The Reliability and Validity of Kiddie-Schedule for Affective Disorders and Schizophrenia - Present and Life-time Version - Persian Version

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Background: The validity and reliability of a Persian version of the Kiddie Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version (K-SADS-PL-P) was evaluated. Method: The K-SADS-PL-P was administered to 102 inpatients (mean age = 15.3 yrs, SD = 1.81) in a child and adolescent psychiatric ward. The psychometric properties were evaluated in comparison to the results of clinical diagnosis. Results: The K-SADS-PL-P showed good-to-excellent concurrent validity in diagnosing current major disorders. Test-retest reliabilities of most of the current diagnoses were also good to excellent. Conclusion: The Persian version of the K-SADS-PL provides reliable and valid youth psychiatric diagnoses.

Keywords: K-SADS-PL; Persian version; validity; reliability

Introduction

Making valid and reliable psychiatric diagnoses has always been a challenge. Psychometric instruments, developed for clinical and research purposes, have affected the traditional approaches of recruiting and evaluating psychiatric patients that mainly relies on clinical interview and projective methods (McClellan & Werry, 2000). Diagnostic instruments are widely used to document the natural course of disorders and response to treatment. The aim is to obtain an objective and replicable diagnosis, comparable to the gold standard psychiatric diagnosis. However, many researchers believe that the most valid diagnoses should integrate data from all available sources by using either the ‘best estimate’ (Leckman et al., 1982) or PLASTIC (prospective, longitudinal, all sources, treatment, impairment and clinical presentations) methods (Young et al., 1987).

Structured and semi-structured interviews have been developed to reduce the variability in information derived from clinical interviews, and thereby to improve the reliability of the gathered information (McClellan & Werry, 2000). Among the interviewer-based instruments, the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) has been studied frequently (Ambrosini, 2000). The present episode version (K-SADS-P; Chambers et al., 1985) has been used in numerous clinical, naturalistic follow-up, treatment, psychobiological family-genetic and epidemiological studies of affective and other child psychiatric disorders. The present and lifetime version (K-SADS-PL-P; Chambers et al., 1985) has been used in numerous clinical, naturalistic follow-up, treatment, psychobiological family-genetic and epidemiological studies of affective and other child psychiatric disorders. The present and lifetime version (K-SADS-PL-P; Chambers et al., 1985) has been adapted from the present episode version and assesses the severity of current symptoms as well as the lifetime status of child and adolescent psychiatric disorders. Kaufman et al. (1997) developed the K-SADS-PL from the K-SADS-P after the
4th edition of DSM was published. It is appropriate for epidemiological studies but is not as sensitive at evaluating treatment response because its scoring characteristic is dichotomous for lifetime/current diagnosis and symptoms, and does not include a broad assessment of symptom severity (Ambrosini, 2000).

The K-SADS-PL has excellent inter-rater reliability and results comparable to semi-structured and fully structured child diagnostic interviews (Kaufman et al., 1997). The test-retest reliability kappa coefficients are in the excellent range for present and lifetime diagnosis of major depressive disorder (MDD), bipolar disorder, anxiety disorder, conduct disorder (CD) and oppositional defiant disorder (ODD); and in the good range for present diagnosis of post traumatic stress disorder (PTSD) and attention deficit hyperactivity disorder (ADHD) (Ambrosini, 2000; Kaufman et al., 1997). The concurrent validity of both the skip-out criteria and the diagnoses generated with the K-SADS-PL is well supported. However, despite the fact that we often need to administer an independent diagnostic instrument for clinical, educational or particular research needs, the authors of the K-SADS-PL do not recommend that it can be administered as a solo instrument. Rather they recommend that it can be used as part of a comprehensive assessment battery together with rating scale data from both parents and children and, whenever possible, teachers.

