Author's response to reviews

Title: Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children's sleep habits in a longitudinal study?

Authors:

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Version: 2 Date: 30 May 2013

Author's response to reviews: see over
We will resubmit the revised manuscript entitled, “Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children’s sleep habits in a longitudinal study?” for publication in BMC Public Health. We would like to thank referees for all the constructive comments. Based on the comments from the referees, we have made changes in the manuscript. In this cover letter, we have answered reviewers’ comments point-by-point.

Title: Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children’s sleep habits in a longitudinal study?

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Authors’ response to editor

Also, please make the following formatting changes during revision of your manuscript. Ensuring that the manuscript meets the journal’s manuscript structure will help to speed the production process if your manuscript is accepted for publication.

1. Copyediting:
   After reading through your manuscript, we feel that the quality of written English needs to be improved before the manuscript can be considered further.

   We advise you to seek the assistance of a fluent English speaking colleague, or to have a professional editing service correct your language. Please ensure that particular attention is paid to the abstract.

   A professional translator (native English speaker) has now edited our manuscript and the abstract.

   We also made a minor change in the title. New title: Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children’s sleep habits in a longitudinal study? Old title: “Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children’s sleep habits in an eighteen-month follow-up?”

   The changes proposed by the reviewers are shown in red in the manuscript, and the language changes are shown in blue. We indicate our changes with page number and the paragraph in our answers to reviewers.

   We have also changed the tables in a way that there are only two decimals instead of three. Table 3 is changed in the way that the dependent variables are in the rows and the independent variables are in the columns as they are in Table 4.

   References now include 34 references. We added four references based on reviewers recommendations.
Authors’ response to reviews

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Version: 2 Date: 30 May 2013

Reviewer’s report

Title: Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children’s sleep habits in an eighteen-month follow-up?

Version: 1 Date: 29 March 2013 Reviewer: Susan Sisson Reviewer’s report:

Thank you for the time invested in the preparation of this manuscript. It has useful information that is timely and relevant to the field. This is an interesting study that addresses gaps in the literature. The purpose was to examine electronic media use and sleep habits/duration cross-sectionally as well as longitudinally (18 months) in school-age children. The content is timely and relevant and study design is sound. There are no major scientific issues but I would recommend English language/grammar review. There were several word choice and order issues throughout. The authors also need to relate their sample to previous research to a greater degree. Specific comments have been noted.

Thank you for the time and the dedication to revise our manuscript. Thank you for all the comments and advices to improve our manuscript. A professional translator (native English speaker) has now edited our manuscript.

Abstract: As the background and purpose are written it alludes to only using the 2008 data not both 2006 and 2008. Consider adding terms like cross-sectional and longitudinal, rather than follow-up.

We have replaced the term “follow-up” with longitudinal throughout the manuscript. We have used both 2006 and 2008 data. Electronic media use and media presence have been measured in 2006, and sleep habits in 2008. For that reason we only use a term longitudinal, not cross-sectional.

Abstract results: Please provide some actual data. Duration of use? Time? Something more descriptive as well as your experimental statistics is needed.

We have now written how many hours a day children used computer, watched TV, as well as how many hours they slept per night. We have also included p-values in the abstract. (Page
Abstract conclusions: the 2nd sentence is redundant with the 1st, or so it seems. If a different point is being made, it is not clear to this reviewer.

We have removed the 2nd sentence.

Background, 3rd paragraph: Are these studies in children or adults? Please make sure these distinctions are clear.

All studies include school-aged children, and it is rephrased in the text to make it clearer. (Page 4, paragraph 3).

Methods:

Please provide more information. Were all 4th and 5th graders in the schools recruited? Were there other exclusions? Is 74% of all the possible children in the correct grades in the involved schools?

All 4th and 5th graders were recruited. We have added this information in the methods section. There were no other exclusions. Response rate 74% is of all the possible children in the correct grades in the involved schools. (Page 5, paragraph 1).

Measures: Please make clear that you are looking at your measures continuously, rather than categorically, as you've written the irregular sleep habits, I thought it was a category, until I read on into the analyses and results. I think just some clarification and details would be helpful in making the clear.

Thank you for your notion that this information is missing. In the methods section we have now written that electronic media use and sleep habits are treated as continuous variables as well as media presence is treated as a dichotomous variable. We have also added this information to the tables. (Page 6, paragraphs 1-3).

Results:

You present no data in the results section and simply refer readers to the tables. While you do not want substantial overlap, I would like to see something said about the sample in the results section.

