The Korean Version of the University of California San Diego Performance-based Skills Assessment: Reliability and Validity

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Objective: The study's aim was to develop and standardize a Korean version of the University of California San Diego Performance—based Skills Assessment (K—UPSA), which is used to evaluate the daily living function of patients with schizophrenia.

Methods: Study participants were 78 patients with schizophrenia and 27 demographically matched healthy controls. We evaluated the clinical states and cognitive functions to verify K—UPSA's reliability and validity. For clinical states, the Positive and Negative Syndrome Scale, Clinical Global Impression—Schizophrenia scale, and Social and Occupational Functioning Assessment Scale and Schizophrenia Quality of Life Scale—fourth revision were used. The Schizophrenia Cognition Rating Scale, Short—form of Korean—Wechsler Adult Intelligence Scale, and Wisconsin Card Sorting Test were used to assess cognitive function.

Results: The K—UPSA had statistically significant reliability and validity. The K—UPSA has high internal consistency (Cronbach's alpha, 0.837) and test—retest reliability (intra—class correlation coefficient, 0.381–0.792; $p<0.001$). The K—UPSA had significant discriminant validity ($p<0.001$). Significant correlations between the K—UPSA's scores and most of the scales and tests listed above demonstrated K—UPSA's concurrent validity ($p<0.001$).

Conclusion: The K—UPSA is useful to evaluate the daily living function in Korean patients with schizophrenia.

KEY WORDS: Cognitive function; Reliability; Schizophrenia; Validity.

INTRODUCTION

Patients with schizophrenia face difficulties due to their inability to solve problems in daily life despite advances in various pharmacological and other treatment methods.[1] Daily living function includes not only independent living, such as the ability to use basic tools, transportation, finance management, eating, and cleaning, but also vocational and social functions. Approximately 62.7 billion USD was spent on patients with schizophrenia in the United States in 2002, much of which was used not only for treatments, but also for problems of daily life, such as unemployment, weakened vocational capability, and independent living.[2] A South Korean study examining the economic burden of people with schizophrenia showed that 3,174,800,000 USD was used in 2005 alone, the majority of which was related to unemployment.[3] In the recent statistical data from the Korea Employment Agency for the Disabled, the employment rate of psychologically disabled people was 18.4%, which was much lower than that of the physically disabled (43.7%), or the sensory disabled (visually impaired, 37.6%; others, 32.8%).[4] Thus, impaired daily living function in patients with schizophrenia causes huge losses in economy and rehabilitation.

Although the causes of impaired daily living function in patients with schizophrenia can be varied, cognitive function disability, which is one of the main symptoms of schizophrenia, is related to the daily living function of the patient.[5,6] Evans *et al*.[7] evaluated the daily life function of elderly patients with schizophrenia using activities of daily living and instrumental activities of daily living. They reported that cognitive function is more helpful than the clinical symptoms for predicting the daily living function of patients with schizophrenia. A longitudinal study inves-

tigating factors related to the daily living function of patients with first-episode psychosis showed a correlation between cognitive function and daily living function.[8] Evaluating cognitive function was helpful in predicting the vocational function of patients with schizophrenia through a vocational rehabilitation program.[9]

In addition to cognitive function assessments, functional capability assessments are widely used, focusing directly on patients' daily living, to predict the daily living function of patients with schizophrenia. This is less dependent than other assessments on reporting of guardians or patients and enables the daily living function of patients to be observed easily.[10] Representative functional capacity assessments are the University of California San Diego Performance-based Skills Assessment (UPSA)[11] and Maryland Assessment of Social Competence.[12] These tools are used in several studies for assessment of daily living function.[13]

The UPSA uses role-play to assess the patient's function for five selected domains of daily living functions. The five domains are financial, communication, comprehension/planning, transportation, and household skills. It uses prepared materials to assess how patients conduct daily living. The UPSA's validity and reliability have been well verified; hence, it is widely used in studies of daily living function in schizophrenia.[11] The UPSA was also reported to be helpful for predicting the residential independence of elderly patients with schizophrenia,[14] and it is correlated with interpersonal skills and community activities.[15]

The UPSA is an assessment based on the performance in daily life, and thus, differences may be due to the social-cultural environment in English-speaking countries, such as the United States.[16,17] Hence, it needs to be adopted in accordance with the environment of South Korea (e.g., household skills and transportation). South Korean standardization of the tool is required to minimize the measurement error that may be caused during translation and adaptation of the assessment tool. Therefore, this study developed a Korean version of the UPSA (K-UPSA) to assess the daily living function of schizophrenic patients, and this was tested for reliability and validity.

