**Author's response to reviews**

**Title:** Sarcopenic obesity and physical performance in middle aged women: A cross-sectional study in Northeast Brazil.

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**Author's response to reviews:** see over
Reviewer: Amanda Salis

1. In the Abstract, it is incorrect to say that the current findings “may represent a distinct phenotype in middle aged women”, because no other population besides middle aged women was studied in the current investigation.

   We accepted the suggestion and changed the phrase to: “Sarcopenic obesity may occur in middle aged women with performance limitations beyond pure sarcopenia-related muscle mass or obesity alone”.

2. References are needed for the sentence on lines 78-79.

   The references were added.

3. Throughout the article, in the Abstract, Methods, Results and Discussion, it will be helpful to mention explicitly that knee flexion and extension strength were determined by isometric dynamometry (as opposed to isokinetic dynamometry), as different methods of muscle strength assessment can give different outcomes.

   We appreciate and agree with the comment and added the information about the isometric dynamometry.

4. On line 209, there are two dollar signs, presumably referring to different currencies. The country of each currency mention should be defined.

   We corrected the signs and put the country of each mention (R$ - Brazilian Real and USD – United States Dollar).

5. On line 212, 3MW needs to be defined.

   Family income was dichotomized as less than 3 MW and 3 MW or more. In the beginning of this paragraph we have explained what is the MW - “Family income was categorized according to the Brazilian minimum monthly wage (MW), which is the lowest remuneration that employers may legally pay workers - At the time of the
interview, the MW was R$ 678.00 (Brazilian Real) per month (approximately $250USD/month)”. We added “3MW = R$ 2.034/$ 750” to better comprehension of definition in the text as it was suggested.

6. Some of the data from the tables is repeated in the text of the Results section. Data should be shown in the table OR in the text, not in both places.

   Some of the results we have shown to highlight the characteristics of the sample as low education, low income and physical inactivity, however we removed some of the results, as it was suggested.

7. Greater statistical evidence is needed for the following statement: “It also appears that obesity and sarcopenia impose a synergic ill effect on physical performance”. For instance, Table 4 should show whether or not the S and SO groups are statistically significantly different from each other. Also, as the trend for differences between the S and SO groups appear present mainly in activities and muscles related to weight bearing (knee strength, standing time), could this interaction effect simply be due to the greater weight that SO participants are carrying, relative to people with sarcopenia that are not obese?

   We have put that “It also appears obesity and sarcopenia impose a synergic ill effect on physical performance” since the sarcopenic obese women showed worse physical performance beyond pure sarcopenia or obesity alone. The non-sarcopenic obeses, for example, have shown similar results to the normal women for strength. We have shown the legend in the table 4 for all the statics differences.

   We agreed that the excess of weight can contribute to the worst performance in the chair stand test, however the sarcopenic obese women needed even more time to perform the activity (worse performance). It is best demonstrated when we look at differences in the spent time for chair stands. For sarcopenic obese women, it took on average 1.18 seconds longer than normal women to perform the test, which is more than what would be expected by adding the excess time of obese women compared to normal women (0.40) and the corresponding excess time in sarcopenic women (0.05).

   In relation to the strength, it have occurred the same: the sarcopenic obese women were weaker on average than the others. In addition, in relation to the strength,
obese women - with and without sarcopenia - presented totally different results, with the women only obese showing the best values (15.73 (IC: 15.08-16.39) and 17.57 (IC: 17.01-18.13) for flexion and extension knee strength) and the sarcopenic obese women presenting the worst values (11.41 (IC: 9.73-13.08) and 14.16 (IC: 12.73-15.58) for flexion and extension knee strength) in the adjusted analysis.

8. On line 310, what is meant by ‘At the healthier end of the spectrum’? This should be defined objectively.

   We agreed that this phrase was not clear and objective, therefore we have reformulated the phrase.

9. Line 133 should specify whether the investigations were done in a single center.

   We added the information that was in a single center. Women were recruited by advertisements in all primary care centers across the city and evaluated in a single community health center.

10. SDs should be shown with a plus or minus sign OR a bracket, not both. This applies to the Results section as well as the Tables.

   We adjusted this suggestion in the results section and in the tables. We removed the brackets and kept the plus or minus signs.

11. On line 294, the word ‘knee’ would be more appropriate than ‘knee’s’.

   We adjusted it as suggested.

Cover letter – point by point

**Reviewer:** Patricia Jarosz

1. This study needs to describe their rationale and criteria for defining SO. In the introduction (lines 105-108) and also in the method section (line 169), it is not
adequately described as to why obesity was operationally defined as waist circumference. The authors need to more clearly indicate why waist circumference, a measure of abdominal obesity, was selected over BMI or percent body fat (measures of overall obesity) in middle aged women. The definition of sarcopenia obtained with BIA is adequately described in lines 187-190.

Janssen et al. (2004) [1] have described their results suggesting that waist circumference is a better marker of health risk than is BMI, and consequently a greater emphasis should be placed on waist circumference in the obesity classification system[1]. The waist circumference may provide an estimate of increased abdominal fat even in the absence of a change in BMI, avoiding some misclassification. In addition to, some recent papers from Kim et al. (2012) [2] and Ryu et al. (2013) [3] also have considered the obesity by the waist circumference in the definition of sarcopenic obesity. We added the comment about this and the reference of Janssen et al. (2004) [1] in the methods. Since we have defined SO in the introduction (lines 90-91), we decided to add this explanation about the waist circumference in the methods section.

2. In the discussion section, the authors of this study recognize the problem of defining SO (lines 302-303). In this section of the discussion (lines 302-318), prevalence of SO from other studies is reported. How did these studies define sarcopenia and obesity? Did any of them use waist circumference or BIA? Are you comparing apples to apples? Did this study define and measure sarcopenia and obesity like the other studies?

As we have described in the discussion, due to the lack of a standard definition for SO, it is difficult to compare its prevalence across populations. In addition, in the eyes of clinicians and researchers, SO is more a problem for older women and has seldom been studied in middle aged women. We put some references describing the few existing studies reporting wide-ranging results. For example, we cited a Korean study that found the prevalence of SO varying from 0.8 to 11.8% in women between 40 and 59 years, according to different indices of definition [4]. We cited some studies in older women using different method (DEXA instead BIA) in the discussion, however the BIA present good correlation with DEXA. In addition, although the BIA it is not the gold standard, it is used in research [5] and it is a reliable alternative for evaluation of body
composition and it has advantages of being portable, lower cost and not exposing subjects to radiation.

In relation to the waist circumference we discussed about it in the previous question: “Janssen et al. (2004) [1] have described that their results suggesting that waist circumference is a better marker of health risk than is BMI, and consequently a greater emphasis should be placed on waist circumference in the obesity classification system. The waist circumference may provide an estimate of increased abdominal fat even in the absence of a change in BMI, avoiding some misclassification. In addition to, some recent papers from Kim et al. (2012) [2] and Ryu et al. (2013) [3] also have considered the obesity by the waist circumference in the definition of sarcopenic obesity”.

References


