

Overlap of ADHD and Oppositional Defiant Disorder DSM-IV Derived Criteria

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Abstract

Objective: One possible reason for being controversies regarding ADHD may be related to the validity and reliability of diagnostic criteria of attention deficit hyperactivity disorder and oppositional defiant disorder. Diagnostic criteria of oppositional defiant disorder include eight symptoms. This study examines the factor structure of oppositional defiant disorder symptoms, its discriminant validity from attention deficit hyperactivity disorder, its convergent validity and internal reliability.

Methods: Parents of 111 referral children and adolescents with attention deficit hyperactivity disorder completed DSM-IV referenced based attention deficit hyperactivity disorder and oppositional defiant disorder checklists.

Results: Factor analysis indicated that the attention deficit hyperactivity disorder symptom of: "often has trouble organizing activities" and "often runs about or climbs when and where it is not appropriate" were a part of the oppositional defiant disorder component. These symptoms less often than other symptoms differentiate attention deficit hyperactivity disorder from oppositional defiant disorder. The convergent validity for oppositional defiant disorder symptoms ranged from 0.64 to 0.79.

Conclusion: The parent-rating checklist of oppositional defiant disorder symptoms properly differentiates oppositional defiant disorder from attention deficit hyperactivity disorder. However, two items of the attention deficit hyperactivity disorder were listed as symptoms of oppositional defiant disorder. If the factor loading of the items is to be confirmed in further studies, it might be necessary to revise these symptoms criterion in future editions of DSM-IV diagnostic criteria.

Keywords: ADHD, DSM-V, oppositional defiant disorder, reliability, validity

Introduction

As much as attention deficit hyperactivity disorder (ADHD) is a common psychiatric disorder, it is a controversial diagnostic entity.^{1,2} According to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV), the presence of at least six symptoms of inattentiveness or hyperactivity/impulsivity in addition to certain other conditions are required to diagnose ADHD. The presence of some symptoms is not equal to an ADHD diagnosis and is not reliable. Detection of pathological symptoms or ADHD criteria and making a diagnosis are highly dependent on the clinician's experiences and judgment.³

Oppositional defiant disorder (ODD) is a common psychiatric disorder in children with ADHD. Its rate in clinical samples has been reported from 30 to 60%.^{4,5} The most common co-morbid disorder with ODD is ADHD.⁴ This high rate of co-morbidity has raised the question whether ODD and ADHD are distinct clinical entities. Some studies have reported these two disorders as distinct, however, they have many common variables.^{6,7}

There are several reasons to have highly valid and reliable diagnostic criteria to differentiate ADHD from ODD. First, ODD might mimic ADHD symptoms.⁴ Secondly, there is no real objective assessment for making a diagnosis of ADHD and subjective reports are used.^{3,4} Thirdly, in fact, what we usually use as ob-

jective measurements are rating scales. These measures provide quantitative information based on ADHD criteria. Other objective methods such as actigraphy are not diagnostic instruments. Additionally, ADHD is not a disease with constructive validity, but rather it is a cluster of symptoms.⁴ ADHD lacks an underlying unique genetic, neurologic and/or psychological etiology. Therefore, clinicians have to use ratings scales and diagnostic criteria.³ Also, a reliable symptom of ADHD or ODD criterion may be repeated in further evaluations; however, each symptom should have enough validity. Lack of sufficient validity of the diagnostic symptoms may cause a mistaken diagnosis or the inability to differentiate distinct disorders such as ODD and ADHD from each other.⁴ This consequence of mistaken diagnosis is not just limited to treatment; it directly affects research results. Finally, there is a serious concern that economical-related conflict of interest may raise the number of children diagnosed with ADHD.⁴ The above-mentioned reasons emphasize the necessity for ADHD children to be diagnosed as much as possible with more valid and reliable instruments. In other words, validity and reliability of the criteria is a crucial subject. Rating scales with enough reliability and validity can decrease the discrepancy of results from different studies.

In a prior study, we compared factor structures from a Farsi parents' rating checklist with diagnostic definitions of ADHD as described by DSM-IV diagnostic criteria in a clinical sample of ADHD children. The 18-item checklist reflected the DSM-IV definition of ADHD. The two factors extracted were inattentiveness and hyperactivity/impulsivity. In the two-factor model of factor analysis, all items related to inattentiveness were loaded on one factor and all hyperactivity-impulsivity related items were loaded on the other factor of which both had sufficient convergent and discriminant validities. Internal reliability of the two factors was excellent.⁸ However, more surveys in different cultures needs to

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Table 1. Confirmatory factor analysis with three factor solution.

