

Development, Validity and Reliability of the Functional Independence and Difficulty Scale.

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Abstract

Although many elderly people can perform basic activities of daily living (BADL) independently, performing BADL “independently” does not necessarily mean disability-free life. Previous study found that older persons who are BADL independent but have difficulty were more frail and susceptible than those without difficulty. They emphasized the usefulness of a BADL scale for assessing both independence and difficulty.

Several BADL scales that include both independence and difficulty were reported. These scales have been developed for the elderly people living in Western countries. To our knowledge, these scales are not used in Japan. To assess BADL disability of Japanese elderly people, it is important to use the suitable scale that reflects the Japanese lifestyle. However, no such scale exists for elderly Japanese people.

This study aimed to develop a new BADL scale that assesses both independence and difficulty of BADL and evaluate the reliability and validity of the new scale.

The results of the study were as follows:

1. We developed a new instrument (Functional Independence and Difficulty Scale; FIDS) comprising 14 items: getting up from bed, standing up from a chair, standing up from the floor, dressing, putting on pants, eating, cleaning after toileting, washing, brushing teeth, opening PET bottle, cutting toenails, walking inside, walking outside, and going up or down 4 to 6 steps. Function scores of FIDS ranged from 14-42, with higher scores representing better function. Internal consistency was acceptable (Cronbach's alpha = 0.92).

2. From a relative reliability perspective, test-retest reliability (unweighted Kappa coefficient = 0.46-0.92, ICC (1,1) = 0.90, $p < 0.001$) and inter-rater reliability (unweighted Kappa coefficient = 0.41-0.77, ICC (2,1) = 0.97, $p < 0.001$) were good. Bland-Altman analysis detected fixed bias and accidental error in the test-retest and inter-rater reliability, respectively. The limit of agreement in test-retest reliability was

-5.2 to 1.8, representing an increase of over 6 points for improvement and a decrease of over 2 points for decline of BADL ability. The minimal detectable change in inter-rater reliability was 3.7, indicating that a 3-point difference might be exist between difference raters.

3. The FIDS has significant relationship with physical functions (grip strength, isometric knee extension muscle strength, balance flexibility and gait performance), existing BADL scale (Barthel Index and Functional Independence Measure), Tokyo Metropolitan Institute of Gerontology Index of Competence and Japanese version of the Medical Outcomes Study Short Form 8 Health Survey.

In conclusion, we developed FIDS, a 14-item instrument to evaluate BADL disability including both independence and difficulty in community-dwelling elderly people in Japan. Psychometric evaluation demonstrated acceptable reliability and validity. FIDS may become useful BADL assessment tool in practice and in research for community dwelling elderly people.