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A Preliminary Study on the Correlation Factor Analysis of Language Cognitive Assessment System Based on Scale Construction

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ABSTRACT

This paper explores the 12 dimensions of language cognition assessment system using factor analysis. Principal component analysis and correlation analysis of factors within the system were conducted on the language cognition assessment system. Factor analysis and principal component analysis: KMO: 0.934, weak bias correlation, suitable for factor analysis, and the contribution of principal component variance was 79.837%, respectively. The correlations between the 12 factors ranged from 0.611-0.903. The correlation values between the remaining 11 factor assignments and the total score of the system were higher than the correlations between the subscales. The system is constructed with good structural validity, but the correlations between the factors are strong. It is suggested that the indicators be combined or the form of the questions be modified to provide guidance for the modification of the language cognition assessment system.

KEYWORDS

Correlation, Factor Analysis, Language Cognition Assessment System

1. INTRODUCTION

As the aging population increases, the prevalence of dementia is increasing each year, and cognitive impairment can occur to varying degrees after brain injury. Mild cognitive impairment is an intermediate state between normal aging and dementia, so there is a strong need for early cognitive screening and intervention for healthy older adults and post-stroke survivors. Current diagnoses of cognitive impairment are mostly based on neuropsychological scales, one of which is a simple structured scale such as the MMSE and Moca, but related studies have shown that the MMSE has low sensitivity, while the MoCA is designed for conceptual transformation in verbal abstraction and has a large difficulty factor for each subscale in the cognitive domain, which is not adapted to severe cognitive impairment (Pendlebury, Mariz, Bull, Mehta, & Rothwell, 2012). One category is the complex and exhaustive set of neuropsychological tests, such as the Wechsler Adult

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Intelligence Scale (WAIS), the Halstead-Reitain Neuropsychological Inventory, and the Wechsler Memory Inventory, which are highly demanding and time-consuming for personnel. Based on this, we designed a language cognition assessment system that can quickly screen people with cognitive impairment based on literature screening, scale construction, and Delphi expert scoring of language cognition entries based on the model assignment of question selection rules and answer trajectories for the characteristics of Chinese language and culture, and now we are going to analyze and study its system internal about language and cognition from principal component analysis, correlation of factors within the system and language and cognition The analysis and research on the correlation between language and cognition from principal component analysis, correlation of factors within the system, and correlation between language and cognition and synthesis are conducted to provide guidance for the modification of the language cognitive assessment system.

2. METHODS AND MATERIALS

2.1 Research Subjects

A total of 78 participants in this study. (Interns and chaperones as normal subjects 24, 12 females, 12 males, aged 38.71years; stroke and traumatic brain injury language cognitive impairment 54, 21 females, 33males, aged 55.55 years years.)

Subjects with language cognitive impairment were obtained from patients hospitalized in the Department of Rehabilitation of Jinan University and the Department of Rehabilitation Medicine of the Second Hospital of Guangzhou Medical University from 03/2018 to 03/2020, and enrolled cases including cerebrovascular accidents and brain injuries were confirmed by CT or MRI and diagnosed by specialists. Normal subjects were obtained from undergraduate interns (20-25 years old) in the Department of Rehabilitation of Jinan University and the Second Affiliated Hospital of Guangzhou Medical University.

The following conditions were excluded: (i) patients in a coma, coma, or persistent vegetative state; (ii) those with a history of psychiatric disorders or congenital mental retardation; (iii) those taking drugs with cognitive effects; (iv) patients with severe visual or hearing impairment; (v) those with alcohol dependence; (vi) those with severe visual or hearing impairment; (vii) those who had to stop the test due to adverse reactions, changes in condition, or concomitant other diseases during the test and could not complete it.

2.2 Assessment Tool: Language Cognition Assessment System

According to the literature screening, the top three language and cognitive scales were listed, and the first-level indicators of the scales were constructed using the Delphi method. After the expert questionnaire survey, 10 first-level indicators were finally screened and 12 factors were included, and the language dimensions included: spontaneous expression, retelling, reading, figure name, and listening comprehension; among them, the second-level entries of listening comprehension were: listening whether, listening recognition. Cognitive dimensions include: orientation, memory, calculation, attention, and reasoning. The secondary indicators of memory are divided into: instantaneous memory, delayed recall. The secondary and tertiary indicators were modified according to expert opinions, and the clinical tests were adjusted with corresponding questions and guiding phrases, and the scale was simulated and computerized after no objection (Wang, Chang, & Douglas, 2012). Each factor was divided into five levels according to difficulty (10, 30, 50, 70, and 90 points).

Assessment process: (i) Talk to the subject, perform an initial clinical assessment, and inform him/her of the significance of the assessment before entering the test. ,The assessment was conducted in a quiet assessment room dedicated to the department. The testers were professionally trained rehabilitation physicians and therapists, and the test was conducted using uniform and standardized instructional language, avoiding hints and other questions and answers as much as possible, and when the test was ready, the testers were told to “prepare for the assessment, please answer the questions

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