Author's response to reviews

Title: Gender differences on the association of social support and social network with self-rated health status among older adults: a population-based study

Authors:

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Version: 2 Date: 10 March 2013

Author's response to reviews: see over
Dear Ms. Emily Crow,

We should be grateful if you would consider the revised version of our article entitled “Gender differences in the association of perceived social support and social network with self-rated health status among older adults: a population-based study” for publication in the BMC Geriatrics.

This is original research that is not presently under consideration for publication elsewhere. It is free of conflict of interest and was conducted applying the highest ethical principles on human subjects.

We thank for reviewers’ comments and we have responded to all of them.

Yours sincerely,

Dr. Cosme Marcelo Furtado Passos da Silva
Reviewer 1

Reviewer's report
Title: Gender differences on the association of social support and social network with self-rated health status among older adults: a population-based study
Version: 1 Date: 25 December 2012
Reviewer: Aubrey Sheiham

Reviewer's report:
This paper addresses an interesting question in a methodical manner. The data are sound. The data are clearly reported in text and tables. Limitations are clearly stated. The writing is not acceptable. There are a number of points that need to be clarified.

Major Compulsory Revisions
1. The English language used through much of the paper needs be considerably improved.
   Answer: The English language was revised and edited by Editage (http://www.editage.com/)

2. The aim of the study needs to more clearly stated. They say it is “The aim of this study was to investigate the association of social support and social networks with self-rated health (SRH) status in older adults, according to gender.” A clearer objective is “to test the hypothesis that there were differences between older men and women in relationship between self-rated health (SRH) status their social support and social networks.
   Answer: The aim of the study was changed according to reviewer's suggestion.

# Abstract, lines 7-9
Removed: “The aim of this study was to investigate the association of social support and social networks with self-rated health (SRH) status in older adults, according to gender.”
Added: “The aim of this study was to test the hypothesis that gender differences exist in the relationship between perceived social support and social networks in elderly men and women in terms of self-rated health (SRH).”

# Background, paragraph 8, lines 5-7
Removed: “Therefore, the aim of this study was to test the association of social support and social network with SRH status in elders according to gender. The hypothesis was that social support and social network characteristics differ between older men and women. In addition, it was hypothesized that the relationship of social support and social network with SRH is different between older men and women.”
Added: “The aim of this study was to test the hypothesis that differences exist in the relationship between perceived social support and social networks in terms of SRH between older men and women.”
3. Their conclusions in abstract and main paper does not encompass the main findings and how they relate to their objective.

**Answer:** The conclusions in Abstract and the Conclusion section in the paper were rewritten.

**# Abstract, lines 27-31**

**Removed:** “Conclusions: perceived and social network were associated with poor SRH in elders. Gender differences were detected in the observed associations, implying that the influence of social aspects of life on health status may vary with regards the demographic characteristics. Population strategies and public health policies aiming to promote the health of elders must consider the improvements in the social environment where they live.”

**Added:** “Conclusions: The association between social interactions and SRH is not uniform across genders. Low social network involvement is associated with poor SRH in older men, whereas low perceived social support is associated with poor SRH in older women. The hypothesis that the relationship of perceived social support and social networks to SRH differs according to gender was confirmed.”

**# Conclusion**

**Removed:** “Social support and social network were associated with poor SRH in elders after adjusting for confounders reinforcing the importance of social ties on health. The gender differences observed on the association of social support and social network with SRH imply that the influence of social aspects of life on health status may vary with regards the demographic characteristics. Strategies aiming to promote the health of elders must consider improvements in social support and social network where they live.”

**Added:** “The association of social ties with SRH is not uniform across genders. Low social network involvement is associated with poor SRH in older men whereas low perceived social support is associated with poor SRH in older women. The hypothesis that the relationship of perceived social support and social networks with SRH differs between older men and women was confirmed.”

**Minor Essential Revisions**

1. They state that “Demographic characteristics are not causal factors for diseases but their role as modifying factors on the association between risk factors for health outcomes is widely accepted.” I find that statement surprising. Can they please explain what they mean.

**Answer:** The sentence above was removed from the manuscript.

**# Background, Paragraph 7, lines 11-13**

**Removed:** “Demographic characteristics are not causal factors for diseases but their role as modifying factors on the association between risk factors for health outcomes is widely accepted”.

