Reviewer's report

Title: Sleep and weight loss in low-income overweight or obese postpartum women

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Reviewer: Elizabeth Cayanan

Reviewer's report:

Review: Sleep and weight loss in low-income women with overweight or obesity

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Thank you for this manuscript examining the association between weight loss and sleep duration, quality and disturbance in a cohort of young, low income post-partum women. This is an important area of research that lacks high quality, longitudinal evidence. The current study presents a secondary analysis of pooled participants in a community based lifestyle behavioural weight management intervention whereby the control and intervention group did not significantly differ in their weight or sleep parameters during the trial. The authors state the basis of this analysis was that short sleep duration seems to be associated with increased weight, therefore it should be confirmed whether weight loss impacts upon sleep duration. It is curious as to why this secondary analysis was conducted as the authors of the current paper have stated that the mean weight loss during the trial was not significant and therefore examined the changes in sleep in the entire cohort where there was no substantial weight loss achieved. This does not align with the basis of their analysis. They measured significant changes at each timepoint in sleep duration, quality and disturbance but the lack of association with change in weight may have been largely due to the participants not losing clinically or statistically significant weight during the trial. In lieu of this, it seems the hypothesis being tested was not valid as weight loss was not achieved and therefore it cannot be determined whether it impacted on sleep duration/disturbance/quality.

In addressing this limitation, the authors dichotomised the sample by weight loss responders (>5% and <5%) however this dramatically altered the number of participants in each group and was very likely underpowered. Nonetheless, this analysis produced no significant results and there did not seem to be any association between weight loss and these parameters of sleep. The academic writing of this manuscript requires revision, whereby the interpretation of some statements is challenging due to sentence structure. It would be helpful for the authors to ensure there are explicit statements regarding their findings and approach to this analysis to aid the reader in their interpretation of meaning.

Careful revision of this manuscript may allow clearer meaning to be deciphered. I have provided extensive constructive suggestions to aid the authors in their review if this is of benefit to them.
Abstract:

Line 42- "Body weight was measured in person" is awkward. Suggest revision eg was measured directly or participants were weighed and > 5% etc

The results are confusing in lines 46-47: "Also, a significantly higher proportion of women lost > 5% of body weight over time" compared to what? Revise wording. Are you trying to say that each time period produced a greater amount of body weight? Eg the longer enrolled, the greater the weight loss in subsequent periods? Consider revision.

Line 48 perhaps should be stated earlier? The weight loss achieved during the study was not significant despite women losing a greater volume of weight as time progressed?

o Also, the numbers quoted are confusing, are you suggesting that loss of 190.9 lbs was the weight measured or the change in weight? These large numbers should be described as mean weight per timepoint rather than weight change so as not to be misleading.

o You have stated that >5% body weight loss was considered meaningful and reported on proportions of women who lost weight and yet stated there was no significant body weight change over time. It seems strange that 5% was achieved when only 2.9 pounds seems to be lost between T1 and T3 as per the results.

Line 49: remove the word also and state "were not significantly associated with …"

The conclusion states that there was no improvement in sleep outcomes with >5% weight loss but stated that there was no significant change in body weight over time. If weight didn't change, then why would these outcomes change?

Why are you suggesting that prospective studies further investigate a trend that is not existing. Perhaps be more specific, studies that achieve a greater or significant volume of weight loss should investigate the impact upon sleep duration, quality and sleep disturbance.

Background

Line 61: revise to "who are low income earners"

Line 61: remove the words There are

Line 64: no need to include the definition in brackets - it is a common descriptor

Lines 71-74: revise sentence structure and grammar

Line 78: reference these studies or merge with next sentence
Line 84 - 86: Why would this contradict. This may be more relevant in discussion or you should provide an explanation for the contradiction

Line 86: Tense needs revision

Line 92: you are moving around a lot in describing multiple populations. I think it is important to denote the group you are interested in/studying - you have established mothers are at risk directly as a result of the maternity period and yet all the evidence for the associations with weight and sleep are in men or in general obesity. It would be helpful to be more explicit in your interpretation of this.

100: revise punctuation, this should not be a colon

Perhaps line 99 on is easier to state that 2 longitudinal studies examining the association between sleep disturbance and weight loss have fund no association.

Line 103: who was the sample - 30 years is a long time, how long was their weight loss intervention?

Lines 105-111 are much clearer, this is easier to read and understand. It is important to be more explicit in earlier parts of the introduction.

Methods

Line 113: WIC needs to be defined before the acronym used

Line 119-120: revise, Height and weight were measured during recruitment and used to calculate BMI

127: name the intervention (eg weight loss intervention)

You should state the goal of the program/intervention early in the methods

Line 140 - 141: this would potentially have impacted upon your findings as the program promoted lifestyle changes that may have not been potent enough for weight loss but still had an impact on other aspects of health and behavior in comparison to the control.

Line 172 - do you mean significant change at each timepoint or just at the beginning and end of the trial?

Line 173 - compare (tense incorrect)
Results

Line 189: please be clear in what you mean by "trend" - it is presumed this is not significant. But I think you must also consider that this trend is in a magnitude of weight loss that was not clinically relevant.

Line 190: typo "deceasing"

Line 192-193: revise this sentence

Discussion

Line 200: You should explain why the cut off of >5% weight loss was selected and mention its clinical relevance

Line 206: didn't you just make this statement above?

Line 207 - reference 21 is not recent, it is 13 years old. Revise wording. This sample tested people who had achieved 10% weight loss and had a very small sample n= 10 so again I would be considering whether it is comparable to your analysis.

Line 214: This reference (Foster et al) measured sleep disordered breathing with PSG but did not mention sleep duration in their publication. Please revise the use of this reference as it is a different tool and cohort to the sample you are considering.

Line 221: It is not clear why you are describing a behavioural/psychological drive in eating; you are studying a cohort in which these drives are presumed relevant to all of the sample or if not, should have been measured as a confounder using a tool such as the three factor eating questionnaire . If you are suggesting this as a drive of inconsistent findings, you need to also state why these factors would be relevant to each of the cohorts tested in your comparative studies. Try to be explicit in why this is important if you are going to suggest it as a mediating factor.

Line 226: revise tense "examined"

Line 229: Please ensure the methods are clear that you have not used the entire tool as intended. By using a sample of items from the PSQI, the validity of the tool is questionable as it has not been used as it was intended. If validated for this sample of questions, you should state that and reference. Otherwise it is a limitation and you should not claim it is validated for this purpose.

Line 233: these should be stated as strengths

Line 235: revise - not valid if you did not use the tool as designed
Line 253-255: requires revision- aren't you suggesting the reciprocal? Weight loss does not have an effect on sleep.

It should be mentioned that this longitudinal study only covered a period of seven months which is considered short in weight loss intervention.

The lack of clinically or statistically significant weight loss may have blunted the impact upon sleep quality, duration and disturbance. This should be discussed early in the discussion.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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