Reviewer's report

Title: Cognitive training in community dwelling elderly can improve performance on assessments associated with independent living: a randomized controlled trial of multi vs single domain interventions

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Reviewer: James W Mold

Reviewer's report:

General: This paper reports the results of an RCT of multi-domain versus single domain cognitive training conducted over a 3-month period on a variety of cognitive tests performed immediately after training and 6 and 12 months later. The research question is important, assuming that the changes in cognitive test scores translate to better daily functioning and that the training performed in the study could be widely implemented. While, for the most part, the paper is clearly written, there are still quite a few grammatical errors, presumably due to translation from Chinese to English.

Major Compulsory

Title:
1. The title is too long and is somewhat misleading. It implies that the outcome was independent living skills when, in fact, it was cognitive tests that have been associated with independent living abilities in other studies. I suggest, “The effects of multi-domain versus single domain cognitive training in non-demented older people: A randomized controlled trial.”

Methods:
2. On page 6, 7 lines from the bottom, the usual cutoff for normal on the MMSE in the U.S. is 24 (some use 26). Is the normal cut-off point lower in China? If so, please state that in the paper.

3. On page 8, second full paragraph, I couldn’t get a good enough handle on exactly what happened during the middle 30 minutes of the training sessions. Since this is so important, I think it deserves a great deal more explanation.

Results
4. On page 12 and Figure 1, the first sentence says that 270 of the 320 were eligible implying that 50 were not eligible, but the next sentence says that those 50 refused to participate. That is confusing.

5. Why did 53 subjects drop out of the study before even completing the baseline cognitive testing? Didn’t they understand what they were signing up to do? Was there a long time lag?

Discussion:
6. It is not at all surprising to me that single domain cognitive training resulted in
greater improvements in reasoning. Those assigned to that group received considerably more training in reasoning skills than the multi-domain group. That needs to be made much clearer. (Or am I confused?)

7. In this section I wouldn’t use statistical expressions like “Time*Group interaction effect.” Just summarize in one paragraph the key findings, then discuss the implications, then discuss the limitations and strengths of the study in ordinary language.

8. Try again to convince the readers that the changes seen in cognitive test scores will probably translate to better daily functioning and that the training performed in the study could be widely implemented at a reasonable cost. Otherwise why should we care?

Conclusions:

9. This section seemed redundant and too long. Try to reduce the whole section to no more than 3 sentences.

Minor Essential

Abstract:

1. Under Background and throughout, the abbreviation, “CT,” for cognitive training is problematic since it usually refers to computed tomography. I suggest using CogTr or just not abbreviating it.

Results:

2. On page 14 - 17, much of the data included in the text is also included in the tables and figure where it much easier to follow. I would reduce the amount of data included in the text to the minimum amount needed to understand the key findings and refer the reader to the tables and figure.

Discretionary

Abstract:

1. Under Results, there seem to be some words missing from the first sentence after the second “CT.” The second sentence is also confusing and should be rewritten.

Background:

4. On page 4, 4 lines from the bottom, I suggest that you begin that sentence with “They concluded that [cognitive exercise training in healthy older adults...”]

5. On page 5, middle of the page. I suggest moving “Previously, few studies .... Positive effects.” To a new paragraph just before the paragraph that begins, “The first aim of the present study...”

6. On page 5, 5 lines from the bottom, I would delete “of the present study” and replace it with “was.”

Quality of written English: Needs some language corrections before being published
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

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