2. The criteria for adequate food intake is very demanding and should be excluded from the analysis. Unsurprisingly, a small proportion complied with the recommendations to eat 5 portions of fruits and vegetables a day.

**Answer:** The variable food intake was removed from the manuscript. The statistical analyses were performed again excluding the variable “adequate food intake”. The
hierarchical multivariate logistic regressions stratified by sex were performed again because of the comments of Reviewers 1 (Minor Essential Revisions, item 2), Reviewer 3 (Minor Essential Revisions, item 3) and Reviewer 4, items 3 and 8. The Results section were edited.

# Abstract, lines 20
**Removed**: “Inadequate food intake and”

# Methods, Covariates, Health-related behaviours, lines 3-4
**Removed**: “and adequate food intake (Yes: daily consumption of at least 5 portions of fruits and vegetables/No) [30].”

# Results, paragraph 2, line 8
**Removed**: “adequate food intake,”

# Results, paragraph 4, line 12
**Removed**: “inadequate food intake,”

# Tables 1, 2, 3 and 4, and Figure 1
**Removed**: “Adequate food intake” variable.

# References

3. Income. As such a high proportion of the women were not employed, how was their income assessed?
**Answer**: Income assessment included retirement pension or paid work. This information was inserted in the article.

# Methods, Demographic and socioeconomic variables, lines 3-5
**Added**: “Income from retirement pension or paid work was classified into four groups, where 1 represents the minimum wage (0.0–1.0; 1.1–3.0; 3.1–5.0; 5.1 and above) [36].”

4. Related to point 3 above, what proportion of the sample where husband and wives and lived in the same household?
**Answer**: In this study, the sample was selected in two stages to represent the 10 Administrative Areas of Health Planning of the city of Rio de Janeiro (See Methods, paragraph 3). In the second stage of selection, the pattern of interval was proportional to the frequency of individuals vaccinated in the previous year of the study (See Methods, Sample design and data collection, paragraph 3). Therefore, because of the sampling design, we can assume the participants were not relatives and did not live in the same household. This information was inserted in the manuscript.

# Methods, Covariates, Demographic and socioeconomic variables, lines 5-8
Added: “Information about kinship between participants was not collected. However, since they were systematically drawn at the vaccination posts it can be assumed they were not relatives nor lived in the same household.”

5. Opening sentence of abstract needs rephrasing. They say “Older adults tend to isolate themselves from family and society, which might affect their health status.” May be related to English usage. Sounds as if they want to isolate themselves.

Answer: The first sentence of Abstract was changed.

# Abstract, lines 1-5

Removed: “Older adults tend to isolate themselves from family and society, which might affect their health status.”

Added: “Information about kinship between participants was not collected. However, since they were systematically drawn at the vaccination posts it can be assumed they were not relatives nor lived in the same household.”

Level of interest: An article of importance in its field

Quality of written English: Not suitable for publication unless extensively edited

Answer: The English language was revised and edited by Editage (http://www.editage.com/)

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'
Reviewer 2

Reviewer's report

Title: Gender differences on the association of social support and social network with self-rated health status among older adults: a population-based study

Version: 1 Date: 9 January 2013
Reviewer: Hye-Kyung Kim

Reviewer's report:
In the section of background, it should be noted that the previous research about social network and social support in Brazilian elderly. In addition, more recent reference should be referred.

Answer: The literature search was revised. Studies that investigated the relationship between social support/social network and health outcomes in Brazilian older adults were included and recent references replaced the old ones. The Background and Discussion sections were edited.

# Background, paragraph 3, lines 5-17
Removed: “Several studies have documented that low levels of social support and social networks can increase the risk for morbidities, dementia, functioning decline and mortality in older adults [6-9]. The association between lack of social interactions and poor perceived measures of health, including health-related quality of life and self-rated health (SRH), has been also demonstrated [10-13].”

