ABSTRACT

Background: Dance performance requires not only lower extremity muscle strength and endurance, but also sufficient core stabilization during dynamic dance movements. While previous studies have identified a link between core muscle performance and lower extremity injury risk, what has not been determined is if an extended core stabilization training program will improve specific measures of dance performance.

Hypothesis/Purpose: This study examined the impact of a nine-week core stabilization program on indices of dance performance, balance measures, and core muscle performance in competitive collegiate dancers.

Study Design: Within-subject repeated measures design.

Methods: A convenience sample of 24 female collegiate dance team members (age = 19.7 ± 1.1 years, height = 164.3 ± 5.3 cm, weight 60.3 ± 6.2 kg, BMI = 22.5 ± 3.0) participated. The intervention consisted of a supervised and non-supervised core (trunk musculature) exercise training program designed specifically for dance team participants performed three days/week for nine weeks in addition to routine dance practice. Prior to the program implementation and following initial testing, transversus abdominis (TrA) activation training was completed using the abdominal draw-in maneuver (ADIM) including ultrasound imaging (USI) verification and instructor feedback. Paired t tests were conducted regarding the nine-week core stabilization program on dance performance and balance measures (pirouettes, single leg balance in passe’ releve position, and star excursion balance test [SEBT]) and on tests of muscle performance. A repeated measures (RM) ANOVA examined four TrA instruction conditions of activation: resting baseline, self-selected activation, immediately following ADIM training and four days after completion of the core stabilization training program. Alpha was set at 0.05 for all analysis.

Results: Statistically significant improvements were seen on single leg balance in passe’ releve and bilateral anterior reach for the SEBT (both p < 0.01), number of pirouettes (p = 0.011), and all measures of strength (p ≤ 0.05) except single leg heel raise. The RM ANOVA on mean percentage of change in TrA was significant; post hoc paired t tests demonstrated significant improvements in dancers’ TrA activations across the four instruction conditions.

Conclusion: This core stabilization training program improves pirouette ability, balance (static and dynamic), and measures of muscle performance. Additionally, ADIM training resulted in immediate and short-term (nine-week) improvements in TrA activation in a functional dance position.

Level of Evidence: 2b

Key Words: abdominal draw-in maneuver, core stability, dancers, pirouette, transversus abdominis

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IRB approval, recruitment of volunteers, and data collection were all at Western Carolina University. Portions of this data to examine the impact of ADIM training on TrA activations during functional dance activities have been published in abstracts via APTA NEXT conference proceedings (June 2015 and 2016). Both authors received only internal funding for travel to this conference. No other sources of funding were received, thus no biases exist.