Reviewer's report

Title: Utilization of the PICO framework to improve searching PubMed for clinical questions

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Reviewer: Enrico Coiera

Reviewer's report:

General

This paper reports a small pilot study of 30 clinicians each assigned to an arm of sample size 10, to evaluate the impact of structured queries using the PICO framework on the ability of clinicians to retrieve relevant documents to help answer clinical questions. It is generally a well written paper. The research area is one of interest to many, and improvements in search are likely to have a clinical impact via improved clinical decisions.

I have three areas of concern with the current paper:

1 - the sample size is clearly very small, and no statistical tests are applied to the data reported. We are thus unable to interpret the meaning of the differences in precision rates reported for the three arms of the study. The authors make interpretations about the relative merits of the different interventions, but with such small numbers this seems no way of distinguishing the differences from random chance. Consequently I have great difficulty in accepting the conclusions of the authors. If they are able to report statistical significance values that are even indicative of their conclusion, this would have been helpful. I interpret the absence of statistical tests to mean that no significant differences were found when testing was done.

2 - The literature review is weak, and the authors do not cite similar studies. For example Westbrook et al's 2005 paper in JAMIA reported a similar study design which looked at the impact of search filters on clinical decision outcomes. There are several studies now that have looked at the impact different search filters have on Medline usage (e.g. Ingui et al in JAMIA in 2001, and several similar papers over recent years, including some in BMJ).

3 - The experimental design is somewhat weak. The outcome measure is location of documents that the research team has a priori decided are 'relevant' to a clinical question. The authors do not report what the inter-rater reliability was for document relevance amongst the researchers (kappa calculations) so we are a little unclear how strong consensus was on what a relevant document might look like. Secondly relevance of an article retrieved is only an indirect measure of clinical outcome, and others have looked further than this, examining the impact of retrieval on clinical decision (e.g. Westbrook et al, 2005). In the pilot study reported here clinicians are given a question and asked to identify relevant documents. It would seem little more effort in the main study (for which the current one is a pilot) for the clinicians to be asked for their answer to the clinical question before and after search. This would provide a more direct measure of the impact of the retrieved evidence on clinical decision making.

Given the first point, that this paper does not report statistically significant results, I feel it is not possible to recommend the current paper for publication. However I would very much welcome seeing a paper with a larger sample size in which the authors are able to report differences which are statistically meaningful. I would also be delighted if they had the ability to incorporate point 3 in their larger study design as it would enhance its value for relatively little additional effort.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)
What next?: Reject because too small an advance to publish

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

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

Declaration of competing interests:

I hold an international patent in search systems, which is related to the types of system described in this paper, and would receive financial benefit were that patent to have commercial value. I believe publication of the paper would enhance rather than detract the commercial prospects for this technology.