METHODS

Participants

The subjects were 18 to 60-year-old patients who were diagnosed with schizophrenia by two psychiatric doctors, based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition.[10] Patients were only included if their symptoms were stably controlled, and they were administered with outpatient or rehabilitation treatment, which was confirmed by a medical record review. In addition, patients were only included if they had been taking the same dose of antipsychotics for the last 3 months. Patients were recruited from four hospitals in Busan, consisting of one university hospital and three hospitals specializing in psychiatry. Patients with psychiatric disorders other than schizophrenia, patients with substance abuse, and patients with intellectual impairment (intelligence quotient [IQ] < 70) were excluded. The control group was selected from hospital staff and volunteers. Their age and education level were similar to the patient group, but they had no history of psychiatric disorder. The patient group was examined for their duration of prevalence, and the type and dose of their current medication. Doses of antipsychotics were converted into the chlorpromazine-equivalent dose.[18,19]

Bonett's method was used to determine the optimum sample size.[20] This study was approved by the Institutional Review Board for Human Research at Inje University Busan Paik Hospital (IRB:11-032).

Clinical Assessments

For the evaluation of clinical symptoms and social functions, the Positive and Negative Syndrome Scale (PANSS),[21] Clinical Global Impression-Schizophrenia scale (CGI-SCH),[22] Social and Occupational Functioning Assessment Scale (SOFAS),[23] and Schizophrenia Quality of Life Scale-fourth revision (SQLS-R4)[24] were administered by psychiatrists.

The PANSS is a psychopathology evaluation tool that consists of 30 items in three subscales, seven-point rating instrument; 7 items assessing positive symptoms, 7 items assessing negative symptoms, and 16 items assessing general psychopathology. Higher scores indicate more severe psychopathologic conditions. A psychiatrist evaluated the patient group using the Korean version of the test.[25]

The CGI-SCH has been developed as a short, standardized method of assessing the symptoms of schizophrenia in a clinical setting. It consists of two categories: the severity of illness and degree of change, each of which rate five dimensions (positive, negative, depressive, cognitive, and global) that are evaluated using a seven-point scale.

The SOFAS assesses the individual's level of social and occupational function during the interview, without being directly influenced by the individual's psychological

symptoms. However, impairment from general medical conditions is considered in the assessment, which ranges along a continuum from "very outstanding" to "remarkably impaired."

The SQLS-R4 is a short, self-report quality of life questionnaire that is generally completed within 5 to 10 minutes. It consists of disease-specific items reflecting the daily lives of people with schizophrenia. A higher score denotes a lower quality of life. It comprises 33 items, and the maximum score is 132 points, which is converted to a 100-point scale. This study used the Korean version of SQLS-R4 (SQLS-R4K).[26]

Neuropsychological Assessments

Korean version of the University of California San Diego Performance−based Skills Assessment (K−UPSA)

The UPSA was developed to evaluate a patient's function in everyday life and basic livelihood skills through role-play tasks similar to those necessary for independent function in daily life.[11] The test consists of five functional domains: financial, communication, comprehension/planning, transportation, and household skills. This tool takes approximately 30 minutes to estimate. Scoring is done according to the manual. One point is given for each correct answer and 0 points for incorrect answers. In addition, UPSA total score (range, 0-100) is calculated using the Summary Scoring Worksheet.

Written pre-approval to develop a Korean version of UPSA was obtained from the primary original author, Patterson, and a professional translator translated UPSA into Korean. A research committee of four psychiatrists, including the principal investigator, finalized the first edition after thorough discussion and revision. The text was back-translated into English by a professional translator and reviewed by the original developer to confirm that the intentions of the original author were accurately reflected in the back-translated version.

Schizophrenia Cognition Rating Scale (SCoRS)

The SCoRS developed by Keefe et al.[27] is an assessment tool that focuses on cognitive dysfunction in patients with schizophrenia and its relationship to their real-world function and functional capacity. It was developed to assess difficulties in attention, memory, motor skills, language production, problem-solving, and cognitive difficulty experienced by subjects during the two weeks before the interview. Patients with schizophrenia and informants respond to 20 items, and their responses are scored on a

four-point scale, with higher scores denoting more severe dysfunction. The test takes approximately 30 minutes to administer.

