ABSTRACT

Cardiorespiratory fitness (CRF) is an important indicator of adolescent cardiovascular and future cardiometabolic health. The PACER test is often used to measure CRF in adolescents but is not feasible with pediatric populations unable to perform physical testing secondary to physical impairments. The non-exercise test (NET) has been recommended as a proxy for estimating VO\textsubscript{2} in individuals not able to perform physical tests by using variables such as gender, age, body mass index, resting HR, and self-reported habitual physical activity levels.

PURPOSE: The purpose of this study was to estimate the concurrent validity of the NET for adolescents against the PACER test and objective measures of VO\textsubscript{2}, and examine the cross correlations of the PACER, NET with the Cosmed K4b\textsuperscript{2} portable metabolic system.

METHODS: Adolescents ages 12-17 (n=37) completed the NET and then performed the PACER test while wearing the K4b\textsuperscript{2} to directly measure VO\textsubscript{2max}. VO\textsubscript{2max} values from the NET, PACER and K4b\textsuperscript{2} were compared using a linear regression with Pearson correlations.

RESULTS: The VO\textsubscript{2max} acquired directly from the K4b\textsuperscript{2} was significantly related to the VO\textsubscript{2max} indirectly estimated from the PACER (r = 0.87, p<0.001, r\textsuperscript{2} = 0.76) and the NET (r = 0.73, p<0.001, r\textsuperscript{2} = 0.54). The VO\textsubscript{2max} acquired indirectly from the PACER was significantly related to the VO\textsubscript{2max} indirectly estimated from the NET (r = 0.78, p<0.001, r\textsuperscript{2} = 0.62).

CONCLUSION: The present study confirms that the NET is a valid measure of CRF in adolescents and can be used as an indirect measure of CRF when an exercise test is not feasible. The study also confirmed a strong concurrent validity between the K4b\textsuperscript{2} and PACER test as measures of VO\textsubscript{2max}. 