Added: “Several studies have documented that low levels of social support and social networks can increase the risk for morbidity, sleep problems, functional decline, and mortality in older adults [3,9–11]. Perceived social support influenced leisure-time physical activity in adults [12]. In addition, older adults who participate in community groups have a greater probability of being more physically active [13] and those with more visits from their children or relatives in the previous month were less prone to binge drinking [14]. The association between a lack of social interaction and poor perceived measures of health, including health-related quality of life and self-rated health (SRH), has also been demonstrated [15–23]. A recent study involving 139 countries showed that despite the evidence of cross-national variation in the association between social support, volunteering, and SRH, the link between social capital variables and SRH is not restricted to high-income countries [22].”

# Background, paragraph 5, lines 5-6
Added: “The association between participation in community groups and physical activity was observed in only older women [13].”

# Discussion, paragraph 3, lines 7-10
Added: “In addition, analysis involving 139 low-, middle-, and high-income countries showed that social participation (defined as volunteering for an organization) was associated with positive self-perceptions of health in older adults [22]. A similar finding was also reported in a cross-sectional study in Brazil [19].”

# Discussion, paragraph 3, lines 13-14
Added: “In addition, social network was associated with poor SRH in men in our study as well as in others [15,23].”

# Discussion, paragraph 3, lines 17-19
Added: “A previous study showed differences on the relationship between social networks and SRH between men and women aged 18 or over [23].”

# Discussion, paragraph 4, lines 7-11
Removed: “The quality and extent of ties and social norms originated from social groups also influence the patterns of health-related behaviours and people’s access and use of medical care [20].”
Added: “The quality and extent of ties and social norms originating in social groups can also influence health through health-related behaviours such as physical activity, binge drinking, functional capacity, cost-related medication non-adherence, and people’s access to and use of medical care [11–14,28,47].”

# Discussion, paragraph 5, lines 6-10
Removed: “However, this hypothesis is still poorly understood.”
Added: “Another potential explanation is the difference in the role of social interactions in lifestyle and health-related behaviours between older men and older women. In a recent study, older women participating in community groups presented a greater probability of being more physically active. However, this association was not found in older men [13].”

# References
Removed:


**Added:**


**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.
Reviewer 3
Reviewer's report
Title: Gender differences on the association of social support and social network with self-rated health status among older adults: a population-based study
Version: 1 Date: 10 January 2013
Reviewer: Wendy Birmingham

Reviewer's report:
The current study examines a cross-sectional sample of older adults to determine if social support processes are associated with self-rated health according to gender. While the area of research is interesting and the findings are interesting, some issues left me less than enthused with this paper. My feeling is that some of the issues could be solved by having a native-English speaker read and edit the paper for language and sentence structure. Other issues are listed below:

**Answer**: The English language was revised and edited by Editage (http://www.editage.com/)

1. The Title appropriately conveyed the study
2. Limitations are clearly stated.
   - Major Compulsory Revisions
3. Quality of written English was poor. A native-English speaker who understands the study is needed to review and revise the manuscript.
   **Answer**: The English language was revised and edited by Editage (http://www.editage.com/)

4.
5. While I understood the rational for this study, I don’t think it was well set up, nor well defined.
   **Answer**: The rationale for this study was edited at the Background section of the manuscript. The rationale for this study was based on potential influence of social relationships on health. The literature on social networks, social support and health in elderly people was updated. In addition, it was emphasized the differences of social connections between genders in older adults and their possible role on health outcomes. Figure 1 was developed to illustrate rationale and the conceptual model of the relationships of social support, social network and other independent variables with SRH.

6. The authors’ definition of social support and social networks is less than adequate. Social support and social networks should be more well-defined (networks being the web of social relationships that we maintain; support being the structures of an individual’s social life and the function they may serve, such as emotional support, informational support, belonging support and tangible support). The authors say that social support is usually referred to as “some kind of perceived assistance that people receive …” and then go on to describe belonging support. There are differences between the benefits from received support and perceived support.
The definition of perceived social support and social networks was changed. The terms “social support” were replaced by “perceived social support” according to Reviewers 4, item 11.

**# Methods, paragraph 9**

**Removed:** “Social support was measured considering any formal or informal relationships that may provide some type of specific or unspecific support [25]. Two questions were used to assess social support: 1. “With whom do you live?” (Alone/Accompanied), 2. “Are there any people with whom you can count on or someone you can ask for help?” (Yes/No).”

