The Reliability and Validity of Kiddie-Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version-Korean Version (K-SADS-PL-K)

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In order to develop a structured and objective diagnostic instrument, authors completed: (1) the translation and back translation of the Korean version of the Kiddie-Schedule for Affective Disorders and Schizophrenia - Present and Lifetime Version (K-SADS-PL) and (2) the examination of its validity and reliability of the K-SADS-PL-Korean version (K-SADS-PL) when used with Korean children. A total of 91 study subjects were recruited from child and adolescent psychiatry outpatient clinics. Clinical diagnoses were used as a gold standard for the examination of validity of K-SADS-PL-K. Consensual validity of threshold and sub-threshold diagnoses were good to excellent for attention-deficit/hyperactivity disorder (ADHD), fair for tic and oppositional defiant disorders, and poor to fair for anxiety and depressive disorders. Inter-rater and test-retest reliabilities were fair to excellent for ADHD and tic disorder. The significant correlations between the K-SADS-PL-K and Korean Child Behavior Checklist (K-CBCL) were found, which provided additional support for the concurrent validity of the K-SADS-PL-K. Sensitivities varied according to the diagnostic categories, but specificities remained high over all diagnoses, suggesting that the K-SADS-PL-K is a desirable confirmatory diagnostic tool. The results of this study suggest that the K-SADS-PL-K is an effective instrument for diagnosing major child psychiatric disorders, including ADHD, behavioral disorders and tic disorders in Korean children. Future studies will examine the validity and reliability of the K-SADS-PL-K in larger samples, including adolescents and community samples on a variety of child and adolescent psychiatric disorders.

Key Words: K-SADS-PL-K, validity, reliability

INTRODUCTION

Attempts to make objective and replicable diagnoses in the psychiatry have received continuous attention over the past 35 years. In child and adolescent psychiatry, various structured diagnostic instruments have been developed for this purpose. Accurate, objective and replicable diagnoses not only have advantages in clinical

practice but also are essential to successful research. Understanding, synthesizing and interpreting results from the numerous state-of-art studies could be only possible if there are comparable studies on similarly characterized subjects. The lack of such diagnostic instruments sorely limited Korean child and adolescent psychiatry research.

There are two versions of the Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS): The K-SADS-P (Present state) and K-SADS-E (Epidemiologic version), which are semi-structured interview schedules for assessing psychiatric diagnoses in children and adolescents. The original K-SADS-P[1] was developed by Puig-Antich and Chambers as a downward extension of the Adult SADS.[2] The first working edition (K-SADS-P II, March 1978) served as the basis for Puig-Antich's studies validating early-onset major depressive disorder (MDD).[3,4] The K-SADS-E was developed by Orvaschel et al.[5] as a semi-structured interview to assess the lifetime and current episodes of psychopathology. All versions of the K-SADS are designed for interviewing both the parents and the child, and have been updated to be compatible with the DSM-III, DSM-III-R.[6] They have been used in numerous clinical, naturalistic follow-up, treatment, psychobiological, family-genetic, and epidemiological studies of affective and other child psychiatric disorders.

After the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) was published in 1994,[7] the K-SADS-PL (Present and Lifetime Version) was introduced by Kaufman et al. It was developed from the K-SADS-P. The K-SADS-PL has been used to assess the severity of symptoms as well as the present and lifetime status of 32 DSM-IV child and adolescent psychiatric disorders. In 1997, Kaufman et al. reported that the K-SADS-PL was a reliable and valid diagnostic instrument for child and adolescent psychiatric diagnoses.[8]

Since the K-SADS has been established as a useful clinical and diagnostic tool in English, this study was designed to develop a Korean version of this instrument. Therefore, the aims of this study were to translate and back translate the K-SADS-PL in Korean and in English, and to evaluate the validity and reliability of the K-SADS-PL

in Korean children.

MATERIALS AND METHODS

Subjects

A total of 91 children were enrolled in this study - 80 psychiatric outpatients and 11 normal controls. Psychiatric patients were recruited from the child and adolescent psychiatric outpatient clinics at four university-affiliated hospitals in Korea (Hallym, Yonsei, Seoul National and Kyungsang Universities). The normal controls had no past or current psychiatric illnesses. The study was approved by the university IRB's. Informed consent was obtained from the parents and assent was obtained from the participating children.

