

## Relationship between anthropometrics and dynamic balance performances

Cristina Cortis<sup>1</sup>, Carlo Varalda<sup>2</sup>, Giuseppe Francesco Giancotti<sup>1</sup>, Andrea Fusco<sup>1</sup>, Giuseppe Di Micco<sup>1</sup>, Corrado Lupo<sup>3</sup>, Laura Capranica<sup>4</sup>

<sup>1</sup> Department of Human Sciences, Society, and Health, University of Cassino and Lazio Meridionale, Cassino (FR), Italy - <sup>2</sup> Italian Weightlifting Federation, FIPE, Roma, Italy - <sup>3</sup> SUIISM Centro Servizi, Department of Medical Sciences, University of Turin, Torino, Italy - <sup>4</sup> Department of Movement, Human and Health Sciences, University of Rome "Foro Italico", Roma, Italy

Dynamic balance performances are highly affected by the base of support, the center of gravity and its projection within the base of support. Although anthropometric characteristics could be expected to affect dynamic balance performances<sup>1</sup>, there is a need to substantiate this relationship. 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±3.4years) were involved in the study. Body mass, height, sitting height, and foot size were measured, whereas 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=40cm) as the time spent in the target zone (diameter=6.3cm) 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-minute familiarization, three 30-second trials were performed with one minute sitting recovery in between. A correlation analysis ( $p<0.05$ ) was applied to anthropometrics and balance performances (the best score out of three trials). Time in the target zone (12.7±5.9s) was significantly related to weight (63.8±12.6kg;  $r=-0.46$ ,  $p=0.02$ ) and foot size (25.3±1.5cm;  $r=-0.42$ ,  $p=0.03$ ), whereas no significant correlation emerged with respect to height (167.0±10.3cm) and lower limbs length (79.6±6.7cm). Therefore, individual anthropometric characteristics should be considered when evaluating dynamic balance performances. Further studies are needed to investigate the relationship between anthropometric characteristics and the length and area of sways, and lateral movements of the center of mass.

### References

- [1] Alonso et al. (2012) The influence of anthropometric factors on postural balance: the relationship between body composition and posturographic measurements in young adults. *Clinics* 67(12):1433-1441.

### Keywords

Proprioception; sitting height; wobble board.