An Investigation of the Validity of Thirty-second Chair Stand Test as a Measure of Lower Body Strength in Korean Older Adults

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Purpose: to examine the validity of the 30 second chair stand test (30CST) in Korean older adults and provide data that could be compared with US and Hong Kong. Method: 1,154 females and 135 males (mean age 75) who participated in the community-based exercise program between 2007 and 2010 conducted 30-second chair stand test and basic health questionnaire. Among those, 316 participants (284 females and 32 males) performed isokinetic strength of knee extension and flexion: concentric knee extension and flexion at 60, 180 degrees/sec with the standard Biodex protocol. Criterion validity was examined by Pearson correlations and construct validity was examined by the analysis of Variance (ANOVA). An alpha-level of 0.05 was used to determine statistical significance using SPSS. Results: The 30CST was significantly, yet only weakly and moderately, correlated with the isokinetic strength measures ($r=0.44$ for knee extension in 60°, $p<.0001$; $r=0.43$ for knee flexion in 60°). However, it was accurately discriminated across age’s groups. Conclusion: The results suggest the 30CST is likely to be a moderately weak measure of lower body strength in the Korean older

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adults, although it adequately discriminates between different age groups.

**Key Words:** validity, lower body strength, function, 30 second chair stand

### Background

Facing the extremely rapid population aging and the burden of long-term care, it is important to establish valid measure of functional status in older adults and provide the representative normative values that are culturally specific. Lower body strength, for example, is critical to monitor and identify those at potential risk of losing their independence or at risk of falling in the community (Wang, Olson, & Protas, 2005).

Several methods have been devised to estimate functional status of older adults by asking questions or performing several tasks. The Katz index (ADL), the Lawton scale (IADL), the Barthel index (Jones, Rikli R.E., & W.C., 2000), and the Tinetti scales are most frequently used. These include different types of test which range from basic motor abilities to relevant everyday activities, depending on the construct area in the domain of physical function that must be measured.

Among these components, lower body strength is seen as an essential part of maintaining functional mobility and preventing or delaying the onset of disability (Gill, Williams, Richardson, & Tinetti, 1996; Guralnik, Ferrucci, Simonsick, Salive, & Wallace, 1995; Haskell & Phillips, 1995). Difficulties in getting out of a chair or bed affect 6% of community-dwelling older adults, and 60% of nursing home residents (Leon & Lair, 1990). Since walking, stair climbing, and rising from a seated position are activities performed by lower body muscular integrity, measuring lower body strength is critical in evaluating the functional performance of older adults.

Field tests of lower body strength in the elderly include time taken to complete five repetitions (Guralnik, et al., 1994) or 10 repetition (Csuka & McCarty, 1985) of a sit-to-stand test. Yet there tests were criticized as being too difficult and failing to discriminate accurately among the elderly (R. E. Rikli & C. J. Jones, 1999) as many elderly members of the population are incapable of completing even five repetitions (Binder, Miller, & Ball, 2001).