Interviewers

The pool of interviewers for this project consisted of master's-level psychologists (experienced in working with children and adolescents) and trained child and adolescent psychiatrists. All K-SADS-PL interviewers underwent intensive training regarding the instrument, diagnostic classification, critical differential diagnostic issues and the use of the K-SADS-PL.

K-SADS-PL

Translation and back translation of K-SADS-PL

The K-SADS-PL was translated by a team of researchers, including child and adolescent psychiatrists, clinical psychologists and developmental psychologists. The translation team translated the K-SADS-PL into Korean, and the K-SADS-PL-Korean-version (K-SADS-PL-K) was back-translated into English by a bilingual child psychiatrist. The back-translated version was reviewed and reconfirmed by a team of child and adolescent psychiatrists, and a child psychologist at the University of Chicago. After completing the translation and back translation, the translation team modified the instrument through a series of detailed discussions on the areas that needed to be recomposed due to cultural differences. The completed version of K-SADS-PL-K was prelimi-

narily administered to the children and their parents who visited the child psychiatry clinics to examine the feasibility of the K-SADS-PL-K interview in this population. Once this was completed and reviewed for satisfactory performance, the instrument was released for use in this study.

Description of K-SADS-PL

The K-SADS-PL is capable of generating 32 DSM-III-R and DSM-IV Axis I child psychiatric diagnoses. Diagnoses are scored as definite, probable (greater or equal to 75% of symptom criteria met), or not present. For purposes of this study, diagnoses were made by using DSM-IV diagnostic criteria in two ways: threshold diagnoses and sub-threshold diagnoses. Threshold diagnoses were based in rigid adherence to the DSM-IV criteria for the presence of symptoms whereas sub-threshold diagnoses included sub-threshold as well as threshold symptoms. The different components of the K-SADS-PL are described in detail in a Kaufman's study.[8]

Consensual validity

In order to examine the consensual validity of the diagnoses made by the K-SADS-PL-K, child and adolescent psychiatrists examined each research participant and made specific psychiatric diagnoses by applying DSM-IV diagnostic criteria to clinical examinations. Additional correlations were examined, using the Korean-Child Behavior Checklist (K-CBCL).[9,10]

Inter-rater Reliability

Fifteen subjects were randomly selected for inter-rater reliability testing. Interviewers were blind to the results of the initial interview and all other information about the child.

Test-Retest Reliability

Fifteen subjects were randomly selected for test-retest reliability. Retest interviews were conducted at 4-week intervals. Test-retest interviews were completed blind to results of the initial interview and all other information about the child.

K-CBCL

The K-CBCL is a 113-item parent-report ques-

tionnaire that surveys internalizing and externalizing symptomatology. The Korean version of the CBCL (K-CBCL) was standardized in 1990. Its validity and reliability has been well established in Korea and has been previously reported.[10]

Statistics

The kappa statistics were performed to examine the validity and reliability of the K-SADS-PL-K. Criteria proposed by Landis and Koch[11] were used to interpret the kappa coefficients: excellent, kappa > .75; good, kappa = .59 to .75; fair, kappa = .40 to .58; and poor reliability, kappa < .40. The correlation analysis between the K- SADS-PL-K and K-CBCL was performed. In addition, sensitivity, specificity, positive predictive value and negative predictive value were examined in the threshold and sub-threshold diagnoses of the K-SADS-PL-K.

RESULTS

Diagnostic profile of the sample

Interviews were conducted at each hospital in outpatient clinics. The range of interviews at each hospital was 11 to 32 for individuals with psychopathology and 2-5 for controls. The subjects included 58 boys (63.7%) and 33 girls (36.3%.) The mean age of the subjects was 8.8 years (SD: 2.1 years). The majority of the subjects came from a middle socioeconomic status (SES) (21.4% from high SES, 71.4% from middle SES and 7.1% from low SES.) 97.8% of the subjects were residing with one or two biological parents at the time of the study. The distribution of clinical diagnoses made by child and adolescent psychiatrists in the subjects were ADHD (58.2%), the most prevalent diagnosis, followed by anxiety disorders (39.6%), tic disorder (20.9%), and depressive disorders (15.4%.). The most prevalent diagnosis by the K-SADS-PL-K was ADHD (48.4%), followed by tic disorder (14.3%), anxiety disorders (9.9%), ODD (4.4%), and depressive disorders (3.3%). The numbers of axis 1 clinical and K-SADS-PL-K diagnoses ranged from zero to five for each individual, with the mean number of diagnoses

being 1.96 by clinical examination and 0.94 by the K-SADS-PL-K.

