to acceptable
care. We now present the results as follows: “We found a 19.4% higher incidence of medication errors among children who received “unacceptable” care compared to children who received acceptable care (4/9 [44.4%] versus 30/120 [25.0%]; p = 0.20).”

4. As recommended by the reviewer we now report the summary score as the measure of association between quality of care and medication errors and have removed the overall quality of care score comparison.

5. The reviewer pointed out some confusion due to our presenting results based both the mean and the median. We have clarified this issue and as recommended by the reviewer, we are now reporting the 95% CI and p value for the difference in the means using the t-test. We state in the Methods section that we also considered the Mann-Whitney test, but that results were similar.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Title:
As recommended by the reviewer we have included the word “Pediatric” to the title. The revised title is “A New Implicit Review Instrument for Measuring Quality of Care Delivered to Pediatric Patients in the Emergency Department”.

2. Abstract:
   a) As recommended by the reviewer, we have included the possible score range of the instrument (5-35) in the description of the instrument. We have included the mean and median of the summary score in the results and in the abstract (Mean = 27.4 and Median = 28.5).
   b) As recommended by the reviewer we have replaced the sentence beginning “To demonstrate the validity of the instrument, the median of the reviewers’ summary score was higher...” to “The validity of the instrument is supported by the finding of a higher score for children without medication errors compared to those with medication errors of borderline significance (mean score = 28.5 vs. 26.0, p=0.076)”.

3. Methods:
   a) As recommended by the reviewer we are now using mean summary score as the measure for association of quality of care and medication error and reporting t-test for the validation. In addition as suggested by the reviewer we are reporting the results from the Mann-Whitney test secondarily as the data is slightly skewed (measure of skewness = -0.869).
   b) The selected physician’s reviewers are pediatricians board-certified in Pediatric Emergency Medicine (PEM) and with more than 5 years of experience in PEM. They were selected based on their board certification status and years of experience as a PEM physician. They were only involved with chart reviews and not in care of the children whose charts were reviewed.
c) As recommended by the reviewer, we have included some of the clinical presentations in the highest triage category in the methods section under selection of participants.

d) There were a total of 49 treating physicians who treated the 178 patients included in the study. As recommended, we have included these data in the Results.

e) Table 3 illustrates the internal consistency of the instrument by assessing whether each component (aspect of care) in the 5-item instrument is measuring the same underlying domain. We feel that it is important for any new instrument to be comprised of components, which are measuring the same domain. This is assessed for each reviewer separately. To measure the reliability of the average summary score, we used the ICC. We report the reliability of the average measure in the fourth paragraph in the result section as “Table 4 also illustrates the ICC for the average rating of each item as well as for the average summary total score, across the two reviewers. The ICC for the mean total summary score was 0.65.”

f) As recommended by the reviewer, we now include the range, mean, standard deviation, measure of skewness and percent of summary scores at the ceiling (35) in the first paragraph of the results section.

g) As recommended by the reviewer we are reporting the mean scores in 4 hospital settings in the first paragraph of the results section.

4. Discussion:
   a) As pointed out by the reviewer, we mention in the methods that we anticipate that the instrument will be used by at least two reviewers. This is because there is some variability in the scores when measured by only one reviewer. We report the reliability for two reviewers and for single reviewers in the results to illustrate the decrease in reliability when used by a single reviewer. If more than two reviewers use the instrument, we expect the reliability to increase even further. Because we only used two reviewers, we cannot measure the gain in reliability with three or more reviewers.
   
b) As recommended by the reviewer, we have included in the limitations (paragraph four) the difficulty in generalizing the reliability findings based on just two reviewers’ assessments.

**Discretionary Revisions (which the author can choose to ignore)**

1. Figure 1: We included the tool as Figure 1 so that the readers would have a good sense of how we structured the instrument to measure the quality. We leave it to editor to decide to include or omit the figure in the article.

2. As suggested by the reviewer, we now refer to the instrument as the “Pediatric Emergency Department Quality Assessment Scale.”

3. As recommended by the reviewer, we have included “A future goal would be to validate this instrument in different ED settings with more than two reviewers. For future validation, we would like to use additional measures not directly linked
to the quality of care of a particular ED visit, such as readmission or return visits to the ED, or the accuracy of the initial diagnosis.”
Response to reviewer: Susan Bratton

General
1. We agree with the reviewer that the study results could be different if the instrument was applied in EDs with fewer quality problems. We have added this as one of the limitations to our study in the Discussion.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. As recommended by the reviewer, we removed the 95% CI from the abstract. We have also included the range for the scale of the instrument in the abstract.

Discretionary Revisions (which the author can choose to ignore)

1. As recommended by the reviewer, we had removed the sentence on ICC from the methods section.
2. We agree with the reviewer. Regarding the reasons for the higher medication error rate, we have added to the Discussion, “The medication error rates may also have been higher because of less pediatric experience or because the EDs were not all staffed by emergency medicine trained physicians with pediatric experience.”
3. We agree with reviewer that we need to validate the performance of the tool in other settings using other reviewers and other methods of validation of the quality. This is part of our future goal for this project.