**Added:** “The perceived social support measure focused on the structure of interpersonal relationships and the functional components of social support [32]. Structure of perceived social support refers to the existence of social relationships (e.g. marital status), the most frequently measured in terms of the existence of or contact with potentially supportive persons [32]. This was assessed through the following question: ‘With whom do you live? (Alone/Accompanied)’. Functional social support refers to the degree to which interpersonal relationships serve particular functions. This is the perceived availability of instrumental social support considering any formal or informal relationships [32]. The question used to assess functional social support was, ‘Are there any people you can count on or whom you can ask for help? (Yes/No).’”

**# Methods, paragraph 10, lines 1-3**

**Removed:** “The evaluation of social networks included the frequency of social contacts and social relationships as well as some form of social participation [33].”

**Added:** “Social networks were considered the ‘web’ of social relationships surrounding the individual and the characteristics thereof, groups of people in contact with the individual, or some type of social participation [33].”

7. Many of the references are quite old. There are certainly more current studies that would support the authors claims. Additionally, many of the references are not in English which makes it difficult for me to determine their application to the manuscript. As well, when I wanted to check the article cited for the SRH measures, it too was not in English.

**Answer:** The references were updated (See answer to reviewer 2). Old references and those not in English were replaced by recent ones. The article cited for SRH measures (Szwarcwald et al 2005) was published in English language (See Methods, paragraph 8).

8. I’m concerned with the validity of the questions ascertaining social support or social networks. Is there validation of these measures?

**Answer:** Methods used to assess social support and social networks are quite varied due to different definitions of social support and social networks and to the lack of a clear conceptualization of these concepts. There are no validated questionnaires to assess social support and social networks for Brazilian older people. Although the questions used to assess social support and social networks were not previously validated for the studied population, they were based theoretical constructs.
Social support items were derived from the MOS social support theory (See reference 32) and social networks items were developed from Berkman and Syme study (See reference 33).
This aspect was included in the Discussion section as a limitation of the study.

**# Discussion, last paragraph, lines 5-7**

**Added:** “Although the items used to assess social support and social networks were derived from theoretical constructs, they were not previously validated for the studied population”.

- **Minor Essential Revisions**

  1. In the abstract the authors note that older adults tend to isolate themselves from family and society which might affect their health. My tendency when reading this sentence would be to believe that older adults self-isolate, but older adults may be isolated because their spouses may have died, close friends may have died, health infirmities may limit their ability to get out of the house and socialize. I would request that the authors reword this introduction to more fully represent the unique challenges of aging on social support that may or may not be self-inflicted.

    **Answer:** The introduction of the Abstract was changed according to Reviewers suggestion.

  2. In the methods section, I am unclear how the sampling was obtained. This seems to be mostly because of the sentence structuring and I believe a native English speaker would be able to correct some of the sentencing problems.

    **Answer:** The description of the sampling was revised in order to clarify how the sample was obtained. In addition, the English language was revised and edited by Editage (http://www.editage.com/)

**# Methods, paragraph 3**

**Removed:** “A two-stage systematic sampling was used to represent elderly people from the 10 administrative areas of the city of Rio de Janeiro. Initially, 60 vaccination posts were systematically selected according the population size with 60 years or more of age in the area covered by each vaccination unit. Then, a systematic sample of older adults was drawn. In this stage, the pattern of interval was proportional to the frequency of individuals vaccinated in the previous year of the study. Further details are available elsewhere [31].”
Added: “The sample was selected in two stages to represent the 10 Administrative Areas of Health Planning of the city of Rio de Janeiro; these were considered the Primary Unit of Selection (PUS). In the first stage, a systematic sample of 60 vaccination posts (Secondary Unit of Selection), distributed among 49 health care units, was drawn without replacement, considering the proportional probability to the population size of the corresponding PUS. The 60 vaccination posts were distributed in order to assure the disaggregation and representativeness of the PUS. In the second stage, a systematic sample of older adults (Tertiary Unit of Selection) was selected from each vaccination post for individual interviews. In this stage, the pattern of interval was proportional to the frequency of individuals vaccinated in the prior year of the study. Further details are available elsewhere [31]. Sixty-seven older adults were selected from each vaccination post resulting in 4,003 interviews.”