Short−form of Korean−Wechsler Adult Intelligence Scale (K−WAIS)

K-WAIS is a standardized cognitive test, a Korean version of the Wechsler Adult Intelligence Scale-Revised (WAIS-R), which is used to evaluate verbal and performance intelligence. This study used a short form of K-WAIS, consisting of picture completion, arithmetic, digit span, and similarities. In a previous study comparing short-form tests of cognitive function in patients with schizophrenia, the short-form tests were more readily administered than full tests, and a high correlation was found between estimated intelligence and WAIS-R-measured intelligence.[28]

Wisconsin Card Sorting Test (WCST) Computer Version 4

The WCST developed by Berg et al.[29] was used in the interviews. WCST is a representative test that measures executive function, with emphasis on perseverance and achievement. The test uses 128 cards that have combinations of four colors, shapes, and numbers. The interviewee must deduce the classifications of the cards first, and then find the changing pattern of one category among color, shape, and number, without any explanation from the interviewer during the test.

Statistical Analysis

All continuous variables were reported as means, standard deviations, and ranges, and discrete variables are given as frequencies and percentages. Comparisons between patients with schizophrenia and controls were performed using t tests, chi-square tests, and Mann-Whitney test, depending on the characteristics of each variable. Validity was tested by the following methods. For discriminant validity, the K-UPSA scores of the patient and the control group were compared using Mann-Whitney tests. For concurrent validity, the correlations between K-UPSA and K-WAIS, WCST, SCoRS, PANSS, CGI-SCH, SQLS, and SOFAS were verified using Pearson's correlation coefficient. Test-retest reliability was evaluated using the intraclass correlation coefficient (ICC), and the internal consistency in each area was tested using Cronbach's alpha coefficient. The test-retest reliability was performed twice for the subjects, with a one-month interval between them. All analyses were performed by using IBM SPSS Statistics ver. 20.0 (IBM Co., Armonk, NY, USA), and the significance level was set at 0.05 or below.

RESULTS

Demographic Data and Clinical Characteristics

The study was participated by 78 patients with schizophrenia and 27 healthy controls. The comparison between the demographic data of the patient and control groups is presented in Table 1. The ratio of male to female patients, mean age, and mean education years of the two groups were closely comparable. The mean duration of illness was 171.92±113.74 months, and the dosage of antipsychotics, converted to the chlorpromazine-equivalent dose, was 625.60±342.25 mg/day.

The results from the PANSS, CGI-SCH), SQLS, and SOFAS are also presented in Table 1.

Cognitive Function

The results for the K-UPSA, K-WAIS, WCST, and SCoRS are presented in Table 2. The patient and control group results were significantly different in all four tests.

Discriminant Validity

A statistically significant difference was found for the cognitive function between the patient and control groups

in all the K-UPSA results (household skills domain, p=0.001; other domains and total score, $p < 0.001$), as shown in Table 2. This included financial domain (15.86± 3.91 for patients and 19.63±0.79 for the control group), communication domain (11.04±4.34 for patients and 16.78±1.63 for the control group), comprehension/planning domain (9.47±4.24 for patients and 16.00±3.15 for the control group), transportation domain (14.01±4.86 for patients and 19.56±1.01 for the control group), household skills domain (15.83±6.81 for patients and 19.81±0.96 for the control group), and total score (66.19±17.89 for patients and 91.63±3.96 for the control group).

Concurrent Validity

Correlation between K-UPSA and clinical characteristics

Correlations between K-UPSA and clinical characteristics are presented in Table 3. Patients' K-UPSA scores correlated significantly with the PANSS' positive symptoms, negative symptoms, general psychopathology subscales, and total scores (positive symptoms, p=0.022; negative symptoms, p=0.008; general psychopathology, p= 0.017; total scores, p=0.006); however, some domains of K-UPSA scores were not significantly correlated with PANSS scores. K-UPSA scores correlated significantly

Table 1. Demographic and clinical characteristics of patients with schizophrenia and controls

