Author's response to reviews

Title: Health indicators correlate with physical activity level change in old age: longitudinal results from a population in Sao Paulo, Brazil.

Authors:

Marcela T Ferreira (marcelatellesferreira@hotmail.com)
Sandra MM Matsudo (sandra@celafiscs.org.br)
Manoel CSA Ribeiro (mcrmacal@terra.com.br)
Luiz R Ramos (lrramos@unifesp.com)

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Author's response to reviews: see over
Author: Thank you for all your suggestions and I would like to explain that some words have been changed in the article (other reviewer suggestion).

Words
“Favorable or Not favorable change in PAL” → Favorable or Not favorable behavior trends in PAL.
“Sedentary” → Physical inactivity in leisure time or just physical inactivity.
“Variables” → “Health-related factors”
“Reduced” → “Decreased”

“A big deal is the year of the research. The study takes data from the “Epidoso Project”. The data were analyzed in 1991/1992 first stage and 1993/1994 as a two year follow up. The only thing I have for this is the difference of almost twenty years between the study was done and publishing the results. It is possible that current society of elderly people within the Brazil will have different knowledge, experience, and education in healthy lifestyle and different fears. I would warmly prefer to use this fact as the limit of the study; if not we cannot generalize results for current population of elderly and have to set this as a historical analysis of the conditions twenty years ago (Major Compulsory Revisions).

The problem of “old” data was said already, but I would really want to clarify whether the data is still relevant for generalization or we can set this study just as a description of historical study (Major Compulsory Revisions).

Author: We included in the limitation section that this time is not necessarily a limitation because what is really important is the phenomenon (“association”), and if the data is still relevant or not to current elderly population it is not our main interest. Besides that, if we compare epidemiological data from nowadays to 20 years ago, it might be not very different in relation to risk factors and behavior trends. The relationship between PAL and health-related factors is not related with the time that data were collected. Moreover, it is necessary to analyze data from our country because we have experienced a great increase in elderly population during the last decades and life expectancy has been increased significantly also.

Fragment included in article.
“Finally, the difference of almost twenty years between the first stage of the Project and the publication of the results is negligible, while our main purpose was to verify the relationship between health-related factors and PAL trends.

“There was any intervention within the two years of follow up. We have just the information that we got data from first stage and after two years repeating measures. Nothing is written there what was between, how the respondents were kept in contact etc. There are references for the project, but basic introduction should help reader to understand what the core of the project was.”
Author:

Background
In background section, according to “instructions for authors” of BMC PH, we included a summary of a search of the literature to indicate why our study was necessary and what it aimed to contribute to the field and also the section should end with a very brief statement of what is being reported in the article. We have been done that and afterward, we described briefly the project, the main objective of the project (“searching for factors associated with healthy aging and risk factors for mortality”) and the objective of our study “used data from the Epidoso Project to identify health-related factors or variables that independently influence changes in physical activity level over the course of two years among the elderly”.

Methods
In methods section we described the project with more details and the main purpose of the project “longitudinal study that has aimed to identify predictors of mortality among the elderly since 1991.”
However, the objective of our study was different from the whole project and we have mentioned in abstract and background sections.
In page 5 line 4 we have explained that “No intervention procedure was conducted during this period.”
We wrote some details about how the respondents were kept in contact in the article. “In addition, after the first wave, sample was followed up on an outpatient basis with routine assessments every 6 months during the study period, with access to a multidisciplinary team.”

“A concern is the use of covariates in the analysis. Why the age groups had been selected so differently (65-69; 70-79; 80+). If we are classifying the elderly, in elderly studies the categories are 60-75 (presenilis), 76-89 (senilis) and 90+ (“whitebeard”). These categories demonstrate biological changes in PA level, mental, somatic and social level (somatic development). Authors may try to reclassify the groups (Discretionary Revisions).”

Author: We have followed the age categories from several studies:


“RESULTS - authors start with the sample size and missing data (Minor Essential Revisions). I think this should be still part of the methods. However a lot of information was presented for those excluded from the study. It can confuse the reader whether you are still talking about the characteristics of the sample or about the excluded ones. It is not necessary to describe sample that was not included in the study. Do all the descriptive for the sample you used.”

