Reviewer's report

Title: The association between physical fitness and depressive symptoms among young adults: results of the Northern Finland 1966 birth cohort study

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Reviewer: Jesper Krogh

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The aim of the current study was to determine the association between physical activity and physical fitness and depression. The authors used a cross-sectional cohort design. They found that physical strength and self-reported physical activity was inversely related to depression. They found no association between cardiorespiratory fitness and depression.

Abstract:
The abstract is well-written. Please provide the ORs and CIs for negative findings as well.

Introduction
A fair presentation of the case and hypothesis. I am not convinced if actual physical fitness has not been used before - the Copenhagen City Heart Study?
I agree with the authors that cross-sectional studies only show associations (like the present) and cannot claim causality. However, this goes for the prospective cohort studies as well. And they do not 'indicate' any causality. 'Suggest' is more soft.

Methods
Please provide the percentage after '5497 (XX percent) persons participated in the fitness test'

Why did you choose a submaximal test and not a maximal test, especially in this young population?

What were your thoughts on the depression test? It is not very used in clinical practice

If I understand correctly, you used the heart rate after a submaximal test as an indicator of physical fitness. I am very concerned with this. I my experience there is not a very high correlation between these two measures. Could you please elaborate on this potential problem in the methods section and provide data that your method i acceptable.

Results
Table 1. It is a bit acward using 95% CI on different mean amount of physical activity. It is not an estimate, and secondly the overlap the other categories.
Discussion

The authors argue that their unexpected findings of no association between actual physical fitness and depression must be a mistake - then why analyze it? Could it be that this finding is actually correct. That patients with depression underestimate the amount of time they actually engage in physical activity - recall bias?

The authors claim that physical activity is good due to its positive effects on both physical and mental health - and do not provide a reference. The evidence that exercise should be beneficial in depression from RCT is not discussed - only a small study finding a positive effect is cited. The largest study to date was published in BMJ last year - showing no effect of exercise on depressive symptoms - what so ever. I think that is worth a mentioning in this discussion.

Overall a fair and balanced description of the results

Results

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests