ABSTRACT

**Background:** Isokinetic testing of the trunk is ubiquitous in the literature and with training, however, there is a lack of normative data for adolescents and adult athletes.

**Purpose:** The purpose of the current review is to present and summarize data about isokinetic trunk strength assessment relative to young, adolescent and adult athletes. Testing position variations, reliability values by age groups, utilization of strength measures and normative data by age groups have been discussed. The information presented within this review are of practical importance for assessment of isokinetic trunk strength to appraise the athlete’s current strength level and provide suitable conditioning training program.

**Study design:** Literature review

**Methods:** NCBI-PubMed, Web of Science, and SPORTDiscus were searched to identify relevant correlation and intervention studies/trials related to isokinetic testing of the trunk. Forty-two studies meeting the inclusion criteria were included in this literature review.

**Evidence synthesis:** The validity of isokinetic trunk measures (i.e. peak torque; flexion/extension ratios) can be affected by a number of factors including whether the individual is tested in seated or standing position, which can alter the muscle length-tension relationship. Reliability is excellent for some strength measures and moderate to high for muscle endurance. Extension and concentric measures tend to have better reliability than flexion and eccentric measures respectively, while females show typically higher reliability scores than men due to the difficulty in controlling men's body position when testing. Normative data for various populations are provided.

**Conclusions:** Muscle assessment methods using an isokinetic dynamometer are considered reliable with high correlations to peak strength values and flexor/extensor ratios over age groups. However, caution should be exercised when interpreting position-specific isokinetic test results that measure trunk flexion (standing vs seated position). Still, there are indications that low-velocity movements are more reliable for measuring trunk strength. In adolescence, boys appear stronger than girls, with higher values for trunk extensors. Trunk flexors and extensors ratios decrease with growth. Data of isokinetic trunk muscle performance seems to be correlated not only to anthropometric parameters but also to sports discipline and training volume. The effects of sport on the muscular strength of the trunk may have both a preventive factor and a possible risk factor for low back pain. There is evidence for an association between high physical workloads and back injury.

**Level of Evidence:** 5

**Key words:** core, endurance, isokinetic reproducibility, trunk strength testing, sport