Consensual validity

Kappa statistics were used to evaluate validity of K-SADS-PL-K, by comparing its diagnoses with those derived from the clinical examinations. Clinical diagnoses made by child psychiatrists and diagnoses by the K-SADS-PL-K were all based on the diagnostic criteria of DSM-IV. Two methods were considered in making diagnoses using the K-SADS-PL-K: threshold diagnoses and sub-threshold diagnosis. Threshold diagnoses were made according to the DSM-IV diagnostic criteria and only using threshold symptoms. Sub-threshold diagnoses were made by including sub-threshold symptoms that caused functional impairment but not to the extent of the DSM-IV threshold level. Threshold diagnoses correspond to definite diagnoses. Sub-threshold diagnoses substituted probable diagnoses in this study because it has several conceptual advantages over probable diagnosis. Diagnostic criteria for both threshold and sub-threshold diagnoses were same with only exception of the differences in symptom severity. Thus diagnostic rules are consistent for both diagnoses and they are comparable on the symptom severity (symptom gradient: sub-threshold diag-

nosis as a milder form of a disorder and threshold diagnosis as a more severe form of the disorder). Also, discrepancy of the reports in symptom severity is more common than discrepancy of the existence of symptoms between reporters, patients and interviewers. Thus utilizing discrepancy in symptom severity in making diagnoses (i.e., sub-threshold diagnoses) can be more informative than the arbitrary definition of probable diagnosis that can be made when 75% of symptom criteria were met. The concordance rates between clinical diagnoses and threshold diagnoses of the K-SADS-PL-K were statistically significant. Kappa values showed an excellent range for threshold diagnoses of the K-SADS-PL-K in ADHD and a good range in tic disorder and oppositional defiant disorder, but a poor range in emotional disorders including depressive disorders and anxiety disorders. When the analysis included sub-threshold diagnoses of the K-SADS-PL-K, the concordance rates in diagnoses improved to the excellent to fair range (Table 1).

Inter-rater and test-retest reliability

The reliability was evaluated for only in two diseases, ADHD and tic disorder, since the number of other diagnoses were insufficient to allow reliability analysis. Inter-rater reliabilities

Table 1. Consensual Validity of Current Diagnoses by the K-SADS-PL-K (N=80)

Diagnosis	n	Kappa	p
Threshold Diagnosis of K-SADS-PL-K			
ADHD	43	0.695	0.000
ODD	4	0.412	0.000
Anxiety disorders	19	0.294	0.002
Depressive disorders	11	0.241	0.007
Tic disorders	17	0.428	0.000
Sub-threshold Diagnosis of K-SADS-PL-K			
ADHD	48	0.756	0.000
ODD	7	0.461	0.000
Anxiety disorders	19	0.407	0.000
Depressive disorders	11	0.453	0.000
Tic disorders	17	0.401	0.000

K-SADS-PL-K, Kiddie-Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version-Korean Versions; N, total number of study subjects; n, number of diagnoses by K-SADS-PL-K; ADHD, Attention Deficit/Hyperactivity Disorder; ODD, Oppositional Defiant Disorder.

were in a fair range in both diseases, and test-retest reliabilities were excellent in both diseases (Table 2).

Correlation between K-SADS-PL-K and K-CBCL

Table 3 shows a summary of the correlation between the K-SADS-PL-K and subscales of K-CBCL. The sample size in this analysis was limited to 43 since not all the participants completed the K-CBCL. In order to increase the sample size in the stratified cells of the correlation matrix, the K-SADS-PL-K diagnoses included threshold and sub-threshold diagnoses, and they were categorized into four diagnostic groups. ADHD diagnoses on the K-SADS-PL-K showed a tendency to be correlated with attention problems on the K-CBCL. Behavioral disorders including

conduct disorders and oppositional defiant disorders showed a statistically significant correlation with conduct problems and externalizing behavioral problems, and a tendency to be correlated with aggression and overall behavioral problems of the K-CBCL. Emotional disorders on the K-SADS-PL-K showed a significant correlation with conduct problem and with other areas, including social withdrawal, depression/anxiety, internalizing symptoms, externalizing symptoms and total behavioral problems. Tic disorder showed significant negative correlations with social withdrawal and sexual problems on the K-CBCL.

