A study on the perception of occupational therapy majors on Cognitive Impairment Screening Test (CIST)

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Abstract

Purpose: The purpose of this study is to classify the characteristics of each item of CIST evaluation and to find out the degree of recognition of the characteristics of the cognitive tool.

Methods: This study was conducted for occupational therapy majors at M University located in Gyeongsangnam-do. The data collection from May to June 2021. Total of 25 copies of the data were finally analyzed, SPSS Statistics 26 was used for data analysis.

Results: As a result of the study, the significance level was visual reasoning 1 test strip and the visual reasoning 1 tool. In the relationship between the correspondence 1 figure simulation sheet and the figure simulation tool for each item and statistically significant, and the correspondence 2 visual reasoning 2 sheet. Visual reasoning 2 sheet and visual reasoning tool also showed that was found to be statistically significant. The correlation for visual reasoning 1 sheet and the visual reasoning 1 tool, reasoning 2 tool and visual reasoning 1 sheet, and the visual reasoning 2 tool and the verbal reasoning sheet.

Conclusion: In this study, in the CIST items that may be difficult, it is better to attach the actual tool rather than the verbal explanation of the test paper to increase the efficiency of the test and the understanding of subjects with mild cognitive impairment. It was implemented by applying the tool, and it was found that the use of the tool in the visual reasoning item showed a high correlation by item. Furthermore, based on this study, it will be possible to suggest a method to control the difficulty of each subject of the cognitive evaluation tool, and to prepare a standard for future research.

Key words: CIST, Cognitive, Cognitive function Test, Dementia, Screening Test

Ⅰ. Introduction

As for the proportion of the elderly population in Korea, the elderly population rate of the elderly over 65 years of age was 5.45 million (11%) in 2010 and 12.69 million (24.3%) in 2030, 2.3 times higher, and in 2060, 17.62 million (40.1%), it is expected to more than triple times. The number of people aged 85 and over is expected to increase more than ten times from 370,000 (0.7%) in 2010 to 4.48 million (10.2%) in 2060[1], and in 2067, it is expected to account for 46.5% of the total population[2].

In addition, the support expense of the elderly population is 38.6% in 2020, and the medical expenses for the elderly are increasing rapidly to 43.6 trillion won in 2010 and 64.6 trillion won in 2016[2,1]. The increase in geriatric illness due to an increase in the elderly population is increasing every year. In particular, the life expectancy of the elderly population in Korea reached 77.2 years for men and 84.1 years for women in 2010, and is expected to reach 86.6 years for men and 90.3 years for women by 2060[1].

As the elderly population increases, the prevalence of dementia is rising sharply, the number of dementia is 10% of over 65 years old in 2025, it is expect 13.2% in 2050. The total medical cost due to dementia is expected to be 18.9 trillion won in 2020 and 38.9 trillion won in 2030, and the dementia treatment cost is more than double that of patients with severe dementia (23.41 million won) than those with mild dementia (13.51 million won)

In addition, if the incidence of dementia is delayed by 2 years or more through early detection of high-risk groups of dementia, the prevalence of dementia will be lowered to 80% of the expected level after 20 years, and the severity will also decrease, so there is an urgent need for early detection and early treatment of dementia[3].

Dementia is a disease in which cognitive function declines, activity of daily living, and behavior change due to various causes. It is known that degradation occurs mainly from the early stage and behavioral change occurs mainly in the middle stage[4]. Various impairments in memory, attention, judgment, insight, and communication skills in dementia can affect patients ability to understand and express questions about their subjective state[5].

The decline in cognitive function due to dementia is also a reason to increase dependence in daily life.

In general, cognitive function refers to a wide range of intellectual ability involved in input, processing, storage, and retrieval of information about the surrounding environment.

It understands what happens in our daily life environment, judges and decides the situation, and among them, basic cognitive ability is defined as 'intellectual function considered as a prerequisite for managing the environment encountered in daily life'.[6] Cognitive functions include orientation, memory, judgment, attention, calculation, and communication[7]. Cognitive symptoms due to dementia are characterized by impairments in memory, language, orientation, personality, depression-like symptoms of a lack of interest in external affairs, and later impulsiveness, may also show symptoms of paranoids and hallucinations[8].

