Reviewer's report

Title: Prevalence of physical, sexual and mental abuse among overweight adolescents.

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Reviewer: Susan Clifford

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The authors describe the prevalence of reporting ever having been physically, mentally or sexually abused amongst underweight, normal weight, overweight and/or obese 13-17 year olds. The study findings provide a rationale for further research confirming higher prevalence of abuse amongst overweight and obese adolescents and exploring reasons for such an association. I believe the study methodology and interpretation of results need to be clarified for readers.

Major compulsory revisions

(1) It is not clear if Aim 1 of the paper (prevalence of abuse in adolescents) was achieved because there is no indication of how representative the sample was of the population (and thus if the prevalence in this sample is likely to reflect the true prevalence in the population). Please report how representative the sample was of the population, or at a minimum, how the BMI distribution in this sample compares to the Dutch population at this age.

(2) One third (#25,000) of the original sample was excluded. If BMI status was defined by the IOTF cut-point (see comment 1 in next section), the low prevalence of obesity suggests a possibility of under-representation of obese adolescents (and thus prevalence of abuse in all adolescents). Please provide the number excluded for (i) not reporting their height or weight and (ii) reporting height and weight data that equates to extreme BMI. On this issue, why were BMI values of 8/45 chosen as exclusion criteria instead of a BMI z-score to exclude similarly underweight/obese children at each age? If these BMI cut-offs were not adjusted for age, is there any evidence that these cut-points had the effect of excluding the very underweight more so if they were young and the excluding the very obese more so if they were older?

Until information on how the sample represents the population and how many declined to answer the abuse question (see comment 2 in next section), I don't necessarily agree with the authors conclusion “it is hypothesised that the current study does provide a good estimation of the extent to which adolescents perceive themselves to be abused”

(3) Study participants were drawn from 2 separate cross-sectional surveys conducted in 2003 and 2007 and are analysed as a single group. The authors provide no details of the sample size in each cohort or how the cohorts differ in demography, BMI, abuse and school setting. Please provide evidence that the groups do not differ in these characteristics before they are presumed to
represent a single group and are analysed without adjustment for cohort. Please explain how the two surveys differed in methodology in the methods section, not only discussion section.

(4) This discussion interpretation of the results is inconsistent and incomplete. Conclusions in the discussion do not match my interpretation of the data presented in tables. Discussion paragraph 6 suggests physical and sexual abuse were not associated with obesity in secondary school students but this is presented as true in Table 4. The sentence “all abuse was more common in overweight and obese” is only true of Model 1 and incorrect for Model 2 and 3. Paragraph 3 says physical abuse is not associated with obesity in girls but it is Model 1 and 2.

Minor essential revisions

(1) Please clarify how BMI status was determined. Two citations are provided so the reader is unsure if IOTF or Dutch references (or a combination) were used. Please also define the term “overweight (obese)”.

(2) Please report the number who declined to answer each abuse question, and the final sample size of those analysed with both BMI and valid abuse data. The methods paragraph 3, the number completing the abuse questions is reported, however in the methods abuse section it is revealed that those answering ‘I don’t want to complete’ were excluded from analyses.

(3) The abstract states that univariate and multivariate analyses were conducted but the method does not provide this detail – please clarify. I presume from Tables 2-4 that univariate analyses are reported given the 3 separate sample sizes, but this needs to be specified. Which analyses were multivariate, if any?

(4) Aim 2 was to investigate the association between BMI status and abuse. The last paragraph of the results discusses only if there was a J-shaped association between BMI status and abuse. No a-priori hypothesis of a J-shaped relationship was suggested, nor does this appear to have been tested in a multivariable analysis, so please consider discussing all significant associations.

(5) Three models are presented but at times it is unclear which model is being referred to in results and discussion— please clarify this text. What is the rationale for including other abuse types in Model 3 (i.e. is it protective or additional risk)?

