Discriminant of Validity the Wender Utah Rating Scale in Iranian Adults

Farideh Farokhzadi[1*], Mohammad Reza Mohammadi[2], and Maryam Salmanian[2]

[1] *Department of Psychology, Payame Nour University, Tehran, Iran*

[2] *Psychiatry and Psychology Research Center, Tehran University of Medical Sciences, Tehran, Iran*

Received: 5 Mar. 2013; Accepted: 2 Jun. 2013

Abstract- The aim of this study is the normalization of the Wender Utah rating scale which is used to detect adults with Attention-Deficit and Hyperactivity Disorder (ADHD). Available sampling method was used to choose 400 parents of children (200 parents of children with ADHD as compared to 200 parents of normal children). Wender Utah rating scale, which has been designed to diagnose ADHD in adults, is filled out by each of the parents to most accurately diagnose of ADHD in parents. Wender Utah rating scale was divided into 6 sub scales which consist of dysthymia, oppositional defiant disorder; school work problems, conduct disorder, anxiety, and ADHD were analyzed with exploratory factor analysis method. The value of (Kaiser-Meyer-Olkin) KMO was 86.5% for dysthymia, 86.9% for oppositional defiant disorder, 77.5% for school related problems, 90.9% for conduct disorder, 79.6% for anxiety and 93.5% for Attention deficit/hyperactivity disorder, also the chi square value based on Bartlett's Test was 2242.947 for dysthymia, 2239.112 for oppositional defiant disorder, 1221.917 for school work problems, 5031.511 for conduct, 1421.1 for anxiety, and 7644.122 for ADHD. Since mentioned values were larger than the chi square critical values ($P<0.05$), it found that the factor correlation matrix is appropriate for factor analysis. Based on the findings, we can conclude that Wender Utah rating scale can be appropriately used for predicting dysthymia, oppositional defiant disorder, school work problems, conduct disorder, anxiety, in adults with ADHD.

Acta Medica Iranica, 2014;52(5):360-369.

Keywords: Attention-Deficit and Hyperactivity Disorder; Wender Utah Rating Scale; Validity; Iranian

Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is one the most popular psychological disorders and several studies show that two to five percent of school children show the symptoms of this disorder (1-3). It has also been shown that the prevalence of ADHD can differ according to gender differences. Studies show that boys are 3 to 10 times more likely to have this disorder than girls (4,5) and scientific findings point to some biological factors as the main cause of this disorder (6,7,8). These factors include genetic factors, personality and mood, prenatal factors, brain structure and probably some chemical differences (9-11). The biological and environmental factors can also interact with each other to cause ADHD (9,12,13).

Adults having this disorder also show the same symptoms as young children. They, however, may show the symptoms in a different way; for example, they may frequently change their job, have problems when faced with boring tasks and are easily distracted by some new distractions. Car accidents are more common among them, and they make impulsive decisions about money, travelling, career and social plans (14).

Researchers hold that 30 to 50 percent of adults who have had this disorder in childhood continue to have it in adulthood too, and the symptoms are so severe that interrupt their daily activities (15). Only 75 percent of these adults finish high school and very few finish college (16). Some psychological disorders, especially anti-social personality disorder and drug use are more prevalent in ADHD adults (16).

Diagnosing ADHD requires an accurate and exact procedure in which different information is used according to the aim of the diagnosis. Diagnosis statistical Manual of mental (DSM-IV) criteria for ADHD include: the existence of six or more of symptoms (1) inattentiveness or (2) Hyperactivity-impulsiveness the symptoms should persist for at least six months and should have no correlation with the person's growth (6).

Corresponding Author: F. Farokhzadi
Department of Psychology, Payame Nour University, Tehran, Iran
Tel: +98 9126965944, Fax: +98 21 55421959, E-mail address: farokhzadi.f@gmail.com

Since there is no complete test to diagnose ADHD symptoms from normal behaviors, the clinicians make use of a number of instruments such as interview, observation and some accurate measures to analyze the symptoms of ADHD, its severity and differential diagnosis (18).

There are a lot of measuring instruments to test ADHD. It is easy for the tester to use these scales and they are easy to fill out and show to what extent the behavior diverges from normal behaviors of a specific age and sex. Questionnaires show the parents and teachers' observations while self-ratings give us invaluable information about young children, teenagers and adults. These instruments not only help with the preliminary diagnosis, but also can be used in persistent measurements and testing the efficacy of treatments by clinicians (17,18).