Dementia is a chronic disease characterized by progressive cognitive and behavioral impairment. As the patient progresses, the amount of effort and time spent by caregivers to support the patient[9].

Most of the subtle changes in the early stages of dementia are not clearly visible, and a comprehensive evaluation of cognitive and

behavioral functions is required for the diagnosis of dementia[10].

In particular, in the initial stage, symptoms such as emotional change, psychological state change, depression and personality change may appear, and cognitive decline has a negative effect on planning, judging, and performing tasks appropriately, making it difficult to live independently, and to need accurate diagnosis and appropriate treatment.

Early detection of dementia has a significant impact on the delay of symptom progression and the quality of life of the elderly. Currently, various opportunities are provided for early detection of cognitive decline in the elderly using the dementia safety center.

First, it is necessary for health care workers to select early dementia patients or mild cognitive impairment using an easy-to-use and reliable evaluation tool.

Therefore, it can be said that the development of a dementia screening test tool that can be easily used by ordinary people who are not experts in preventive medicine and mental health, if they receive appropriate education[11].

In addition, it is necessary to develop an effective dementia screening test tool that allows the elderly at risk of dementia to easily receive dementia screening, and a test method that can accurately detect cognitive decline in subjects with a high risk of dementia at an early stage is needed[12].

It can be said that it is essential to reduce the prevalence of dementia as much as possible by frequently applying these dementia screening tools to dementia risk groups not only in the general population but also in clinical settings.

The evaluation tools used in dementia screening and diagnosis in Korea include the Mini-Mental State-Examination-Korea (MMSE-K) and the Short Form of Samsung Dementia Questionnaire (S-SDQ), 7 Minute Screening Test (7 MS), etc[11], the Korean version of CERAD, the Simplified Mental State Test (MMSE-KC), the Korean version of the Simple Blessed Test, and the Time-Money Test have been reported recently, however, efforts are being made to supplement the limitations of the existing dementia screening tests[13][14].

CIST (cognitive impairment screening test) is a dementia screening tool developed by the Ministry of Health and Welfare for use in dementia safety centers, health centers, clinics, and affiliated hospitals, and has been applied since January 1, 2021. MMSE-DS, a screening test tool, has been used repeatedly for more than 10 years, causing problems, and there are limitations depending on language and cultural background to use as an overseas tool adaptation was designed to develop. Therefore, the purpose of this study is to classify the characteristics of each item of CIST evaluation and to find out the degree of recognition of the characteristics of the cognitive tool.

Ⅱ. Methods

2.1. Research subject

This study was conducted for occupational therapy majors at M University located in Gyeongsangnam-do. The data collection period was 2 months from May to June 2021, and the research purpose, significance, and guarantee of anonymity were explained to the study participants in consideration of ethical issues.

After obtaining consent to participate in the study, the subjects were evaluated.

A total of 30 copies of the data were distributed, and a total of 25 copies of the data were finally analyzed, excluding the data containing insufficient answers and errors.

2.2 Research Design

The purpose of this study is to find out the difference between understanding and performance in cognitive function evaluation by comparing the evaluation with the test paper for each test item among the CIST evaluation items by making an actual tool and examining it.

Figure simulation, visual reasoning 1 and 2, and language reasoning items that can be made and implemented were targeted.

2.3. Data analysis

In this study, SPSS Statistics 26 was used for data analysis, and the correlation of test values through the corresponding sample for each item was evaluated, and the Pearson correlation coefficient between the subscales of the evaluation items was measured.

