Reviewer's report

Title: A retrospective survey study of mobile phone use and its effects on daytime sleepiness in California high school students

Version: 3 Date: 29 May 2013

Reviewer: Louise Foley

Reviewer's report:

Survey study of mobile phone use and its effects on daytime sleepiness in California high school students" for BMC Public Health.

General comments

This was interesting study examining aspects of mobile phone use and sleepiness in adolescents. The method (cross-sectional survey) was appropriate for exploring the relationships between variables, but not for establishing causality. My main comment is that the authors did not define their research question well, which made it difficult for me to assess whether this was answered sufficiently and/or appropriately. In particular, I felt the discussion was - for the most part - a missed opportunity to place the findings in context, discuss the strengths and limitations of the study design, and explore the implications for practice.

Major compulsory revisions

1. Title. I think the title is misleading as it implies causality: “....mobile phone use and its effects on daytime sleepiness”. Causality can not be inferred from your cross-sectional design, so please consider changing this. For example “A retrospective survey study of the association between mobile phone use and daytime sleepiness in California high school students”.

2. Abstract. In your abstract, the stated aim of the study is to examine “mobile phone use at night and the lack of sleep in teenagers”. For two reasons, I think this misrepresents what you actually did. Firstly, of the eight questions asked about mobile phone use, only two referred specifically to mobile phone use at night. The rest asked about total daily volume of mobile use, and perceptions of mobile phone use. Secondly, your scale assessed subjective sleepiness – I don’t know if this is exactly the same thing as “lack of sleep”.

3. Background. Para 2. Here, it seems you are making the point that sleepiness is a normal part of going through puberty, due to changes in circadian rhythms not accommodated by the school schedule. This may then be compounded by mobile phone use. However, in the abstract you make the point that sleep time is declining in teenagers. This seems to represent two slightly different points – that sleep time is low in teenagers, and that sleep time is declining over time in teenagers. Can the authors provide some clarity?

4. Background. I did not get a good sense of why sleepiness is an important
issue. What are the long-term implications of sleepiness on health or academic achievement etc in adolescents?

5. Background. Para 4. No specific aims or hypotheses are stated. The authors do mention an aim in the abstract, and a hypothesis in the discussion but it would be good to clearly state both in the background section.

6. Methods. Para 1. “The modified ESS consists of eight questions…..” In the supplementary file provided, only seven questions are included. The item about watching TV is not included. Can the authors please clarify how many items were included?

7. Methods. Para 1. Can the authors provide more detail (and a reference) on what “clinically-significant sleepiness” is? Is this sleepiness that would be expected to negatively impact daily function? Or does all sleepiness impact daily function, but it is a question of degree?

8. Methods. Para 1. The item “tried and failed to reduce mobile phone use”. I think this item is poorly worded, as it does not capture those who tried and succeeded to reduce mobile phone use. Later on in the results section (para 1 “most (83%) had never tried to reduce their mobile phone use”, and para 3 “We did a similar analysis, parsing the population into those who had attempted to reduce their use of mobile phone (17%)…”), the authors refer simply to people who tried to reduce mobile phone use, which is not how the actual item is worded. My understanding of this item is that it captures those who have tried AND failed, not just those who have tried per se. The authors could consider re-wording these sections to reflect this.

9. Methods. Para 1. 211 out of 2000 potential participants sent back a survey (response rate 11%). This is a poor response rate, but perhaps not unexpected in this type of survey study. The authors should discuss the response rate, and implications thereof, in the discussion section. What type of response rate has been found in other similar research?

10. Methods. Para 2. Was the study given ethical approval? The authors mention that it was conducted according to the Declaration of Helsinki but an explicit statement should be made about ethical approval.

11. Discussion. I felt there were many issues that were not addressed in the discussion section. Specifically, discussion of the findings relative to other research would have placed the findings in context and given me a better appreciation of their importance. The strengths and limitations of the study should be discussed. Key limitations include the cross-sectional nature of the study (can’t infer causation), use of a self-report tool (social desirability bias, memory bias) and poor response rate (non-responders may differ in key ways to responders, meaning that results can’t even be generalised to the sample, let alone the wider population). I would have also liked to see further discussion of the practical implications of the findings (the authors did touch on this by mentioning temporal patterning of mobile phone use, but I think more detailed discussion is warranted).

12. Discussion. Para 1. This hypothesis should be stated at the end of the background section. See also point 2 and point 5 in this section. Given that you
measured a range of variables on mobile phone use (total daily volume, perceptions etc), did you have a hypothesis about anything else other than mobile phone use at night?

13. Discussion. Para 1. “It may be that adolescent females score higher on the ESS without being objectively sleepier, though this remains to be tested”. I wasn’t sure about the value of this discussion point. It suggests that the ESS has inherent flaws in its construct validity, in which case I would question the validity of the entire study. I’m also not sure how you would measure sleepiness objectively.

Minor essential revisions
None.

Discretionary revisions
1. Background. Para 1. Given that you conducted the study in the US, do you have any mobile phone ownership statistics for adolescents, similar to what you presented for the UK?
2. Methods. Para 1. The ESS question “in a car for an hour without a break” – I was not clear whether this referred to driving the car, or travelling as a passenger.
3. Results. Para 1. “The number of mobile phone calls sent or received per day”. Suggest changing to “the number of mobile phone calls made or received per day”.

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

**Quality of written English:** Acceptable

**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