Author: We consider the inclusion of no respondents in the article because presents information about the profile of total sample (initial) of the Epidoso Project, and our data is a subsample of this whole sample. Furthermore, significant differences between...
respondents and not respondents may affect the association between health-related factors and PAL and could be considered a limitation of our study. Consequently, considering this information important and considering that respondent’s characteristics should be described, we did not exclude this information however, we included in methods section. The other reviewer didn’t include this suggestion as part of the review. We considered that some articles have included differences between respondents and missing data. For an example:


“Study population
This was a cross-sectional study of a representative sample of Vietnamese adults aged 25–64 years living in HCMC. The sample size was calculated to yield prevalence estimates for NCD risk factors with the expected precision of ± 8%. A total of 1981 of the 2355 invited adults aged 25–64 years participated in the study (response rate 84.1%). After eliminating records that had missing information on physical activity (for each domain or all, 70 records) or over-reported on total of minutes spent in physical activity per day (> 1440 minutes/day, 5 records), the final usable sample size was 1906 (missing 3.8%). There were no significant differences in socio-demographic characteristics between the usable sample and the respondents with missing physical activity data (p > 0.05).”


We have also rewritten methods section for a better understanding as suggested by the other reviewer.

Table 1 is confusing reader. There are two stages: PA level (baseline) and PA level (after two years). The numbers are telling the percentage of respondents who were sedentary etc., however there is no comparison, what was the level at the baseline and after two years. Revise this (Major Compulsory Revisions).

Author:
Table 1 describes only baseline characteristics of respondents, and then we could not include PAL after two years (follow-up).

In table II we described PAL at baseline (physically inactive, insufficiently active and active) in the left column and in the right column what happened (trends – changes or maintenance) in PAL with each group classified at baseline after two years. Measures of comparison between the two periods were not made because it was not our purpose. We made a figure than will substitute table II. We think that content will be easier to understand. Also we described with more details data about content of figure.
Figure 1: Distribution (%) of physical activity level after two years among older individuals in São Paulo, Brazil

Table 3 describes it more clearly.

Table III – As mentioned in methods section we classified first elderly in PAL (physically inactive, insufficiently active and active) in baseline, then we grouped each group according to changes or maintenance of their PAL after two years in other groups (reduced, increased or maintenance), ending with two groups (“favorable behavior trends or not favorable behavior trends) to make multivariate logistic regression model.

Methods

Page. Last line. “independence in daily life activities” More often is written “activities of daily life” (further on text you use the term “ADL=activities of daily living). Make the terms uniform consistently across the whole paper (also leisure PA, leisure time PA etc.). ok

Are there any current Brazilian physical activity guidelines for health? If yes why these were not used in place of the American PA guidelines? References that are mentioned within the text are probably incorrect cited here (Discretionary Revisions).

Authors: In Brazil we use the same PA guidelines for health as in USA – ok (ACSM, WHO and CDC recommendation).

Page 5. References “American College of Sports Medicine [12] and Center of Disease and Prevention Control (CDC) [28]”. Numbers of the reference probably belong to some other reference! (Minor Essential Revisions) –

Author: Reference number 12 included a special communications: position stand about Exercise and PA for Older Adults written for the ACSM by the authors cited in the article. And reference 28 is also correct - “Physical activity and public health: a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine.” – ok
“Scoring of these variables would be reader friendly more if you will present it in tables (Discretionary Revisions).”

Author: Since we have already presented scores in table 1 to describe baseline characteristics (all the variables with each respective score), we preferred to describe scores in the text (methods section). If we present the scores in tables it will be two tables representing almost the same content.

Statistical Analyses
I am not the statistician but I gave authors some suggestion how to interpret data in different way. Try to combine more statistics to see the differences in repeated measures. (Discretionary Revisions).

