Author's response to reviews

Title: Practicing evidence based medicine at the bedside: a randomized controlled pilot study in undergraduate medical students assessing the practicality of tablets, smartphones, and computers in everyday clinical life

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

I have received your comments and the remarks from the reviewers and found them very helpful in order to improve the content as well as the structure of the manuscript. Here are the revisions I have done:

Your comments

#1 Please rephrase your Competing Interests, Funding and Acknowledgement sections.

As you requested, I have rephrased the competing interest, funding and acknowledgements section

Reviewer P. George comments

#1 While this study attempts to address the use of mobile applications versus using a computer in clinical settings, it’s methodology and results are concerning. For example, I don’t expect in an academic paper to read, "All groups equally thought that the practical course was fun."

Thank you for this comment. I have rephrased this section and hope it is now more academic.

The following lines were changed:
Page 8, ll. 14-16

To assess emotional involvement, the participants were asked about their perception of fun during the course. In this regard, there were no significant differences between groups.

#2 In addition, I think a clearer delineation of what exactly students were using on their iPhones/tablets would be important. PubMed isn't
particularly useful on a smartphone, although apps that answering clinical questions in real time like Up to Date or Dynamed are very useful.

We have used the app "Unbound Medline", which provides simplified access to PubMed (over the selection of appropriate MeSH terms). This has also been described in the text: "All groups searched via the online platform" unbound medline "as it provides the same interface for all mobile devices and thus the search conditions were standardized. In addition, the software proposes MeSH terms when entering medical terminology, which corresponds to the search with the MeSH database." (page 6, ll. 6-9)

#3 Other comments include the lack of data on the statistics used - did the authors compare the groups with a paired t-test or an ANOVA or something different.

I am sorry that I have failed to clarify this point in the first place. I have changed the respective lines and hope that it is now clear.

The following lines were changed:
Page 7, ll. 6-9

We used analysis of variance (ANOVA) and chi-square tests to evaluate whether students’ baseline characteristics and students’ internet access, internet use, and frequency of literature search were balanced between groups. Significance was set at $\alpha = 0.05$.

#4 What were the demographics of each group (meaning is the PC group more facile with technology in general than the other groups).

Demographic data such as age and gender are described. To compensate for differences in these groups have been randomized. However, we have changed the respective lines.

The following lines were changed:
Pages 7-8, ll. 21-2

The baseline characteristics (age and gender) of students as well as students’ habits regarding internet access, internet use, and literature search frequency did not differ significantly between the three randomized groups.

#5 The writing in the article broke multiple grammatical rules (changing tenses in paragraphs; words incorrectly used; run on sentences, etc.

I am sorry for the grammatical errors. We have sought help from a professional website (EDANZ) and hope the language has improved.
While I like the idea of randomizing students to different interventions (which is unfortunately done seldomly in medical education), this study has too many shortcomings to warrant publishing.

I hope that in this revision I could clarify the shortcomings you mentioned.

Reviewer C. Pearce comments

#1 Thanks for the opportunity to review this interesting paper. The use of tablets as a bedside tool is one that is talked about, but only now starting to be implemented. Computers on Wheels (COWs) have been around for a while.

Thank you very much for this comment.

#2 Major revisions: As a usability enthusiast, the title made me expect to see a discussion about the practical aspects of using the unbound Medline on the pads, what navigation of the site was like, etc.

Thank you for this comment. I have added more information regarding the practical aspects.

The following lines were changed:
Page 10, ll. 8-12

The proposed MeSH terms provided by the software when entering medical terminology were a big help for students, especially for non-native English speakers. A correspondence between the search and the MeSH database could be achieved in seconds, which allows the use of mobile devices in principle. When a MeSH term was mistakenly used in the search and the search had to be started from the beginning, correcting the results did not always work reliably with the newly selected MeSH term.

#3 Perhaps the title should be different: Acceptability? practicality?

I am grateful for this helpful remark. As you have proposed, I have changed the title.

#4 Following on from that, the use of Medline as the only source of evidence is limiting, and this limitation needs to be better acknowledged in the introduction and limitations section.

Thank you for this comment. I agree that using medline as the only source of evidence is limiting, however it is the world’s largest and most important medical literature database and the electronic equivalent of Index Medicus, Index to Dental Literature, and International Nursing Index. Further the focus of our study was rather on the practicality of using this database on either a pc, smartphone or tablet than on the content. However, I have added more explanatory lines.
The following lines were changed:
Page 3, ll. 17-21
Of all databases, Medline is the world’s largest and most important medical literature database. It is the electronic equivalent of Index Medicus, Index to Dental Literature, and International Nursing Index. It can be accessed from numerous online services by using an appropriately equipped computer (PC).

Page 11, ll. 13-16
Third, participants only used the search platform Unbound Medline. The usability of the devices might differ if other platforms were tested. Important databases including the Cochrane Library and the ACP Journal Club were not used in our study.

#5 Doctors use a wide variety of evidence based resources - UpToDate, Cochrane reviews, and there are attempts to structure this better for the busy clinician (see health pathways New Zealand, for example).

I believe this is a very important point. Unfortunately, there is no convincing evidence that interventions regarding access to digital medical data have an impact on the clinical everyday life and on the outcome of patients (McGowan et al. Electronic retrieval of health information by healthcare providers to improve practice and patient care. Cochrane Database Syst Rev (2009) (3) pp. CD004749). Accordingly there are calls for more studies to determine effective methods that provide access to medical literature.

#6 There are also studies showing that Google search can be faster and just as accurate as Medline.

I would be very interested in finding out about these studies, unfortunately I have failed to find them myself.

#7 It is described as a controlled study, but what where the controls? Students without access or the students using PC’s.

I am sorry that I have failed to clarify this point in the first place. As mentioned in the abstract the group with the personal computers in the control group. I have added explanatory lines in the methods section.

The following lines were added:
Page 5, ll. 7-11

In a randomized controlled pilot study, 120 third-year students (first clinical semester) were divided into three groups. One group served as controls and solved clinical problems on a PC that was located in a doctor’s room on the ward, as is so often the clinical reality. The second group was an intervention group that represented the growing use of smartphones.
Finally, I want to thank the editor and the reviewers for the thorough reading of the manuscript and providing numerous helpful ideas for improvement in the process. I sincerely hope that I have made all corrections to your approval and provided satisfactory answers to all your remarks. If any other points might come up that might help to raise the quality of this work, please do not hesitate to contact me. I would be very grateful if you would now consider our manuscript for publishing.

Yours sincerely,

Anne Weissenstein, M.D.