Reliability of Mainstream Tablets for 2D Analysis of a Drop Jump Landing

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Clinicians, coaches, and trainers would benefit from a reliable and practical tool to analyze movement patterns such as a drop vertical jump (DVJ) which is often used to screen for lower extremity injury risk. Smart devices such as handheld tablets and phones offer attractive possibilities for analyzing these skills. However, little is known about the validity of using these devices in the day to day clinical or field settings where the observation and recording may often be done from different locations of by different evaluators. **PURPOSE**: To determine the effect of position and evaluator on the reliability of a mainstream tablet to perform a 2D frontal plane analysis of DVJs. **METHODS**: Six college students studying human movement analysis were arbitrarily assigned to hold one of two tablets while concurrently recording the frontal plane of a standard DVJ. The students held the tablets close to chest height while standing side by side 3.7 m in front of the DVJ landing area creating variability in tablet positioning of approximately 25 cm in vertical height, 30 cm left or right from midline, and 20 cm in front of the landing. The six students were then randomly assigned to measure left leg frontal plane projection angle (FPPA) at the instant of maximum downward displacement of the initial DVJ landing using a free video analysis app. No student analyzed the same DVJ on both tablets. In total, 90 DVJs performed by 30 college aged volunteers were analyzed. Intraclass correlation coefficients (ICC), standard error of measurement, and minimal detectable change (MDC) were calculated. Alpha = 0.05. **RESULTS**: ICC between the two tablets was 0.83 ($p < 0.001$) with a 95% confidence interval of 0.76 to 0.88. FPPA standard error of measurement was 1.7° with a MDC of 2.4°. **CONCLUSION**: The exact positioning of an observer does not make a significant difference when using a tablet to capture and evaluate a DVJ and different evaluators can assess FPPA. These findings increase the practicality and reliability for using tablets to perform a 2D motion analysis of a drop jump landing.