Items	Factors		
	Oppositional defiant factor	Inattentiveness factor	Hyperactivity-impulsivity factor
“Often has trouble keeping attention on tasks or play activities”	0.376	0.759	-0.317
“Often avoids, dislikes, or doesn't want to do things that take a lot of mental effort for a long period of time”	0.212	0.822	-0.263
“Often has trouble organizing activities”	0.468	0.446	-0.404
“Often does not give close attention to details or makes careless mistakes in schoolwork, work, or other activities”	0.382	0.550	-0.395
“Often loses things needed for tasks and activities (e.g. toys, school assignments, pencils, books, or tools)”	0.284	0.793	-0.365
“Is often easily distracted”	0.219	0.802	-0.295
“Is often forgetful in daily activities”	0.185	0.546	-0.287
“Often does not follow instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)”	0.224	0.544	-0.283
“Is often angry and resentful”	0.402	0.525	-0.337
“Is often spiteful or vindictive”	0.363	0.404	-0.765
“Often loses temper”	0.345	0.415	-0.783
“Is often touchy or easily annoyed by others”	0.404	0.356	-0.867
“Often blames others for his or her mistakes or misbehavior”	0.378	0.335	-0.776
“Often argues with adults”	0.374	0.297	-0.802
“Often deliberately annoys people”	0.447	0.346	-0.559
“Often actively defies or refuses to comply with adults' requests or rules”	0.607	0.457	-0.600
“Often does not seem to listen when spoken to directly”	0.547	0.521	-0.592
“Often runs about or climbs when and where it is not appropriate”	0.530	0.355	-0.444
“Often gets up from seat when remaining in seat is expected”	0.772	0.140	-0.394
“Is often «on the go» or often acts as if «driven by a motor»”	0.648	0.176	-0.544
“Often fidgets with hands or feet or squirms in seat”	0.534	0.494	-0.537
“Often has trouble playing or enjoying leisure activities quietly”	0.605	0.327	-0.574
“Often talks excessively”	0.598	0.358	-0.358
“Often blurts out answers before questions have been finished”	0.636	0.229	-0.199
“Often interrupts or intrudes on others”	0.843	0.311	-0.372
“Often has trouble waiting one's turn”	0.828	0.457	-0.446

Extraction Method: Maximum likelihood.

be conducted to study the validity and reliability of ODD symptoms. It is recently reported that ADHD diagnostic classification should be broadened and ODD should be considered as an alternative presentation of ADHD.⁹ However, others do not confirm this view.^{9,10} Considering these controversies and debates, current study surveys the factor structure of ODD symptoms, its discriminant validity from ADHD symptoms, its convergent validity and internal reliability. It also examines whether there is any overlap for ADHD and oppositional defiant disorder DSM-IV-derived items.

Materials and Methods

The sample consisted of 111 consecutively referred children and adolescents with ADHD from a child psychiatric clinic. Patients and their parents were informed about the study. Participation was voluntary and all participants orally consented to take part in the survey. The children and at least one of their parents were interviewed face to face. Psychiatric diagnosis were made using the valid, reliable Farsi version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children ac-

cording to Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) diagnostic criteria.^{5,11} The ADHD and ODD checklists of Child Symptom Inventory-4, a screening test, were used.^{12,13,14} Parents reported ADHD and ODD symptoms by completing the checklists. The ADHD checklist contained 18 symptoms, which included nine each from ADHD-inattentive and ADHD-hyperactive impulsive types. The ADHD and ODD checklists of Child Symptom Inventory-4 were translated into Persian and re-translated into English. Its content validity was confirmed by several child-adolescent psychiatrists and psychologists.¹³ Convergent and discrimination validities of the ADHD checklist were adequate. The internal reliability for ADHD-inattentive type, ADHD-hyperactive impulsive type, and combined type of ADHD were 0.81, 0.85, and 0.83, respectively.⁸

The ODD checklist consisted of eight symptoms, which are DSM-IV diagnostic criteria. The symptoms are scored on a Likert type scale with choices of: “never,” “sometimes,” “often,” and “almost always.” In the categorical model of scoring, the number of symptoms is counted. Score 0 refers to the category of “never/sometimes,” and 1 refers to the category of “often/ almost always.” The maximum score is nine with a minimum score of zero for each dimension of the ADHD criteria. Minimum and maxi-

Table 2. The range of convergent validity and discriminant validity for the items of the oppositional defiant disorder checklist.

