Mulvaney et al

Parent-Rated Behavior Problems Associated with Overweight After Controlling for Sleep Disordered Breathing

Response to Referee #1

MAJOR REVISIONS

1. The inclusion of sleep disordered breathing (SDB) constitutes the novel aspect of this paper and is potentially of great interest. Yet the authors have not given sufficient weighting to this aspect in the paper. The review of SDB in the background section should be expanded, particularly research relating to the relationship between SDB and overweight, to provide a rational for looking at these conditions within the same study. A description of the polysomnography methodology and how SDB was defined should be included in the methods section. Further analyses should be conducted to allow the authors to report the relationship between overweight and SDB in this sample and whether SDB was related to each of the behavior problems, before they go on to report whether SDB influences the overweight-behavior problem relationship. It would also strengthen the paper to consider the possible mediating effect of SDB in the overweight-behavior problem relationships that are identified, rather than merely adjusting for SDB. In the conclusions section there should be some discussion of why SDB was important to consider and the implications of your findings showing certain overweight-behavior problem relationships diminished when SDB was accounted for.

   We have expanded the review of SDB and overweight in the Background section and expanded the rationale for the study.
   We have added a section on polysomnography measurement and the definition of SDB using RDI in the Methods section.
   We previously published a manuscript outlining the relationships between SDB and behavior within this data set (see Mulvaney, Goodwin, Morgan, et al. 2006, J Ped Psychol, 31(3), 322-330). The goal of this (subsequent) manuscript was to address the specific relationship between overweight and behavior problems independent of SDB.
   Our adjusted odds ratios take into account the mediating effect of SDB in the overweight-behavior relationship. We have expanded the discussion of the possible reasons for significant differences with and without a mediating effect of SDB. Hypotheses are made regarding differential mechanisms of action of the independent influences of overweight or SDB on behavior.

2. The description of the analyses performed should be expanded. Include the analyses used to compare descriptives of normal vs overweight children. Clarify for which variables simple odds ratios and adjusted odds ratios were calculated.

   We have expanded the description of the analyses including the tests used in Table1. We clarified which variables were associated with unadjusted and adjusted odds ratios.

3. Paragraph 2 of the conclusions section. You need to be more explicit that you're trying to explain why this scale may have been related to overweight before but not after accounting for SDB. You should also include an explanation of the similar finding for the general internalizing symptoms scale.
We have highlighted the purpose of this section and expanded hypotheses related to overweight and SDB potentially differential mechanisms of action. We do not repeat the same point for the general internalizing scale because it would be redundant. The general internalizing scale is made up of other subscales on the CBCL.

4. Paragraph 3 of the conclusions section: Are you referring to the CBCL withdrawal scale in the first sentence? This should be more explicit. Table 4 indicates that the highest prevalence behavior problem in the sample was social problems, not withdrawal as you indicate here.

We have edited and generally clarified this section and identified the scale to which we refer in that paragraph. We have edited the text to reflect the fact that social problems and withdrawal were two of the most prevalent behaviors.

5. Paragraph 5 of the conclusions section: The final sentence does not appear to be relevant and could be removed. It would be more valuable to comment on whether you would expect to see differences in behavior problems between the Hispanic and Caucasian groups. If this could be the case, it would be necessary to stratify your analyses or adjust for race.

We have removed the final sentence in paragraph 5.

MINOR REVISIONS

All minor revisions requested by referee #1 have been completed.

1. The term a prospective study implies this was a longitudinal study and should be removed from the title.

Abstract:
2. Methods 402 normal children the word normal should be removed.
3. Methods include description of the measure of SDB.
4. Results missing from 4th set of brackets.

Background:
5. 3rd para between overweight and depression [15, 16] as well as between overweight and social problems and withdrawal [15] or both could be reworded to between overweight and depression [15, 16], social problems, withdrawal [15] and both
6. 4th para While cognitive problems should begin a new paragraph.
7. 4th para SDB should be spelt out in words prior to providing this abbreviation for the first time.
8. 4th para The sentence Understanding what behaviors could be reworded to make it clearer.

Methods:
9. Include the number of schools from which the sample was drawn.
10. Provide a reference for the statement that the TUSD school population is representative of children in southern Arizona.
11. Move within the Department of Pediatrics to the end of the sentence.
12. $25 for completing the behavioral evaluation.

Methods, measurement:
Introducing a second sentence along the lines All children <95th percentile were classified as normal weight would clarify that all children not classified as overweight were classified as normal weight.