We have added more information about the sample in the methods section: “At the baseline in 2006 51% (n = 181, 52% girls n = 94) of the children were at grade 4 in the control schools, the rest being at grade 5 (n = 172, 51% girls n = 87). In 2008, 52% (n = 183, 52% girls n = 95) were at grade 5 and the rest were at grade 6 (n = 170, 50% girls n = 85)”. We think that description of the sample is more suitable in the methods section than in the results section. (Page 5, paragraph 1).

Discussion:

In the sentence for future research, you should include something to the effects of a better variety and objective measurement of behaviors, not just self-report. You address this in the discussion previously, but do not include it in the areas of future research.
Yes, we agree that more objective measurements are needed in future research. In the discussion, we have now added that objective measurements of behaviors could be used in future research. (Page 13, paragraph 6).

Please provide in the discussion a comparison of your sleep duration, TV viewing time, computer use and presence of a bedroom TV with other studies of children of similar ages. While there may be done in the Finnish population, there are several in other groups. It would be helpful for readers to understand these youth and perhaps explain your findings in a more thorough way, especially as others start to use similar methods and compare back to your findings. For example, the prevalence of bedroom TV is approximately half that of the U.S. This is relevant and necessary information that needs to be presented for your paper.

We have added more details (age group, details of sleep e.g. sleep duration or bedtime) from previous studies from different countries. We have also added that the prevalence of TV in the bedroom is higher in U.S. than it was in our study. (Pages 10-11, paragraph 2).

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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 interest

Reviewer’s report

Title: Do computer use, TV viewing, and the presence of the media in the bedroom predict school-aged children’s sleep habits in an eighteen-month follow-up?

Version: 1 Date: 11 April 2013 Reviewer: Evelyne Touchette Reviewer’s report:

REVIEWER General comment

This paper presents a very interesting public health subject, whether computer use and television viewing predict shorter sleep duration and later bedtimes among school-age children. However, one major comment is that the authors should analyse the results with more complex statistical method to fully take the data into account and answer the research questions.

Thank you for your advices to improve our manuscript and the time and the dedication to revise our manuscript.

Here are points that should also be addressed:

Major Compulsory Revisions

Abstract
1. Please change by "The purpose of this eighteen-month study follow-up (...)".

We have revised the sentence in the following way: “The purpose of this longitudinal study was to investigate whether baseline electronic media use and media presence in child’s bedroom predicted sleep habits as well as changes in sleep habits 18 months later among 10 to 11-year-old children in Finland.“ (Page 2, abstract).

2. Please put P-values in the results section.

Thank you for your comment that p-values could be added in the abstract. We have put the p-values in the abstract. We have also added p-values in the Tables 3 and 4. P-values are indicated as *<0.05, **<0.01, ***<0.001. (Page 2, abstract).

Introduction

1. The introduction is well-written but I would suggest incorporating other important papers in the literature review.


Thank you for your advice to add this reference. We referred to main findings of Garmy et al. (2012). We have added this reference in the introduction and in the discussion. (Page 4, paragraph 3) and pages 10-11, paragraph 2).


We have added this reference in the discussion. Garmy et al. (2012) has measured TV viewing, computer use and sleep almost in a same manner as we have measured. Thus, we added this reference to support our argument that these measurements can measure electronic media use and sleep in valid way. (Page 13, paragraph 6).

Methods

1. Please put an s "The pupils completed a questionnaire about health behaviors (...)".

We have added a s to health behaviors. (Page 5, paragraph 2).

2. I am wondering why the authors did not use a validated questionnaire in their Hälsoverkstaden project: Garmy et al. Development and psychometric evaluation of a new instrument for measuring sleep length and television and computer habits of Swedish school-age children. The Journal of School Nursing. 2012;28(2):138-43. The
authors should explain why they did not measure the computer use/TV viewing during
the weekend.

In our study the data collection has taken place before Garmy et al. (2012) has
published their validation study. However, our questions do not differ substantially. For
example computer use: “How many hours daily do you usually use a computer or play
games with a console?” (Hälsoverkstad) and “About how long each day I typically
spend at the computer: ....hrs. and ... .... minutes” (Garmy et al. 2012) or bedtime prior
school days “When do you usually go to bed if the next morning is school day?”
(Hälsoverkstad) and “When I have school the next day, I go to bed at about:”
(Garmy et al. 2012). We admit that it would have been beneficial to add questions
concerning computer use and TV viewing at weekends, but the questionnaire was
quite long and the number of questions had to be limited to make it possible for
children to answer all questions in a limited time.

3. Please add the child’s age as a confounder. It would control for children who repeat a
class.

The exact age is available only for 70% of the children participating in the study.
Therefore we preferred to use grade as a confounder. Grade indicates age well in
Finland as we have explained in the methods section: “Grade was used to adjust for
age because grade is a good indicator of age in Finland. When children begin school in
Finland, they are all born in the same calendar year and only a few repeat a class.”
(Page 7, paragraph 5).

