PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Associations between objectively assessed and self-reported sedentary time with mental health in adults: an analysis of data from Health Survey for England
AUTHORS	Hamer, Mark; Coombs, Ngaire; Stamatakis, Emmanuel

VERSION 1 - REVIEW

REVIEWER	Professor Michael Ussher St George's University of London UK
REVIEW RETURNED	23-Jan-2014

GENERAL COMMENTS	This study is important as it is the first study I am aware of to compare objective and self-report measures of physical activity in relation to mental health outcomes. The methods are rigorous and well explained throughout. I have some suggestions for minor changes to improve the clarity of the paper, except for point 3. which is more challenging: 1. Abstract conclusion: I suggest amending this to: 'Sedentary time, whether measured objectively or by self-report, is associated with adverse mental health outcomes.' I see no need to state '..future work is required to explore the underlying mechanisms.' 2. Introduction, lines 34 -39: The authors say that the 'Majority of studies to date in this area have relied on self report measures of sedentary behaviour...'. At this point I would advise the authors to insert a short summary of the studies that have used objective measures in this context. I am aware that these studies are described in the discussion , but I feel that they first need to be presented in the introduction. If necessary, they can then be briefly referred to in the discussion. 3. Methods p. 6, lines 7 -14: As regards the accelerometer, it is reported that 70% had six to seven days of valid data and 84% had at least three valid days of data. This shows a reasonably good level of compliance; however, there is still likely to be fairly good spread in the number of days of valid data provided. It is not clear whether the number of valid days of data has influenced the outcomes and I think that it is important to investigate this. For example, it is possible that as the number of days of valid data increases the relationship with poor mental health either strengthens significantly or weakens significantly. I suggest the authors conduct an analysis in which they test for the effect of number of days of valid data on outcomes for the measure of mental health. Hopefully, the outcomes are not affected by the number of days of valid data.

	4. Discussion, p. 11, lines 39-41: I can believe that there have been no previous large scale studies comparing objective and self-report measures of physical activity (PA) against mental health outcomes, but I imagine that some smaller scale studies have done this. If they haven't already done so, I suggest the authors conduct a thorough search, as this is the type of secondary analysis that might be conducted within an RCT of a PA intervention. 5. Discussion, p. 12, first three lines: It would be helpful if the authors added a further sentence to illustrate what they mean when they refer to a 'conceptual overlap'. 6. Discussion, p. 12, first paragraph, final sentence: I acknowledge the point the authors make about the importance of context (e.g. 'where' and 'who with') to the potential impact of PA on mental health. I am less convinced by how the authors use this issue to interpret the findings. In particular, both accelerometer and self-report measures of PA are influenced by context, and the self-report measures did not specifically inquire about context. Therefore, I believe, that this interpretation isn't as straight forward as the authors imply. 7.p13, first paragraph: It would be useful the authors added a sentence or two to provide a possible rationale for why light activity might be associated with positive mental health outcomes, while moderate-vigorous PA is associated with these outcomes. 8. Please check for grammatical errors and typos, throughout (e.g. p. 10, final two lines). In particular, more use of commas and semi colons is needed (e.g. p. 13, line 25: I suggest you add a semicolon before 'thus')

REVIEWER	Nanette Mutrie University of Edinburgh, UK
REVIEW RETURNED	05-Feb-2014

GENERAL COMMENTS	This is a timely analyses in the growing literature of sedentary [sitting] time and health. This article addresses mental health. It suggests that too much sitting time is associated with poor mental health. The obvious limitation is the cross sectional nature of the data. The strengths are both objective and self report data. The paper is very well written and I could find no typographical errors.

VERSION 1 – AUTHOR RESPONSE

Reviewer Name Professor Michael Ussher

This study is important as it is the first study I am aware of to compare objective and self-report measures of physical activity in relation to mental health outcomes. The methods are rigorous and well explained throughout. I have some suggestions for minor changes to improve the clarity of the paper, except for point 3. which is more challenging:

Our response: Thank you for your supportive comments.