There are over 20 foreign translations of the K-SADS-PL (Kaufman & Schweder, 2003). It has been validated as a semi-structured instrument in other countries like Korea, Israel, Mexico, Greece and Spain. Kim et al. (2004) used the Korean version and clinical diagnoses of 91 participants from outpatient clinics to evaluate its validity. They reported consensual validity of good-to-excellent for ADHD, fair for tic and oppositional defiant disorders, and poor to fair for anxiety and depressive disorders. They found significant correlations between the Korean K-SADS-PL and Korean Child Behaviour Checklist (K-CBCL) that provided additional support for the concurrent validity.

The inter-rater reliability and consensual validity of the Hebrew translation of the K-SADS-PL were evaluated in 57 adolescents admitted to two psychiatric units in Israel, and showed good-to-excellent reliability and validity of diagnoses (Shanee, Apter & Weizman, 1997).

The inter-rater reliability of the Spanish version of K-SADS-PL for 40 psychiatric outpatients (aged 6 to 17 years) was between good and excellent for affective, anxiety and conduct disorders using the Cohen’s kappa coefficient (Ulloa et al., 2006). A pilot inter-rater reliability study of K-SADS-P with Greek children and adolescents showed that the kappa statistic of the diagnosis for depressive disorders was 0.90 and inter-rater reliability of assessment of anxiety symptom was lower (r = 0.59) than that of depressive disorders. The kappa for conduct disorders was also high (K = 0.90) (Kolaitis et al., 2003).

There was a need for a reliable and valid psychiatric instrument for evaluating psychiatric diagnoses in Iranian children and adolescents. Persian is the official language in Iran, Tajikistan and Afghanistan. A large number of people who live in the United States, Europe and many other parts of the world speak Persian as their first language, so a Persian speaking psychiatrist would find it very helpful to use a valid and reliable

structured interview. We translated the K-SADS-PL into Persian and evaluated its reliability and validity in a clinical sample of children and adolescents with mental health problems.

Methods

Participants

The sample consisted of children and adolescents who were consecutively admitted in the child and adolescent psychiatric ward of a referral university psychiatric hospital in Tehran. The patients were evaluated by trainee psychiatrists, and patient’s history of psychiatric and medical problems as well as school performance were sought. The patients whose IQs were below 70 according to their educational records were excluded from the study. In addition, children with active psychosis or severe agitation were excluded since they were not cooperative with administration of the K-SADS. Informed consent was obtained from the parents and assent was obtained from the patients. The research protocol was approved by the university ethics committee, in accordance with the Helsinki Declaration.

Interviewers

The interviewers were seven child and adolescent psychiatry fellows who had been practicing in child and adolescent psychiatry for 12 months. All underwent appropriate training regarding the use of the K-SADS-PL, consisting of a two day workshop given by a child and adolescent psychiatrist. The trainees observed how the K-SADS-PL was administered to patients and their parents before they themselves administered it under the supervision. Finally, all the trainees independently scored the K-SADS-PL while they observed it being administered by the trainer. This process was repeated 3 times, which was not sufficient to obtain full inter-rater reliability but the calculated diagnostic agreement among the raters was 95.2% for lifetime diagnosis of bipolar disorder. Diagnostic agreements were 77%, 71%, 28.5% and 14.8% for present diagnoses of specific phobia, bipolar disorder, generalised anxiety disorders (GAD) and PTSD, respectively.

Measures

Translation and back translation of K-SADS-PL

The K-SADS-PL was translated into Persian by a psychiatrist and a child and adolescent psychiatrist who were both assistant professors of psychiatry. Then it was back-translated into English by a bilingual general physician. The back translation version was reviewed and compared to the original version by a second child and adolescent psychiatrist. The translated sentences of the Persian version were then revised and edited by two expert child and adolescent psychiatrists. The completed version of K-SADS-PL-P was preliminarily administered to a number of inpatient children and their parents at the child and adolescent psychiatry ward to evaluate its feasibility. After the ultimate review, the instrument was brought to use in the study. K-SADS-PL is capable of generating 32 DSM-III-R and DSM-IV Axis I child and adolescent psychiatric disorders. Diagnoses are scored as definite, probable
(greater than or equal to 75% of symptom criteria met), or not present. The different components of the K-SADS-PL are described comprehensively in Kaufman (1997) and Ambrosini (2000).