4. The statistical analyses section is very confusing. First, the authors should present
descriptive analyses for all variables, including a description of missing data. Building
on the work of Nicassio and Wallston (1992), we suggest that the authors conduct a
path analysis to model directional relationships among computer use/TV viewing and
sleep habits at baseline and eighteen-month follow-up. This type of path analysis offers
several advantages over traditional regression analysis, including more accurate
regression estimates, modeling of interactions with sex, reduced likelihood of spurious
findings, and the ability to handle missing data. (Example: Bigatti et al. Sleep
disturbances in Fibromyalgia syndrome: relationship to pain and depression. Arthritis &

We have added description of missing data in methods section: “Number of missing
values of examined variables varied between 0 and 26. There were most missing
values for having computer in the bedroom. There were no missing values for
bedtimes and wake-up times at weekend, and sleep duration at weekend in 2008.”
(Page 7, paragraph 4).

Descriptive statistics of computer use, TV viewing, media presence and sleep habits
are presented in Tables 1 and 2.

We think that a linear regression analysis is suitable to answer our research questions
and this method has also been used in similar type of studies (linear or logistic
regression) (Adam et al. 2007; Garmy et al. 2012 Li et al. 2007; Owens et al. 1999;
Van den Bulck et al. 2004). We have also tested interaction terms (gender and media
variable) and we conducted linear regression analyses separately for boys and girls when the interaction term was significant (p<0.1). Because the examination of so many separate associations in this study we think that path models are not a good option. In the way we conducted the analyses, each association separately, it would by path modeling make more than 20 pictures.. All independent variables where examined separately in the models and we have added this information to the Tables.

Results (Tables) The Tables are very hard to understand.

1. Table 1. Please add Grade above 2006 and 2008. I suggest putting SD instead of 95% CI. Please use Bonferroni’s correction.

   We have added grade above 2006 and 2008 in Table 1.

   We have also changed 95% CI to SDs. We have performed independent samples t-test to compare whether there are gender differences in sleep habits within years. Within data we have only two groups to compare (girls and boys) and to our knowledge it is not possible to use a Bonferroni’s correction in that case. We have added below Table 1 that the comparisons have been conducted within years.

2. Table 2. Put SD instead of 95% CI. I suggest grouping media presence during school days together: computer in bedroom, TV in bedroom, computer use and TV viewing.

   We have changed 95% CI to SDs in Table 2. We prefer to have computer use and TV viewing separately because TV viewing is a more passivating behavior than computer use. Thus, TV viewing and computer use can be differently associated with sleep habits.

3. Please put a figure of the path model should the authors follow my suggestion, and explain the results in the text.

   Please see the explanation (Methods, answer 4, reviewer 2) why we prefer to use linear regression instead of path model in this study.

Discussion

1. The authors discuss other important covariates such as low physical activity, unhealthy diet, and overweight. Why were these potential confounders not included in the analyses?

   Physical activity is a potential confounder because it can influence both the exposure and the outcome. Physical activity can decrease screen time and on the other hand, physical activity can improve sleep. As a matter of fact, we conducted all linear regression analyses adjusted for physical activity (data not shown). This did not, however, change the results. This information is included in the manuscript: “We also did regression analyses in a way that we adjusted for physical activity, but it did not change the results, and therefore we did not include it into the final analyses”. (Page 12, paragraph 4).
Previous studies have shown that computer use and TV viewing are associated with higher intake of soft drinks, candies and crisps. However, it is unlikely that consumption of unhealthy snacks increases computer use or TV viewing. Therefore, unhealthy diet is a potential mediator for associations between electronic media use and sleep, and we think that the analyses should not be adjusted for possible mediators.

We agree with the reviewer that overweight is a potential confounder. However, there are too many missing values in the weight data (about 30%) and therefore we couldn’t use it as a confounder without missing a lot of observations in the analyses.

Discretionary Revisions Discussion

1. The authors should discuss the gender differences in more depth (e.g., types of computers games).

Gender differences may exist between electronic media use and sleep. Different type of media may explain gender differences or that pubertal status is differently associated with sleep by gender. We did the following insertion: “Gender differences may exist in the associations between electronic media use and sleep habits because pubertal status is associated with sleep differently by gender. It has been shown that pubertal development increased sleep problems among girls, but not among boys. Pubertal development and sleep duration were negatively associated in both sexes [28].” (Page 12, paragraph 3).

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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

Declaration of competing interests:

I have no competing interests