ADHD should be spelt out prior to providing this abbreviation for the first time.

Include total number of scales in CPRS-R.

ADHD such as cognitive problems and hyperactivity or

Provide examples of behaviors comorbid with inattention and hyperactivity that the scale measures. Move sentence Behaviors are rated on a 4-point to after criteria for ADHD [29].

The Child Behavior Checklist (CBCL)

children aged 4-18.

Move the description of the RDI above the description of the analyses. These could be separate paragraphs.

Results:

Explain the discrepancy between the 503 who agreed to participate and the 480 who completed a sleep study.

For consistency, 56% should be reported to 1 decimal place. You state there are no significant differences between the groups on gender. While not quite reaching $p<0.05$, there is a notable tendency for overweight subjects to be male, which you mention and discuss in the conclusion section. This trend should be noted here.

It is unclear whether you are assessing if the presence of behavior problems increases the odds of overweight or whether the presence of overweight increases the odds of behavior problems please clarify.

3rd para no longer significantly different across the groups.

4th para (moderate to severe) by the Child Behavior Checklist

4th para the results reported in the final 2 sentence should be described more clearly and expanded.

Conclusions:

Clarify whether by Current findings..you mean this study (be explicit) or previous studies (in which case you should provide references).

Overweight children had increased parent

3rd para You seem to jump between explaining the results observed for the withdrawal and social problems scales. This paragraph could be made clearer. In addition, references are required for a number of the statements made (sentences 3, 4 and last sentence).

4th para the final sentence does not appear to be particularly relevant and could be deleted.

Tables:

Indicate the unit of measurement for age and parent education in the variable column eg. Age (yrs) Remove the % signs from the variable column Table 1 variable should read overweight not obese

Table 1 (59/402) should be removed.

Table 1 move the n for parent education to a footnote and also include an explanation of the discrepancy.

Table 2 heading between normal weight versus

Table 2 it is common to round significance figures to 2 decimal places.

Table 3 provide the full name of the measurement tool used.

Table 3 include (95% CI) in heading for last 2 columns.

Table 4 include unadjusted to heading for second last column.
Response to Referee #2

Minor Essential Revisions

1. Although the general goals of the study are outlined in the Introduction, no specific hypotheses are included.

   A specific hypothesis regarding the unadjusted and adjusted relationship between overweight and externalizing behaviors has been outlined in the Background. The lack of support for this hypothesis may be found at the end of paragraph 1 in Discussion.

2) The current nomenclature classifies children according to BMI percentile as normal weight, at-risk for overweight, and overweight. The authors should use this updated classification.

   We have noted in the Methods that the group labeled as "normal weight" includes those children at risk of overweight.

3) Why was tonsillectomy an exclusion criteria?

   In the TuCASA study, tonsillectomy was used as an exclusion criteria because children with tonsillectomies 'muddied' the waters. We could not be sure if they did initially have SDB or not before the tonsillectomy.

4) Was parent education considered to be a proxy measure for SES?

   Parent education alone may be used as a proxy for SES. However, as SES is not a unidimensional construct, parent education would be more useful as part of set of variables that indicate SES. A full set of variables might include income, employment status, or other variables.

5) The group differences on key demographic variables are listed; did the groups differ on severity of SDB (RDI)?

   RDI did not significantly differ between the two weight groups. We have added this information to the Results text and to Table 3.

6) Why was a t-score of 65 selected as the cut-offs for Conners and CBCL instead of the more conventional 60 (at risk) or 70 (clinical range)?

   Although studies have used 60, 65, or 70 as cut points, the Conner's scale manual indicates that 65 is the t-score at which "moderately atypical" levels of behaviors begin. We wanted to use a consistent cut point for both scales so used that same criterion for the CBCL.

7) There was a substantial range of BMIs in the sample; might the heaviest children have accounted for the greatest differences compared to normal weight children in behavioral measures? This needs to be addressed in the statistical analysis.

   In any analyses, the subjects with the most severe conditions are more likely to contribute to averages of symptoms or correlates. We would not expect this dataset to be any
different. As the CDC does not recommend any designation higher than the 95th percentile for children, we do not believe that creating an additional extreme subgroup is necessary or would provide greater insight into the results presented. Additionally, there were only 5 subjects in the overweight group with zBMI scores above 2, and 7 subjects with zBMI above 1.5 which does not allow for subgroup analyses with those subjects.