Author's response to reviews

Title: Effectiveness of a training program on compliance with recommendations for venous lines care

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Version: 4 Date: 31 March 2015

Author's response to reviews: see over
Dear Dr. Zingg,

Thank you very much for your comments and help about our article entitled “Impact of a training program on the care of peripheral and central lines: assessment with 2 point prevalence studies”. We proceed to answer all the questions.

Referee 1

Given that the study is about a behavioural change intervention you must provide much more information: who (person, study group, project group...) prepared the intervention? What were the rationales to choose this strategy but not another? Was the study group multidisciplinary – or multiprofessional? Or was it prepared and executed by infection control only? How was the online tool promoted? Were there sanctions if nurses did not perform? Did you also address doctors? How many talks with nurses did you do? Did you use an established format to do so? What were the barriers and facilitators during the intervention? Was the project backed by hospital management? Try to give as much detailed information to the reader to allow having an idea about how to do implement such a project in a hospital.

We have included answers to the reviewer’s points along the material and method’s section.

Minor comments

Line 63: this is not really evidence of infection but also phlebitis and induration?

This has been further clarified in the text (Material and Methods).

Line 67: “Multi-oriented” sounds weird. Please, use multimodal or comprehensive or multifaceted.

We have changed it.

Line 101: you may consider the following studies that looked into the use of central venous catheters in ICU- and non-ICU: Zingg, J Hosp Infect 2009 Sep;73:41; Zingg, J Hosp Infect 2011;77:304.

We have now included these references.

Line 108: Please, be more specific in what months the surveys were performed.
Two point prevalence studies were performed (January 2013 and September 2014). We have included it. This information is in the material and methods section.

**Line 112: Please, provide the range of dates of the intervention.**

From February 2013 to June 2014 an educational intervention was implemented. This is now further clarified in the text.

**Line 119: What were the clinical signs for infection you used to assess infection?**

We defined clinical evidence of local signs of infection when there was at least one of the following manifestations: phlebitis, erythema, induration, redness, or suppuration, in the data collection section. The selection of this definition is now further clarified in the text.

**Line 126: How was necessity obtained? Written indication or by asking the care team? Was a catheter deemed unnecessary if there was no indication written in the patient charts? Try to be more specific in this issue.**

We considered as unnecessary a VL on the study day when a patient was hemodynamically stable, had not indications to use IV fluids by that line and no IV medication was required. This is now been introduced in the text.

**Line 138: phlebitis and induration alone are most often associated with non-infectious thrombophlebitis (Zingg, Int J Antimicrob Agents. 2009;34 Suppl 4:S38). You should talk about thrombophlebitis/exit-site infection here.**

This now has been clarified in the text. For the sake of this study all inflammatory changes were included as infection.

**Line 145: I struggle with the two first sentences here. What is a “qualitative variable” in the context of a statistical analysis (other than explanatory variables in qualitative research) and as you explain, the way of reporting “quantitative” variables depends whether it is a continuous (and normal or not normal distributed) or a categorical variable.**

We have the issue clarified in the text.

**Line 155: What does the p-value mean here? Please, provide the proportions here (I assume the statistic refers to the number of patients with a catheter visited as per total patients hospitalized at that survey dates).**

We have removed the p-value, but can not provide the proportions here because the number of beds is different every day according to the needs of the hospital.
Line 163: Please, go for thrombophlebitis/exit-site infections instead of “local clinical infection” – I do not assume that the proportion of infected peripheral lines in your hospital is really 2%.

As stated in the text and in order to simplify the questionnaire we made a compositum variable including all local inflammatory signs. Our signs were really that low because the policy in the institution is to immediately substitute with inflammatory signs at the portal of entry. This is a prevalence study and it may explain the low figures. A comment on this issue is now included in the text.

Line 169: This merits some discussion: was this because of hospital purchasing issues or because there was concern about the use of mechanical valves? Was this part of the intervention (recommendation to use a split septum rather than a mechanical access device)?

We use a split septum valves following the recommendations guidelines, 2011 of IDSA and SHEA (O’Grady, et al). This recommendation was part of the intervention. A comment is now included in the text.

Line 179: Please, be clear that prevalence surveys are useful to measure performance indicators but not rare outcomes such as catheter-associated bloodstream infections.

