Author’s response to reviews

Title: Reliability and validity of a sedentary behavior questionnaire for South American pediatric population: SAYCARE Study.

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Author’s response to reviews:

São Paulo, October 18th, 2019.

Dear Editor-in-Chief Dirk Krüger,

We are resubmitting a revised version of our manuscript (R2 BMRM-D-18-00088) entitled “Reliability and validity of a sedentary behavior questionnaire for South American children and adolescents: SAYCARE Study”.

We would like to thank the reviewers for the thoughtful and constructive comments. We have considered all the suggestions and have incorporated them into the revised manuscript. We believe that our manuscript is stronger as a result of these modifications and we hope you now consider the paper suitable for publication in BMC Medical Research Methodology.

Please, find below the reviewers’ comments in full, followed by our point-by-point responses (in bold). All changes made in the manuscript are highlighted in the track changes mode of MS Word in the
attached file.

Sincerely,

Marcus Vinicius Nascimento-Ferreira, PhD* on behalf of coauthors

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BMC Medical Research Methodology – Response to reviewers and editor letter

EDITORIAL COMMENT:
Your manuscript "Reliability and validity of a sedentary behavior questionnaire for South American pediatric population: SAYCARE Study." (BMRM-D-18-00088R2) has been assessed by our reviewers. They have raised a number of points which we believe would improve the manuscript and may allow a revised version to be published in BMC Medical Research Methodology.
Their reports, together with any other comments, are below. Please also take a moment to check our website at https://www.editorialmanager.com/bmrm/ for any additional comments that were saved as attachments.
If you are able to fully address these points, we would encourage you to submit a revised manuscript to BMC Medical Research Methodology.
We want to thank the Editor for these comments and the opportunity to improve our manuscript. We have read carefully your recommendations; as well as, the reviewers’ comments.

TECHNICAL COMMENTS:
- no list of abbreviations
Thank you for your recommendation. We have now provided the list of abbreviations (page 12, line 336).

EDITOR COMMENTS:
Thank you for submitting your manuscript and its revision. The reviewers have some remaining concerns about your manuscript. Please make sure to address all of their concerns in your revision. In your revision, please be sure to thoroughly proof read your manuscript.
Dear editor, we would like to thank by time that you devoted to our work. We have considered all suggestions and we have incorporated them into the revised manuscript.
REVIEWERS' COMMENTS TO AUTHOR:

REVIEWER REPORTS (Wendy Yajun Huang):

I appreciate the authors' efforts in revising this manuscript. However, I have several suggestion/concerns shown as follows:

Dear reviewer, we would like to thank by time that you devoted to our work. We have read carefully your comments and recommendations. Please, find below our responses point-by-point.

1. There is some inconsistency in sample size/number of invitations. In lines 115-116, it is said that 495 participants were recruited; however, in line 141, 400 children and adolescents were invited. Please clarify.

Thank you for your comment. Four hundred ninety-five participants composed the sample for we studied the validity of several tools (e.g., blood pressure automatic oscillometric device; physical activity questionnaire, food frequency questionnaire). Whereas, the sample composed of 400 children and adolescents is about SAYCARE sedentary behavior questionnaire validity study. We have now clarified this information. Please, see the METHODS section (page 5, line 140):

“…a total of 400 research subjects to assess the reliability and validity of the SAYCARE sedentary behavior questionnaire.”

2. Line 150, not clear to me why participants who were pregnant were excluded; any other exclusion criteria applied (e.g. only healthy children and adolescents included)?

Thank you for your comment. Regarding pregnancy, the subjects were excluded mainly because this condition can force sedentary behavior increasing (Fazzi et al. Int J Behav Nutr Phys Act 2017. 14(32): 1-13) and confuse our validity findings by overestimation results objectively measured. In addition, pregnancy is a condition that needs a specific questionnaire with specific variables (and questions) for cardiovascular environment. However, our goal (in SAYCARE study) addresses children and adolescents without any “specific” health condition. Regarding any other exclusion criteria, we have now provided expanded information. Please, see METHODS section (page 6, line 150): “Participants were excluded if they were pregnant or if their questionnaires were incomplete; as well as, the absence of informed consent from parents, guardians, and/or the individual himself.”

3. Lines 182 and 201: I am still not convinced of the justifications for classifying sedentary time (assessed by both questionnaire and accelerometer) using a 120 min/day cut-point. For questionnaire based assessment, why not only summing up screen-based sedentary activities (in line with the guidelines of not more than two hours of this kind of behavior per day)?

Thank you for your comment. We agree with your concern. However, we applied this assessment to obtain comparable data with European multicenter data. In this sense, we made explicit to the readers this limitation in our discussion.

Please, see DISCUSSION section (page 12, line 328): “…In this sense, in order to compare with European data,(11, 34) we assessed reported sedentary behaviors, other than screen time, and ranked participants who attend media time recommendations (≤ 120 min/day).(18)”

For accelerometer based assessment, there lacks of rationale for using two hours a day of sedentary time as a cut-point. In addition, reference 17 is not supportive for using this cut-point (120 min/day of sedentary time). Please clarify.