Sensitivity, specificity, positive predictive value and negative predictive value of K-SADS-PL-K

Sensitivities of the threshold diagnoses by K-

Table 2. Reliability of Current Diagnoses by the K-SADS-PL-K

Diagnosis	n	Kappa	p
Inter-rater Reliability (N=11)			
ADHD	10	0.421	0.087
Tic disorders	3	0.421	0.087
Test-retest Reliability (N=13)			
ADHD	11	0.755	0.005
Tic disorders	2	1.000	0.000

K-SADS-PL-K, Kiddie-Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version-Korean Versions; N, total number of study subjects; n, number of diagnoses by K-SADS-PL-K; ADHD, Attention Deficit/Hyperactivity Disorder.

Table 3. Correlation between Diagnoses by the K-SADS-PL-K and the K-CBCL (N=43)

	ADHD	BD	ED	Tic disorder
Social withdrawal	.113 (.472)	.192 (.216)	.279 (.071)	-.325 (.034)*
Depression/Anxiety	-.173 (.266)	.254 (.100)	.287 (.062)	.040 (.801)
Attention problem	.265 (.086)	.196 (.208)	.096 (.542)	.043 (.783)
Conduct	.174 (.263)	.367 (.015)*	.305 (.047)*	-.133 (.397)
Aggression	-.017 (.263)	.268 (.082)	.270 (.080)	-.168 (.282)
Internalizing problem	-.075 (.633)	.231 (.136)	.275 (.075)	-.134 (.393)
Externalizing problem	.007 (.963)	.317 (.038)*	.286 (.063)	-.186 (.232)
Total behavior problem	-.017 (.913)	.269 (.081)	.285 (.064)	-.203 (.192)
Sex problem	-.163 (.297)	.015 (.923)	-.030 (.849)	-.308 (.044)*
Labile emotion	-.231 (.136)	.237 (.126)	.292 (.057)	.094 (.549)

K-SADS-PL-K, Kiddie-Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version-Korean Versions; K-CBCL, Korean Children Behavior Checklist; N, total number of study subjects; ADHD, Attention Deficit/Hyperactivity Disorder; BD, Behavioral Disorders (Oppositional Defiant Disorder and Conduct Disorder); ED, Emotional Disorder (Anxiety Disorders and Depressive Disorders).

Table 4. Sensitivity, Specificity, Positive Predictive Value and Negative Predictive Value of the K-SADS-PL-K (N=80)

Diagnosis (n)	Sensitivity	Specificity	PPV	NPV
Threshold Diagnosis of K-SADS-PL-K				
ADHD (43)	0.774	0.947	0.953	0.750
ODD (4)	0.400	0.973	0.500	0.960
Anxiety disorders (19)	0.263	0.967	0.714	0.808
Depressive disorders (11)	0.182	0.986	0.667	0.883
Tic disorders (17)	0.471	0.921	0.615	0.866
Sub-threshold Diagnosis of K-SADS-PL-K				
ADHD (48)	0.849	0.921	0.938	0.814
ODD (7)	0.600	0.947	0.429	0.973
Anxiety disorders (19)	0.421	0.934	0.667	0.838
Depressive disorders (11)	0.364	0.986	0.800	0.907
Tic disorders (17)	0.471	0.905	0.571	0.864

K-SADS-PL-K, Kiddie-Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version-Korean Versions; N, total number of study subjects; n, number of diagnoses by K-SADS-PL-K; PPV, positive predictive value; NPV, negative predictive value; ADHD, Attention Deficit/Hyperactivity Disorder; ODD, Oppositional Defiant Disorder.

SADS-PL-K ranged from 0.182 to 0.774, with highest in the ADHD and lowest in the emotional disorders. Sensitivities for sub-threshold diagnoses by K-SADS-PL-K were in similar range with same order. Specificities, on the other hand, were consistently high (above 0.9) over all disease categories. Positive predictive values were high in ADHD whereas they ranged from 0.429 to 0.800 for the other diagnoses. Negative predictive values were ranged from 0.750 to 0.973 in all diagnoses.