Characteristic	Patient (n=78)	Control (n=27)	p value
Gender			
Male	46 (59.0)	14 (51.9)	0.519*
Female	32 (41.0)	13 (48.1)	
Age (yr)	37.12±10.08	37.11±9.42	0.998[†]
Education (yr)	13.03±1.68	13.33±1.18	0.050[†]
Duration of illness (mo)	171.92±113.74		
Average daily neuroleptic dose (mg, CPZE)	625.60±342.25		
PANSS			
Positive subscale	15.42±6.25		
Negative subscale	15.49±6.27		
General psychopathology subscale	31.87±9.49		
Total score	62.78±19.36		
CGI-SCH			
Positive symptoms	3.17±1.35		
Negative symptoms	2.47±1.20		
Depressive symptoms	1.99±1.05		
Cognitive symptoms	2.58±1.22		
Overall severity	2.92±1.03		
SQLS	29.39±20.42		
SOFAS	52.95±11.49		

Values are presented number (%) or mean±standard deviation.
*Chi-square test; [†]Student's *t* test; [†]Mann-Whitney test.
CPZE, chlorpromazine equivalent; PANSS, Positive and Negative Syndrome Scale; CGI-SCH, Clinical Global Impression-Schizophrenia scale; SQLS, Schizophrenia Quality of Life Scale; SOFAS, Social and Occupational Functioning Assessment Scale.

Table 2. Comparison of patients with schizophrenia and controls in cognitive measures

	Schizophrenic (n=78)	Control (n=27)	Z or t score	p value
K-UPSA				
Financial	15.86±3.91	19.63±0.79	−6.044	<0.001
Communication	11.04±4.34	16.78±1.63	−6.181	<0.001
Comprehension/ planning	9.47±4.24	16.00±3.15	−6.159	<0.001
Transportation	14.01±4.86	19.56±1.01	−5.856	<0.001
Household skills	15.83±6.81	19.81±0.96	−3.240	0.001
Total score	66.19±17.89	91.63±3.96	−7.354	<0.001
K-WAIS	92.88±12.02	108.44±11.85	−5.726	<0.001*
WCST				
PR	39.27±26.87	25.95±17.40	−2.322	0.020
PE	32.33±19.63	22.05±13.17	−2.379	0.017
CA	1.55±1.90	3.68±2.34	−3.645	<0.001
SCoRS				
Patient	35.24±11.22	22.63±4.20	−5.827	<0.001
Informant	35.23±12.11	22.63±4.20	−5.596	<0.001
Interviewer	37.27±11.89	21.22±1.97	−6.864	<0.001
Global rating	4.31±2.06	1.11±0.32	−7.201	<0.001

Values are presented as mean±standard deviation.
Using Mann-Whitney test (*Student's *t* test).
K-UPSA, the Korean version of the University of California San Diego Performance-based Skills Assessment; K-WAIS, Short-form of Korean-Wechsler Adult Intelligence Scale; WCST, Wisconsin Card Sorting Test; PR, perseverative responses; PE, perseverative errors; CA, numbers of categories achieved; SCoRS, Schizophrenia Cognitive Rating Scale.

Table 3. Correlations between the K-UPSA and demographic/clinical characteristics in patients with schizophrenia (n=78)

	Financial		Communication		Comprehension /planning		Transportation		Household skills		Total score	
	r	p	r	p	r	p	r	p	r	p	r	p
Age	−0.154	0.118	−0.214	0.028	−0.265	0.006	−0.193	0.049	−0.123	0.210	−0.240	0.014
Education	0.260	0.007	0.184	0.061	0.109	0.267	0.125	0.204	0.144	0.141	0.204	0.037
Duration of illness	−0.205	0.072	−0.239	0.035	−0.189	0.097	−0.209	0.067	−0.183	0.108	−0.278	0.014
CPZE	0.204	0.075	0.052	0.655	0.100	0.386	0.171	0.138	0.120	0.300	0.175	0.127
PANSS												
Positive	−0.133	0.244	−0.140	0.222	−0.125	0.276	−0.244	0.031	−0.262	0.021	−0.258	0.022
Negative	−0.309	0.006	−0.225	0.048	0.038	0.741	−0.342	0.002	−0.242	0.033	−0.297	0.008
General	−0.178	0.119	−0.182	0.111	−0.052	0.649	−0.213	0.061	−0.305	0.007	−0.269	0.017
Total	−0.231	0.042	−0.207	0.069	−0.054	0.641	−0.294	0.009	−0.312	0.005	−0.311	0.006
CGI-SCH												
Positive symptoms	0.004	0.969	−0.134	0.243	−0.030	0.795	−0.198	0.082	−0.290	0.010	−0.200	0.078
Negative symptoms	−0.088	0.445	−0.225	0.048	0.072	0.528	−0.185	0.104	−0.104	0.363	−0.147	0.200
Depressive symptoms	0.015	0.894	−0.210	0.064	−0.013	0.909	−0.183	0.109	−0.180	0.115	−0.168	0.140
Cognitive symptoms	−0.390	<0.001	−0.415	<0.001	−0.199	0.081	−0.557	0.000	−0.347	0.002	−0.518	<0.001
Overall severity	−0.216	0.058	−0.360	0.001	−0.120	0.297	−0.394	0.000	−0.315	0.005	−0.387	<0.001
SQLS	−0.213	0.048	−0.262	0.014	−0.250	0.020	−0.269	0.012	−0.300	0.005	−0.338	0.001
SOFAS	0.129	0.262	0.291	0.010	0.230	0.043	0.280	0.013	0.313	0.005	0.345	0.002