Scale	Number of items per scale	Convergent validity (range of correlation)	Discriminant validity with oppositional defiant disorder (range of correlation)	Scaling success (for discriminant validity)	Scaling success rate
Inattentiveness	9	0.60 – 0.79	0.16 – 0.41	9/9	100
Hyperactive/impulsiveness	9	0.64 – 0.79	0.42 – 0.58	9/9	100
Oppositional defiant disorder	8	0.64 – 0.79	—	—	—

num scores for ODD symptoms are 0 and 8, respectively.

Statistical analysis

Data was statistically analyzed using SPSS for Windows statistical software. Confirmatory factor analysis was applied to examine the factors loading for items of ADHD and ODD. Because of the interdependency of ADHD and ODD, an oblique rotation method was used. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity were conducted to indicate if the data were suitable for factor analysis. Cronbach's alpha was used to assess internal consistency, reliability, or the extent to which items measured the same concept for each of the factors in the questionnaire. Pearson's *r* correlation coefficient was used to examine convergent validity of ODD symptoms and assess the discriminant validity of ODD from ADHD symptoms.

Results

The mean age of the children was 9.2 years (standard deviation: 1.9). About 80% were boys. The Kaiser-meyer-olkin Measure was 0.84 and Bartlett's Test of sphericity criteria for factor analysis was 0.001, which supported that the data met the criteria for factor analysis. The three-factor solution accounted for 51.3% of the total variance. Table 1 shows the loading of items on the three factors.

Component one was named the oppositional behavior symptoms factor. There were eight items that loaded strongly on this factor from 0.44 to 0.86.

Component two consisted of nine items that were named inattentiveness items, which had a range of loading from 0.52 to 0.82. All ODD items were loaded in the ODD component more than the other two components.

Table 1 indicates that the item of "Often has trouble organizing activities" similarly loaded in both the ODD (0.46) and inattentiveness (0.44) components.

The item of "Often runs about or climbs when and where it is not appropriate" was loaded on the ODD component more than hyperactivity-impulsivity component.

The Cronbach's α calculation for the eight ODD items was 0.88 with a convergent validity range of 0.64 – 0.79. Regarding discriminant validities, the ranges of ODD items correlations with inattentiveness and hyperactivity/impulsivity were 0.16 – 0.41 and 0.42 – 0.58, respectively (Table 2).

Convergent validity shows the correlation of each criterion with the mean score of the scale that the criterion belongs to. For example, the range of correlation of the inattentiveness criteria with the mean score of the inattentiveness scale was 0.60 to 0.79. Its dis-

criminant validity with hyperactive/impulsivity and ODD mean scores were 0.39 ($P < 0.001$) and 0.41 ($P < 0.001$).

Discussion

In a previous study, the components of ADHD which included inattentiveness and hyperactivity-impulsivity were extracted as proposed by the DSM-IV classification.⁸ All of the inattentiveness items were loaded on the component of inattentiveness. However, the factor loading for the item of "Often has trouble organizing activities" for ODD and inattentiveness components were very similar. In fact, it was higher in the ODD component than the inattentiveness component of which, according to DSM-IV, it actually belongs.

One possible explanation is that the concept or construct measured by this item in the Farsi version is not equal to the original English version. However, its face validity has been previously confirmed.^{13,14} If more studies confirm this finding, it might be necessary to revise "Often has trouble organizing activities" in the DSM diagnostic criteria. In addition, current results indicate that ODD symptoms have sufficient convergent validity and discriminant validity. In other words, ODD symptoms can be well-differentiated from ADHD items. However, the current results differ with previous study results where few items of hyperactivity were loaded on the impulsivity factor.⁸ Whereas, in the current study, all hyperactivity and impulsivity items were loaded on the factor as proposed by DSM-IV, with the exception of: "Often runs about or climbs when and where it is not appropriate".¹¹ The internal reliability of ODD items in the current study was very similar to an Italian study, which was 0.84.¹ This indicates a high degree of internal consistency.