Ⅲ. Results

3.1. General characteristics

The general characteristics were 16% (4) male and 84% (21) female in gender, and the age was 28% (7) 21 years old, 56% (14) 22 years old, and 16% (4) 23 years old. They knew about the cognitive evaluation 96% (24) said, and the preference for the method used in the cognitive evaluation was 23%(6) using the test strip, 76%(19) using the tool, and the awareness of the number of known cognitive evaluations. 3 were 40% (10), 4 were 12% (3), and 5 were 8% (2). The number of tests in the cognitive evaluation domain is 84% (21) for one evaluation at a time, and 16% (4) for multiple domain evaluations at a time, and the cognitive evaluation execution time is 40% (10) less than 10 minutes, 40% (10) less than 20 minutes (10), less than 5 minutes 16% (4), and less than 30 minutes 4% (1). The development of cognitive evaluation tools is necessary 96% (24) say that , 4% (1) do not need it, and the number of cognitive tools that they know is 3, 52% (13), and 4, 36% (9). Regarding whether or not there is a cognitive domain they want, 76% (19), yes 24% (6), 96% (24) say that the development of mild cognitive tool is necessary from necessity, 4% (1) say that it is not necessary, and it is a tool for cognitive evaluation As for the material, wood 44% (11), plastic 32% (8), cloth 16% (4) and metal 8% (2) were found (Table 1).

Since the significance level was less than 0.05 in the visual reasoning 1 test strip and the visual reasoning 1 tool, the statistically significant probability was 0.021, indicating that there was a statistically significant relationship when the test paper and the visual reasoning tool were used.

Table 1. General Characteristics (N=25)

Variable	Category	Number	Percent (%)
Sex	male	4	16.0
	female	21	84.0
Age	21.00	7	28.0
	22.00	14	56.0
	23.00	4	16.0
Cognitive Assessment awareness	Yes	24	96.0
	No	1	4.0
Cognitive evaluation tool application	evaluation sheet	6	24.0
	tool	19	76.0
Number of tools	one	1	4.0
	two	9	36.0
	three	10	40.0
	four	3	12.0
	five	2	8.0
Number of cognitive function areas	Multiple evaluations at once	4	16.0
	one at a time	21	84.0
Cognitive evaluation execution time	less 5 minutes	4	16.0
	less 10 minutes	10	40.0
	less 20 minutes	10	40.0
	less 30 minutes	1	4.0
Develop. cognitive evaluation tool	necessary	24	96.0
	not necessary	1	4.0
Cognitive index you know	three	13	52.0
	four	9	36.0
	five	1	4.0
	six	1	4.0
	more seven	1	4.0
Cognitive area to be evaluated	yes	6	24.0
	no	19	76.0
Development of mild cognitive tool	necessary	24	96.0
	not necessary	1	4.0
Cognitive assessment tool material	wood	11	44.0
	metal	2	8.0
	plastic	8	32.0
	fabric	4	16.0
Total		25	100.0

Table 2. corresponding sample

		Mean	N	SD	CC	SP
corresponding 1	shape copy-sheet	15.3444	25	9.83104	.177	.398
	shape copy-tool	3.1828	25	2.20499		
corresponding 2	visual reasoning1-sheet	5.1064	25	3.68141	.458	.021
	visual resoning1-tool	7.5920	25	4.35740		
corresponding 3	visual reasoning2-sheet	29.6768	25	11.78226	.145	.490
	visual reasoning 2-tool	5.1604	25	4.92774		
corresponding 4	language reasoning -sheet	4.8064	25	4.75515	.005	.981
	language reasoning -tool	10.4832	25	8.37469		

In the relationship between the correspondence 1 figure simulation test strip and the figure simulation tool for each item, the T value was 6.27 and the significance probability was .000, which was less than .05, so it was found to be statistically significant, and the correspondence 2 visual reasoning 2 test strip and time.

The reasoning tool had a t value of 2.942 and a significance probability of .007, which was less than .05, so it was found to be statistically

significant.

Correspondence 3 visual reasoning 2 test paper and visual reasoning tool also showed that the t value was 10.134 and the significance probability was .000, which was less than .05, so it was found to be statistically significant.

The value was 2.954, and the significance probability was .007, which was less than .05, indicating that it was statistically significant (Table 3).

