Reviewer's report

Title: A systematic review of attention deficit/hyperactivity disorder and mathematical ability: current findings and future implications.

Version: 1 Date: 29 December 2014

Reviewer: Andrea Cipriani

Reviewer's report:

I'm not an expert in ADHD, so I'll limit my comments to the methodological part of the systematic review.

Major compulsory revisions

As for all systematic reviews, to do a proper peer review process it is necessary to have the protocol of the review in order to be able to check the consistency between the two documents and adequately comment on the review itself (a lot of information is missing in the manuscript, for instance re. the search strategy). I couldn't find the protocol in the attached documents (sorry if I missed it), so I assume it was not published or made available before carrying out the review (another important limitation). Am I correct? If so, this review does not meet the minimum standard for publication in a scientific journal (please, visit PROPERO at http://www.crd.york.ac.uk/PROSPERO/). If not, please let me have the protocol and the reference of its publication.

Overall, the reporting of the manuscript is not properly organised and structured as it should be (the authors mentioned the PRISMA statement but they do not seem to follow the instructions carefully - for instance, Table 1 of the PRISMA publication in PLoS Medicine, item 5 about protocol and registration). In the submitted manuscript some of the results are reported in the method section (for instance, the number of studies retrieved by the search), a lot of information is missing from the search strategy (for instance, the full list of the search terms and key words), the paragraph of the search strategy is written before the inclusion/exclusion criteria, no information about the statistical analysis in the method section, etc. Please, clarify.

Re. quality of the studies: I couldn't find a clear consistency between references 17 and 18 (as quoted by the authors) and what the authors did in their paper. As far as I can see, the authors changed the items of ref. 17 (see http://media.wix.com/ugd/dded87_19dd1d558a9977c0e0b30cedf86a9da7.pdf) and added the answers to the questions as a final score, which is not the intent of the CASP appraisal tool. Moreover, the authors seem to divert once more from the correct interpretation of the CASP guidelines. For instance, in the reported link a few lines above it is written that "...the first two questions are screening questions and can be answered quickly. If the answer to both is
“yes”, it is worth proceeding with the remaining questions”. Looking at Table 1 of the submitted manuscript, ref 55 (Barkley et al., 1991) does not meet the first criterion or ref 41 (Hannula et al) does not meet the second criterion. Why did the authors include these studies? Finally, the classification into High, medium and low quality seems to me absolutely arbitrary and without any backing reference. Am I correct? I think that a clear explanation of how the authors addressed the quality issue and why we can find these (at least apparent) inconsistencies is needed. Thanks.

Please, add the number of pages to the manuscript!

Can you add the date of the search?

Why did you include people with a diagnosis of ADHD or without a diagnosis and only with symptoms according to a (standardised?) rating scale (quote: "...participants of any age who had a diagnosis of ADHD (DSM-defined ADHD or ICD-defined hyperkinetic disorder) or were assessed for symptoms of the disorder on ADHD validated scales,...")? I think this can generate some important heterogeneity in the sample and reduce the validity of the results. Can you explain your choice?

Can you clarify which are the "appropriate tests used to determine mathematical ability"? This is something that it is usually specified in the review protocol.

There are some white empty boxes near the beta coefficient on page 9 and Table 2. I'm sorry, but I don't understand the meaning. Can you explain?

All the results section in the manuscript basically duplicates results reported in Table 2. I think that the table is much clearer and I would reduce the result section to the very minimum (cross referencing Table 2)

Minor essential revision

Why DSM is one of the keywords of the manuscript? Please, clarify

Figure 1 (or the text) should report the broad categories/reasons for exclusion of the more than 2000 references originally retrieved (otherwise, the criticism could be that the search was not appropriately done, too broad or too imprecise)

Add a proper legend for Figure 1. Why is the figure so small if compared with the rest of the manuscript? A better resolution would be of help

The discussion should be based on the results of the review and be more balanced, taking into full consideration all the limitations of the studies and the heterogeneity of the population. I don't think the quality of the evidence retrieved by this manuscript is robust enough and I frankly doubt that this evidence can be used to back any clear statement of causal association between ADHD and mathematical ability. I would be more cautious, but this is matter of interpretation and I leave it to the authors.

I'm sorry, but I don't think the very last statement of the conclusion section is
pertinent to the previous discussion. Can you clarify?

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests