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©Journal of Sports Science and Medicine (2004) 03 , 147 - 159

Research article

**Validity and Reliability of Physical Activity
Measures in Greek High School Age Children**Eugenia C. Argiropoulou , Maria Michalopoulou, Nikolaos
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ABSTRACT

The aim of this study was to determine the validity and reliability of 3 physical activity questionnaires in Greek high school children. Forty children participated in the study aged $M = 13.73$ ($SD 0.8$ years). The validation study was conducted by comparing an accelerometer (MTI/CSA Model 7164) to 3 questionnaires: a) Three-day Physical Activity Record (3DPAR), b) Four by One-Day Recall Physical Activity Questionnaire (4BY1RPAQ) and c) Physical Activity and Life Style Questionnaire (PALQ). Validity of the 3 self-report questionnaires was assessed against the MTI/CSA accelerometer by comparing the scores obtained by each instrument on the first week of measurement. Reliability was assessed with two consecutive measurements performed two weeks apart. The measures of reliability were assessed by Intra Class Correlation, Typical Error and Limits of Agreement. A two-way ANOVA for repeated measures was performed. Repeated measures were week and day; in order to determine differences between the two scores obtained with the two measurements for MTI/CSA, 3DPAR and 4BY1RPAQ. A paired Student's t -test was performed for the two scores obtained with the PALQ. Post-hoc multiple comparisons were performed using the Bonferroni test. Significance for all parts of the analysis was determined at an alpha level of $p < 0.05$. A paired Student's t -test was performed for the two scores obtained with the PALQ. Results of this study indicated that reliability measured by intra class correlations (ICC) were for MTI/CSA ($ICC = 0.52$, $p < 0.05$), 3DPAR ($ICC = 0.97$, $p < 0.01$), 4BY1RPAQ ($ICC = 0.70$, $p < 0.01$), and PALQ

(ICC = 0.52, $p < 0.01$). Significant Pearson product moment correlation coefficients (r) were observed between MTI/CSA and the other instruments, as a measure of validity: 3DPAR ($r = 0.63$, $p < 0.01$), 4BY1RPAQ ($r = 0.62$, $p < 0.01$), and PALQ ($r = 0.53$, $p < 0.01$). The reliability of the four instruments used in this study was acceptable. Validity correlations were also significant for the three self-report instruments used in this study.

Key words: Physical activity, activity monitors, energy expenditure, children, validity, reliability

Key Points

- The PALQ demonstrated a moderate reliability (0.52) and validity (0.53) in recording physical activity.
- A relatively high correlation was observed between the MTI/CSA and 3DPAR and a moderate correlation was observed between MTI/CSA and the 4BY1RPAQ tested in this study.
- Only a combination of the available instruments would be able to respond to the interpersonal and intrapersonal variability when assessing physical activity in children and adolescents. Self-report instruments and accelerometers are probably able to quantify only gross fluctuations in physical activity.
- All 4 instruments used in this study were valid and reliable in recording physical activity when used with children, since the instruments were able to detect changes in physical activity and the respective energy cost.

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