Reviewer's report

Title: Impact of Computerized Physician Order Entry (CPOE) System on the Outcome of Critically Ill Adult Patients: A Before-After Study

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Reviewer: Saeid Eslami

Reviewer's report:

This paper concerns an interesting area. In contrast to the majority of CDSS evaluation studies the evaluation was performed in a developing country and a commercial CPOE system was used. There are, however, some issues with this paper that if addressed, could potentially improve the paper.

In general and as authors also mentioned, CPOE is for improving the safety which should result in better patient outcome. Unless there were problems in implementation (Eslami, S., et al., Errors associated with applying decision support by suggesting default doses for aminoglycosides. Drug Saf, 2006. 29(9) or Han et al. and Keene et al. which you already refer to them). I am wondering why authors’ hypothesis is that CPOE is unsafe and increase mortality and then they wanted to reject it! To my opinion, the main role of CPOE is improving the safety which should results in reduction of ADEs, mortality and morbidity as patient outcome indicators. Evaluating the effect of CPOE on patient outcome needs more time and energy and majority of studies evaluated the effect of CPOE on process (e.g. adherence to guidelines, errors etc) (Eslami et al., Int J Med Inform, 2007 and JAMIA 2007). I strongly recommend the authors to re-write the introduction, discussion and conclusion in different way and discuss why they could not show benefits of CPOE on patient outcome. Below please find my specific comments.

Major Compulsory Revisions

Introduction:
1) Please use a better definition for CPOE and provide a reference for it. You can use its definition in recent review about CPOE (Eslami, S., N.F. Keizer, and A. Abu-Hanna, The impact of computerized physician medication order entry in hospitalized patients-A systematic review. Int J Med Inform, 2007.)
2) As I already mentioned, please also talk about positive studies which showed that CPOE decreased mortality nearby or even instead of Han et al. and Keene et al. studies. You have couple of examples in your discussion.

Methods:
3) Do you mean “close-format ICU” by “closed ICU”?
4) Similar duration for before and after periods has not been selected (24 vs. 12). Why? Please also compare 12 vs. 12 months.
5) Please describe in more detail the prescribing process at the study sites and
the used electronic prescription system and the CDSS in your institute: Who prescribe? Which percentage of orders prescribed electronically? etc.

6) Was there any other important change in the studied site which could influence the results? For example were the users similar during the study? Please mention them (if there are) and discuss their possible influences in the discussion.

7) In a simple before/after design, many other things may account for these changes; therefore, better risk adjustment is needed such as with a propensity score. A control ward or patient population would be ideal. In the absence of these better study designs, more circumspection would be encouraged in the discussion.

8) What do you mean by “laboratory studies”?

9) The power calculations should be mentioned.

10) What is independent variable in your multivariate logistic regression?

11) How do you end up with current list of variables for adjustment in your multivariate logistic regression? Please motivate it.

Results:

12) During stepwise multivariate logistic regression some variables are excluded from model. Please clarify which variables remained in the final model and which one has been excluded.

13) Satisfaction, usage and usability measurement: Do you have any data on provider satisfaction? Was it annoying users? Did it disturb the clinical process? Was the CPOE usable from users’ point of view? Was there any resistance among users? If yes how did you solve it? Please also discuss the possible effects of the satisfaction and usability on results in the discussion part.

Discussion:

14) As I already mentioned, in principle CPOE is for safety. If one could not show that it makes the ward safer (in this case in term of patient outcome), it is a problem and the reasons should be discussed. I think everything is in the discussion but should be re-written from this point of view.

15) Please discuss if you used other patient outcome (e.g. ADEs, cost etc.) or process outcome (e.g. errors, adherence to guideline etc.), you could possibly show the positive effect of the CPOE and explain why you did not use them.

16) What is the difference between this study and previous ones? I suggest the authors discuss the two strong points of their study in the discussion:

a. Study location in the developing country.

b. Evaluating a commercial CPOE system.

Conclusion:

17) Should be re-written in the way that the study could not show any benefit from CPOE in term of mortality but at least did not increase it like some others. Perhaps more time is needed to show the CPOE effect on mortality.
Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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

Declaration of competing interests:
I declare that I have no competing interests