3. In the demographic information: education should be listed in a way that is relatable to other educational systems. The income measures should also be listed in a way that is relatable to, perhaps, poverty levels. I do not understand what “minimal wage” levels equate to.

Answer: Education and income have been categorized in different ways in epidemiological studies. There is no consensus on how these variables are listed even in the papers published at BMC Geriatrics. The categories of education and income were redefined based on a recent paper conducted in Brazil published at the BMC Geriatrics: ‘Prevalence and correlates of dizziness in community-dwelling older people: a cross-sectional population based study. BMC Geriatrics 2013,13:4’.

# Methods, paragraph 11 - Covariates, Demographic and socioeconomic variables, lines 1-5
Removed: “Covariates included demographic data on age and sex, socioeconomic characteristics for educational level, income and current occupation. Educational level ranged from ‘0 to 7 years’, ‘8 to 11 years’, ‘12 to 16 years’ and ‘17 or more years’ of schooling. Income was categorized as following: ‘< 1 minimal wage (MW)’, ‘1 to < 2 MW’, ‘2 to < 4 MW’, ‘4 or more MW’.”

Added: “Demographic and socioeconomic variables consisted of age, gender, occupation (current worker or not), and years of schooling (classified as illiterate, 1 to 4 years, 5 to 8 years, and 9 years or more). Income from retirement pension or paid work was classified into four groups, where 1 represents the minimum wage (0.0–1.0; 1.1–3.0; 3.1–5.0; 5.1 and above) [36].”

# Tables 1, 2, 3 and 4
“Educational level (years)” was replaced by “Years of schooling”

The categories ‘0 to 7 years’, ‘8 to 11 years’, ‘12 to 16 years’ and ‘17 or more years’ were replaced by ‘illiterate’, ‘1 to 4 years’, ‘5 to 8 years’ and ‘9 years or more’.

The categories ‘< 1 minimal wage (MW)’, ‘1 to < 2 MW’, ‘2 to < 4 MW’, ‘4 or more MW’ were replaced by ‘0-1.0’, ‘1.1-3.0’, ‘3.1-5.0’, ‘5.1 and above’

# References

4. I need more information regarding “use of health services” being assessed by “health insurance”. Does this mean that someone who does not have health insurance does not use health services at all?  
**Answer:** Health care services in Brazil are offered by the National Health Care System through state-funded health care units and by health insurance companies. People without health insurance usually look for health care at public health services of the National Health Care System.

5. There were several typos, and serious sentence structure issues. A native English speaker who understands the study is needed to review and revise the manuscript.  
**Answer:** The English language was revised and edited by Editage (http://www.editage.com/)

**Level of interest:** An article whose findings are important to those with closely related research interests  
**Quality of written English:** Not suitable for publication unless extensively edited  
**Answer:** The English language was revised and edited by Editage (http://www.editage.com/)

**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
Reviewer 4
Reviewer's report
Title: Gender differences on the association of social support and social network with self-rated health status among older adults: a population-based study
Version: 1 Date: 11 January 2013
Reviewer: S Kumar
Reviewer's report:
This paper examines the gender differences in the association between social support, social network and self-rated health (SRH) among older adults in Brazil. This is an interesting paper with credible findings- results indicate a strong association between social capital and SRH and strength of the association varied by gender of the respondents. The paper is well written and clear. The paper contributes to knowledge in this area. I have following comments to improve the paper.

1. Readers would benefit if the name of the city/country is included in the title of the paper.
   Answer: The name of the country was included in the title.

2. Could you provide one-two line motivation for using the hierarchical model?
   Answer: The motivation for using hierarchical model was inserted in the manuscript.

# Methods, paragraph 18 - Statistical analysis, lines 4-9
Removed: “The stepwise forward selection of variables in different blocks was used according to the theoretical framework presented in Figure 1.”
Added: “The hierarchical analysis stepwise forward selection of variables in different blocks was used according to the theoretical framework presented in Figure 1. This analytical approach is recommended when the study aims to test the effect of a postulated risk factor on an outcome derived from a conceptual framework describing the hierarchical relationships between risk factors [39].”

# References
3. Table 3: Model 6 in table 3 does not include “social network” as a predictor. Authors claim to have used “forward selection” technique to choose which variable to use based on significance. I would argue to include social network in the final model as it is an important measure of social capital. Or have a model 7 that includes social network variable.

