Reviewer’s report

Title: Objective and perceived food environment and household economic resources related to food insecurity in older adults living alone in rural areas

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Reviewer: Youngmi Kim

Reviewer’s report:

The study addresses important topics regarding food insecurity and food environment for older adults living alone. This paper would be strengthened if the following were taken into consideration and incorporated.

1. This paper mainly raises a question about food insecurity status of older adults living alone in rural areas, South Korea. I find, however, the paper fairly remain with general older adults population, which may mislead the study focus. Three interesting characteristics of the target study population, "those living alone", "in rural areas", and "South Korea", should be greatly reflected in the background, methods, and discussion. What are the unique needs (competing consumption demands) of older adults living alone compared to those living with a family member(s)? What makes those living in rural areas confront high risks of food insecurity compared to those living in big cities? How are the experiences of Korean older adults living alone different from those in other countries? The authors would want to elaborate the underlying conceptual framework and make a strong argument/discussion accordingly.

2. Methods:

- The study participants were recruited in two counties, Yanpyeonog and Hongcheon. How rural are these areas? Are there variations across the counties in terms of economic and environmental characteristics?

- What kind of sampling method was used? The sample is fairly old (mean=78) and poor (44% in public assistance). Is it common among rural seniors?

- When was the data collection conducted and how long?

- Measures: I highly recommend the authors revisit the description of the variables. I appreciate your efforts presenting the detailed tables 1-3, but it was not clear what each variable indicated and how it was measured. Also, please align the variables in the same order, indicate the reference periods, clarify each variable names (use it consistently throughout the entire paper - names of some variables may be desirable to be shorted for clear communications), make sure all the variables are included in the tables, etc; international readers may not know what the national basic livelihood is; household food insecurity is one of the key measures - more descriptions are
needed and I would place it first in the measures. Related: please justify all of these variables are necessary. Some of them seem quite repetitive or may not make distinct contributions in the variation of food security of older adults (e.g. income).

- Given the total sample size, the number of variables used in logistic regression appear too many. Did you check the statistical power?

3. Results:

- Tables 1-3 compare the sample characteristics by food security status. If that is one of the study inquiries, please also show those of the full sample by adding one column in Tables 2 and 3 so that the full sample's characteristics are shared with readers. And, I prefer one combined table rather than three separate tables. Present test values (e.g., t or chi-square) instead of p values. P values can be shown with asterisks.

- In the Table 4 note, I find "Dependent variables were selected based on the association with food insecurities (α=0.15)". I assume it is a typo for independent variables and α=0.05. In any manner, selecting significant independent variables from bivariate tests are like a random cherry picking, which is not desirable in science. If this study is derived from theories per deductive reasoning, key determinants explaining food insecurity of single older adults living in rural areas should be logically selected as I comment above in # 1. Please revise the analysis or justify.

- In Table 4, I do not find any noticeable changes of findings in Model 3 after running (compared to) Model 1 and Model 2. Model 3 would be good enough to present.

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

No

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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