K-SADS-PL diagnoses were made according to DSM-IV diagnostic criteria for the presence of symptoms. The subthreshold symptoms were not considered as a diagnosis.

**Procedure**

Each patient and their parents underwent a comprehensive psychiatric assessment by a child and adolescent psychiatric fellow. All other information such as teachers’ reports and school documents, inpatient files, physicians’ reports was also considered. Then, a board-certified child and adolescent psychiatrist interviewed and evaluated the patient for a ‘best estimate’ diagnostic standard based on DSM-IV diagnostic criteria.

All the patients were interviewed using the K-SADS-PL-P in their first week of admission. The interviewers were blind to the clinical diagnoses of the patients. The parents were interviewed first if the patient was a child; vice versa if the patient was an adolescent. In case of disagreement between the parents’ and the child’s accounts, the difference was discussed with them to obtain their most agreed account. As recommend by the developers of the K-SADS-PL, the interviewer had the final word on the most appropriate item.

To obtain the test–retest reliability, 32 patients were randomly selected from patients who had agreed to take the second interview at the beginning of the recruitment. Retest interviews were conducted at one-week intervals, blind to the results of the initial interview and all other information about the child.

**Statistical analysis**

The data were analysed using STET SPSS 11.5. The kappa coefficients were applied to examine the reliability and concurrent validity of the K-SADS-PL-P. The kappa coefficients were interpreted as excellent \((k > 0.75)\), good \((k = 0.59, t = 0.74)\), fair \((k = 0.4, t = 0.58)\) and poor reliability \((k < 0.4)\) (Landis & Koch, 1977). If there were an insufficient number of cases \((< 5)\) to justify kappa statistics, percent agreement was used to generate the reliability and validity estimates (Cohen, 1960). Sensitivity, specificity, and the likelihood ratio (positive/negative) were evaluated for the threshold diagnoses of K-SADS-PL-P using the Chi-square test to compare clinical and K-SADS-PL-P diagnoses.

**Results**

**Diagnostic profile of the sample**

The participants were 102 children and adolescents, aged 9 to 18 years. The mean age was 15.3 years \((SD = 1.81)\). Fifty-one of them were male \((50\%)\). Ninety percent of the interviewed parents were biological mothers, between 35 and 58 years of age. Other interviewed caregivers were fathers or grandparents.

Table 1 shows the prevalence of psychiatric disorders based on clinical evaluation and K-SADS-PL-P. Overall similarity is observed between the most prevalent diagnoses by the two methods. However, several disorders displayed a higher prevalence on K-SADS-PL-P as compared to the clinical diagnosis, for instance, ODD, anxiety disorders, MDD, and substance use disorder (SUD). The majority of patients met the criteria for bipolar disorder. The mean age of the patients who had bipolar disorder (based on the clinical diagnosis) was 15.6 years. Forty-eight percent of them were female \((N = 41)\).

The results of the K-SADS-PL-P showed that 20% of patients had pure bipolar disorder on present diagnoses, and 25% on lifetime diagnoses. The majority of patients with bipolar disorder met the criteria for multiple current diagnoses (43%, 25% and 4.8% had respectively one, two and three comorbid disorders.) The most prevalent diagnoses comorbid with bipolar disorder were ADHD (41% current, 33% past), and psychosis (30% current, 12% past). The prevalence rates of disorders comorbid with bipolar disorder based on clinical evaluation and the results of the K-SADS-PL were respectively, 35% and 41% for ADHD, 2.5% and 12.2% for CD, 7.5% and 13.4% for obsessive-compulsive disorder (OCD), 2.5% and 8.5% for tic disorders.