Author: Our main purpose was not to compare physical activity levels but to identify possible factors that influence changes or maintenance in PAL. Our main focus was to convert or translate these changes in a “delta” that could be subsequently converted (“translate”) into a qualitative variable (favorable or not favorable behavior trends). Therefore, the use of logistic analysis is easier to do and more simple to understand.

Results
Sample size and missing data should be posted in the Methods part. Make sure to describe just the observed sample of respondents. Reader would be confused to get the information about the excluded data (Minor Essential Revisions). ok

Table 2 (page 9) – Explain the differences and the method how the table was created. All the percentages presented in the table and in text describe the change? Or is there any difference? Revise this part, it is unclear. Was the change statistically significant? Did you think about the effect size? –

Author: We didn’t analyze the magnitude of differences between changes in PAL because it was not our main objective. Table II included each group classified according to PAL in baseline and what happened with each group after two years in percentage.

Discussion
Page 12 line 19. “persons greater than 64 years of age“ Consider revising to older (Discretionary Revisions) - Ok

Page 12 line 21. There is missing reference number (only “reference” written there) (Minor Essential Revisions).

Author: The reference is at the end of the phrase (“34”). We excluded the word “reference”. Thanks

Page 13. Line 17. “…the current study, which indicate that“ Consider revising to “which indicates that” – Ok

Limitations
Include a limitation regarding the use of 17-19 years old data set (Minor Essential Revisions).- Ok

References
Go through the list of references and follow the publication manual for this journal to revise the mistakes that appear within this part of the paper. Small mistakes are in the references number: 12, 13,18, 22, 25, 26, 32, 46 and probably in couple of others too (I did not go through this part in details!) (Minor Essential Revisions).

Author: ok.

Table 1.
The unit of BMI is kg/m$^2$ Revise your “Kg/m$^2$” (Discretionary Revisions) - ok
Table 2.
Revise the table for reared to understand the differences! (Major Compulsory Revisions) - ok
Tables 4 and 5.
Revise the title – “…and a not favorable…” consider excluding “a” “…and not favorable…” (Discretionary Revisions) - Author: Our English reviewer included the word “a” for “not favorable”.

Cover Letter

Reviewer's report
Reviewer: Mauro VG Barros

Author:
Thank you for all your suggestions. Some words have been change in the article and our article has been reviewed by a native speaker of England before we have sent to BMC PH for the first review (American Journal Experts / http://www.journalexperts.com)

Major Compulsory Revisions:
Overall the manuscript was objectively and clearly written and the review of the literature is reasonable and updated. I am confident that the readers from Latin America will be benefited reading this paper since it provides a reasonable synthesis of the available knowledge in this area. Authors describes carefully methodological details such as explaining how missing data were addressed and explaining how quantitative variables were handled in the analyses
“however the, outcome variable seems to be inadequately generated and for the reason that analyses, results, and discussion will need to be completely revised.
The outcome variable was stated by combining and grouping categories of other variables. Authors stated that subjects were first classified in four categories based on baseline and follow-up PALs. The main problem is with G3 group that encompasses subjects who were and remain insufficiently actives. This G3 group was then classified as a group that showed a positive change in PAL and to remain classified as insufficiently cannot be considered a positive change”

One other important aspect that needs to be considered is the labels used to classify the PAL levels. I strongly suggest the authors to change the use of “sedentary” to refer the subjects who does not perform moderate-to-vigorous A since the sedentary behavior is not the opposite of the physical activity. To classify a subject as “sedentary” it is needed to evaluate the exposure to sedentary activities such as the time spent seated while reading, writing, listening music, watching TV, and others.

Author:
- We changed the word “sedentary” to “physically inactive in leisure time”.

- In relation to G3 group that includes subjects who were and remain insufficiently active we have considered this “maintenance” as a favorable behavior considering the following information.
- A physiological decrease in all measures or variables is expected among elderly population. Then, maintenance is considered positive.
- All the cut-off points of variables in elderly are above those stated for young adults, considering the negative changes that this population experiences.
- Doing some or even few activities in elderly is considered positive (“doing something is better than nothing”)
- During follow-up period there were no intervention procedures, and then the “maintenance” was spontaneous / natural.
Considering these information we grouped the subjects who were and remain insufficiently active in the G3 (“Remained active”) and subsequently in the favorable behavior trends group.

