

Peer-Review comments and author responses

Reviewer 1

General Comment:

Congratulations on addressing such a relevant topic! Your work provides some valuable insights into a significant public health concern and how health disparities in vulnerable populations could contribute to chronic health conditions. I would like to offer a few suggestions based on my review of your manuscript:

1. Abstract:

-Comment: I recommend including the definition of immigration status in the methods section of the abstract. Since this is your main exposure variable, it is important to specify how it was categorized.

Response: *Thank you for your feedback about the abstract. The suggestion made about immigration status definition and categorization from the Nhanes dataset is specified in the method section. Born in the United States or not born in the United States (foreign born)*

-Comment: It is important to confirm if the number of subjects included in the methods section (5,591) aligns with the number analyzed and reported in the results section (2, 540). If any exclusions were made, it would be helpful to specify them.

Response: *Thank you for your feedback about the abstract. The suggestion made about the subject included in the study was revised and specified in the results section instead of the abstract for clearer and better readability of the abstract.*

-Comment: Your conclusion effectively highlights the main findings, but it could benefit from a concise take-home message. You might consider proposing potential hypotheses or areas for future research, to guide further investigation and broaden the scope of inquiry in this field.

Response: *Thank you for your feedback about the abstract. The suggestion about the conclusion of the abstract was revised and added with the need of future research studies mentioned.*

2. Introduction

-Comment: The background is well-established, highlighting the significance of obesity prevalence in the U.S. and mentioning relevant statistics. This information effectively underscores the impact of obesity on the healthcare system and its potential consequences.

The issue of obesity among immigrants is well-identified as a gap in literature. However, I would recommend explicitly stating that the migration status has not been studied *as a risk factor for obesity*. Given the increasing importance of migration status as a determinant of health, this would help clarify the focus of the study.

The study's objective is clearly stated. I would recommend providing a brief rationale for the selection of the covariates mentioned in the last paragraph.

Response: *Thank you for your feedback about the introduction. The suggestions about clarifying the focus of the study and presenting the rationale for covariates were added.*

3. Methods

-Comment: The study design is clearly defined and the data source is widely recognized and appropriate for the research. Inclusion criteria and exclusion criteria are well-described.

While the covariates selection is comprehensible, it would be appropriate to provide the rationale behind their inclusions. Additionally, the terms “various health and behavioral indicators” should be expanded to specify which elements were considered.

Response: *Thank you for this valuable feedback! We added a sentence to explain why we chose to include socioeconomic factors as covariates:*

‘We chose to include these variables as covariates since they present important social determinants of health that could confound or explain observed relationships between other covariates and outcomes’.

We also specified ‘various health and behavioral indicators’ and elaborated shortly on why we included them:

‘We also decided to include smoking status and physical activity as health and behavioral indicators as they could potentially have an influence on health outcomes and behaviors’.

-Comment: The handling of missing data was well-explained. However, the imputation

assumption of 20 years for length of stay among U.S.-born individuals could be better justified and sustained with references or data.

Response: Thank you for your comment! We decided to use 20 years for imputation for missing data on length-of-stay for US-born individuals since we only included adults aged 20 years or older. Therefore, we assume that the individuals we included must have spent at least 20 years in the US.

-Comment: The ethical aspects were clearly stated and aligned with the use of de-identified data.

4. Results

-Comment: Text describes key findings, including outcome and covariates, and aligns with the study's hypothesis. However, be cautious about describing detailed frequencies and percentages already presented in the tables and figures. Instead, **focus on describing trends and relationships among variables**. When using numerical data, **prioritize the most relevant findings and avoid mentioning less relevant variables, such as dietary fiber intake**.

Response: We thank the reviewer for your valuable comments. We have focused our results on describing the main trends and relationships between the variables.

5. Discussion

-Comment: Key findings are effectively summarized and the text follows a clear and logical narrative. The integration of the findings with other factors contributing to obesity among immigrants provides a clear overview of the main findings. There is robust comparison with previous literature and provides a comprehensive overview.

