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: 24 May 2013

Reviewer: Sara Thomée

Reviewer's report:

The authors have done a cross-sectional survey study with the focus on mobile phone use at night and daytime sleepiness in a group of high school students. It is highly relevant to study possible mechanisms relating mobile phone use to sleep problems and sleepiness, which makes this study interesting! The manuscript is nice and short and mostly easy to follow. However, in its shortness there are areas that need to be expanded. Furthermore, there are methodological issues that demands improvement. In summary, the authors are encouraged to consult a statistician in order to ensure the appropriate use of statistical methods, and to elaborate on e.g. possible limitations of the study in order to make a scientifically sound presentation.

Do the title and abstract accurately convey what has been found?

The title is misleading. “Retrospective” gives the associations that the study deals with data that dates back in time. Both the dependent and the independent variables deal with the present including the past 30 days. The study is better described as cross-sectional. Furthermore, since it is cross-sectional, it is difficult to conclude anything about causal directions of associations and it is therefore advisable to avoid the term “its effects on”.

The abstract conveys what has been found, but the background statement about an equally rapid decline in teenage sleep is a bit too definite and should be modified. The Abstract results could put less emphasis on discussing possible moderating factors. The Abstract conclusions, as is discussed later, are a bit over-confident.

Major compulsory revisions:

1. I suggest crossing out “retrospective” and “its effects on” in the title.
2. Abstract conclusions: Avoid generalizing the conclusions too far from the study, perhaps by changing the tempus, i.e., from is to was.

Do the authors clearly acknowledge any work upon which they are building?

The background is nice and swift and yet covers relevant studies. However;

Minor essential revisions:

3. The references are rather outdated. When studying a rapidly increased phenomenon such as mobile phone use it seems relevant to report fresh
statistics on e.g. number of users (or perhaps statistics from the same year the study was performed, which is not defined). Also, the reference for the 3.3 billion subscribers in 2008 seems to be missing.

4. Some editing is needed concerning tempus when reporting the earlier research.

Is the question posed by the authors well defined?

In the abstract, the aim of the study is defined as “to see if there was a correlation between mobile phone use at night and the lack of sleep in teenagers”. The aim is not defined in the main manuscript (“…it seemed worthwhile to attempt a cross-sectional study of sleep and mobile phone utilization in a US high school”). Isn’t it sleepiness rather than lack of sleep that is studied?

Major compulsory revision:

5. Define the aim in the main manuscript. Besides making sure that it corresponds with the abstract aim, it could also be expanded to include research questions. Moreover, an a priori hypothesis is mentioned in the Discussion, which should be stated here.

Discretionary revision:

6. I suggest that the statistical term “correlation” is changed to “associations” in the aim.

Are the methods appropriate and well described?

The survey is included as an additional file, which is good. The ESS is well described and referenced in the manuscript. The mobile phone questions are attributed to Thomée et al (2011) which is correct with the exception of one item; staying up late to use the mobile phone. This was probably designed by the authors? Also, the phone calls and texts items in Thomée et al had category response sets, but were open-ended in the present study (an adaptation).

Minor revisions

7. Update referencing of mobile phone questions as mentioned above.

8. When describing how data was collected, I miss a mentioning on how the survey was sent to the students, e.g. by email?

9. What year was the data collected?

10. There were more than twice as many girls than boys that responded to the survey. What was the gender distribution at the school?

Are the methods appropriate and well described? Are the data sound? Does the manuscript adhere to the relevant standards for reporting and data deposition?

Major compulsory revision

11. The authors are encouraged to consult a statistician to ensure that correct statistical methods are used and that results are reported appropriately. The use
of t-tests and multivariate regression analysis is based on the assumption that data is normally distributed. There are no comments about the distributions of data in the study. The summary data is presented as means +/- 1SD in Table 1. It is clear that the calls and text data must be skewed, i.e. not normally distributed, and it would thus be more appropriate to present medians (and perhaps upper and lower quartiles). And because the data most likely isn’t normally distributed, t-testing of the variable “texts” is inappropriate. What about the main independent variable; the ESS scores? Is it normally distributed? If the ESS isn’t normally distributed the choice of parametric statistics should at least be motivated. Moreover, r=0.02 is presented as a linear relationship. This must be a typing error?

Minor essential revisions:
12. The use of X2 (chi square)-tests are not mentioned in the analysis section.
13. Results section could be more clearly structured (please see also point 19.). Only some data is presented in Table 1, not well referenced in the text. (Is Demographics the correct heading for the table?) The descriptive data of the predictor variables would be easier to overview in a separate table. The column heading in Table 1: “tried to stop using phone” should be “tried to reduce using phone”?

14. The use of the term “significance” can be misunderstood – better to write (in last paragraph of Results): “…had a numerically though not statistically significant higher texting rate…”.

Discretionary revisions
15. I am not familiar with the term iterative multivariate regression analysis but assume that this means some kind of stepwise regression model?
16. Given that gender was a major predictor variable, it would have been nice if gender specific analysis (the n permitting) had been performed.

Are the discussion and conclusions well balanced and adequately supported by the data? Are the limitations of the work clearly stated?

Major compulsory revision
17. The discussion lacks mentioning of limitations (!); such as dropout, cross-sectional design, possible common causal factors (confounders) not adjusted for etc., which of course is essential in scientific reporting!
18. Due to the limitations of a cross-sectional study in a specific population and with a high dropout etc, generalized conclusions should not be drawn. Tempus of conclusions could be changed (i.e.”…likely contributed to daytime sleepiness”) so that it is clear that the conclusions concern the present study (and not a general truth). Also, check that conclusions respond to the aim.

Minor essential revisions
19. Make sure that the results discussed are actual results (such as the linearity of texts and sleepiness?).
20. Some emphasis is put in discussing likely moderators. Weren’t these tested in the regression analyses? Furthermore, some of the discussion takes place already under Results. Please check the structure of reporting results and discussing the results.

Is the writing acceptable?
Yes, but needs some editing concerning tempus, as mentioned earlier.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.