Relationship between anthropometrics and dynamic balance performances

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Wobble board are generally used for preventive and rehabilitative purposes and to assess dynamic balance performances, highly effected by the base of support, the center of gravity and its projection within the base of support, and body mass. Although an effect of anthropometrics on balance could be expected, there is a need to substantiate the relationship between anthropometrics and dynamic balance performances. Therefore, the aim of this study was to evaluate the relationship between anthropometric measurements and dynamic balance performances. After signing an informed consent, 26 (female, n=14; male, n=12) college students (25.7±3.4 years) were involved in the study. Anthropometrics (body mass, height, sitting height, and foot size) were measured and lower limbs length was calculated as the difference between standing and sitting height. Dynamic balance performance was assessed on a wobble board (Balance Board WSP, GSJ Service, Rome, Italy; diameter=40 cm) as the time spent in the target zone (diameter=6.3 cm) displayed on a screen. Participants were asked to stand barefoot on the wobble board with a comfortable double leg stance, keeping their hands on the hip and looking at the screen (displaying performance in real time). After a 3 minutes familiarization, three 30 seconds trials were performed with one minute sitting recovery in between. A correlation ($p<0.05$) analysis was applied to anthropometrics and balance performances (the best score out of three trials). Time in the target zone (12.7±5.9 s) was significantly related to weight (63.8±12.6 kg; $r=-0.46$, $p=0.02$) and foot size (25.3±1.5 cm; $r=-0.42$, $p=0.03$), while no correlation was found with respect to height (167.0±10.3 cm) and lower limbs length (79.6 ± 6.7 cm). These findings suggest considering anthropometric measures of the individual when evaluating dynamic balance performances. However, the time spent in the target zone might not be a sensitive parameter, while advanced data such as the length and the area of sways, and lateral movements of the center of mass should be included.