Table 3. Correspondence sample verification

		Correspondence difference					t	DF	SP (Both)
		Mean	SD	standard error mean	95% confidence interval of difference				
					lower limit	maximum			
corresponding 1	shape copy-sheet & shape copy-tool	12.16160	9.68786	1.93757	8.16265	16.16055	6.277	24	.000
corresponding 2	visual reasoning 1 -sheet & visual resoning1-tool	-2.48560	4.22467	.84493	-4.22946	-.74174	-2.942	24	.007
corresponding 3	visual reasoning 2 -sheet & visual reasoning 2-tool	24.51640	12.09562	2.41912	19.52357	29.50923	10.134	24	.000
corresponding 4	language reasoning ¬sheet & language reasoning -tool	-5.67680	9.61005	1.92201	-9.64363	-1.70997	-2.954	24	.007

If you look at the correlation for each item, the figure simulation test strip and the visual reasoning 1 test strip are .493, the figure simulation test strip and the visual reasoning 2 test strip are .589, the visual reasoning 1 test strip and the visual reasoning 1 tool are .458, the visual reasoning 1 test strip and the visual.

The reasoning 2 tool showed .506, the visual reasoning 1 test paper and the verbal reasoning test paper were .436, and the visual reasoning 2 tool and the verbal reasoning test paper were .819 (Table 4).

Table 4. Correlation coefficient

Division	shape copy-sheet	shape copy-tool	visual reasoning1-sheet	visual resoning1-tool	visual reasoning2-sheet	visual reasoning 2-tool	language reasoning-sheet	language reasoning-tool
shape copy-sheet	1	.177	.493*	.383	.589**	.266	.365	.073
shape copy-tool		1	.162	.294	-.118	.162	-.125	.063
visual reasoning1-sheet			1	.458*	.078	.506**	.436*	-.022
visual resoning1-tool				1	-.023	.265	.207	-.043
visual reasoning2-sheet					1	.145	.323	.285
visual reasoning 2-tool						1	.819**	.073
language reasoning-sheet							1	.005
language reasoning-tool								1

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

Ⅳ. Discussion

Dementia should be selected by health care workers who are primarily responsible for the health of community residents using an easy-to-use, easy-to-use, and reliable evaluation tool[16]. However, in Korea, the tools used abroad are standardized for domestic use. Previous studies have attempted to supplement the limitations[18)19)20)] in which the test results of the existing dementia test tools are affected by the age, education, sex, etc. of the test subject. The CIST test tool has a slightly higher level of difficulty than the existing cognitive screening tool, so it is expected that there will be a degree of discrimination. In order to increase the efficiency of the test and the understanding of subjects with mild cognitive impairment, some

items were applied by applying a tool.

As a result of the study, in general characteristics, the recognition level of cognitive evaluation was high at 96.4%, and in cognitive evaluation, direct application of the tool was preferred at 76%, and the evaluation time was 80% for 10-20 minutes, and the hardness. The development of an evaluation tool for cognitive impairment was needed, 96% showed. In this study, the item in which it was more effective to apply the tool than the itemized test paper was the item of visual reasoning 2, which was expressed as difficult even when some students applied it. Because it was aimed at students majoring in occupational therapy, it is expected that sufficient explanation and understanding will be needed in case of mild cognitive impairment in the case of graphic simulation, visual reasoning 1, and verbal reasoning. Dementia is related to the quality of life of not only the subject but also all of the subject's members, which is a social problem and causes a national crisis due to serious medical expense problems[21]. Early detection of such dementia is important, and about 15% of dementia patients can be recovered or delayed through intervention if detected at an early stage[22]. The limitation of this study is that it is difficult to generalize because it was not conducted with patients with mild cognitive impairment or early dementia, as it was for occupational therapy majors. In a future study, it will be helpful to adjust the difficulty of the evaluation tool if it is conducted on patients with mild cognitive impairment or early dementia to increase the efficiency of the test.

V. Conclusion

In this study, in the CIST test tool developed by the Ministry of Health and Welfare in 2021,

for some items that may be difficult, it is better to attach the actual tool rather than the verbal explanation of the test paper to increase the efficiency of the test and the understanding of subjects with mild cognitive impairment. It was implemented by applying the tool, and it was found that the use of the tool in the visual reasoning item showed a high correlation by item. Furthermore, based on this study, it will be possible to suggest a method to control the difficulty of each subject of the cognitive evaluation tool, and to prepare a standard for future research.

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