(6) The ‘yes’ and ‘currently not, but I was abused in the past’ responses to abuse were treated as a single outcome. Please report what proportion of the sample reported each response. It is difficult to interpret these responses due to the confusing wording of these items i.e. does ever being mentally abused mean you were often picked on; in response to the question were you ever abused, ‘currently not, but I was abused in the past’ must mean ‘yes’?

(7) I am surprised that ethics approval was not required but this is not my expertise. Given institutional consent was not required, please describe if individual consent was obtained (Did the adolescents provide individual consent? Were they free to choose not to participate?)

(8) Table 2-4: Either the table caption or column headings within the table need to indicate that 3 separate models are presented. A footnote is required to tell the
reader what level of significance the bold text signifies. Also, the abuse headings in the first column should not be in bold if boldness indicates statistical significance.

(9) Abstract: Results are quite vague. Please describe the direction of associations, and replace ‘much higher’ with prevalence values or odds ratio and the comparison group. The last two sentences discussing stratified analyses contradict each other.

(10) Results last paragraph – The pattern of association between physical and mental abuse and BMI status cannot be said to be due to the pattern in vocational school students. Similar patterns are seen in mental abuse in the other school group

Minor issues not for publication

The manuscript also needs to be carefully proof-read for grammar and that the data is described accurately (i.e. past abuse data is incorrectly described as current abuse and risk of future abuse in places). Some specific incidences below:

• Abstract: Write words in full before using the abbreviations BMI and GEE

• Throughout the paper, BMI status is referred to as weight status. Weight and BMI are separate concepts so it is correct to use the terminology BMI status.

• Introduction paragraph 1 currently incorrectly reads that behavioural coping strategies are ineffective or immature.

• Reference to a table should be made when it is first mentioned in the text.

• The second paragraph of results (regarding those reporting multiple forms of abuse and abuse context) refers to Table 1 however this data is not present in the Table. It would be interesting to report those with multiple abuse by BMI status.

• Results sentence 4 refers to mental abuse where I think you mean sexual abuse.

• Results last sentence refers to Table 3 however this data is not presented.

• The first sentence in the conclusions ‘physical and sexual abuse were reported by almost 1 in 5 adolescents’ is inconsistent with data reported.

• Given the international readership of this journal, can you please explain what “TNO-GP” stands for?

• Introduction paragraph 1 – The term ‘obesity’ does not require definition, but if you choose to do so it would be better to use the BMI cut-point that “extreme overweight”.

Discretionary revisions

(1) The key data of the paper (abuse prevalence by BMI status) is shown in part in a figure (underweight is not shown). It would be clearer if Table 1 was restructured to report demographic and abuse characteristics for (i) whole sample and (ii) by BMI status. The current structure showing characteristics by
gender and school setting is less important. Restructuring the table this way would also allow the reader to see what proportion of overweight adolescents reported abuse (a conclusion of the paper) and the characteristics of those who reported multiple type abuses.

(2) Adolescents aged 13-17 years are analysed as a single group. Have the authors investigated if the abuse-BMI status association varies across these ages? Differences in abuse by age could exist as older children have lived over a longer period during which abuse may have occurred. This may particularly be the case with sexual abuse, where increased sexual activity in the period spanning late puberty may increase the risk of receiving unwanted sexual activity.

(3) The title, abstract-background section and aims state that the study examined the association between overweight and abuse. The results also include analyses of underweight and obese adolescents compared to normal weight peers. Specifying the paper examines the full BMI spectrum may widen your audience.

(4) The discussion outlines future longitudinal research but it would also be useful to assess cross-sectionally how the association changes with abuse severity and duration.

(5) Introduction paragraph 1 – It would be interesting to explain this literature in more detail, given it forms the major part of your study rationale i.e. the direction of the relationship, in which samples is the relationship found, over what time period is the relationship examined?

(6) Please briefly explain education level (education setting?) for international readers not familiar with this system, and why it is expected to be of such importance to be included in analyses. Was it the best available measure of socio-economic position?

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

**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 interests