Reviewer's report

Title: Exploring associations between parental and peer variables, personal variables and physical activity among adolescents: a mediation analysis.

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Reviewer: Jonathan Mitchell

Reviewer's report:

This is a well-conducted and well-written manuscript. Using cross-sectional data, the authors found that parents have an important role in adolescent physical activity. They specifically found that parental support could lower perceived internal barriers to being physically active and thereby increase adolescent physical activity levels. A major strength of this study is that physical activity was objectively estimated using accelerometry and moderate-to-vigorous (MVPA) was the primary outcome. Specific comments are listed below; comment 1 is a major compulsory revision and the remaining are minor essential revisions.

Major compulsory revision:

1. In the methods section, it is mentioned that there are baseline data for the participants included in this study (page 4, line 119). Given that the authors mention in the limitation section that future longitudinal research is needed, why not include an analysis that investigates change in physical activity levels from baseline to follow-up and change in perceived barriers/self-efficacy?

Minor essential revisions:

2. There is quite extensive missing data, with only 42% of the baseline sample re-contacted at follow-up. What are the reasons for this low follow-up rate? Was the follow-up assessment originally included in the baseline study design and if so were any cohort retention strategies considered?

3. Age-specific accelerometer cutpoints were used to define MVPA. Trost et al. recently compared the validity of several MVPA cutpoints and found that the Freedson et al. age-specific cutpoints and the Evenson et al. cutpoint provided the most valid estimates of MVPA (Trost et al. Med Sci Sports Exerc. 2011 Jul;43(7):1360-8). While the use of the age-specific cutpoints can be justified, I do think that it is important to note that the 15 years olds in the study have to reach a higher accelerometer count threshold than the younger participants to accumulate time spent in MVPA. This will be even more important to consider if a longitudinal approach is used.

4. The accelerometers were worn for 8 consecutive days and at least one weekend day was required for the accelerometry data to be considered valid. How many participants provided one day and how many provided two days of weekend data? Is it reasonable to stratify the analyses by weekdays and weekend days given the limited weekend data collected? This should at least be
mentioned in the limitation section of the discussion.

5. The statistical analyses are well described. However, I think it would be helpful to include a generic figure showing the alpha, beta and alpha/beta paths if space allows. This would also aid the reading of each section in the results.

6. In the discussion, it is stated that “family-based interventions” are needed to help increase adolescent physical activity (line 252). This is certainly an approach that could be taken based on the results. However, it would be helpful if this is discussed in a deeper context. For example, who are parents that can and cannot provide logistical support? Is it possible to make modifications to increase parental logistic support? What if parents can't provide additional logistical support due to non-modifiable reasons (e.g., both work full time jobs and have more than one child to raise)?

7. In the results and/or discussion sections the magnitude of the associations observed should be mentioned. For example, what is the predicted difference in weekday MVPA between parents with a logistic support score of 1 and parents with a logistic support score of 6?

Level of interest: An article of importance in its field

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