Key limitations are adequately identified, but the implications of some of these limitations to the study are not mentioned. Aspects such as self-reported data, the nature of the study and its generalizability and how this could affect the conclusions of the study should be explained. Additionally, the management of these limitations and the efforts to reduce the effects of any source of bias should be mentioned. The take-home message could be more specific. Concrete steps for research and public health policies should be explained.

Response: We thank the reviewer for their comments. The discussion section has been updated to describe the implications of the study limitations, as well as how we managed them.

Reviewer 2:

Comments for authors:

Dear colleagues,

It is with great pleasure and appreciation that I take this opportunity to review your manuscript.

I believe the manuscript you developed is a very well structured and statistically sound project. My observations are the following:

1. The introduction section is very well written, with the background and the gap very clear, as well as the aim of the study. One observation that I would add, to further explain and back up the gap would be that due to the multifactorial nature of obesity (as you greatly mentioned with the varying susceptibilities) the need to better understand the associations of obesity with this specific population may lead to a personalized and more holistic approach, which may be another important reason to conduct this study, highlighting the impact as well.

Response: *Thank you for your feedback about the introduction. The suggestions about explaining the association of obesity with this particular population were added.*

-Comment: Regarding the results from the logistic regression comparing natives and immigrants, it is mentioned particularly that gender (i.e., female) is associated with an increased risk of obesity, as well as, length of stay (i.e., between 5-10 and between 10-15 years). However, these variables have confidence intervals that include 1, meaning that they are not statistically significant in your sample, which I believe is important to mention. Also keeping in mind the p-values to further back up your interpretation. In the regression model only evaluating immigrants, you appropriately mentioned and clarified the previous results of ethnic background and income, both losing significance.

Response: *We thank the reviewer for your valuable comments. We have highlighted the fact that when considering only the model in immigrants, we observed similar results, except for age (OR: 0.98, 95% CI: 0.97–0.99, $p = 0.001$) and female gender (OR: 1.33; 95% CI, 1.03–1.72, $p = 0.03$), which gained significance, although with limited relevance.*

-Comment: 3. The discussion section could benefit from a more organized structure in my opinion. The first paragraph adequately restates the hypothesis of the study. The most important and significant findings mentioned in the results section should be discussed in a

broader context and in order of significance. In my opinion, the model/results of the length of stay is the most significant one and is appropriately backed by previous studies as you mentioned. It is also imperative to explain how/why your results contribute to what is already known in the literature, highlighting the importance and significance of your study, which would connect with the introduction section.

Response: *We thank the reviewer for their comments. The discussion section has been updated to a more organized structure, discussing the main findings of the study and their importance.*

-Comment: In the conclusion, it is mentioned that lower obesity prevalence is influenced by lower income; I believe it is important to make this statement carefully, since there is mixed evidence regarding socioeconomic status and obesity, some stating a direct relationship [1,2] and some others claiming an inversely related association. [3,4]

You also mentioned that higher income was associated with higher obesity rates (but appropriately mentioned that the results lost significance in the regression model only assessing immigrants), however, it is important to point out the mixed evidence in the literature.

Overall, it is a very well done study with some issues that I have found important to address for better understanding and a clear assessment of the results. I don't believe there is much to improve in the methods section, since you have greatly specified and explained important aspects such as the inclusion/exclusion criteria, explained the variables used, covariates to account for, etc., which at the end it is to ensure the replicability and reproducibility of the study.

Regarding the wording/phrasing of the manuscript, I get the impression that some parts were written by different authors with different styles, thus, it is important to keep a fluid and cohesive style throughout the manuscript.

Response: *We appreciate your thoughtful comment from the reviewer regarding the relationship between socioeconomic status and obesity. We have revised our conclusion to better reflect the complexity of this relationship and the mixed evidence in the literature. Specifically, we have removed the definitive statement about lower income influencing obesity prevalence, modified the language to acknowledge the complex nature of socioeconomic factors in obesity risk, and added language about the need for further research to better understand these relationships. The revised conclusion now reads more cautiously and emphasizes the need for further research to understand these complex relationships in immigrant populations.*