Reviewer’s report

Title: Psychometric Properties of the Zephyr Bioharness Device: A Systematic Review.

Version: 0 Date: 30 Apr 2017

Reviewer: Anthony Scott Leicht

Reviewer’s report:

General Comments:

The authors are thanked for their study that reviewed the ZB for assessment of HR. This was an interesting topic with some aspects requiring further consideration. Firstly, justification for this study was poor and should be significantly improved to warrant need and publication. Secondly, the Results section was awkward with a review of this needed to clearly delineate the comparisons with a criterion and/or other device. The relevance of some results (and not others) in text was unclear and should be reviewed. Finally, the Discussion was very brief with very little discussion of the reliability/validity of the ZB and other studies that have examined these aspects of the ZB or other similar wearable devices. The authors are encouraged to review and focus the current study and Discussion on these parameters to highlight the unique aspects of the study and need for publication.

Specific comments:

Page

Line

Comment

2

36-39

MCID was not discussed in the manuscript. Relevance??

2

48

"bronze" Please clarify as not a common term.
"narrow" Please clarify how this term was defined in the manuscript as one may argue that LOA weren't narrow.

Reference 5 - suitable and valid source?? Source was difficult to determine from the listed format.

This section was long and should be condensed to focus the manuscript.

The aim of the study was written clearly but it was not clear how this aim was arrived at given the Introduction. Greater justification for the review is necessary, other than nobody has done it. Further, why was HR the focus given the capabilities of the harness?? A focus on HR may be of limited application for the harness and therefore a strong justification for HR examination is vital.

"physiological responses" Please clarify that it was HR only as the harness can collect other physiological responses (which may be of wider relevance).
SEM, mean differences and CI were extracted. Please clarify how these were used as it was not obvious in the results or interpretation.

MCID and CID were extracted or calculated?? Further, how were these used as there were no results or discussion of these variables in the manuscript?? If not used/discussed, then they were not needed and should be removed.

The tool has been used in MS outcomes but clarification was needed regarding its suitability for other variables including the current HR variable. Further, how was "thorough literature review" defined as this could be quite variable between studies and researchers interpretations??

Please clarify how an article's quality score was calculated as the current results seem to indicate a different methodology than that written here (i.e. total sum divided by best possible score)?? Further, what was the range of scores for each item - 0 to 2??

"Table 2" I'd also suggest to refer to Figure 1 that shows the scores for quality of studies.

Suggest authors review Table 2 for the most commons flaws as "specific hypotheses" scored poorly and was not stated here in text.
SEM or CV?? Please review and clarify.

26-39

This was difficult to follow and suggest to combine and simplify. Details of the physical activities was not needed here.

"device heart rate variable" should be rephrased for clarity.

Authors should clearly indicate here those studies that compared ZB HR with ECG and those studies that compared HR with a telemetric HR monitor (e.g. study 1 and 18). Was the POLAR HR monitor considered a "criterion" measure?? If so, please explain how it was defined as a criterion measure and the qualifications to be considered a criterion measure. If not, then the Results section should be amended to indicate the criterion devices and the results of such comparisons.

Please review this statement and the results as I could not see how 4 were identified. Further, how was narrow LOA defined??

Please clarify why this result was presented as it was not clear of its relevance.
This was the first time that the results were indicated for a comparison between ZB and the POLAR HR monitor. This should be clearly indicated previously in the Results and differences noted between comparisons with an ECG and a POLAR clearly stated.

Please indicate if this statement was in reference to the ECG or POLAR comparisons or both devices?? As indicated above, this should be clearly indicated and justifiable.

"good to excellent quality" Please clarify how this was defined and shown in the current results.

"low risk" Clarify how AF patients are low risk. Many clinicians and Exercise Physiologists would consider that AF patients are a high risk group.

The focus here was on use of wearable devices in clinical practice. Please explain why this focus was provided given the focus of the studies in the review (most were non-clinical).

Why were other measurements from the ZB not examined given its widespread use for these measures?? How relevant was the examination of HR alone??

Table 2
NA?? Please clarify how a scoring of NA was possible. Also, how was each property scored = 0 to 2?? Please provide details.

Table 3

SEM or CV?? Please clarify.

Table 4 and 5

Clarify why some studies that listed different protocols only had one mean difference (e.g. 19). Are both protocols then relevant??

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

Yes

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

Yes

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

No

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

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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