

Reliability and Validity of Culturally Adapted Executive Function Performance Test for Koreans with Stroke

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Background: Executive Function Performance Test was unusable in Asia because of cultural differences, although evaluating the effect that executive function has on real life is essential to people with stroke. The aims of this study were to report the development and standardization of culturally appropriate Executive Function Performance Test for Koreans (EFPT-K) and to verify its reliability and validity in the stroke population. *Methods:* EFPT-K was developed by going through the process of translation, back-translation, and an expert committee's conference on cultural adaptation. Inter-rater reliability was examined and 34 people with stroke were recruited to test the internal consistency and criterion validity of EFPT-K. To verify the criterion validity, EFPT-K scores were compared with those of the Trail-Making Test, the Korean Color-Word Stroop Test, the Digit Span Test, and the Assessment of Motor and Process Skills (AMPS). *Results:* Inter-rater reliability and internal consistency of the total score of EFPT-K supported high levels of reliability. In the criterion validity of EFPT-K, all neuropsychological tests but digits backward showed a correlation with the total score of EFPT-K, and AMPS components of initiation, notice/response, and termination showed a moderate correlation with the EFPT-K score. *Conclusions:* EFPT-K is a useful tool to evaluate the executive functioning of patients with stroke in real-life tasks and could be used as a sample in other Asian cultures where thorough evaluation of executive function in the performance of daily life is needed. **Key Words:** Executive function—performance—criterion validity—cultural adaptation—stroke.

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Introduction

Executive function disorder affects 19%-75% of patients with stroke according to how it is defined and assessed in each literature.^{1,2} As a higher cognitive function,

executive function controls and regulates lower ones, and integrates purposeful and goal-directed behavior processes.^{3,4} Executive function disorder lasts chronically even after 6 months from the onset of a stroke,⁵ diminishes the effects of rehabilitation and functional recovery,² and limits returning to the workplace and social participation.^{6,7}

Standardized executive function tests are essential to screen executive dysfunctions after stroke, to plan rehabilitation interventions considering the dysfunctions, and to evaluate the effect of cognitive rehabilitation in real life.¹ Until now, paper-based neuropsychological tests such as the Stroop Color-Word Interference Test and the Trail-Making Test (TMT) were primarily used to evaluate executive functions. Besides, performance-based executive function tests such as the Allen Cognitive Levels Screening Battery (ACLS), Assessment of Motor and Process Skills (AMPS), Kitchen Task Assessment, and Behavioral Assessment of the Dysexecutive Syndrome (BADS) are used.

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Nevertheless, paper-based neuropsychological tests cannot predict the performance of executive functions in naturalistic environment or real life.⁸ In particular, many neuropsychological tests are not sensitive to multitasking and have limitations of low ecological validity, which means the inability to evaluate the effect that executive dysfunctions have on daily activities.^{3,4,9,10} Among the performance-based tests, ACLS and AMPS are the most difficult to use when clearly evaluating the evaluator's capability of assistance because these tests do not reflect the amount of help on the score when the evaluator provides gradual assistance, and Kitchen Task Assessment requires performance and assessment of only 1 task, which limits assessment of diverse aspects of the executive function.⁴ BADS is not usable in most clinical settings not only because preparing and setting up for complex 6 tasks are difficult but also because the ecological validity is low and could only be used in a certain cultural context.^{11,12}

The Executive Function Performance Test (EFPT) was developed to overcome such limitations.^{3,4} EFPT is an evaluation tool that tests the degree of executive function deficits and one's ability to independently function based on one's performance on 4 daily tasks: cooking oatmeal, using a telephone, taking medications, and paying bills.^{4,13} Several studies support the use of original EFPT by verifying the reliability and validity when the test is performed on people with acute and chronic stroke and schizophrenia.^{4,14,15}

Although EFPT was tested with reliability and validity, and consistently used in Western culture such as the United States, Israel, Sweden from the 2000s,^{4,14,15} original EFPT was not usable in Asia due to the cultural differences in instrumental activities of daily living (ADLs) that demand executive functions and how they perform the tasks. Using the 4 tasks from the original EFPT is impracticable as these tasks are culturally unsuitable, not used in Korean society, or used differently. Thus, not only translations but also replacing the tasks with equivalent levels of culturally fit tasks are necessary, and testing the reliability and validity is crucial to apply EFPT in Korea.

The purpose of the present study was to report the development and standardization process of the culturally appropriate Executive Function Performance Test for Koreans (EFPT-K) and to verify its inter-rater reliability, internal consistency, and criterion validity.

Methods

Translation and Cultural Adaptation

Developing the EFPT-K was processed with the following 4 steps (Fig 1).

The first step was to translate the original EFPT in Korean and back-translate it into English to examine the appropriateness of EFPT-K. After getting approved by the developer of the original EFPT, an occupational therapist (first author) bilingual in Korean and English translated the manual and evaluation form of the original EFPT

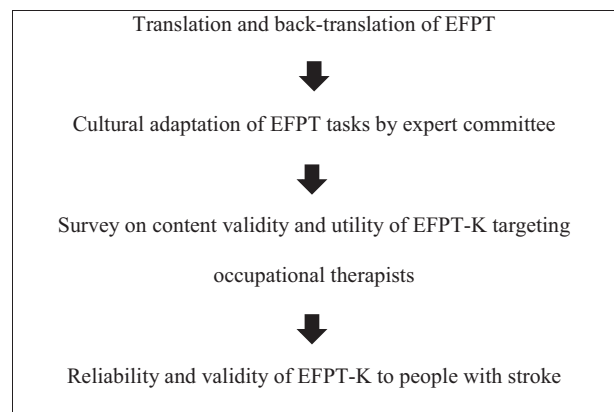


Figure 1. Development process of EFPT-K. Abbreviation: EFPT-K, Executive Function Performance Test for Koreans.

obtained from the Cognitive Rehabilitation Research Group's Website (http://crrg.wustl.edu/outcome_assessment.html) into Korean (V1). A bilingual undergraduate student majoring in occupational therapy (BT1) and a bilingual professor who majored in clinical psychology (BT2) each back-translated the V1 into English. Both back-translators were not familiar with EFPT, were blinded to the original one, and worked independently on back-translation. By comparing the two back-translations and original EFPT, the authors verified the clinical components and appropriateness of terminology. Discrepancies were discussed to find agreements to complete the EFPT translated in Korean (V2).

Second, an expert committee was formed consisting of the translator, 1 occupational therapy professor expert in cognitive rehabilitation, and 3 occupational therapists with more than 5 years of clinical experience in cognitive rehabilitation. After discussing the cultural appropriateness of EFPT, the committee selected unsuitable tasks and processed to replace the tasks as shown in Table 1. Necessary materials, a manual, and an evaluation form were modified for the adapted tasks to make the prefinal version of EFPT-K.

Table 1. Tasks replaced by culturally appropriate ones in EFPT-K

EFPT tasks	EFPT-K tasks
Making instant oatmeal	Making instant rice porridge
Ordering groceries by phone	Ordering delivery food by phone
Taking prescribed medications	Taking prescribed vitamins
Paying bills by check	Paying bills by transferring from bank account

Abbreviations: EFPT, Executive Function Performance Test; EFPT-K, Executive Function Performance Test for Koreans.

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