DISCUSSION

The K-SADS-PL has been reported to have excellent to good validity and reliability in the U.S. and other countries. It has been used in child and adolescent psychiatric research as well as in clinical practice for more than 25 years.[8,12] The K-SADS-PL is characterized as followings: 1) it assesses current and lifetime psychiatric history; 2) it surveys additional disorders not assessed in previous versions of the K-SADS (e.g., ADHD, Post-traumatic Stress Disorder, tic disorders); 3) it contains improved probes and anchor points for scoring previously problematic items; 4) it includes diagnosis-specific impairment ratings to assist in "caseness" determination; 5) it generates DSM-III-R and DSM-IV diagnoses; and 6) divides

the symptoms surveyed in the instrument into an 82-symptom Screen Interview and five supplements to facilitate differential diagnoses and expedite administration with patients and normal controls.

The K-SADS-PL is an integrated parent-child interview. Final diagnoses are generated by synthesizing parent and child data, with greater weight typically given to parents' reports of observable behaviors and children's reports of subjective experiences.[13]

Rating scale data from the Kaufman's study[8] supported the concurrent validity of screens and K-SADS-PL diagnoses. Interrater agreement in scoring screens and diagnoses was high, ranged from 93% to 100%. Test-retest reliability kappa coefficients were in an excellent range for present and/or lifetime diagnoses of major depression, any bipolar, generalized anxiety, conduct, and oppositional defiant disorder, ranging from .77 to 1.00 and in a good range for present diagnoses of post-traumatic stress disorder and attention-deficit hyperactivity disorder (.63 to .67).

In the present study, the K-SADS-PL-K appears to be a useful instrument that is somewhat different than its English counterpart. It showed a good to excellent validity and reliability in diagnosing major disorders in child and adolescent psychiatric patients, including ADHD, oppositional defiant disorder, and tic disorder. When

sub-threshold diagnoses were included in the analysis, the diagnostic reliability of the K-SADS-PL-K with respect to emotional disorders improved from the poor to the fair range. Also, high specificity of K-SADS-PL-K supports that it is a desirable diagnostic tool for confirmatory diagnoses in various research settings. Based on these findings from this preliminary study, it would appear that similar to that for English speaking patients, the K-SADS-PL-K is an appropriate and useful diagnostic instrument for use with Korean children and adolescents.

Additionally, the results of this study are consistent with those of Kaufman et al.[8] and Shanee et al.,[12] even though the kappa values of this study are slightly lower than those from two previous studies. These discrepancies in kappa values are likely to arise from differences in study subjects and methods. In the study by Kaufman et al.,[8] the validity of the K-SADS-PL was examined by using a technique that would ordinarily be used to determine concurrent validity, using pre-existing behavioral rating scales such as the CBCL. While the CBCL, Screen for Child Anxiety Related Emotional Disorders or Children's Depression Inventory are excellent tools to aid in the diagnostic process and providing important information to the clinicians, they are not diagnostic tools. Therefore, diagnoses cannot be made based on those instruments only, and consequently, they cannot be used directly to study the diagnostic validity of the instrument. As Kaufman et al.[8] pointed out, best estimate diagnoses utilizing all available information about the patients would be the "gold standard" that would ultimately need to be utilized in order to truly examine the diagnostic validity of the K-SADS-PL. However, Leckman et al.[14] reported that even with the best estimate diagnostic procedure, agreement rates of psychiatric diagnosis between experienced clinicians decreased if clinical interviews were omitted, suggesting the crucial importance of the clinical interview by experienced clinicians in not only the diagnostic process but also in studies validating clinical instruments. In this context, diagnoses made by experienced child and adolescent psychiatrists, based on the clinical interviews used in this study, would be one substitute for the best estimate of

diagnoses. However, the application of strict diagnostic processes used in this study might have deflated kappa values of the validity, but not to the point of the concern. In addition, Kaufman et al.[8] included a wider age range of study subjects with more diverse diagnoses. These differences might have contributed to the lower kappa value in emotional disorders in the K-SADS-PL-K that will be discussed later in detail.

Similarly, the small number of diagnostic categories in this study may have provided only limited information for the inter-rater and test-retest reliability assessments performed in this study. In an Israeli study, Shanee et al.[12] reported that the reliability and validity of the K-SADS-PL in 57 Israel adolescent patients. The authors reported that kappa values for consensual validity of the K-SADS-PL ranged from 0.73 to 1.00 for most of major psychiatric disorders, including depressive disorders, anxiety disorders, behavioral disorders and tic disorders, with the exception of phobia (kappa was 0.48). Inter-rater reliability along with consensual validity was excellent and much superior to the results of this study. However, these observed outcomes in the Shanee study were expected for several reasons. First, their study subjects were inpatients whereas the subjects in the current study were outpatients. As authors pointed out in the discussion, diagnostic reliability is more easily achieved in severely ill population.[15,16] Hospitalized patients seem to allow for a more thorough clinical evaluation, including more extensive clinical observations in various situations, along with psychological tests and response to treatment data. This may then lead to more accurate clinical diagnoses. Lastly, most subjects in the Shanee et al.'s study[12] were adolescents who can provide better information on their emotional status than school-aged children.