We obviously agree with the referee and that is the reason why Catheter-Related Bloodstream Infections (CRBSI) were not included.

Line 184: please see suggested additional references.

We have included them.

Line 187: This has been shown also by others (e.g. Zingg, J Hosp Infect 2009).

We incorporated the reference as suggest by the reviewer.

Line 189: You are absolutely right – but you make the same mistake: you scarcely explain what you did.

We now included our recommendations in the material and methods section.

Line 197: The study by Zingg et al. (J Hosp Infect 2011) found a proportion of only 4.8% of unnecessary central-venous catheter-days (2.7% in the ICU and 6.6% in non-ICU settings). I wonder how this reference did not make it into your reference list.

We apologize for the mistake and have now the reference included.

Line 204: I think there are many more limitations to be mentioned and although I agree that the numbers and proportions provided here are not applicable to gynaecology/obstetrics and paediatrics, the idea of the intervention and the use of prevalence survey can be applied in those settings.
We also think that this survey can be applied in those settings.

Line 208: If you talk about “bundle”, please, explain the bundle. However, by reading the manuscript I am almost certain that it is not about a bundle but a comprehensive education and training programme.

The “bundle” was: Use of chlorhexidine with alcohol 2%, use of connectors (split-septum) in all hubs, daily surveillance, replace dressings every 2 days for gauze dressings and 7 days for transparent dressings, replace of administration sets every 7 days including connectors and remove unnecessary catheters.
We have clarified this in the Material and Methods section.

Table 1: “General data” as a title seems to be a bit short in my opinion. I would refer to survey 1 & survey 2 instead of study 1& study 2 – if I understood correctly, there were two different point prevalence surveys as part of one study. Could the significant difference in age be due to seasonal differences – why did you use a t-test (SD) here (age is unlikely to be normally distributed)?

The time of the studies (winter and summer) may explain small differences, as are, in the age distribution of hospitalized patients. January usually include more elderly patients with respiratory infection. We include a sentence to discussion this potential difference.
We use the mean and SD in age because had a normal distribution.

Table 2: Please, check the columns of the line types: the proportions do not add up everywhere. You may consider “insertion site” instead of “Entry site of...”. The information about use of catheters is peculiar. It seems as if you decided to provide only data of selected indications. Please, add other indications and at least a category “other indication” and “unnecessary use”.

We have modified the Table 2 according to your suggestions.

Table 3: Given the selection of the parameters in this table I assume that those were part of the intervention (this includes the use of split septum rather than another [which type?] access device)? If so, you need to explain this in the method section.

We discussed already this point before.

Referee 2:

Major Compulsory Revisions
The question addressed in the background section of the article “to evaluate the efficacy of bedside point prevalence studies to assess compliance with recommendations” does not match with the title of the article. I think the question must be reconsidered to “effectiveness of a training program on compliance with recommendations for VL care”. The point prevalence studies are only the instrument to measure the compliance but not the intervention itself.
We now have modified the title in the manuscript according to the reviewer’s suggestions.

The authors do not give information about their recommendations for VL care within the training program and on which bases they developed their recommendations. They only give the criteria they surveyed in the prevalence studies. Furthermore, the authors state that “a line was considered adequate if all the following criteria were fulfilled” but results for this “overall” compliance are not given. As an example: The reader of this article does not get information if the use of split-septum connectors was recommended in the campaign but in table 4 it is given as a parameter indicating good infection control. Another discussion might be for example if the registration of set replacement is an indicator for good infection control. This might have been a recommendation within the training program but registration as such does not necessarily improve the quality of care. As the authors do not give information about their recommended changing frequency for administration sets nor if the registration was part of the recommendation it remains unclear if the compliance with the changing frequency or just with registering was improved.

This has been already answered in the reviewer 1. We now have included in the method section our recommendations on catheter care in our Hospital.

Minor essential revisions
In table 2 in line “location of peripheral lines” the numbers of % are missing for study 2.

We have already taken care of it.

Discretionary revisions
Table 2 might be left out as these data do not add information to the study question unless e.g. the insertion site for CVL was part of the training program

We believe that can be interesting to compare with other studies, but if the reviewer consider it important to remove we do it.

Thank you once more for your kind attention to our manuscript and all your help.

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