Reviewer’s report

Title: Change in physical activity is not associated with change in mental distress among adolescents: The Tromsø Study: Fit Futures

Version: 0 Date: 20 Apr 2019

Reviewer: Serge Brand

Reviewer’s report:

In their longitudinal study the authors investigated the associations between changes of physical activity levels and changes in psychological functioning. Against expectations, increased levels of physical activity were not associated with favorable changes in psychological functioning.

The sample is large, the Introduction provides an excellent overview of both physiological and psychological explanations as to why (regular) physical activity might favorably impact on body and mind. References are timely; I suggest to introducing the following publications: (Brand et al., 2014; Brand et al., 2017; Gerber et al., 2015); from these studies it turned out that a minimum of physical activity intensity (moderate to high intensity) appeared to be necessary to be substantively related to favorably improved psychological functioning and mental well-being. Further, the authors might also turn their results the other way round: perhaps the physical activity intensity was such to counter-balance an unfavorable change in psychological functioning and mental well-being; in this view, as the authors correctly stated, for instance (Bor et al., 2014) showed that (at least among female adolescents) internalizing problems increased over the last three decades and that accordingly, in the present study, physical activity intensity might have been sufficient to counteract such kind of unfavorable development. While I do agree with the authors' statement that compared to subjective ratings objective physical activity measurements should be more reliable, also 'objective' measurements might be biased, as often missing data must be adjusted post-hoc, and as conventional devices such as Actigraph®, Fitbit® and similar do not fully explain the underlying algorithm to assess the 'true' level of physical activity. Next, the authors should consider that 'more' is not always 'better', or simply put: there is mounting evidence that adolescents highly involved in (competitive) strenuous physical activity are at increased risk to suffer from symptoms of burnout and depression (Gerber et al., 2018a; Gerber et al., 2018b; Gerber et al., 2019).

Abstract: Generally well written. Conclusions: "Conclusion: The results of our study indicate that for adolescents,…"; I suggest not to overstate their results from their study sample to 'all adolescents'.

Methods: well-performed.

SPSS® version xx (IBM Corporation, Armonk NY, USA) for Windows®/Apple Mac®.
Results: well reported.

Discussion: well performed. The authors might take in consideration the findings mentioned in the papers above and below.

References


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.
Unable to assess

**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?**
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I am able to assess the statistics

**Quality of written English**
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Acceptable

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