Author's response to reviews

Title: A systematic review of the content of critical appraisal tools

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Author's response to reviews: see over
We are grateful that the reviewer provided us with more guidance regarding his request for empirical evidence, and we believe that in answering his queries we have added to the quality of this paper. I suspect that we were so overwhelmed by the critical appraisal and review process, that this very obvious issue passed us by! Thank you. We have provided the changes to the paper below, and also highlighted them in the paper (in red) for easy tracking.

We trust we have addressed the issue of the generic appraisal tools in the manner suggested by the reviewer. We are mindful of introducing any personal opinion into this debate, and hope that we have made the point regarding tool content, specificity and relevance to allied health. Thanks again for giving us the opportunity to improve this paper.

Abstract
Method additional sentence
A systematic review was undertaken of 121 published critical appraisal tools sourced from 108 papers located on electronic databases and the Internet. The empirical basis for construction of the tool, the method by which overall quality of the study was established, the psychometric properties of the critical appraisal tools and whether guidelines were provided for their use were also recorded.

Results
Additional sentence: Twelve percent of the available tools were developed using specified empirical research.

Background
new sentence paragraph 3:
There is no evidence that generic critical appraisal tools and design-specific tools provide a comparative evaluation of research designs.

Method
New third sentence, para 2. Data extraction consisted of a four-staged process. First, identical replica critical appraisal tools were identified and removed prior to analysis. The remaining critical appraisal tools were then classified according to the study design for which they were intended to be used [1,2]. The scientific manner in which the tools had been constructed was classified as whether an empirical research approach has been used, and if so, which type of research had been undertaken.

Results
New section in the results entitled:
**Empirical basis for the tool**

We identified 14 instruments (12% all tools) which were reported as having been constructed using a specified empirical approach [20,29,30,32,35,40,49,51,70,71,72,79,103,116]. The empirical research reflected descriptive and/or qualitative approaches, these being critical review of existing tools [40,72], Delphi techniques to identify then refine data items [32,51,71], questionnaires and other forms of written surveys to identify and refine data items [70,79,103], facilitated structured consensus meetings [20,29,30,35,40,49,70,72,79,116], and pilot validation testing [20,40,72,103,116]. In all the studies which reported developing critical appraisal tools using a consensus approach, a range of stakeholder input was sought, reflecting researchers and clinicians in a range of health disciplines, students, educators and consumers. There were a further 31 papers which cited other studies as the source of the tool used in the review, but which provided no information on why individual items had been chosen, or whether (or how) they had been modified. Moreover, in 21 of these tools, the cited sources of the critical appraisal tool did not report the empirical basis on which the tool had been constructed.

**Discussion**

Additional sentence in Para 1.

There was a distinct lack of information on the empirical basis for tool development in approximately 90% of tools. Approximately one-third of the published tools were reported to be based on versions of earlier tools, or reflect clinical or research specialty concerns, without justification of inclusion or decision-making criteria. Less than 10 of these were related in any sense to evaluating the quality of allied health research, and none of these tools were based on empirical research.

**Generic tools**

Of the small number of generic critical appraisal tools, we found few that could be usefully applied (to any health research, and specifically to the allied health literature),
because of the generalist nature of their items, variable interpretation (and applicability) of items across research designs, and lack of summary scores. Whilst these types of tools potentially facilitate the synthesis of evidence from quantitative and/or qualitative allied health research for clinicians, their lack of specificity in asking the ‘hard’ questions about research quality related to research design also potentially precludes their wide-spread adoption. At present, the gold standard study design when synthesizing evidence is the randomized controlled trial [4] which supports the common finding of experimental critical appraisal tools identified in the allied health literature [37,39,52,58,59,65]. As more systematic literature reviews are undertaken on allied health topics, it may become more accepted that evidence in the form of other research design types requires acknowledgement, evaluation and synthesis. This may result in the development of more appropriate and clinically useful allied health critical appraisal tools.

We have removed this sentence from the next paragraph: , nor is there a widely accepted generic critical appraisal tool

Revised Conclusion

Conclusions

Based on the findings of this evaluation, we recommend that consumers of research should carefully select critical appraisal tools for their needs. The selected tools should have published evidence of the empirical basis for their construction, validity of items and reliability of interpretation, as well as guidelines for use, so that the tools can be applied and interpreted in a standardized manner. Our findings highlight the need for consensus to be reached regarding the important and core items for critical appraisal tools that will produce a more standardized environment for critical appraisal of research evidence. As a consequence, allied health research will specifically benefit from having
critical appraisal tools that reflect best practice research approaches which embed specific research requirements of allied health disciplines.