

PEER REVIEW HISTORY

BMJ Paediatrics Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Screen time behaviors and caffeine intake in U.S. children: Findings from the cross-sectional National Health and Nutrition Examination Survey (NHANES)
AUTHORS	Ahluwalia, Namanjeet; Frenk, Steven; Quan, Stuart

VERSION 1 – REVIEW

REVIEWER	Reviewer name: Stefano Finazzi Institution and Country: IRCCS - Mario Negri Institute for Pharmacological Research Competing interests: none
REVIEW RETURNED	07-Feb-2018

GENERAL COMMENTS	The statistical methods are standard. They are well described and appropriately applied. Results are clearly presented and limitations of the study are honestly discussed. As optional modification, I suggest the Authors to report in the main text the median caffeine intakes in the considered subgroups with appropriate confidence intervals.
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REVIEWER	Reviewer name: Dr Donna Traves Institution and Country: Derbyshire Childrens Hospital, Royal Derby Hospital NHS foundation Trust, UK Competing interests: none.
REVIEW RETURNED	13-Mar-2018

GENERAL COMMENTS	<p>The article is clear and concise drawing out the important data that has been obtained. The article does answer a clearly focussed question and I feel the methods are reasonably robust.</p> <p>With regards to data collection page 4 (lines 36-41) can it be clarified if the data collection was intentional for this study or collected as part of a larger study and then extracted and analysed subsequently?</p> <p>On page 4(48-55) I note that the data collection is subject to much recall bias of the child and family, a time span of 30 days is along time to recall over. Despite this there is surprisingly high levels of screen time recorded, but suspect the actual time might be even higher if this was prospectively recorded rather than retrospective recall.</p> <p>On page 5 (11-19) The caffeine intake was only recalled for a 24 hour period; Again this may lead to significant over / under estimates and prospective data would be more accurate in future studies.</p> <p>There is however a very clear analysis of the content of the caffeine in the food/drink with robust assessment which is a very positive feature of the study.</p> <p>On page 5 (50-54) there was a surprisingly high amount of children with screen time >2 hours, despite the potential underestimate of recall bias. I would suggest that the difference of 75.2% v 70.3% is not that significant regarding the amount of children who consumed</p>
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	<p>caffeine compared to the amount of time spent on screens. Both of these numbers are worryingly high and support the well know concern that young people ore trending towards unhealthy foods/ drinks on a daily basis in conjunction with high levels of screen time. I agree with the discussions of the paper that further research is needed to ensure that all confounding factors are analysed including lifestyle and demographics as these are important features not analysed in this paper.</p> <p>Overall, I feel the paper is well put together and for a general paediatrician gives supporting data that there is work to be done on both the trends of increased screen time and caffeine intake.</p>
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REVIEWER	<p>Reviewer name: morris Gordon Institution and Country: UCLAN, UK Competing interests: None</p>
REVIEW RETURNED	15-Apr-2018

GENERAL COMMENTS	<p>I liked the concept</p> <p>I do have some issues that need resolving.</p> <p>Title - there is no methodology mentioned - any study I feel should clearly describe the methodological alignment in the title.</p> <p>Introduction - where is the question / hypothesis - a vague mention of looking for an association, but this links to many of my problems in the discussion and conclusions - you cannot just mine data and need a hypothesis or question to answer - I hope this is a writing issue and not a methods issue?</p> <p>Methods - Section 1 is very confusing - this is a key section and must be clear to people with no understanding of local or national data sources or organisations?</p> <p>Can you specifically present a proforma or data collection tool for potential replication and also describe the source for these questions, any previous validity or reliability data?</p> <p>Statistical section must have a stats review by BMJ</p> <p>I HAVE A REAL PROBLEM WITH THE THIRD SECTION OF THE DISCUSSION, Page 7. It ultimately leads to a key sentence saying that watching more tv and food adverts leads to bad eating and higher caffeine. Firstly, not sure this makes sense, but secondly this is a very flawed proposal and particularly reductionist and not helpful, invalidating the whole study from a public health perspective.</p> <p>Could caffeine not keep people awake and bored so they have to watch tv, the opposite relationship. Could there be an underpinning factor to influence both (socioeconomic status, state, type of school, religion) or most importantly, parental factors - could poor parenting be the key issue and any other assumption of a relationship escape this</p> <p>My children are not allowed caffeine or TV!</p> <p>I am really interested in the authors thoughts on this?</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Comments to the Author

