Reviewer's report

Title: Cognitive Function, Social Integration and Mortality in a U.S. National Cohort Study of Older Adults

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Reviewer: Maria Victoria Zunzunegui

Reviewer's report:

This paper examines the associations between cognitive function, social integration and mortality in a sample of US people over 60 years of age.

The paper is difficult to read because there is no logical flow of ideas between the sentences. It is not clear what this paper adds to the literature since it has been repeatedly shown that social integration is associated with higher survival and that those with cognitive impairment have higher mortality than those with good cognitive function. The introduction announces that there may be an interaction between social integration and cognitive impairment. This hypothesis could be the justification of the article. However, this hypothesis is not grounded on previous research or on theoretical basis.

MAJOR COMPULSORY REVISIONS:
What could be the biological or psychosocial mechanisms by which those who are well integrated in their society would be less likely to die when they experience cognitive impairment?

MINOR ESSENTIAL REVISIONS

Abstract:
In the Background section of the abstract, a first sentence is missing to understand the second sentence. There is no theoretical or empirical justification of the hypothesis on the interaction being tested. Methods: State type of statistical analysis. Results: Is the cognitive function score treated as a categorical variable? Why then low CF is compared with SICF=17? Conclusions: Repetition of results without stating that the interaction hypothesis has not been confirmed.

Introduction:
No justification of main hypothesis to be tested. References 10-13 do not cover well the possible pathways between social integration and mortality and are mostly based on the work on participation on religious activities and mortality. There is nothing in the literature review that leads us to the interaction hypothesis.

Methods:
A comparison of the 5908 persons included in the analysis of this paper and those excluded because of missing data from the 6588 that were age 60 and over would be needed.
For the SICF, a very detailed description is given but the cut-off points for the final categories used in the analysis should be explicit. We guess that they are: 12,13,16,17

Social integration has been measured very crudely. Maybe the authors could explain better the cut-off points used for the 4 items.

The list of possible mediators between social integration and mortality is not referenced or justify. For example, how physical activity or blood pressure could be considered mediators between social integration and mortality? Even life habits such as smoking and alcohol use have been shown to have a minor role as mediators of the associations between social integration and mortality in the published literature.

Results:
What is non religious social support, on page 11?
Why many interactions were tested (gender, ethnicity, age?).
Please, include in the introduction the hypothesis that inflammation may be a pathway both for social integration and cognitive impairment and justify with available literature. This comes out in the last paragraph of the results section.
Tables format should be changed to standards in geriatrics and public health journals.
What is the meaning of the p-values column in Table 1? Why are there p-values for each category of the same variable? BMI should be model with a curvilinear function. In table 2, there is considerable overadjustment since many of the hypothesized risk factors are not associated with mortality. A more parsimonious model should be presented.

Discussion:
Please state in the introduction that low social integration may be a risk factor for cognitive decline and dementia. The literature suggests that low social integration could be a common cause or a common underlying factor for cognitive decline and mortality.
CRP is an unspecific inflammatory marker. Discuss its limitations.
Discuss the limitations of the social integration index and state what is missing from this index that could help to disentangle the associations between cognitive impairment, social integration and mortality.

Level of interest: An article of limited interest

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests:

'I declare that I have no competing interests'