Different measuring instruments available include:

1. Parents rating scales: the most common parents rating scales are Conner's Parent Rating Scale (CRRS) and Child Behavior Checklist (CBCL)(17,18)
2. Teacher rating scales: these include Conner's teacher rating scales - revised (CTRS-R) and Child Behavior Checklist-Teachers Report Form (CBCL-TRF)(17,18)
3. Self-ratings: up to now, the two forms of teenagers self-rating CBCL (CBCL-VSR) and Wender Utah Rating Scale (WURS) have been used, and recently Conners and Wells have developed two other self-rating scales (17,18).

- Conners/Wells Adolescent Self-report of Symptoms (18,19)
- Conners Adult Attention Deficit Rating Scale (CAARS) (17,18).

Wender Utah Rating Scale which has been designed to diagnose ADHD retrospectively in adults (16) is the one which has been normalized in this study. This scale consists of 61 questions and lets adults rate their childhood behaviors on a scale from 0 to 4. It seems this measure separates ADHD adults from the depressed and abnormal ones (16).

There are a lot of scientific findings pointing to the fact that there is a strong effect of genetic factors on dysthymia and ADHD (19). Researchers hold that there is a 25-percent overlap between ADHD and stress disorders (20). Signs of impulsiveness are not usually reported with those of stress disorders and the people who have the co-occurrence of ADHD and stress disorders don't respond to stimulating medicine well (21).

In a recent study around 30 to 50 percent of the subjects showed symptoms of ADHD and CD (Conduct Disorder). The subjects having CD do more physically aggressive actions and more illegal activities than those with ADHD (22).

The subjects having ODD (Oppositional Defiant Disorder) usually resist doing their homework because they are not willing to satisfy others' demands whereas the ADHD subjects are willing to do their favorite homework (22).

Different studies show up to 30 percent variations regarding what percentage of clients experience ADHD and learning disorders (LD) at the same time (22). Since ADHD people usually have educational problems and show little educational improvements, expert clinicians should determine whether ADHD clients have learning disorders and co-occurring disorders or not.

Because of the above-mentioned reasons, the present study has tried to normalize and analyze Wender Utah rating scale regarding the diagnosis of ADHD and its co-occurrence with disorders such as ODD, CD, anxiety, dysthymia, and school work problems.

Materials and Methods

The current research is a descriptive study conducted on 400 parents of children (200 parents of children with ADHD and 200 parents of normal children). The data were gathered using available sampling from among the clients of Roozbeh hospital and the private clinic. The schools from which the children were selected were located at regions 3 and 5 of Tehran educational ministry. The data were collected through Wender Utah Rating Scale (WURS) for adult ADHD.

Instruments

On the whole, the following instruments were used for the purpose of data gathering.

Wender Utah rating scale (WURS)

The WURS is a self-report questionnaire which is used to retrospectively diagnose the occurrence of attention deficiency hyperactivity disorder in childhood in the age group 18 years and above and confirms the occurrence of attention deficiency hyperactivity disorder in childhood. This questionnaire is filled out by each of the parents, and the collected data are used to complete the findings of the direct interviews in order to most accurately diagnose ADHD in parents (29). This measurement has been applied vastly in various studies, and its reliability and reactivity has been reported to be

favorable (23,24) has reported the sensitivity of this tool to be 85% and the specificity to be 76%. Cronbach's alpha has been reported to be 0.91 and correlation coefficient has been reported to be 0.85.

Scoring the questionnaire

Wender Utah rating scale can be used to diagnose ADHD in adulthood and has 25 items related to this diagnosis. 61 questions answered by the patients are about remembering childhood behaviors. Ratings were made on a 5-point scale ranging from 0 to 4: (0= Not at all or very slightly, 1= mildly, 2= moderately, 3= quite a bit, 4= very much)

The lowest and highest scores for the 25 items of ADHD diagnosis are 0 and 100 respectively. With a cut-off score of 46, 86 subjects had ADHD, 99 were normal, and 81% were depressed.

Result

In this study Wender, Utah rating scale was divided into 6 factors and each factor was analyzed separately. In order to extract the factor loading of each of the factors, the sub scales related to dysthymia, oppositional defiant disorder, school work problems, conduct disorder, anxiety disorder, and ADHD were separated and the results of exploratory- confirmatory factor analysis are presented in the table1.

Table 1. Factor analyses of the 25-item Wender Utah Rating Scale child and adult versions (WURS-C, WURS-A)

Factors	p	df	Chi square	Kaiser-Meyer-Olkin
dysthymia	0.00	36	2242.974	0.865
Oppositional defiant disorder	0.00	36	2239.112	0.869
School work problems	0.00	21	1221.917	0.775
conduct disorder	0.00	153	5031.511	0.909
Anexity	0.00	36	1421/062	0.796
Attention-Deficitand Hyperactivity Disorder	0.00	300	7644/122	0.935

The data presented in table 1 show the results for KMO and Bartlett's Test. All the values related to different factors are larger than the Chi square critical values and thus statistically significant ($P<0.05$).

