This manuscript addresses an important public health issue, i.e. the physical activity patterns over time on youth population. The stronger value of the study was the use of group-based trajectory analyses to identify different PA patterns among a heterogeneous population. However, the manuscript would need a deep and meticulous work to be clearly understood. Therefore, I believe that several major and minor revisions are warranted as described below.

Major Compulsory Revisions:

1. It is strongly recommended shortening the methods section, since there are too many information. The same information is repeated sometimes and it is difficult to follow the article (e.g. in fifth or seventh paragraph). The introduction also contains a few redundant statements and unnecessary aspects (e.g. line 60 to 62 or 81 to 85).

2. I strongly suggest discuss the most relevant results such as the mean of PA levels at each assessment which was higher among White than Blacks girls. It is suggested rewriting the third paragraph and include more information about this relationship between PA and TV viewing.

- Background.

4. It is strongly recommended clarify whether the results shown were for boys or girls. (line 96 to 98 and 104 to 109). It should also be clarified what kind of sample was measured in longitudinal studies, i.e. childhood and /or adolescents (line 58).

5. Why was an unrealistic assumption?, it suggest that you tone down a bit (line 54 to 56).

6. I suggest removing the last sentence of the first paragraph of the introduction, since it contains redundant information.

7. I would recommend include the hypothesis of the study. This could facilitate the understanding of the manuscript.

- Methods

8. Several important information are missing in the methods section. Participants: the decision that not measure both ages 11 and 13 is an analytical decision that requires justification. Please, clarify. Further, why Cincinnati area was racially representative? (line 123). Were compared girls who were additionally recruited with prior recruitment? (line 126). What measurements were performed related concordant household?. Were parents informed and signed a consent to accept the participation of his girls?. Please address.

9. Further, data were collected on sociodemographic characteristics of each area?, if not, it must be emphasized, since sociodemographic characteristics could influence the practice of regular physical activity (see the reference: “Sociodemographic, developmental, environmental, and psychological correlates of physical activity and sedentary behavior at age 11 to 12, Brodersen NH, 2005”).

10. Measurements: it is unclear who were local trainers. They were students or researchers? How did trainers “help” girls to complete the questionnaires? If trainers provided assistance collecting data, then they have become engaged in the research enterprise, and should have been identified as such in the human subjects protocol. Please address. Could you specify why you decided that 16 years was the appropriate age to self-administered the HAQ questionnaire?. If you meet previous studies to justify this decision, please mention here.

11. Moreover, i suggest that you clarify “fraction of the year of the participation” in the first mention (line 146). It also suggest provide a citation in the line 155 (perhaps you should consider moving the citation Kimm S., 2012 at the end of the paragraph) and in the line 160.

12. Statistical analysis: could you adressed more detail regarding to “four of seven HAQ”? I also recommended add more information about a dual trajectory model.

- Results

13. I also strongly suggest that you make more clear how the results from table 2 and 3 should be interpreted.
14. It addressed information in the results that belongs to the section methods (e.g. line 249 to 250).

15. From my understanding, the research design involved girls within several areas; therefore, the authors should discuss whether their outcomes of interest vary between them.

- Discussion

16. It strongly recommended include more detail about why the mean of PA levels at each assessment was higher among White than Blacks girls. This is shown in results, but you should hypothesize about it. Please, address.

17. “Future research should confirm the existence of maintenance trajectories in a large cohort study using objective PA measures”. This should be acknowledged as a limitation of the study, due to this method are still up for debate.

18. I would recommended include more detail from previous observational studies, since it unknown if the non-association was for boys or girls (line 286 to 289).

19. Authors must speculate about the relationship between the behavioral development of PA and TV viewing. It is suggested rewriting the third paragraph and include more information about this relationship.

In summary, the authors do a good job integrating findings with the existing literature. However, they do not present any compelling or plausible explanations for their results.

Minor Compulsory Revisions:

20. Title: Regarding your purpose; “demonstrate the group-based trajectory analysis process for identifying developmental physical activity (PA) trajectories and their risk factor, and for examining a relationship between PA and television (TV) viewing trajectories among adolescent girls, it is suggested to include “TV viewing” as a secondary variable in the title. (i.e. of Physical Activity and TV viewing).

21. It suggest include percentages in the line 235 and 236.

22. I would advise to include the percentages of Blacks and Whites girls at baseline (line 129).

23. I recommend clarify the meaning of “medical conditions”. It refers to injuries or special conditiones such as diseases?

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.