However, if you do not agree with these considerations we can exclude the group classified as insufficiently active that remained insufficiently of the G3 and include in the G4, and then make a new bivariate and logistic regression analysis.

G1 – Reduced or (Decreased) PAL (insufficiently→physically inactive; active→insufficiently; active→physically inactive);
G2 – Increased PAL (sedentary→insufficiently; physically inactive→active; insufficiently→active);
G3 – Remained active (active→active; insufficiently → insufficiently);
G4 – Remained physically inactive (physically inactive → physically inactive).

Minor Essential Revisions:
In the abstract, the background is not presented. Authors just stated two different purposes that are both in disagreement with the objective presented in the background section (page 3). I suggest writing a short background and then state the purpose exactly as it was written in page 4 (first paragraph, line 4-5). “… to identify factors or variables that independently influence changes in physical activity level over the course of two years among the elderly.”

Author: ok

“Background: Physical inactivity in leisure time is common among elderly in Brazil and this finding is particularly alarming considering that this population is greatly affected by chronic diseases. The identification of health factors that influence physical activity level (PAL) will help in the development of strategies for increasing PAL older adults. The current research aimed to identify variables that independently affect behavior trends in PAL over the course of two years among elderly.”

Page 3 - The Portuguese meaning of the acronyms VIGITEL must be excluded
since there is an English one presented in the same sentence - Author: ok

Page 3, Line 9 - VIGITEL survey was restricted to the capitals of the 26 Brazilian states and the content of the sentence lead the reader to understand that the survey was carried out in the 26 Brazilian states. - Author: ok

I strongly suggest that the authors must avoid using the label “sedentary” to refer to physical inactivity or insufficiently PAL. For instance, in Line 8 (page 3), authors refers to a paper from Hallal and colleagues whose have studied physical inactivity and not sedentary behavior. - Author: ok

Page 3, second paragraph, 2nd Line - the term health-related factors or health-related variables must be preferred to refer the aspects that were treated as independent or covariate factors in the study. I suggest reviewing the writing of the entire paragraph. Author: We have changed covariate/independent factors to “health-related factors”.

Page 4, Line 1 - Change the word “several” for “some” since just three studies were referred - Author: ok

Page 4 - Change the subtitle “Study subjects and design” for “Design and subjects” - Author: ok
Page 4 - First paragraph - The first two sentences are quite confused. The sampling procedures were not clearly presented and need to be revised. It was the sample or the district selected? – Author: ok. We revised the sentences and also included missing data and differences in methods section according to the other reviewer.

Page 4, 2nd paragraph - Is there any data on psychometric properties of the instrument used in this study?
Author: The articles about Epidoso Project don’t include this information

Page 6 - Classification of the physical activity level by using the label “sedentary” is equivocal since sedentary behavior is not just the opposite of PA practice as was early stated. Also the labels used to classify changes in PAL are to a certain extent confused since it refers much more to the follow-up PAL than to the change in PAL. 
Author: ok
The change must refer to a decrease or increase in PAL rather than to a state such as “reduced PAL”. As previously mentioned the groups of PAL change needed to be reviewed since, for instance, does not make sense grouping people who remain insufficiently and those who remain active over the follow-up period (G3 group).

**Author:** We changed “Reduce” to “Decrease”

Page 7 - Statistical procedures needed to be clarified since the multivariate regression model was not identified. It will be a binary logistic, multinomial logistic or Poisson regression?

**Author:** We used Multivariate logistic regression model with Stepwise Forward methodology. The outcome (qualitative) was “behavior trends in PAL” (favorable or not favorable).

Page 7, 2nd Line - Pearson Chi-square was classified as an univariate procedure but it must be considered bivariate.