The K-SADS-PL-P showed that the rates of ODD, panic disorder, GAD, PTSD, phobias and SUD in these patients were 13.4%, 2.5%, 9.8%, 12.2%, 2.4% and 11%, respectively but these comorbidities were not detected by clinical diagnoses. There was a rate of 10% for pervasive developmental disorders in these patients that would be an important finding of clinical evaluation, which is not covered by K-SADS-PL interview.

**Validity**

Kappa statistics were used to evaluate the concurrent validity of the K-SADS-PL-P by comparing its diagnoses with the clinical diagnoses. Tables 2 and 3 show the validity of present and lifetime diagnoses respectively. Kappa values for current diagnoses of psychosis, bipolar disorder and ADHD fell into the excellent range. Kappa

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Clinical diagnosis</th>
<th>K-SADS-PL-P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Attention deficit</td>
<td>32</td>
<td>31.4</td>
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<tr>
<td>Hyperactivity disorder</td>
<td>32</td>
<td>31.4</td>
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<td>Oppositional defiant disorder</td>
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<td>3.9</td>
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<tr>
<td>Conduct disorder</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Bipolar disorder</td>
<td>80</td>
<td>78.4</td>
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<tr>
<td>Psychotic disorder</td>
<td>28</td>
<td>27.5</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>4</td>
<td>3.9</td>
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<tr>
<td>Brief psychotic disorder</td>
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<td>2.9</td>
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<tr>
<td>Generalised anxiety disorder</td>
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<td>1.9</td>
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<td>0</td>
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<tr>
<td>Obsessive compulsive disorder</td>
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<td>8.8</td>
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<tr>
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<tr>
<td>Panic disorder</td>
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<td>Agoraphobia</td>
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<tr>
<td>Conversion disorder</td>
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<td>Tic disorder</td>
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<td>Encopresis</td>
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<td>0</td>
</tr>
<tr>
<td>Substance use disorder</td>
<td>2</td>
<td>1.9</td>
</tr>
</tbody>
</table>
coefficients for lifetime diagnoses were excellent for tic disorder, good for ADHD and fair for OCD and CD.

Sensitivities of the threshold present diagnoses by K-SADS-PL-P ranged from 0.66 to 1 (highest sensitivity for MDD, GAD, PTSD, and SUD; and lowest sensitivity for enuresis). Specificities were consistently high (above 90%) in nearly all diagnostic categories. Positive and negative likelihood ratios demonstrated good results in most current and past diagnoses.

Test-retest reliability
Test-retest reliabilities of current diagnoses were excellent for ADHD and ODD, and good for OCD and psychotic disorders. Kappa statistics of lifetime diagnoses were good in ADHD and ODD, and fair in bipolar disorder (Table 4).

Discussion
This study was conducted with a group of Iranian children and adolescent inpatients to evaluate the validity and reliability of the Persian version of K-SADS-PL. Although general agreement was found between the K-SADS-PL-P and clinical evaluation in several diagnoses there were major differences in their prevalence. Anxiety disorders (GAD, PTSD, Phobias) were underdiagnosed by clinical evaluation compared to the K-SADS-PL-P. The prevalence of SUD, OCD, CD, and ODD diagnoses on clinical evaluation was nearly half the respective prevalence identified by the K-SADS-PL-P. These findings suggest that unstructured clinical interviews are more likely to miss on some major diagnoses, especially if they are comorbid with other diagnoses. It is possible that clinicians are more likely to pay attention to most severe and impairing present disorders; therefore, they relate many symptoms or complaints to the major diagnosis, and do not probe for further symptoms or other diagnoses. Since many of these underdiagnosed disorders have internalising symptoms, they would not be obvious unless they are surveyed directly by the clinicians. When they remain undiagnosed, the child would be at higher risks of...
developing major psychiatric disorders and impairment of function in many domains.

