Author's response to reviews

Title: Physician organization care management capabilities associated with effective inpatient utilization management: a fuzzy set qualitative comparative analysis

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Author's response to reviews: see over
Dear Editor:

RE: MS 2003693095998404

We are responding to comments from two referees to the submitted paper: “Physician Organization Care Management Capabilities Associated with Effective Inpatient Utilization Management: a Fuzzy Set Qualitative Comparative Analysis”.

First, we want to thank our two Referees for reviewing our paper. We are very grateful for their constructive feedback and suggestions.

Our responses to the specific issues raised are as follows:

Referee 1:
1. Please provide “access to complete statistical charts”.

   Authors’ response: we are submitting the data table with raw measures and fuzzy set membership values in all dependent and independent variables used in our analytic models in Additional file 3 IPA_Assessment_data_table_Sheehy_Thygeson.pdf.

2. Address which combination is most effective

   Authors’ response: we have revised the Results and Discussion sections to make clearer which physician organization capabilities have the biggest impact on inpatient utilization. Please also see response to feedback from second Referee.

3. Results section is not clear enough—please reorganize

   Authors’ response: we have revised the Results section to address this. We removed abbreviations and made other changes to help with comprehension. We also identified and corrected a methodological error (see below, additional change 2) that simplified the results slightly.

4. In the discussion section, address the relationship between different management actions and reduced bed-days/LOS (“reduced time bed days per thousand”)

   Authors’ response: we address this in the first two paragraphs of the Discussion section state which physician organization capabilities are associated with lower medical and surgical length of stay. We have also added the following sentence to address the plausibility of these findings: “These results are consistent with our theoretical expectations that rigorous PO management of the inpatient stay is associated with shorter length-of-stay.” If the referee meant something different by “the relationship between different management actions and
reduced bed-days/LOS (“reduced time bed days per thousand”), please let us know and we will make further revisions as needed.

5. In addition to discussing limitations of method, discuss limitations of results

Authors’ response: in addition to discussing the limitations of the fsQCA method, we have three paragraphs in our paper that address limitations of the results. We address limitations of the study due to narrow scope (California capitated medical groups delegated for utilization management, and not all contextual factors included in the analysis); failure to identify all possible sufficient configurations of capabilities associated with low bed-days; and lack of validation of the survey tool used to conduct the structured interviews. If the referee believes there are other specific limitations we have failed to address we will be happy to include them.

6. Include copy of survey in appendix

Authors’ response: we have included a copy of the survey in the Online Appendix.

7. Clearer discussion of the dependent variables of the text, and a better analysis about how the variables interrelate between them

Authors’ response: the key dependent variables in this study are bed-days, and the four intermediate outcomes medical length of stay, medical admits, surgical length of stay, and surgical admits. These dependent variables are related to each other as illustrated in Figure 1 and discussed in the associated paragraph. We added the following sentences to that paragraph to enhance clarity on this point: “Total bed-days is the sum of medical bed-days and surgical bed-days. Medical and surgical bed-days are the product of medical and surgical admits and average length of stay, respectively.”

8. More about the policy implications of these results

Authors’ response: we believe our discussion section contains numerous references to the policy implications of our findings, including a specific comment about how we are using these findings in revising our internal programs and our approach to working with our contracted medical groups to enhance their utilization management capabilities. However, to strengthen this part of the discussion we have added the following sentence to the end of the Discussion section: “Our findings have policy implications as well. As the healthcare system in the United States undergoes rapid change in response to the Affordable Care Act, policy makers should keep in mind that utilization management methods such as concurrent review, discharge planning, strong hospitalist programs, and prior authorization for elective surgical admissions play important roles in reducing potentially harmful avoidable inpatient bed-days and are necessary components of high quality managed care programs.” As noted below, we also added language to the discussion section re: the contribution this study makes to the literature documenting the utility of fsQCA for program evaluation and health services research.
Referee 2:
1. Major compulsory revision: what is the real contribution of using the fuzzy approach? It is not clear that is better than other conventional statistical analysis.

Authors’ response: the fsQCA approach offers a number of advantages in this study. First, it can identify associations (subset relationships) between independent conditions and dependent conditions (outcomes) in small-N case series that would generally be missed using conventional statistical analysis. With only fourteen provider organizations in our study, conventional statistical methods have limited explanatory power. Second, fsQCA is designed to identify configurational, equifinal causal relationships that are characteristic of real-world social systems like healthcare organizations, and are generally not identifiable using conventional statistical methods, especially with small data sets. Third, fsQCA provides a method (fuzzy set membership assignment) for calibration and quantification of inherently “fuzzy” qualitative data that enables systematic analysis using both qualitative comparative analysis and standard statistical methods. We have inserted a paragraph to this effect into the “Background” section of the paper to expand on our reasons for using fsQCA in this study. We also added language in the Methods section to highlight the advantage fsQCA has over regression for evaluating interaction effects. Finally, we added the following sentences to the discussion section: “Our decision to use fsQCA for this study was validated in that we identified a variety of equifinal sufficient configurations of PO care management capabilities associated with low inpatient utilization. This study adds to the growing literature documenting the utility of fsQCA for program evaluation and health services research [23].”

2. Minor essential revisions: what is or what are the best approaches of organization care management capabilities associated with effective inpatient utilization management. This is the title of the article and it seems that everything works in some conditions, but what is or what are the management capabilities that have the more constant and across the board effects.

Authors’ response: A key concept underlying our analysis and the rationale for using the fsQCA method is that there may be multiple paths to the same outcome (equifinality), and that the impact or value of an intervention may be conditioned on the context—the presence or absence of other characteristics (configurational causality). In contrast to conventional net-effects regression analysis, fsQCA is not used to identify which conditions are responsible for the most variation in the outcome, but rather is focused on identifying the combinations of conditions that are associated with the outcome. That said, necessary conditions are always important. With respect to sufficient conditions, the relative, empiric importance is a function of the coverage associated with a sufficient configuration, assuming that the consistency is greater than 0.80.

Applying this to our results, managing medical and surgical length of stay, and surgical admissions, are all sufficient conditions for achieving low bed-days, with similar consistency scores. Medical LOS has the highest consistency, indicating it has the strongest association with low bed-days. With respect to the professional organization capabilities required to achieve these intermediate outcomes, strong hospitalist relationships and active PO engagement in the discharge process are necessary conditions for low medical LOS, and
therefore very important. With respect to low surgical admissions, having a robust prior authorization process for elective surgical admissions is a necessary condition, and therefore very important. Night/ED hospitalist coverage and active PO involvement in the discharge process are important necessary conditions for low surgical length of stay. We have edited the paper to highlight the importance of these specific capabilities.

In addition to the changes above, we have made a small number of additional changes to our paper, none of which materially alter our findings.

1. We made some minor enhancements to our description of fsQCA in the Methods section to improve clarity and comprehension for readers unfamiliar with the method.

2. In the original submission, we inadvertently used the complex fsQCA solutions for surgical and medical admits, and medical readmissions. We have corrected this in the resubmitted paper so that only intermediate solutions are used. This simplified the medical admits model (reducing the number of sufficient configurations from three to two, and removing case management staffing from the second configuration listed in the table). It also slightly simplified the surgical admits model (removing lack of primary care physician discharge notification from the first listed configuration). It also simplified the readmits model by eliminating one component from one of the configurations. There were minor changes in the consistency, coverage, or unique coverage of some of the remaining sufficient configurations, but the consistency and coverage for the total admits and readmits models did not change.

We have also re-formatted the paper to ensure conformity with BMC editorial guidelines using your recommended template, and corrected typographical errors.

Sincerely,

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