

## Reviewer 1

I am pleased to have had the opportunity to review this manuscript, which presents an innovative methodology for assessing the association between multiple variables and Self-Rated Health (SRH). The work is intellectually engaging, but there are several areas that require clarification or further elaboration for proper scholarly evaluation.

### Methodological Concerns

- **Ambiguity in Model Justification:** The manuscript outlines the use of a mixed-effects model, emphasizing its capability to account for multiple data points from the same participant. However, the Results section does not make it explicit whether multiple measurements per participant were actually gathered. This raises questions regarding the appropriateness of the chosen statistical model.
- **Utility of Mixed-Effects Model:** If it turns out that only a single measurement point was collected for each participant, the rationale for selecting a mixed-effects model becomes ambiguous. I would appreciate clarification on this issue.
- **Transformation of SRH Variable:** The manuscript mentions that the categories 'poor' and 'not so good' were merged in relation to SRH. It remains unclear what happened to the 'very poor' category. If this category was omitted due to negligible responses, please specify this, along with a more precise mapping of the original and new categorizations. The reader should be left with no ambiguity on this matter.
- **Discrepancy Between Figure 1 and Table 3:** The independent variables presented in Figure 1 do not appear to be consistent with those listed in Table 3. Specifically, Table 3 includes age squared in the dependent variables, while Figure 1 seems to represent age as a categorical variable. This inconsistency merits clarification.
- **Interpretation of Age in Table 3:** For a complete and robust interpretation of the age variable, both the linear and quadratic terms should ideally be included in the model, unless there is a compelling theoretical or empirical reason for their exclusion.

### Conceptual Considerations

- **Social Support as a Modifiable Factor:** The manuscript identifies 'social support' as a factor amenable to modification. While this is conceptually interesting, 'social support' often involves complex interpersonal dynamics that are not readily changeable. Therefore, I recommend reconsidering the classification of 'social support' as a modifiable factor, or offering a robust justification for its inclusion as such.

### Clarity and Readability

- **Complexity in 'Model Presentation Algorithm' Section:** This section could be enhanced by providing a clearer and more intuitive explanation. The citation of Figure 6, positioned at the end of the manuscript, disrupts the reading flow.
- **Technical Language:** The section employs technical language that could be simplified for the sake of broader accessibility.

- Dose-Response Explanation: A more detailed account of what is meant by 'dose-response' in this specific context would be beneficial.
- Clarification on Hard-Coded Objectives: The paper states that certain objectives are hard-coded into the model. A comprehensive explanation for the reasoning and implications behind this choice is warranted.

I would be delighted to review your work further once these ambiguities and points requiring clarification have been resolved. I am convinced that these potential improvements will significantly enhance the scope and credibility of your research.