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Unraveling Age-Driven Shifts in Adolescent Cardiorespiratory Fitness: A Comprehensive Analysis Using the Yo-Yo Intermittent Endurance Test

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Pantelis Theo Nikolaidis School of Health and Caring Sciences, University of West Attica, Athens, Greece l.youzbashi@znu.ac.ir	**Reviewer 1:** Masoud Mirmoezi Department of Physical Education and Sport Sciences, Islamic Azad University, Central Tehran Branch, Tehran, Iran. Email: massoudmirmoezi@live.com **Reviewer 2:** Farhad Namjoo Department of Psychology and Counseling, KMAN Research Institute, Richmond Hill, Ontario, Canada. Email: farhadnamjoo@kmanresce.ca

1. Round 1

1.1 Reviewer 1

Reviewer:

The sentence “Adolescents with higher levels of CRF are more likely to exhibit better cardiovascular health reduced risk of obesity and enhanced cognitive function” lacks citation. Please provide references to support this claim.

Provide more information on the reliability and validity of the Tanita impedance device for measuring body fat percentage, particularly in an adolescent population. There might be limitations with this method that need to be acknowledged.

The sentence "Warnings are issued for false starts or incomplete shuttle runs" could be confusing. Clarify what constitutes a "false start" or "incomplete run" for readers unfamiliar with the procedure.

While you mention Tukey’s HSD test following ANOVA, it would be beneficial to justify why this specific post-hoc test was chosen compared to others, such as Bonferroni correction, particularly given your multiple comparisons.

You mention that "Tanita body impedance analyzer may have limitations" but do not specify what these limitations are. Consider elaborating on why the Tanita device may not provide accurate measurements, particularly in adolescents.

Author revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

The statement “Much of the research to date has either focused on broader age groups or predominantly explored adult populations” needs more clarity. Consider specifying the specific studies or fields where adolescent populations are under-researched to give better context.

The term “muscle mass particularly in boys” might be misleading. Although boys typically experience greater muscle hypertrophy, girls also undergo significant physiological changes. Please revise for gender inclusivity.

The inclusion criteria should be expanded to explain why the absence of injuries or medication was important for participation in the Yo-Yo test. It would also be beneficial to include details regarding the physical activity history of the participants.

The presentation of the data in Table 1 lacks explanation for outliers. The high standard deviation for distance covered (±627.20) suggests variability that should be discussed. Are there any outliers that influenced the mean?

It would be useful to include a brief explanation for why height was the only anthropometric variable with significant differences across age groups, given that weight and fat percentage remained non-significant. Does this align with the literature?

The trends shown in Figure 2 could be better explained in the text. Why do younger age groups have such significantly lower distances covered? Consider explaining this with reference to developmental changes during adolescence.

The phrase "older adolescents particularly those aged 17 and 18 exhibited higher VO2max levels compared to younger participants" needs further explanation. What physiological factors, specifically related to puberty or training regimens, contribute to this?

Author revised the manuscript and uploaded the updated document.

2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.