ABSTRACT

Background: A new functional movement assessment, known as the Fusionetics™ Movement Efficiency (ME) Test, has recently been introduced in the literature. Before the potential clinical utility of the ME Test can be examined, the reliability of this assessment must be established.

Purpose: To examine the intra-rater test-retest reliability of the Fusionetics™ ME Test.

Study Design: Cross-sectional.

Methods: ME Test data were collected among 23 (6 males, 17 females) university students (mean ± SD, age = 25.96 ± 3.16 yrs; height = 170.70 ± 9.96 cm; weight = 66.89 ± 12.67 kg) during sessions separated by 48 hours (Day 1, Day 2). All participants completed the seven sub-tests of the ME Test: 2-Leg Squat, 2-Leg Squat with Heel Lift, 1-Leg Squat, Push-Up, Shoulder Movements, Trunk Movements, and Cervical Movements. Overall ME Test scores and ME Test scores for each individual sub-test were calculated on a scale of 0 – 100 (worst – best) based on commonly observed movement compensations associated with each sub-test.

Results: Intraclass correlation coefficients (ICC_{3,1}) statistics indicated that the intra-rater test-retest reliability of the Overall ME Test and individual sub-tests ranged from fair-to-excellent (ICC_{3,1} range = 0.55 – 0.84). Statistically significant differences in ME Test scores were identified between Day 1 and Day 2 among the 2-Leg Squat with Heel Lift (p = 0.015) and Cervical Movements (p = 0.005) sub-tests. In addition, a large range in the standard error of the measure (SEM) and minimal detectable change values (MDC_{90%} & MDC_{95%}) were identified within individual sub-tests of the ME Test (SEM range = 7.05 – 13.44; MDC_{90%} range = 16.40 – 31.27; MDC_{95%} range = 19.53 – 37.25), suggesting that the response stability varies among these individual sub-tests. Prevalence-adjusted bias-adjusted kappa statistics (κ_PABA) suggest that 55 of the 60 (92%) individual movement compensations hold moderate-to-almost perfect intra-rater test-retest reliability (κ_PABA range = 0.30 – 1.00).

Conclusions: Excellent intra-rater test-retest reliability of the Overall ME Test score was identified, and thus, clinicians can reliably utilize the Fusionetics™ ME Test to assess change in functional movement quality across time. However, caution should be taken if utilizing an individual sub-test to assess functional movement quality over time.

Level of Evidence: 2b

Keywords: Functional movement quality assessment, movement screening, movement system, response stability, systematic bias

1 Human Performance & Sport Physiology Laboratory, Integrative Health Care & Performance Unit – Department of Kinesiology, University of Wisconsin-Milwaukee, Milwaukee, WI, USA

Conflict of Interest Statement: This study was facilitated by Fusionetics, LLC (Milton, GA) by providing access to the Fusionetics™ Human Performance System for Movement Efficiency (ME) Test scoring purposes. All authors declare no conflicts of interest.