The statistical methods are standard. They are well described and appropriately applied. Results are clearly presented and limitations of the study are honestly discussed. As optional modification, I suggest the Authors to report in the main text the median caffeine intakes in the considered subgroups with appropriate confidence intervals.

Reply: Thank you for the suggestion. We have added this information under Results.

Reviewer: 2

Comments to the Author

The article is clear and concise drawing out the important data that has been obtained. The article does answer a clearly focussed question and I feel the methods are reasonably robust. With regards to data collection page 4 (lines 36-41) can it be clarified if the data collection was intentional for this study or collected as part of a larger study and then extracted and analysed subsequently?

Reply: We thank the reviewer for this comment and have updated the text on data collection on Page 4 clarifying that NHANES dietary intake data (assessed by 24-hour dietary recall) were collected every NHANES cycle, and the ST behavior questions were assessed in certain cycles of NHANES: “Cross-sectional data were also collected on ST behaviors on 6-11 year old survey participants (SP) in certain NHANES cycles (2007–2008, 2009–2010 and 2010–2012).”

Comment: On page 4(48-55) I note that the data collection is subject to much recall bias of the child and family, a time span of 30 days is along time to recall over. Despite this there is surprisingly high levels of screen time recorded, but suspect the actual time might be even higher if this was prospectively recorded rather than retrospective recall.

On page 5 (11-19) The caffeine intake was only recalled for a 24 hour period; Again this may lead to significant over / under estimates and prospective data would be more accurate in future studies. There is however a very clear analysis of the content of the caffeine in the food/drink with robust assessment which is a very positive feature of the study.

On page 5 (50-54) there was a surprisingly high amount of children with screen time >2 hours, despite the potential underestimate of recall bias. I would suggest that the difference of 75.2% v 70.3% is not that significant regarding the amount of children who consumed caffeine compared to the amount of time spent on screens. Both of these numbers are worryingly high and support the well know concern that young people ore trending towards unhealthy foods/ drinks on a daily basis in conjunction with high levels of screen time.

Reply: We have added a paragraph describing the limitations of the study in the Discussion section (Page 8), including that these analyses are based on cross-sectional reported data that may be subjected to recall bias and discussed their implications.

As per this reviewer’s suggestion, under Results paragraph 1, we have also rephrased the finding relating the proportion of children who consumed caffeine in relation to the amount of time spent on TV watching being a trend that approached significance (rather than being statistically significant).

Comment: I agree with the discussions of the paper that further research is needed to ensure that all confounding factors are analysed including lifestyle and demographics as these are important features not analysed in this paper.

Reply: We appreciate the reviewer’s feedback and constructive comments.

Overall, I feel the paper is well put together and for a general paediatrician gives supporting data that there is work to be done on both the trends of increased screen time and caffeine intake.

Reply: Thank you.

Reviewer: 3

Comments to the Author

I liked the concept

I do have some issues that need resolving.

Comment: Title - there is no methodology mentioned - any study I feel should clearly describe the methodological alignment in the title.

Reply: Thank you for the comment. We have updated the title per your suggestion.

Comment: Introduction - where is the question / hypothesis - a vague mention of looking for an association, but this links to many of my problems in the discussion and conclusions - you cannot just mine data and need a hypothesis or question to answer - I hope this is a writing issue and not a methods issue?

Reply: We submitted this paper as a brief report and have used your feedback to provide more details about our research question, the hypothesis, and data collection and access. This work was hypothesis driven and a follow-up on our research describing caffeine intake in children (ref 17 and 18 in the revised manuscript).