It is possible that most diagnostic agreements are found in psychosis, bipolar disorder, and ADHD because of their display of more overt symptoms that would not go unnoticed by parents and teachers. High rates of comorbidity warrant more accurate probing for other psychiatric disorders in patients with a major disorder as the natural history, prognosis, and treatment interventions of comorbid disorders would differ substantially. This fact was very prominent in patients with bipolar disorder, characteristics of the majority of the participants in this study.

The general agreement between the K-SADS-PL-P and clinical diagnoses was acceptable (Kappa greater than 0.4 for most diagnoses). In some cases (ODD, CD, schizophrenia, psychotic disorders, OCD, enuresis, and tic disorders) the specificity was greater than the sensitivity. The resulting number of fewer false positives is an important consideration in research.

The K-SADS-PL-P was sensitive at diagnosing patients with ADHD, MDD, bipolar disorder, GAD, PTSD, and SUD. Therefore it can be used as a diagnostic and not as a screening instrument in epidemiological studies. The accepted sensitivity and specificity of the diagnoses based on the K-SADS-PL-P findings in the current study may be due to our method of patient evaluation (using parents', teachers' and physicians' reports, file data, clinical history and interview, observation and other instruments). Although validating K-SADS-PL-P was the main aim of this study, comparisons of the clinical diagnoses with structured interviews were also interesting.

There are some differences between our results and those of the other researchers. The K-SADS-PL-P showed a good-to-excellent validity in diagnosing major disorders including psychotic and bipolar disorder, ADHD, schizophrenia, and MDD. The validity was fair for tic, enuresis, OCD; and poor for the rest of the disorders. The K-SADS-PL-Korean version, however, showed fair-to-good kappa coefficients for ADHD, tic disorders and OCD. This difference may be due to differences in the sampling and study method. The Korean research was done in the outpatient setting comparing the K-SADS-PL-K with the results of the K-CBCL. Since the prevalence of diagnoses is different in outpatient and inpatient subjects, the results of kappa statistics may vary. Analysis of the results of test-retest reliability statistics in our study showed good to excellent kappa coefficients in a significant number of present and lifetime diagnoses.

A similar study administered K-SADS-PL on psychiatric inpatients in Israel (Shanee et al., 1997) with comparable results. Their subjects were 57 adolescents of comparable age to participants in this study. Older patient age may be an important factor that would ease data collection by the interviewer. Reported Kappa values for the consensus validity of the Israeli study ranged from 0.73 to 1.00 for most of the major psychiatric disorders (depressive disorders, anxiety disorders, behavioural disorders and tic disorder); except for phobia (Kappa = 0.48). An inpatient study setting may be easier to conduct due to availability of patients and a longer time of evaluation, as well as providing more comprehensive information from multiple informants and sources before a best estimate clinical diagnosis can be reached.

Ghanizadeh, Mohammadi and Yazdanshenas (2006) investigated psychometric properties of a Persian translation of the K-SADS-PL in an outpatient clinical sample of children and adolescents (N = 109) in Iran, with a good-to-excellent consensual validity in all psychiatric disorders. It was highest for panic disorder, conduct disorder and simple phobia. They reported sufficient validity and test-retest reliability, and good-to-excellent sensitivity, specificity, positive and negative predictive validity for nearly all of the disorders. Test-retest reliabilities of ADHD, ODD, and tic disorder were 0.81, 0.67, and 0.56, respectively.

Limitations

We did not apply any concurrent diagnostic scales to be compared with the results of K-SADS-PL-P. Our samples were restricted to inpatients, the majority of whom had bipolar disorder and therefore the results might be different from work with more diverse outpatient or community samples. The interviewers were psychiatry fellows doing a two year subspecialty on child and adolescent psychiatry. Their clinical judgment and estimations of signs and symptoms of the disorders may have influenced the accuracy of diagnoses. In most of the published studies on administration of the K-SADS-PL, the interviewers were bachelor or masters level clinicians (Kaufman et al., 1997; Kim et al., 2004; Ghanizadeh et al., 2006).

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References


