Concurrent Validity of Standing Balance Assessment Using Nintendo Wii Balance Board Compare with Posturography on Different Surface and Standing Conditions

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Abstract

Introduction: Balance ability is related to athletic movement ability especially during the uncertain surface. Wii Balance Board (WBB) has been used as a research tool for measuring static balance performance compared with the conventional force plate. The influence of unstable surface and standing base of support type on the validity of WBB has not been explored despite the importance for sports performance evaluation. The objective of this study is to determine the validity of WBB compared to the standard posturography.

Methods: Thirty-one participants who have no disease or symptom affecting on standing balance participated in the study. Eight standing balance conditions, bilateral on stable and unstable surface and unilateral on left and right legs were performed with eyes open and eyes closed. Simultaneous center of pressure velocity data was collected from WBB, which was placed upon the posturography. Validity of WBB was examined by using Pearson's correlation coefficients and Bland-Altman Plots.

Results: WBB presented a good to excellent level of the agreement level on the unstable bilateral and unilateral standing balance tests at both eye open and eye close conditions. Poor correlation found on the bilateral stable standing test with eye open and eye close conditions.

Conclusions: WBB is appropriate for evaluating the standing balance for unstable and unilateral standing tests, which were relevant to athlete balance performance on the uncertain standing surface, but not suitable for measuring bilateral balance on the stable hard standing surface.

Keywords: Wii Balance Board, Posturography, Sensory Organization test, Unilateral standing test, Unstable surface, Concurrent validity