Per your suggestion, we have added information about the purpose of the study and the hypotheses tested in the Introduction section:

“Thus, the purpose of this study was to examine the association of ST behaviors with caffeine intake in a nationally representative sample of U.S. school-aged children. We tested the hypothesis that there was no association between ST behaviors and caffeine consumption (i.e., proportion of children who consumed caffeine, and amount of caffeine consumed on a given day).”

Comment: Methods - Section 1 is very confusing - this is a key section and must be clear to people with no understanding of local or national data sources or organisations?

Can you specifically present a proforma or data collection tool for potential replication and also describe the source for these questions, any previous validity or reliability data?

Reply: Done. Per your comment and with less stringent word limits, we have provided further details in the Methods section about NHANES and methods used for data collection, as well as accessing these data from the NHANES's website. We have included the link to this site where data used for these analyses are publically available to download. We have also provided information about the reliability and validity of questions related to ST behaviors in the Methods Section under Screen-time behaviors.

Comment: Statistical section must have a stats review by BMJ

I HAVE A REAL PROBLEM WITH THE THIRD SECTION OF THE DISCUSSION, Page 7. It ultimately leads to a key sentence saying that watching more tv and food adverts leads to bad eating and higher caffeine. Firstly, not sure this makes sense, but secondly this is a very flawed proposal and particularly reductionist and not helpful, invalidating the whole study from a public health perspective.

Reply: Thank you for raising this important point to clarify further that our findings show an association between TV watching and caffeine intake, and do not establish directionality nor causality. We have added literature discussing both sides of the observed association (TV watching and caffeine intake) in the discussion section (Page 7).

Comment: Could caffeine not keep people awake and bored so they have to watch tv, the opposite relationship. Could there be an underpinning factor to influence both (socioeconomic status, state, type of school, religion) or most importantly, parental factors - could poor parenting be the key issue and any other assumption of a relationship escape this

My children are not allowed caffeine or TV!

I am really interested in the authors thoughts on this?

Reply: Thank you for these comments. We have updated the discussion section to include a more careful overview of our findings and their implications. We also added several sentences where we discussed the limitations of our analysis (Page 8 first paragraph).

We agree with the reviewer that our data do not allow us to establish the direction of the association (TV watching and caffeine intake) observed in the current study. To clarify this, we have added how caffeine intake can reduce sleep time and could increase TV watching and cited additional supportive references (Page 7 last paragraph). This now adds to our previous discussion on how TV watching may increase fatigue and exposure to unhealthy food-related advertising that in turn may be associated with increased consumption of junk food and caffeinated products (e.g. cakes, candy/soda).

Comments to the Author:

Please avoid use of the word "First" in relation to your study.

Reply: Thank you for raising this point. We have made this change throughout the manuscript.

Comment: Expand your methods considerably.

Reply: As per the reviewers' suggestions, we have expanded the methods section considerably and added relevant references.

Comment: Expand your reference list.

Reply: Done; see above.

Comment: Amend your title to describe the methods used, ie a questionnaire study Please note comments of reviewer 3 Be cautious with your conclusions.

Reply: We have amended the title as suggested and rephrased the discussion section considerably, per this reviewer's insights and constructive feedback.

Comment: Why did you use 2 hours as a cut-off for screen time?

Reply: We have clarified the use of this cutoff along with providing additional references in Methods under Screen-Time behaviors, as described below and on page 5 of our revised manuscript:

All ST variables were dichotomized to <2 or ≥ 2 hours, considering recommendations to limit ST to < 1 to 2 hours per day^{6,13} as used in other studies examining eating habits and ST behaviors in children.^{2, 14, 15}

VERSION 2 – REVIEW

REVIEWER	Reviewer name: Morris Gordon Institution and Country: Uclan, uk Competing interests: None
REVIEW RETURNED	21-May-2018

GENERAL COMMENTS	They have dealt with my concerns
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