Thank you for your comment. We agree with your concern. However, we applied this assessment to obtain comparable data with European multicenter data. In this sense, we made explicit to the readers this limitation in our discussion.

Please, see DISCUSSION section (page 12, line 328): “…In this sense, in order to compare with
European data,(11, 34) we assessed reported sedentary behaviors, other than screen time, and ranked participants who attend media time recommendations (≤ 120 min/day).(18)”

4. Data analyses/interpretation: the justifications provided for "acceptable" reliability observed in this study are not convincing and may not be appropriate. Both the systematic review by Nascimento-Ferreira (Obesity Rev 2018) and the study by Ridgers (2012) referred to validity (not reliability) of subjective measures compared with objective measures. The criteria mentioned in these studies (e.g. spearman rho of 0.3 as moderate validity) are therefore not suitable for determining the reliability. In fact, the systematic review by Hidding 2017 in Sports Medicine has suggested kappa values >0.7 and Spearman correlation >0.8 as indicative of acceptable reliability.

Thank you for your comment. However, we disagree with your concern. In our point of view, the referred cutoff point for acceptable reliability (Hidding et al. Sports Medicine 2017; 47(4): 677-699) seems too conservative. Mainly because, regarding energy-related behavior (e.g., physical activity, sedentary behavior and sleep time) the most commonly applied reference method is accelerometry (Nascimento-Ferreira et al. Obes Rev 2018; 19(6):810-824; Nascimento-Ferreira et al. Nutr Hosp 2019;36(2):449-462; Nascimento-Ferreira et al. Sleep Medicine Reviews 2016; 30: 85-96). The accelerometer metric cannot exactly provide physical activity, sedentary behaviour, and sleep time outcome. Thus, in our point of view, in this case, energy-related behavior should be evaluated with less optimist cutoff points (Strong et al. J Pediatr. 2005;146(6):732-7; Ridgers et al. Journal of Science and Medicine in Sport. 2012;15(2):136-41; Landis and Koch. Biometrics. 1977;33(1):159-74) than health status questionnaires (Terwee et al. Journal of Clinical Epidemiology 2007; 60: 34-42). And, under the cited condition of energy-related behavior measures, we argue that these questionnaires should be evaluated (regarding cutoff point) similar to food frequency questionnaire (Nascimento-Ferreira et al. Obes Rev 2018; 19(6):810-824), for example. Regarding to sedentary behaviour, most tools currently used for population surveillance of sedentary behaviour systematically underestimate the amount of sedentary time by 2–4 hours per day (Dall et al. BMJ Open 2017;7:e013844). In addition, tools which contain behaviours which might occur concurrently (such as watching TV and using a tablet computer) may lead to an overestimate in total sedentary behaviour time (Dall et al. BMJ Open 2017;7:e013844); as well as, self and proxy-report measures are less reliable than other methods of assessing sedentary behaviour in children and adolescents (Lubans et al. Obes Rev. 2011 Oct;12(10):781-99). In this sense, we also argue that different degrees of validity and reliability may be acceptable (or not) depending on whether the data are being used for population surveillance purposes, for the assessment of burden, risk or association, or to investigate intervention effects (Kelly et al. Int J Behav Nutr Phys Act. 2016 Mar 1;13:32), and we add the stability, concomitant and intermittent patterns of the behaviour should be considered. Thus, sedentary behaviour (as well as physical activity) (r>0.3) (Nascimento-Ferreira et al. Obes Rev 2018; 19(6):810-824; Nascimento-Ferreira et al. Nutr Hosp 2019;36(2):449-462) should be evaluated with lower correlation coefficient (acceptable outcome) than health status questionnaires (r>0.7) (Terwee et al. Journal of Clinical Epidemiology 2007; 60: 34-42). Corroborating with a classic paper (cited 1081, https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/8450681/citedby/?tool=pubmed), where physical and mental constructs were evaluated regarding validity and reliability.

The findings and conclusion of this study, especially for reliability, should be cautiously presented. Thank you for your comments. However, we disagree with your concern. We applied accepted cutoff points for reliability diagnose (Nascimento-Ferreira et al. Obes Rev 2018; 19(6):810-824; Nascimento-Ferreira et al. Nutr Hosp 2019;36(2):449-462; Nascimento-Ferreira et al. Sleep Medicine Reviews 2016; 30: 85-96) in a realistic condition for energy related behaviors. As we commented above.

Lastly, is ICC more appropriate for assessing test-retest reliability? Thank you for your comments. We agree with your concern. However, the ICC is subject to a variety of
statistical assumptions such as normality and stable variance, which are rarely considered in health applications (Bobak et al. BMC Medical Research Methodology 2018; 18:93; Kirkwood B and Sterne J. Essential medical statistics. 2nd Ed. Blackwell Publishing. 2008). Our sample did not meet these assumptions satisfactorily.

