Reviewer's report

Title: Validity of simplified, calibration-less exercise intensity measurement using resting heart rate during sleep: A method-comparison study with respiratory gas analysis

Version: 0 Date: 24 May 2019

Reviewer: Craig McNulty

Reviewer's report:

Specific comments

Page 5, Line 20-21: You only very briefly mention the 24/7 measurement model at the end of the background. As the 24/7 model forms part of the title of this manuscript, it would be worth expanding on this.

Page 5, Line 36: The format for how you present mean/SD demographic data changes. Keep the formatting the same.

Page 5, Line 51: Were the two exercise tests (Bruce & 6MWT) randomised? Also, was there a rest period between these tests? If so, for how long?

Page 6, Line 4: This comment also relates to your use of the equation on page 7. Did you confirm that the participants reached exhaustion on the treadmill test? If so, how? Were you able to confirm, from the data, that VO2max was attained for each participant? If so, could you please include the method you used for this within the manuscript? It is important that the reader is assured that VO2max, rather than VO2peak, was identified in the data.

Page 6, Line 10: I am unable to locate any product information/specifications for the Mobile Aero Monitor. As you are using VO2 reserve as the gold standard, the accuracy of your sitting/laying and maximal exercise VO2 data is important. Commercial VO2 systems significantly vary in reliability and accuracy of measures, often dependent on their components. Are you able to supply a link to the product information (there appears to be no link on the manufacturer's page) in your reviewer response (not the manuscript)?

Page 6, Line 16: Was participant comfort while sleeping with the hitoe system considered during recruitment? For example, were only subject who normally wear clothing in bed selected? There may be potential for sleep disturbance if the individual's sleeping attire/environment is changed.

Page 6, Line 49: Were potential HR measure influences considered and controlled? For example, caffeine, exercise, sleep deprivation.

Page 6, Line 49: I agree with the practicality of using the Gellish formula for age-predicted heart rate max. However, the HRmax value from the exercise test should be used for the study's
%HRR calculations. You should limit as much potential predictive variability as possible. The Gelish formula should be advised for use with general population in a practical setting, however the %HRR values should be derived from rested HR and maximal exercising HR measures.

Page 7, Line 8: See comment for Page 6, Line 4.

Page 7, Line 15-20: This is more of a consideration. If using the average of the final minute for each stage, check that there is no increase to HR immediately prior to initiating the next stage of the exercise. The HR may increase in anticipation of the increased workload. If this is the case, it may be worth getting a minute average minus the ~15 seconds prior to the next workload increment.

Page 8, Line 57 to Page 9, Line 9: As comment earlier, I think there needs to be more information regarding the 24/7 measures. It reads as more of an afterthought. For example, of the three subjects, what type of work did they do? What exactly is meant by 'holidays'? Given the period of time of which this data was collected, and potential implications to research in average HR responses, this could probably be an entirely separate manuscript.

Page 9, Line 45: Could you please neaten this equation? Use the Math function in word, for example. I would suggest removing the (=SV*HR) altogether, or including as a footnote or in a separate sentence, for reasons of clarity.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics
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Please indicate the quality of language in the manuscript:

Acceptable

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