**Answer:** The variable “social network” was included in all Models in Table 3 and Table 4, including Models 6.

4. Table 4: Model 6 includes social network and the coefficient is significant. Since the main objective of this paper is to detail the gender differences in the association between social capital and SRH, it would be incorrect to compare odds ratios in models table 3 and 4 as included variables are not the same.

**Answer:** The odds ratio in models 3 and 4 were not compared.

5. How about combining table 3 and 4 by running one single model with gender as an interaction variable with different measures of social capital.

**Answer:** The suggestion of the reviewer is interesting but the findings obtained by running one single model with gender as an interaction variable would not be in accordance with the aim of the study: “to test the hypothesis that gender differences exist in the relationship between perceived social support and social networks in elderly men and women in terms of self-rated health (SRH).” To achieve this objective separate models for men and women are needed.

6. Are odds ratios statistically different across gender- you can test it?

**Answer:** No, the odds ratio across genders were not tested and were not statistically compared.

7. Could you provide some explanation why ORs for social support among women is significant but it not among women; while contrary is true about social network (significant in men).

**Answer:** Possible explanations for the differences in the relationship between perceived social support and social networks in older men and women in terms of self-rated health are presented in paragraphs 4 and 5 in the Discussion section. In the revised version of the manuscript these explanations were expanded.

8. Health insurance and usage of health services are important predictor or SRH model 6 should always include these variables.

**Answer:** As suggested by the present reviewer, health insurance and use of health services were maintained in all statistical models. The hierarchical multivariate logistic regression was performed again because of the comments of Reviewers 1 (Minor Essential Revisions, item 2), Reviewer 3 (Minor Essential Revisions, item 3) and Reviewer 4, items 3 and 8. The Results section was edited.

# Methods, paragraph 18 - Statistical analysis, lines 15-17

**Added:** “Use of health services variables (4th block) were maintained in all models because they are important predictors for SRH.

# Abstract, line 19-26

**Removed:** “Results: Male older adults without social networks were more likely to report poor SRH, OR 1.56; 95% CI 1.10-2.20, while lack of perceived social support increased the odds of poor SRH in female older adults, OR 1.70; 95% CI 1.26-2.30.
Poor SRH remained associated with low income, poor functional capacity, number of somatic health problems and depression in both men and women. Occupational status was also associated with poor SRH in males and females, respectively."

**Added:** “Results: Older men without social networks were more likely to report poor SRH, (OR = 1.55; 95% CI = 1.08–2.23), while lack of perceived social support increased the probability of poor SRH in older women (OR = 1.65; 95% CI = 1.21–2.24). Poor SRH continued to be associated with low income, occupational status, poor functional capacity, and depression in both men and women. Absence of health insurance, number of somatic health problems, and joint diseases were also associated with poor SRH in women while regular physical activity and age continued to be associated with poor SRH in men.”

### Results, paragraph 3, lines 11-15
**Removed:** “In the final model (Model 6), women without a person to count on (perceived social support) showed 1.65 higher odds for poor SRH. Other characteristics associated with poor SRH in women were low income, no current job, absence of health insurance, low independence on performing daily activities, more number of somatic health problems, joint diseases and depression (Table 3).”

**Added:** “In the final model (Model 6), women without perceived social support showed 1.65 higher probability of poor SRH. Other characteristics associated with poor SRH in women were low income, lack of current employment, absence of health insurance, low independence in daily activities, greater number of somatic health problems, joint diseases, and depression (Table 3).”

### Results, paragraph 4, lines 7-14
**Removed:** “In the fully adjusted model (Model 6), men without participation in group activities were 1.56 times more likely to poor SRH compared to those reporting participation in group activities (95% 1.10-2.20). In addition, the odds of poor SRH were significantly higher for men with income between 1 and 2 minimal wages (compared to those with income ≥ 4 minimal wages), inadequate food intake, low independence on performing daily activities, more number of somatic health problems and depression (Table 4).”