REVIEWER REPORTS (Reviewer 2):

This is multi-country study with a diverse sample of children and adolescents with the aim to validate a sedentary behaviour questionnaire. The manuscript was well written and coherent. Following the reviewers' comments, conclusions were drawn appropriately, showing acceptability and reliability of the questionnaire but not validity. Authors further explained that the questionnaire should not be used as a proxy of sedentary time. However, I still have some recommendations for authors to consider before this is accepted for publication.

Dear reviewer, we would like to thank by time that you devoted to our work. We have read carefully your comments and recommendations. Please, find below our responses point-by-point.

REQUESTED REVISIONS:

Line 68 - Please present sample for children (parent-reported) and adolescents (self-reported) separately,

Thank you for your suggestion. We have now provided this information. Please, see ABSTRACT section (page 3, line 66): “Children and adolescents from seven South American cities were involved in the test-retest reliability (children: n = 55; adolescents: n = 106) and concurrent validity (children: n = 93; adolescents: n = 94) studies.”

Line 97 - Delete "more"

Thank you for your suggestion. We have now deleted this word. Please, see INTRODUCTION section (page 4, line 96): “Thus, high-quality research is required into the measurement properties of measurement instruments of sedentary behavior.”

Line 117 - Information about parental consent should be provided in here and not introduced only in line 148.

Thank you for your suggestion. We have now provided this information. Please, see INTRODUCTION section (page 4, line 115): “The inclusion criteria were: i) age ranging from 3 to 18 years old, ii) informed written consent signed by a parent (or legal guardian) or by adolescent participants prior to enrollment and iii) provide information about sex and age.”

Line 117 - Shouldn't participants with mobility issues be excluded as they would be outliers of the population for sedentary behaviour parameters.

Thank you for your suggestion. We have now provided this information. Please, see INTRODUCTION section (page 6, line 151): “Participants were excluded if they were pregnant or if their questionnaires were incomplete; as well as, the absence of informed consent from parents, guardians, and/or the individual himself. In addition, participants who reported mobility issues were excluded from data analysis.”

Line 141 - Please change "subjects" to "participants" in here and everywhere else when appears in the text.
Thank you for your suggestion. We have now changed this information. Please, see METHODS section (page 5, line 141): “…a total of 400 participants to assess the reliability and validity of the SAYCARE sedentary behavior questionnaire.”

Line 150- Information about exclusion criteria should be presented in line 115 when inclusion criteria were presented.
Thank you for your suggestion. We have now provided this information. Please, see METHODS section (page 4, line 117): “The exclusion criteria were: i) pregnancy, ii) inability to complete the questionnaires and iii) refusing to sign the informed consent.”

Line 153 - Previous studies have shown that the Actigraph GT3X is not the most accurate device to measure sedentary behaviour. Devices such as ActivPal provide a better estimate (references below). The authors should justify the use of Actigraph as a sedentary behaviour validation toll and address the limitations of this device.
References:
Thank you for your comments and suggestion. We have now provided this information. Please, see DISCUSSION section (page 11, line 308): “Thus, studies drawing inferences about total sedentary time (from accelerometers) compared to a set of sedentary behavior (from questionnaires or diaries) should be interpreted with caution. In this sense, we hypothesized that the poor agreement between questionnaire and accelerometer for assessing sedentary behavior found in our study could be likely due to the choice of accelerometers (e.g., Actigraph GT3X) as a reference method rather than the subjective method per se. Although the accelerometer was the most common device used on validity studies, (5, 33) posture sensor (e.g., activPAL) emerges as a new potential reference method.(1)”

Line 249 and 250- Please change "achieved" to "recorded"
Thank you for your comments and suggestion. We have now changed this word. Please, see DISCUSSION section (page 9, line 253): “The SAYCARE sedentary behavior questionnaire reported complete information from 83.8% of the participants; whereas, a European multicenter study about this topic reported 75% of complete information.”

Line 251 - Could you add the data on what is considered an "important decreases”?
Thank you for your suggestion. We have now provided this information. Please, see DISCUSSION section (page 9, line 255): “…Conversely, we found important decreases in the response rate from Q1 (83.8%) to Q2 (61.8%) surveys.”

Line 275 to 276 - Please consider the comment provided above in respect to Actigraph compared to other devices such as ActivPal (Line 153).
Thank you for your suggestion. We have now provided comment about activPAL. Please, see DISCUSSION section (page 11, line 308): “Thus, studies drawing inferences about total sedentary time (from accelerometers) compared to a set of sedentary behavior (from questionnaires or diaries) should
be interpreted with caution. In this sense, we hypothesized that the poor agreement between questionnaire and accelerometer for assessing sedentary behavior found in our study could be likely due to the choice of accelerometers (e.g., Actigraph GT3X) as a reference method rather than the subjective method per se. Although the accelerometer was the most common device used on validity studies,(5, 33) posture sensor (e.g., activPAL) emerges as a new potential reference method.(1)’