The reasons for unsatisfactory validity of the diagnoses in emotional disorders in contrast to behavioral disorders in Korean children were also examined. One possibility for this problem is the high co-morbidity rates of emotional disorders and behavioral disorders.[17,18] Woolston et al.[18] reported that 51% of children with conduct disorders showed at least one affective disorder or

anxiety disorders, and also reported that children with emotional disorders show correlation with many subscale elevation for behavioral problems on the CBCL. Also, most studies reported that children with ADHD suffer frequently from depression and low self-esteem,[19] possibly due to isolation from and troubles with peers, poor academic performance and criticism by teachers or parents. And, since poor academic performance accompanies low self-esteem in school age children, it could be an important factor inducing a depressive disorders.[20] Thus there is a possibility that this common comorbidity of two conditions hindered identifying emotional disorders in the presence of behavioral problems. This is partly evidenced by the trend of correlation between diagnoses of emotional disorders and various behavioral problem subscales of the K-CBCL in this study. A second explanation for the validity problems is that the number of children who were diagnosed with emotional disorders was significantly smaller compared to the children with behavioral disorders. This, in turn, significantly limited the statistical analysis.

Another reason for validity problems may be factors unique to the characteristics of the Korean parents who provided the reports of their children's emotional disorders. It has been reported that Korean parents have a tendency to report positive outcomes more than negative outcomes, and are less sensitive to their children's emotional states, such as depression and anxiety when compared with the subjective reports by their children.[21] Therefore, Korean parents who bring their children to the hospitals and clinics tend to mainly focus on the children's behavioral problems, such as aggression, impulsivity and compulsivity, not noticing their children's emotional difficulties. Additionally, Korean parents tend to report emotional problems to the clinicians with less weight.[21] When this is coupled with a study population that lacks adolescents, it is consistent with report that children of this age group have more difficulties to identify their own feelings than adolescents, which might lead to lower diagnostic validity of emotional disorders in this study compared to other studies. Adding to this confound are reports that Korean children tend to have difficulties in expressing their emotional

states. This is related to the socio-cultural characteristics of Koreans who are said to feel guilty when expressing negative feelings and assume the cultural view that it is their virtue to suppress negative feelings. Therefore, Korean children may have defensive patterns of reporting their negative feelings[22] that would minimize their expression on structured, diagnostic interviews. Although the interviewers could mobilize their clinical judgments in making final diagnoses by the K-SADS-PL-K, it would be difficult to identify subtle emotional disturbances during a single interview session unless interviewers have extensive clinical experiences with the patients. Considering that the most of the patients were outpatients with lesser severity of emotional disorders, this was unlikely to happen in this study.

Despite these difficulties, there are positive elements of this study. The number of subjects was sufficient, clinical diagnoses were made by child and adolescent psychiatrists, and the correlation analysis between diagnoses of the K-SADS-PL-K and K-CBCL was performed to assist the examination of validity. However, this study lacked diversity of diagnosis, was conducted mainly in clinical subjects, and did not include adolescents in the study subjects. Despite these limitations, the results of the present study suggest that the K-SADS-PL-K is a valid, reliable and useful diagnostic instrument for diagnosing major childhood-onset neuropsychiatric disorders such as ADHD, behavioral disorders and tic disorder in school-aged children in Korea. Future studies will be needed to examine validity and reliability of the K-SADS-PL-K in the myriad of other child and adolescent psychiatric disorders. Studies using a larger study population, community samples and a mix of children and adolescents will be necessary to accomplish this goal. In that process, a procedure to account for the variations in the Korean versus Western attitudes toward emotional disorders will need to be considered. However, structured diagnostic instruments that have a cross-cultural reliability are essential for clinical and epidemiologic trials as well as clinical practice. From these preliminary data, it appears that the Korean K-SADS-PL has significant potential for use in each of the arenas and that further studies are justified.

ACKNOWLEDGEMENT

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