Reviewer’s report

Title: Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: a systematic review, meta-analysis and GRADE of the evidence

Version: 0 Date: 21 Aug 2019

Reviewer: James C. Anthony

Reviewer's report:

With general faithfulness to PRISMA guidelines and the 'a priori' protocol, the systematic review and meta-analysis seem quite sound, with no more than minor issues I choose to leave to the attention of other reviewers.

My comments reflect a puzzle that involves description of methodological approach and perhaps a misunderstanding that, I believe, will face other reviewers and readers.

Namely, I count at least three response variables with no clearly stated relationship of the three: (1) text emphasizes Problematic Smartphone Use (PSU), whereas the lead figure is a meta-analysis summary labeled with an 'Addiction' outcome, and the second figure speaks of Problematic Mobile Phone Use.

As described in the text, the estimated associations purport to be based on what essentially are cross-classifications of PSU with mental health and behavioral outcomes most readers would characterize as unhappy experiences (anxiety, depression, sleep difficulties, and social problems). But the size of the associations are remarkably small, given an apparent reliance upon a PSU case definition that is not fully explained in the text, but that specifies the presence of anxiety, etc, as a defining feature of PSU. The result is that the y1*y2 cross-classification is of y1 (Smartphone use accompanied by anxiety, etc.) with y2 (anxiety, etc.).

An allowance can be made for the possibility that an attempt to be succinct has gotten in the way of this reader's comprehension of the research approach, but the 'control' in the research design may be inadequate. For example, think of smartphone users as a set (y0==1) and think of anxious people as a set (y2==1), with overlap as in a Venn diagram. Unless set y0 is defined without reference to components of set y2, the result has an uncontrolled upward bias. It seems that PSU is defined to require anxiety or some other manifestation of an unhappy experience (e.g., neglecting responsibilities).

What might be of greater interest and public health significance in psychiatry is a cross-classification of y0 with y2 — that is, frequency of smartphone use 'per se' as cross-classified with the y2 vector of outcomes under study here. But apparently that is not what has been accomplished.

Clarity on this matter is needed. In the meantime, the conclusions are uncertain.
There are some typographical errors (e.g., Prevalance), which deserve attention.

The presentation and labeling of figures with estimates do not quite meet standards of other systematic reviews and meta-analyses and might deserve some attention.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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