Title: A multifaceted feedback strategy alone does not improve the adherence to organizational guideline-based standards. A cluster randomized trial in intensive care

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Author's response to reviews: see over
Response to reviewers

We appreciated the comments of the reviewers very much and have used their comments to improve the manuscript significantly. A point-by-point response is written below.

1. The intervention was implemented by intensivists and nurse leaders in the ICU. How much latitude do these professionals have regarding decision making that could result in improved nurse to patient ratios and bed occupancy?

Answer:
We agree with the reviewer that this is a very important point. In advance, we thought that this was not an issue and we did not explore that. In the discussion we added this point now.

2. The literature shows that improved ICU bed occupancy is aided by the availability of intermediate care areas that care for patients who may no longer be in need of ICU level care but whose acuity requires a higher level of care than is provided on general medical/surgical floors. What is the distribution/availability of these intermediate care areas in the hospitals included in the study?

Answer:
Unfortunately, we did not collect this information prospectively from the participating hospitals. In the Netherlands, an intermediate care facility as a step-down facility for ICU patients is not often present (because there is no specific financial arrangement for such a department). However, looking at the participating ICUs we estimate that in both groups 2 hospitals have such a facility. Anyway, it is not very likely that this has influenced our results.

3. One aspect of nurse to patient ratios is the ICU nurse staffing levels. Did the hospitals included in the project have adequate nurse staffing (that is, availability) to allow for latitude in modifying nurse to patient ratios? Did the nurse and physician leaders in these institutions have latitude to adjust nurse staffing to meet the guideline?

Answer:
To adjust the nurse to patient ratio, the staff has two options: 1) change the number of nurses and 2) change the number of patients. The question of the reviewer addresses the first one. In our study we thought that in the 14 month period the management of the ICU would be able to address both options one way or the other to achieve a better ratio. Whether nursing staffing is adequate, depends on the number of patients and the flexibility of the availability of nurses. We have addressed this in the discussion now.

4. The authors suggest that efforts to improve bed occupancy rate and nurse to patient ratios may require an intervention with practical tools for improvement and longer follow-up. This is likely very true. Do they have any suggestions for which types of improvement tools might be useful and should be considered in future research efforts?
Answer:
Practical tools may for instance be extended information on the logistics of patient admission and discharge rates. For instance, in which shifts do unplanned admissions occur most frequently or how are the planned admissions distributed over the shifts. For a shortage of nurses, the implementation of flexible pools of nurses may be helpful with or without the use of electronic devices or apps.

5. The authors indicate that "trust in data" was a barrier to effective use of the data reports to improve practice. This is likely true. However, effective QI often requires a transdisciplinary team that uses data as a guide to the development, improvement, and maintenance of effective interventions. Other than the metric of whether an ICU had a ICU quality manager were they teams able to develop or did they have existing transdisciplinary QI teams?

Answer:
As described, the QI teams did have (at least) a nurse, intensivist and a representative of the ICU management. As such, they should be able to achieve effective interventions. However, the teams were mostly starters and not experienced in their work, which may have reduced their efficacy.

Reviewer 1 & 2

Needs some language corrections before being published. And: The weak point of the paper is the writing. As I read through it, I saw multiple opportunities to improve the English expression.

Answer:
We have thoroughly checked the manuscript and have made numerous grammatical changes and rephrased many sentences. Of course, we would welcome English editing by the journal to improve further.

Reviewer 2

Reconsider the extent to which the methods could be replicated elsewhere. A clearer description of the interventions, as indicated above in point two, might help.

Answer:
We would like to refer to reference 24 for the detailed description of the interventions. We published the study protocol for this reason previously and referred to this publication in the text.