Reviewer's report

Title: Psychometric Properties of the AHRQ Hospital Survey on Patient Safety Culture

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Reviewer: Marleen Smits

Reviewer's report:

This is an important and long-awaited paper in the field of patient safety culture research from the developers of the Hospital Survey on Patient Safety Culture (HSOPS). The HSOPS is being used in many countries over the world. The paper is clearly written and it is easy to understand which steps the authors have taken to examine the psychometric properties of the HSOPS. They examine the data using multilevel techniques, which is important when data are layered (individuals within units and units within hospitals).

I have, however, some remarks about the structure of the paper and about the analyses and discussion:

Major Compulsory Revisions

Structure:

1) In the results section, there is a lot of text describing steps that were taken in the analyses, reasons why these steps were taken and criteria that were used for interpretation. These text parts should be placed in the methods section. It mainly concerns the following parts:
   - Page 9 “Individual Level Factor Analysis”: “Factor analyses were conducted to confirm whether........should be .40 or greater” (6 lines)
   - Page 9 “Individual Level Factor Analysis”: “Another statistic examined to determine the adequacy of a factor......at least 50% of the variance should be accounted for by the composite” (4 lines)
   - Page 9/10 “Multilevel Analyses”: “Individuals responding to the Hospital SOPS are located....should be conducted to account for the multilevel nature of the data” (18 lines).
   - Page 11 “Multilevel Confirmative Factor Analysis (MCFA)”: “MCFAs were conducted using MPlus Version 5.1....a valua less than 0.08 is considered a good fit” (24 lines)
   - Page 13: “Reliability Analysis”: “Internal consistency reliability was examined by calculating......is a alpha of at least .70” (5 lines)
   - Page 14: “Interrelations Among the 12 Patient Safety Culture Composites”: “Intercorrelation among the patient safety culture composites were explored at three levels...... and avoid problems with multicollinearity”. (8 lines)
Methods/Analyses:

2) The authors use criteria that hospitals and units have to meet to be kept in the database (page 6, "Analysis Dataset"). One is that a hospital has to have more than one unit that responded to the questionnaire. Why is the cut-off point between one and two units? Is two units enough for the analyses?

3) Another criterion is that units have to have 3 respondents or more. This is a very low number, especially in larger units with for example more than 30 employees. Shouldn’t there be different cut-off points for large and small units? For large units, a cut-off point of 10 is more agreeable (then you really have a GROUP of people responding to this group culture survey).

4) More information on the response rate calculation is needed. Was it related to only the participating units of the hospitals or the whole hospital? Was the whole unit invited to participate in the survey (so that if the response rate was 100%, every employee of the unit responded) or was a sample taken?

5) Page 7 “Measures”: please provide more information on the analyses that were performed previously to define the 12-composite-structure. This composite-structure is now described as a given fact, but, as there is no previous paper of the authors that describes the exploratory analyses, more information should be given in this paper.

6) The confirmative factor analyses were performed for each a priori patient safety composite separately. There is a method to place all composites together in a model to confirm the factor structure. Did the authors consider this structural equation modeling (SEM) technique? (for example with LISREL)

7) ICCs are calculated per item. Please add the composite ICCs.

8) The significance of the ICCs is not tested. Why not?

Discussion:

9) My colleagues and I have written a paper on a study we performed to examine the multilevel structure of the HSOPS with the Dutch version of the HSOPS. The authors have referred to our paper in a short list of different countries that have examined psychometric properties (reference nr 38). However, I miss a comparison of the results of our multilevel study with the current study in the discussion section: a comparison on ICC scores at the different levels and intercorrelations of the composites.

Minor Essential Revisions

10) Page 17: the authors list methodological approaches that can be used to identify patient safety vulnerabilities. They should add a method that is commonly used in many countries over the world: patient record review (for example record review based on the Harvard Medical Practice Study).

11) Table 6: First row, first column: Please replace “Hospital Survey Dimensions and Items” by “Hospital Survey Composites”.
Discretionary Revisions

12) Tables: There are a lot of tables in the paper. Table 1 is the least important for a paper on the psychometric properties of a questionnaire and can be deleted.

13) Page 13: “Reliability analysis”: Please delete “on the row next to the composite title”. This is evident.

14) Discussion: The authors can add another strength of the survey: The amount of clustering at higher levels indicates that the survey measures what it is supposed to: group culture (and not only individual attitudes).


Researchers from Switzerland (Y. Pfeiffer) and Scotland (C. Sarac & R. Flin) are still working on their papers on the psychometric properties.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.