Reviewer's report

Title: A large-scale assessment of hand hygiene quality and the effectiveness of the "WHO 6-steps"

Version: 1 Date: 24 July 2012

Reviewer: Simone Scheithauer

Reviewer's report:

Szilagyi at al. presented an analysis of hand hygiene performance in healthcare workers.

As the authors mentioned, that there is a growing body of knowledge on hand hygiene compliance and how to measure and increase it, however knowledge on hand hygiene performance is limited.

Therefore it seems to be at least reasonable to investigate this issue.

The findings of the authors consist mainly of a so called new technique to assess performance including an educational programme.

Therefore it seems to be at least reasonable to choose the format “Technical advance article” to focus on the new finding. However, as the authors stated themselves, the technique has already been published elsewhere (reference 21).

Despite the fact, that an assessment of hand hygiene has not been presented in this concrete way for a large number of health care workers so far, the impact of the presented data remains questionable for several reasons.

In general:

1. (major point) The investigation did not cover all day routine practices. Observation was performed not during work, but within a targeted education tool. Therefore the transferability of the results remains at least questionable.

2. (major point) Main results presented well-known fact, e.g. that nurses perform better than physicians and women better than men.

   (minor point) By the way: Did the findings differ significantly? Because most nurses were female, is there a bias included? Please offer the confidence intervals and the ps at least.

3. (major point) Why did the authors do not perform a baseline observation – documenting a pre post training effect? In my view at least a baseline before training and even better a follow up – some weeks after training will markedly improve the authors findings.

4. (major point) By now, the manuscript consists mainly of a description of a novel tool to assess performance. And moreover, assessment by UV-light and documentation of disinfectant gaps had been already performed as mentioned above.
A methodologically strong advantage is the electronical documentation allowing a follow up of individual health care workers.

5. (minor point) The text is redundant several times. Please offer results in the text or in a table or in a figure. Not in all. This will mean, that many tables should be omitted because they only provide unnecessary or too detailed and thus not getting the point information, e.g. table 1 and 2. by the way, they are really hard to read and the information is very limited concerning the question of hand hygiene performance in the health care setting.

6. (minor point) The same is true for figure 1 and 2 and especially for the very detailed presentation style. Please omit these figures or put the main information in one clear figure.

7. (major point) The results and discussion part completely lacks a discussion.

In detail:

1. (major point) Because wearing rings and artificial nails is a big problem from the infection control point of view: Did the authors assess these factors not inline with an adequate hand hygiene? Please offer these observations.

2. (minor point) Did the data showed normality distribution (and equal variance) allowing to perform the t-test? If data complied with these requirements please provide this information for the readership.

3. (minor point) Table 3 and 4: it is very unusual to provide the “p”s as the authors did. Please offer the usual style as p<0.0001 or p=0.02.

4. (major point) The style of table 3 and 4 is hard to understand, however information is simple. Please simplify the table and include better fitting headings (“Successful of All”? “Complementary group” I suggest females in the first line, but who in the second?) for the readership. Omit column 3 of table 4, I suggest you calculated that the 12.7 difference in performance is 51% more compared to the worse group (for raw 1)? But this information is given by the numbers themselves in a better way.

I would suggest putting all observed significant AND relevant differences in one simple table for a better understanding.

To sum:

The main finding is, that hand hygiene performance in health care workers in a training situation immediately after teaching hand hygiene is modest.

Follow up and baseline data as well as a correlation to hand hygiene compliance according to the WHO concept are necessary to improve data quality expected for publication in the BMC Infectious Diseases.

I would advise against publication in the BMC Infectious Disease at the current level.

Level of interest: An article of limited interest
Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

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