K-UPSA, the Korean version of the University of California San Diego Performance-based Skills Assessment; CGI-SCH, Clinical Global Impression-Schizophrenia scale; CPZE, chlorpromazine equivalent; PANSS, Positive and Negative Syndrome Scale; SQLS, Schizophrenia Quality of Life Scale; SOFAS, Social and Occupational Functioning Assessment Scale.

Table 4. Correlations between the K-UPSA and cognitive functions in patients with schizophrenia (n=78)

	Financial		Communication		Comprehension /planning		Transportation		Household skills		Total score	
	r	p	r	p	r	p	r	p	r	p	r	p
K-WAIS	0.582	<0.001	0.607	<0.001	0.467	<0.001	0.520	<0.001	0.348	0.001	0.615	<0.001
WCST												
PR	−0.014	0.895	−0.271	0.010	−0.190	0.074	−0.013	0.905	0.000	0.997	−0.122	0.256
PE	−0.034	0.751	−0.273	0.010	−0.199	0.061	−0.031	0.771	−0.003	0.978	−0.134	0.212
CA	0.316	0.003	0.442	<0.001	0.351	0.001	0.353	0.001	0.272	0.010	0.429	<0.001
SCoRS												
Patient	−0.389	<0.001	−0.533	<0.001	−0.435	<0.001	−0.517	<0.001	−0.338	<0.001	−0.556	<0.001
Informant	−0.487	<0.001	−0.538	<0.001	−0.351	<0.001	−0.592	<0.001	−0.464	<0.001	−0.618	<0.001
Interviewer	−0.525	<0.001	−0.626	<0.001	−0.450	<0.001	−0.618	<0.001	−0.473	<0.001	−0.677	<0.001
Global rating	−0.544	<0.001	−0.588	<0.001	−0.420	<0.001	−0.594	<0.001	−0.463	<0.001	−0.653	<0.001

K-UPSA, the Korean version of the University of California San Diego Performance-based Skills Assessment; K-WAIS, Short-form of Korean-Wechsler Adult Intelligence Scale; WCST, Wisconsin Card Sorting Test; PR, perseverative responses; PE, perseverative errors; CA, numbers of categories achieved; SCoRS, Schizophrenia Cognitive Rating Scale.

with scores on cognitive symptoms and overall severity of the CGI-SCH ($p < 0.001$). The SQLS and SOFAS were shown to have a positive correlation with K-UPSA total score ($p=0.001$ and $p=0.002$, respectively).

Correlation between K−UPSA and cognitive function

Table 4 presents the results for K-WAIS, WCST, and SCoRS correlations with K-UPSA. All K-UPSA domains correlated significantly with K-WAIS scores (household skills domain, $p=0.001$; other domains and total score, $p < 0.001$). For the three categories in the WCST (perseverative responses, perseverative errors, and categories ach-

ieved), only the latter correlated significantly with all K-UPSA domains (financial domain, $p=0.003$; comprehension/planning and transportation domain, $p=0.001$; household skills domain, $p=0.010$; communication domains and total score, $p < 0.001$). In the SCoRS, all types of response and global rating scores correlated significantly with all domains and K-UPSA total score ($p < 0.001$).