Current results indicate that the use of an ODD- and ADHD-referenced items checklist is a valid and reliable instrument¹⁵, which is in accordance with many previous studies in other cultures.^{16,17} In addition, parents are sensitive in identifying and differentiating between ODD and ADHD.¹ Therefore, considering covariant effect of ODD and ADHD is very important.

There are some limitations that need to be considered. Both K-SADS and CSI-4 survey symptoms according to DSM-IV diagnostic criteria from a clinical sample that this may impact current results. The sample was from a specialized clinic. So, generalization of the results to general population is not guaranteed. Further studies from general population with a large sample size are recommended.

Considering that the parent-rating checklist properly differentiates between ADHD and ODD, its use is recommended for decreasing discrepancies among different studies' results by accu-

rate screening of children with ODD. Moreover, if the loading of the items, “Often has trouble organizing activities” and “Often runs about or climbs when and where it is not appropriate” should be confirmed in further studies, revision of this symptom criterion might be necessary in future editions of DSM-IV diagnostic criteria. In addition, it may also indicate that the Farsi translations of these two items are not equal to the original English versions and therefore their Farsi translations need to be revised.

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References

- Zuddas A, Marzocchi GM, Oosterlaan J, Cavolina P, Ancilletta B, Sergeant J. Factor structure and cultural factors of disruptive behaviour disorders symptoms in Italian children. *Eur Psychiatry*. 2006; **21**: 410 – 418.
- Ghanizadeh A. Is it time to revise the definition of attention deficit hyperactivity disorder? *Ann Acad Med Singapore*. 2010; **39**: 155.
- Furman L. What is attention-deficit hyperactivity disorder (ADHD)? *J Child Neurol*. 2005; **20**: 994 – 1002.
- Furman LM. Attention-deficit hyperactivity disorder (ADHD): does new research support old concepts? *J Child Neurol*. 2008; **23**: 775 – 784.
- Ghanizadeh A, Mohammadi MR, Moini R. Comorbidity of psychiatric disorders and parental psychiatric disorders in a sample of Iranian children with ADHD. *J Atten Disord*. 2008; **12**: 149 – 155.
- Drabick DA, Gadow KD, Carlson GA, Bromet EJ. ODD and ADHD symptoms in Ukrainian children: external validators and comorbidity. *J Am Acad Child Adolesc Psychiatry*. 2004; **43**: 735 – 743.
- Gadow KD, Nolan EE. Differences between preschool children with ODD, ADHD, and ODD+ADHD symptoms. *J Child Psychol Psychiatry*. 2002; **43**: 191 – 201.
- Ghanizadeh A, Jafari P. Cultural structures of the Persian parents' ratings of ADHD. *J Atten Disord*. 2010; **13**: 369 – 373.
- Poulton AS. Time to redefine the diagnosis of oppositional defiant disorder. *J Paediatr Child Health*. 2010 May 24. [Epub ahead of print]
- Ghanizadeh A. Should ADHD broaden diagnostic classification to including oppositional defiant disorder? *J Paediatr Child Health*. 2011. [Epub ahead of print]
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 1994.
- Gadow KD, Sprafkin J. *Child Symptom Inventory-4 Screening and Norms Manual*. Stony Brook, NY: Checkmate Plus.; 2002.
- Alipour A, Esmaili EM. *Studying of Validity, Reliability, and Cutoff points of CSI-4 in the School Children Aged 6 to 14 in Tehran* [in Persian]. Tehran: Tehran Exceptional students' Research Center; 2004.
- Ghanizadeh A. Distribution of symptoms of attention deficit-hyperactivity disorder in schoolchildren of Shiraz, south of Iran. *Arch Iran Med*. 2008; **11**: 618 – 624.
- Pineda D, Ardila A, Rosselli M, Arias BE, Henao GC, Gomez LF, et al. Prevalence of attention-deficit/hyperactivity disorder symptoms in 4- to 17-year-old children in the general population. *J Abnorm Child Psychol*. 1999; **27**: 455 – 462.
- Gomez R, Burns GL, Walsh JA, de Moura MA. A multitrait-multisource confirmatory factor analytic approach to the construct validity of ADHD rating scales. *Psychol Assess*. 2003; **15**: 3 – 16.
- Gomez R, Burns GL, Walsh JA, Hafetz N. A multitrait-multisource confirmatory factor analytic approach to the construct validity of ADHD and ODD rating scales with Malaysian children. *J Abnorm Child Psychol*. 2005; **33**: 241 – 254.