**Author:** We changed the word “univariate” for “bivariate”, however it can be considered as an univariate since the definition is the same: “investigates separately the relationship between each explanatory variable and response variable, without taking into account additional variables” “and univariate procedure can be also considered as a bivariate analysis, for investigating the association between an explanatory variable and a response.” einstein: Educ Contin Saúde. 2010;8(1 Pt 2): 1-2 (on-line)


Page 8 - Sample size is presented but no information regarding to the statistical Power was showed. It was sample size calculated at the planning of the study?

**Author:** We haven’t done sample size calculations for our specific study because our sample was a subsample of the total sample from Epidoso Project.

Results - The entire section is quite choppy and hard to follow. I will suggest presenting the results in subsections allowing the readers to better understand the evidences that were gathered. **Author:** Subsections were created.

**Author:** We included subsections in results. Also, the other reviewer suggested changes in table II, thus we prepared a figure that can substitute table 2. We also excluded missing data from results section and included in methods section.
Figure 1: Distribution (%) of physical activity level after two years among older individuals in São Paulo, Brazil

“Tables - I strongly suggest combining tables’ 4 and 5 in one single table. It is hard to the readers to understand modification in adjusted from crude OR when the results are presented in different tables
Author: ok

Table 4. Associations between health-related factors and not favorable behavior trend in PAL among older individuals in São Paulo, Brazil

<table>
<thead>
<tr>
<th>Variable</th>
<th>Crude OR (95% CI)</th>
<th>p</th>
<th>Adjusted OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2.30 (1.58-3.35)</td>
<td>0.000</td>
<td>2.50 (1.60-3.90)</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80+</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>70-79</td>
<td>2.27 (1.51-3.43)</td>
<td></td>
<td>2.03 (1.29-3.18)</td>
<td>0.002</td>
</tr>
<tr>
<td>65-69</td>
<td>6.99 (3.24-15.08)</td>
<td>0.000</td>
<td>6.29 (2.70-14.68)</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>ADL dependence score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (independent)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>1-3 (mild)</td>
<td>1.32 (0.88-1.98)</td>
<td>0.185</td>
<td>0.98 (0.60-1.59)</td>
<td>0.929</td>
</tr>
<tr>
<td>4-7+ (moderate/severe)</td>
<td>4.00 (2.27-7.01)</td>
<td>0.001</td>
<td>2.25 (1.20-4.21)</td>
<td>0.011</td>
</tr>
<tr>
<td><strong>Falls (last year)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No + Yes with no impact</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes with impact</td>
<td>3.24 (0.99-10.54)</td>
<td>0.051</td>
<td>6.89 (0.91-52.00)</td>
<td>0.062</td>
</tr>
<tr>
<td><strong>Education</strong></td>
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<tr>
<td>No formal</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
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</tr>
<tr>
<td>Primary/Secondary</td>
<td>1.56 (1.03-2.35)</td>
<td>0.001</td>
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<tr>
<td>College/University</td>
<td>2.71 (1.54-4.77)</td>
<td>0.033</td>
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<tr>
<td></td>
<td>OR</td>
<td>CI</td>
<td>P</td>
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<tr>
<td><strong>MMSE</strong></td>
<td>1.00</td>
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<tr>
<td>24 + (24/25) (18-19)</td>
<td>1.00</td>
<td></td>
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<tr>
<td>&lt; 24</td>
<td>2.07</td>
<td>(1.28-3.36)</td>
<td>0.003</td>
<td></td>
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<tr>
<td><strong>Dysthymia Screening</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Positive - 5+</td>
<td>1.00</td>
<td></td>
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<td></td>
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<tr>
<td>Negative - &lt; 4</td>
<td>1.53</td>
<td>(0.98-2.40)</td>
<td>0.062</td>
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<td><strong>Fractures</strong></td>
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<tr>
<td>No</td>
<td>1.00</td>
<td></td>
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</tr>
<tr>
<td>Yes</td>
<td>4.37</td>
<td>(1.05-18.23)</td>
<td>0.043</td>
<td></td>
</tr>
</tbody>
</table>

ADL = activities of daily living; MMSE = Mini-Mental State Examination
OR=odds ratio adjusted for gender, age and education; CI=confidence interval