Reliability

Two interviewers (SS Jung and DU Jung) participated in the same interviews of 12 patients. The ICCs of the rela-

Table 5. Test-retest reliability (n=76)

K-UPSA	Baseline	Follow-up	ICC	95% CI	*p* value
Financial	16.83±3.77	17.73±3.47	0.756	0.660-0.827	<0.001
Communication	12.51±4.58	13.40±4.48	0.738	0.637-0.814	<0.001
Comprehension/planning	11.15±4.90	12.37±5.16	0.662	0.540-0.757	<0.001
Transportation	15.44±4.87	15.92±4.39	0.672	0.552-0.765	<0.001
Household skills	16.86±6.13	18.05±5.26	0.381	0.206-0.533	<0.001
Total score	72.73±19.12	77.42±18.02	0.792	0.708-0.854	<0.001

K-UPSA, the Korean version of the University of California San Diego Performance-based Skills Assessment; ICC, intraclass correlation coefficient; CI, confidence interval.

tionship between the ratings generated by the two interviewers were calculated to assess interrater reliability. The ICCs for the items were greater than 0.913. Cronbach's alpha was 0.837 and demonstrated high internal consistency for the K-UPSA. Table 5 shows the high test−retest reliability at the 1-month follow-up for ICCs calculated for the K-UPSA.

DISCUSSION

This study aimed to develop a Korean version of the UPSA, which is widely used to assess the daily living function of patients with schizophrenia, to translate, and to standardize the instrument in Korean.

The K-UPSA showed high inter-rater reliability and internal consistency, which was confirmed to be similar to the study results of the original authors.[11] In addition, we found significant differences when the K-UPSA total score and each functional domain score were compared between the patient and control groups, which suggest high discriminant validity. The test-retest reliability was confirmed via a re-test conducted at an interval of 1 month. Likewise, the total score and all functional domain scores showed significant results ($p < 0.001$).

The correlation with clinical and cognitive function tests was examined to confirm the concurrent validity of K-UPSA. Some PANSS scores, which were conducted to assess clinical symptoms, showed a significant correlation. Negative symptoms, particularly, showed a significant relationship to not only the K-UPSA total score, but also all the domains, except for comprehension/planning. Many studies have already shown the correlation between negative symptoms and cognitive function.[30,31] In the CGI-SCH, the cognitive symptoms dimension showed significant correlations with all the domains and K-UPSA total score, except for the comprehension/planning domain. This demonstrates that the K-UPSA accurately reflects impaired cognitive function, as it appears in clinical assessments.

The SQLS and SOFAS, which were conducted to assess social function, showed high correlation with the K-UPSA in most domains. This means that the K-UPSA reflects not only daily living function, but also social function. It also supports research showing that patients with schizophrenia who are studying or working have better daily living function and quality of life than those who are not.[32]

Based on existing studies on the correlation between daily living function and cognitive function, a correlation was found with executive function,[33] attention,[34] and working memory.[35] In addition, another study by the present authors showed a significant correlation between language ability and K-UPSA.[36]

K-WAIS, WCST, and SCoRS were conducted as cognitive function tests in this study. Intelligence, as estimated by the K-WAIS, showed strong associations with the total and functional domain scores of K-UPSA. In contrast, the WCST, a test wherein performance can be measured in patients with schizophrenia, showed a significant correlation with the K-UPSA only in the numbers of categories achieved. In cases of perseverative errors or perseverative responses, because these are assessed based on the proportion of the patient's responses, a wide range of results is possible based on the patient's clinical symptoms or external factors. In contrast, one category for categories achieved is recognized to have been completed when 10 consequential answers are correct. Hence, it is thought to have more relevance to the K-UPSA, which requires a continuous understanding of the changing state of the assessment throughout the role-play of daily living. The SCoRS is a representative instrument for assessing the cognitive function of patients with schizophrenia based on face-to-face talk, which is known to particularly have high reliability and validity for assessing the degree of disability of cognitive function in relation to daily living function.[37] This study showed that all items of the SCoRS and K-UPSA are significantly correlated. In the Pearson correlation analysis, the K-UPSA was correlated with age, education, and duration of illness. Hence, a partial correla-

tion analysis was conducted wherein these factors were fixed. The correlation between the IQ, SCoRS, WCST, and the K-UPSA was similar with the prior Pearson correlation analysis, even after accounting for these variables.

In summary, the K-UPSA showed high internal consistency and test-retest reliability. The discriminant validity and concurrent validity were also confirmed to be high. The K-UPSA is thought to be useful for assessing the daily living function of patients with schizophrenia, and is a meaningful instrument for estimating cognitive function in relation to daily living function.

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