Reviewer’s report

Title: Health professions digital education on clinical practice guidelines: a systematic review by Digital Health Education collaboration

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Reviewer: Mark Newman

Reviewer’s report:

The abstract of the study makes the following claim "Health professions digital education on clinical practice guidelines is as effective as traditional learning and more effective than no intervention in terms of knowledge" This claim is repeated in the conclusion and therefore I assume is the 'take away message that the authors believe is supported by their review of the evidence. Given the pressure on healthcare resources including staff time and the pressure on healthcare education budgets, the lure of a possible cheaper 'digital' learning alternative to face to face interactive modes of learning is persuasive to budget managers. It is therefore important to make sure that a message suggesting that digital learning is an equally effective alternative to face to face education for implementing guidelines is a valid conclusion.

MY concerns with this conclusion

1) it is not clear from the report what exactly is being done in the name of 'digital education'? the labels given in table 1 such as 'on-line' module are not sufficient to a) help design interventions or b) to check whether similar interventions are being grouped for the purposes of synthesis. The authors state that in 10 of the studies the digital learning takes place in the context of a broader CME intervention which raises the question of whether it is valid to consider the outcome of being the effect of the digital intervention only. Furthermore the authors make the point several times that most of the digital education has little or no interaction raising the question of whether the digital education investigated question is simply the provision of information (or perhaps even the guideline itself) in a digital rather than paper format.

Similarly the comparison group descriptions are not very informative but to the extent that its possible to tell where there appear to be two different types of comparison; with printed information or with some kind of lecture/teaching.

It is also not clear whether the outcomes measured in the studies are sufficiently similar. What are the details of the 'knowledge', skills, behaviour outcomes in each study?

Furthermore the 'guidelines in question appear quite different. It seems reasonable to assume that 'Diabetes Management' and 'Resuscitation' guidelines have quite different requirements and meanings in terms of 'implementation'.
Any synthesis needs to group sufficiently similar interventions and comparing them with sufficiently similar controls. It is not clear from the report whether this is the case or whether the impact of this variation has been explored.

2) The authors state "The included studies were diverse with largely unclear or high risk of bias". This statement would on its suggest that any conclusion based on these studies should be more cautious than is presented here. I understand the authors concerns based on the Risk of Bias assessment but it seems somewhat counterintuitive to say that the selection criteria were limited to RCT studies, say that there were 17 RCT studies included and then be stating that the allocation method is the main risk of bias concern.

3) Results

Digital learning v no education section

It is perhaps reassuring though hardly surprising that If compare scores on a test of knowledge between a group that has received an educational intervention on a specific topic with one that that has not received any educational intervention on that topic that the group receiving the intervention performs better on the test. However the data for this outcome (SMD = 0.85, 95% CI: 0.16, 1.54; I² = 83%) show a high level of heterogeneity and very imprecise estimate. Furthermore these results did not come from studies that also compared digital education with some other means of guideline implementation support and so we cannot draw any conclusions from them about the relative merits of different approaches. More pertinently perhaps knowledge on a test is not a practice or patient outcome and so is arguably of little significance to the question of guideline implementation.

Digital learning vs traditional learning section

The authors state "The pooled analysis of three studies with comparable data showed no differences between the intervention and control". The authors need to explain why only these studies are considered comparable. The reader needs this explained rather than having to work it out themselves from tables and references.

Furthermore the data for this claim is given as (SMD = 0.23, 95% CI: 0.12, 0.59; I² = 34%) (Figure 3) i) the pooled effect size shows a positive direction of effect (i.e in favour of digital education) ii) The 95% Confidence interval does not exclude a negative effect iii) The heterogeneity statistic indicates a moderate degree of heterogeneity which is also evident visually in the forest plot (The study by nurse has the opposite effect to the other two studies and being so small has a very imprecise estimate - this difference should be explored).

It is therefore not accurate to report this result as 'no difference' which invites the misinterpretation that 'digital' and 'traditional' learning are equally effective'. A more accurate interpretation of this data would be it is unclear whether digital education leads to a better or worse outcome than traditional education.
The paragraphs reporting the impact on 'behavioural outcomes' is also very unclear being difficult to tell which studies are in which comparisons. The two forest plots in Figure 4 appear incomplete? (no pooled estimate?) And need further explanation (for the inclusion of multiple outcomes from a single study for example. The same incorrect reporting of results also needs correcting in this section.

Long-term retention and change from baseline section

The 6 studies reported in this section were presumably reported in the previous sections (a quick check of reference nos suggests this is the case) but how the results reported for the studies in this section relate to the previous sections is not clear.

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If not, please specify what is required in your comments to the authors.

Yes

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Not applicable

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