**Added:** “In the fully adjusted model (Model 6), men without participation in group activities were 1.55 times more likely to report poor SRH compared to those reporting participation in group activities (95% CI = 1.08–2.23). Furthermore, the odds of poor SRH were significantly higher for men with low income, lack of current employment, no regular physical activity, low independence in daily activities, and depression. Older men aged between 70 and 79 years showed lower odds of poor SRH compared to those between 60 and 69 years of age (Table 4).”

9. Kumar et al. (2012) have analyzed the gender differences in the association between social support and SRH- could you compare your results with the result in that paper in Brazil. I understand that the sample in the current paper is restricted to Rio De Janeiro; however a comparison would still benefit the readers. Social support, volunteering and health around the world: Cross-national evidence from 139 countries Social Science & Medicine, Volume 74, Issue 5, March 2012, Pages 696-706
Answer: The literature search was revised and updated (See answer to reviewer 2). The Kumar et al (2012) study was included and their results were compared against our findings. See Discussion section, paragraph 3, lines 1-10:

“There are several studies on social connections and SRH [15–20,22,23]. The association between involvement or exclusion from formal and informal networks and SRH in individuals aged 18 and above was observed in Russia [16,23]. The number of friends willing to help (auxiliary friends) and membership in any religious group were significantly associated with good SRH in adults in Finland and Sweden [15]. A higher likelihood for poor SRH was found in men and women with low friendship social support [15,20,22]. In addition, analysis involving 139 low-, middle-, and high-income countries showed that social participation (defined as volunteering for an organization) was associated with positive self-perceptions of health in older adults [22].”

10. In the discussion section, last paragraph, last sentence, authors mention cross-sectional design of the sample as limitation since causality cannot be established. This is an odd statement as now we know that by using sophisticated econometric techniques, causality can be established even in the cross-sectional data (Instrumental variables, matching technique etc.)

Answer: We agree with the reviewer. However, since sophisticated econometric techniques were not used in this study, the limitation regarding causality was maintained. The text was changed.

# Discussion, last paragraph, lines 7-10
Removed: “The cross-sectional design is another limitation and causal links between social support and social network and SRH cannot be inferred.”

Added: “The cross-sectional design is another limitation since econometric techniques were not used, and causal links between perceived social support, social networks, and SRH could not be inferred.”

Discretionary:
11. Self-rated health (SRH): The strength of the paper is offset by the method used to measure SRH, indexed by single-item measure. Though this could be data limitation, but the paper does not recognize the limitation of single-item measure, I think there is an extensive literature on this. SRH in this paper is subjective measure as perceived by the respondents. Many papers lack data on the objective measures of health (so they use SRH), but this paper has a few objective measure of health status (Functional status and somatic health problems; health related behaviors)- why not use these measures as outcomes in addition to SRH. Similarly, social support is perceived not actually received, so mention the word “perceived” throughout. There is a distinction between perceived vs received.

Answer: The suggestion of the reviewer is interesting. However, the pre-established hypothesis considered self-rated health as the outcome of interest. Including additional outcomes, such as self-reported somatic problems and health related behaviours would take the focus off of what was the main objective. In addition, the length of the paper would increase significantly. Future analysis considering other potential status as outcome can be performed and published.

The terms ‘social support’ were replace by ‘perceived social support’ throughout the manuscript, including title, text, Figure and Tables.
12. I am also concerned with the multicollinearity among variables in 3rd, 4th, and 5th blocks. This could be a reason for insignificant results. You can look at variance inflation factor to check the multicollinearity problem.

**Answer:** As suggested by this reviewer, multicollinearity among all independent variables used in multivariate analysis was tested using Variance Inflation Factor. Multicollinearity was not detected. This information was inserted in the manuscript.

# Methods, paragraph 18 - Statistical analysis, lines 17-18

**Added:** “Multicollinearity was not detected between perceived social support, social networks and covariates in a Variance Inflation Factors analysis.”

**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 have no competing interests

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Caetano SC was involved in design of the study, acquisition of data, analysis and interpretation of the data, interpretation of the results and drafted the manuscript. Passos da Silva CMF developed the statistical framework for data analysis, conducted the statistical analysis, interpreted the data and reviewed the manuscript. Vettore MV was involved with the conception and design of the study, developed the statistical framework for data analysis, and drafted the manuscript. All authors read and approved the final manuscript.”

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We are grateful to the coordinators, supervisors and examiners of the ‘1st
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