1. Abstract conclusion: I suggest amending this to: 'Sedentary time, whether measured objectively or by self-report, is associated with adverse mental health outcomes.' I see no need to state '..future work is required to explore the underlying mechanisms.'

Our response: We have removed this sentence.

2. Introduction, lines 34 -39: The authors say that the 'Majority of studies to date in this area have relied on self report measures of sedentary behaviour...'. At this point I would advise the authors to insert a short summary of the studies that have used objective measures in this context. I am aware that these studies are described in the discussion , but I feel that they first need to be presented in the introduction. If necessary, they can then be briefly referred to in the discussion.

Our response: Thank you. We added the following text: “To our knowledge, only one population study has previously examined associations between objectively assessed sedentary time and depressive symptoms, which demonstrated null associations.”

3. Methods p. 6, lines 7 -14: As regards the accelerometer, it is reported that 70% had six to seven days of valid data and 84% had at least three valid days of data. This shows a reasonably good level of compliance; however, there is still likely to be fairly good spread in the number of days of valid data provided. It is not clear whether the number of valid days of data has influenced the outcomes and I think that it is important to investigate this. For example, it is possible that as the number of days of valid data increases the relationship with poor mental health either strengthens significantly or weakens significantly. I suggest the authors conduct an analysis in which they test for the effect of number of days of valid data on outcomes for the measure of mental health. Hopefully, the outcomes are not affected by the number of days of valid data.

Our response: This is a valid point, thus we have run some sensitivity analyses to explore it further; logistic regression models, with number of valid wear days as the main exposure (continuous) and psychological distress (binary) as the outcome, showed that number of wear days was not associated with psychological distress in either a basic age/sex adjusted model (p=0.138) or fully adjusted model (p=0.594). We have noted this in the revised manuscript.

4. Discussion, p. 11, lines 39-41: I can believe that there have been no previous large scale studies comparing objective and self-report measures of physical activity (PA) against mental health outcomes, but I imagine that some smaller scale studies have done this. If they haven't already done so, I suggest the authors conduct a thorough search, as this is the type of secondary analysis that might be conducted within an RCT of a PA intervention.

Our response: To the best of our knowledge we are not aware of any other published studies that have made this comparison. It is perhaps not surprising given the relatively small number of published studies that have examined associations between objectively measured PA and mental health outcomes.

5. Discussion, p. 12, first three lines: It would be helpful if the authors added a further sentence to illustrate what they mean when they refer to a 'conceptual overlap'.

Our response: We have added the following text: “For example, symptoms such as lethargy may cause individuals to under report their activity”.

6. Discussion, p. 12, first paragraph, final sentence: I acknowledge the point the authors make about the importance of context (e.g. 'where' and 'who with') to the potential impact of PA on mental health. I am less convinced by how the authors use this issue to interpret the findings. In particular, both

accelerometer and self-report measures of PA are influenced by context, and the self-report measures did not specifically inquire about context. Therefore, I believe, that this interpretation isn't as straight forward as the authors imply.

Our response: This is a valid point. We have added the following text to clarify the issue: “We did not, however, take contextual information into account in our analysis of self reported MVPA.”

7.p13, first paragraph: It would be useful the authors added a sentence or two to provide a possible rationale for why light activity might be associated with positive mental health outcomes, while moderate-vigorous PA is associated with these outcomes.

Our response: We added the following text: “Lighter intensity activity may be more beneficial for mental health as greater exertion during vigorous forms of exercise may produce discomfort and shortness of breath, thus feel less enjoyable.”

8. Please check for grammatical errors and typos, throughout (e.g. p. 10, final two lines). In particular, more use of commas and semi colons is needed (e.g. p. 13, line 25: I suggest you add a semicolon before 'thus')

Our response: Thank you. We have checked for grammatical errors and typos, throughout.

Reviewer Name Nanette Mutrie

This is a timely analyses in the growing literature of sedentary [sitting] time and health. This article addresses mental health. It suggests that too much sitting time is associated with poor mental health. The obvious limitation is the cross sectional nature of the data. The strengths are both objective and self report data.

The paper is very well written and I could find no typographical errors.

Our response: Thank you for these very supportive comments.