Reviewer's report

Title: Perceived Body Image in Men and Women with Type 2 Diabetes Mellitus: Correlation of Body Mass Index with the Figure Rating Scale

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Reviewer: Tiffany Cox

Reviewer's report:

I am enthused to review work in this relevant area. This area of research is very important in understanding the dynamic between weight status, perception of weight, and health status/outcomes. While the authors have some potentially great data and interesting questions that can be examined, additional rigor should be employed in order to clearly test and report findings in this emerging area. Please accept these comments and suggestions in future research ventures in this area.

Major Compulsory Revisions

1. General: The research question is not clearly defined. The description of the study objectives and the results vary between “body image in individuals with various levels of BMI,” body image by T2DM status, and body image by gender. Though there is potentially useful information in any of these 3 questions, the intended question of this particular study is not clearly defined, thus making the logic, study design, and results difficult to follow.

2. Introduction General: Additional review of the literature and organization would help strengthen the case for why this study is important. Also, a clear statement of the research question/objective would help to set the framework for the rest of the paper.

3. Introduction Para 2 Sentence 3: There are actually several studies that look at this relationship. A quick PubMed searched retrieved several studies including Baptiste-Roberts et al. 2006 Perceived body image among African Americans with type 2 diabetes and Charles, Britt, and Knox, 2006 Patient perception of their weight, attempts to lose weight and their diabetes status.

4. Methods Para 2 General: The methods described highlight several potential issues that are not addressed in the methods sections or the discussion of limitations including potential biases of mailing surveys (selection bias), a single informant for up to 4 household adults (response/recall bias), low response rate (possible impact on internal and/or external validity), up to 4 participants per household (cluster/correlation issues that should be addressed in statistical analysis using one of several methods such as GEE or multi-level modeling). Also, much more detail should be provided about how the “selected individuals” were selected to complete the baseline survey. Please clearly provide the criteria of how they were selected and some data showing how they compared to the
larger study sample.

5. Methods Para 3 General: Please provide specifically how the question was asked about T2DM status. Age of onset > 21 is potentially problematic given the emergence of T2DM in adolescents. Please discuss why this was chosen and its potential impact. The categories as described in the current form are not all inclusive or mutually exclusive. For example, if a woman had gestational diabetes, she does not meet the criteria for “no diabetes mellitus”, but she doesn’t meet the criteria for “T2DM” either. How was she classified? Or if one was diagnosed with T2DM at age 20, how was he classified?

6. Methods Statistical analyses: Several points in the statistical analyses do not seem consistent with the research question or appropriate to obtain valid results. In general, this is a very complex measure with variables that are likely highly correlated and at the very least clustered participants. More thorough and sophisticated analysis would likely be helpful to obtain increase confidence in the results.

7. Please justify why Pearson correlation was used instead of Spearman which may be more appropriate for this data which seems to be rank data. What kind of t-test was done and what mean differences were compared (sentence 2)? Further, if median BMI was compared rather than mean BMI, Mann-Whitney test would be appropriate for comparing medians as opposed to t-test.

8. Results General: There is no reporting of any overall relationships, only stratified by figures. Please provide overall results. Also, the differences in sample sizes across groups in the different strata make it difficult to make legitimate across group comparisons.

9. Results Para 2 Sentence 1: “Based upon their mean BMI, …” Please clarify what this means. Was the mean or median BMI deemed to be the most appropriate representation? Whichever it was should be used and reported consistently.

10. Discussion Para 3 Sentence 5: “no adjustments were made for these parameters in this analysis.” Why not? If the data is available, the analysis and validity of results would be greatly strengthened by including these covariates in the analysis.

11. Discussion Para 5 Sentence 2 and 3: Please see Bulik et al 2001, Relating body mass index to figural stimuli: population-based normative data for Caucasians. This paper provides the results of 30,000 participants used to developed BMI norms for the Stunkard FRS. Please clarify how this differs from what is proposed as a major finding of this study.

12. Discussion Para 6 Sentence 1: not supported by the research findings of this study

13. Discussion Para 6 General: Much of this paragraph is not supported by findings of this research study. Further determinations seem speculative and
should be supported by references or acknowledged as only speculation.

14. Conclusion Sentence 1: This was not tested or shown in the data.

15. Conclusion Sentence 4: How is this conclusion supported by this research study? If it were possible to make the T2DM individuals have a body image perception like non-diabetics, this does not mean that it would lead to weight reduction. Even in this data set, though the non-diabetics seemed to have a “more positive body image” they were still overweight/obese. Thus, this body image does not necessarily lead to achieving a healthy/normal body weight.

Minor Essential Revisions

16. General: Throughout the paper it is important to clearly define terms related to body image and be consistent in the usage. In short, body image is commonly thought of as one’s feelings about their appearance. However, in this paper, body image frequently used to refer to the actual figure chosen by an individual. While this is not technically incorrect, it can be confusing. I would suggest that “figure” is used rather than “image” when referring to the Stunkard FRS responses.

Abstract

17. Background Sentence 4: “Subjective perceptions”- Please clarify whether this is self-perception, perception of others, or both.

18. Methods Sentence 4: Please state what kind of t-test was conducted and what mean differences were compared.

Main paper

19. Introduction Para 1 Sentence 3: needs a reference

20. Methods Para 1 Sentence 1: “A cohort of individuals with a diagnosis of T2DM was identified from the…” This suggests that the entire cohort has been diagnosed with T2DM, which I assume to be untrue since the comparisons are between those with and without T2DM. Please clarify.

21. Methods Study measures: no description of how waist circumference data was collected. This would seem to be challenging to collect as self-report given the variability in how/where waist is measured.

22. Results Para 2 Sentence 4: Please delete “Conversely.” It does not accurately characterize the relationship shown in the results.

23. Results Para 3 Sentence 1: “Body image perception…” Is this different from “body image”? This is an example of the importance of consistent terminology.

24. Discussion General: This section could be strengthened by developing it much more in terms of the current literature and where this research fits. Where is it consistent, where does it differ, what gap does it fill?

25. Discussion Para 2: The last sentence can be deleted as it is not related to the topic of this study.
26. Conclusion Sentence 5: This final sentence suggests that comparisons were made across gender groups.

Discretionary Revisions
none

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**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.