Based on the above findings, one can conclude that the correlation matrix is appropriate for factoring.

The findings of exploratory factor analysis (EFA) in table 2 show the extracted factors for determining the sub scales of dysthymia, oppositional defiant disorder, school work problems, conduct disorder, anexity disorder, and ADHD are appropriate.

The findings in table 3 show that the values regarding variables can account for the variance of dysthymia thoroughly and completely. The findings show that only one item of this subscale can account for about 44.489 percent of this variable's variance. In other words, the results of Initial Eigenvalues show that all nine types of items can detect dysthymia and therefore can function as the factor loadings for dysthymia.

The findings in table 4 show that the values regarding variables can determine the variance of oppositional defiant disorder thoroughly and completely. Only two items of this subscale can explain about 55.07 percent of this variable's variance. In other words, the results of Initial Eigenvalues show that all nine types of items can detect oppositional defiant disorder and, therefore, can function as the factor loadings for oppositional defiant disorder.

The findings in table 5 show that the values regarding variables can determine the variance of school work problems thoroughly and completely. Only two items of this subscale can explain about 57.17 percent of this variable's variance. In other words, the results of Initial Eigenvalues show that all 7 types of items can detect school work problems and therefore can function as the factor loadings for school work problems.

The findings in table 6 show that the values regarding variables can determine the variance of conduct disorder thoroughly and completely. Only four items of this subscale can explain about 56.826 percent of this variable's variance. In other words, the results of Initial Eigen values show that all 18 types of items can detect school work problems and therefore can function as the factor loadings for conduct disorder.

The findings in table 7 show that the values regarding variables can determine the variance of stress thoroughly and completely. Only three items of this subscale can explain about 57.741 percent of this variable's variance. In other words, the results of Initial Eigenvalues show that all 9 types of items can detect

school work problems and therefore can function as the factor loadings for anxiety. The findings in table 8 show that the values regarding variables can determine the variance of ADHD thoroughly and completely. Only four items of this subscale can explain about 52.005 percent of this variable's variance.

Table 2. Factor loadings extracted based on different variables

Dystaymia	Initial	Extraction	CD	Initial	Extraction	ADHD	Initial	Extraction
VAR2	1	0.417	VAR7	1	0.768	VAR3	1	0.594
VAR4	1	0.621	VAR9	1	0.508	VAR4	1	0.668
VAR5	1	0.530	VAR00011	1	0.534	VAR5	1	0.764
VAR12	1	0.526	VAR13	1	0.495	VAR6	1	0.499
VAR16	1	0.384	VAR15	1	0.476	VAR7	1	0.764
VAR17	1	0.432	VAR17	1	0.460	VAR9	1	0.570
VAR26	1	0.437	VAR21	1	0.771	VAR10	1	0.513
VAR27	1	0.482	VAR27	1	0.684	VAR11	1	0.494
VAR29	1	0.175	VAR28	1	0.369	VAR12	1	0.558
ODD	--	--	VAR29	1	0.693	VAR15	1	0.569
VAR7	1	0.800	VAR30	1	0.704	VAR16	1	0.515
VAR9	1	0.485	VAR34	1	0.589	VAR17	1	0.476
VAR11	1	0.449	VAR35	1	0.579	VAR20	1	0.444
VAR15	1	0.543	VAR36	1	0.480	VAR21	1	0.696
VAR21	1	0.766	VAR37	1	0.542	VAR24	1	0.364
VAR24	1	0.398	VAR41	1	0.610	VAR25	1	0.374
VAR27	1	0.676	VAR42	1	0.529	VAR26	1	0.453
VAR28	1	0.499	VAR61	1	0.440	VAR27	1	0.611
VAR29	1	0.341	ANEXITY	1	--	VAR28	1	0.431
School work problems	--	--	VAR2	1	0.459	VAR29	1	0.261
VAR3	1	0.631	VAR4	1	0.713	VAR40	1	0.349
VAR6	1	0.652	VAR5	1	0.680	VAR41	1	0.497
VAR10	1	0.658	VAR17	1	0.529	VAR51	1	0.563
VAR41	1	0.398	VAR31	1	0.478	VAR56	1	0.637
VAR51	1	0.567	VAR38	1	0.560	VAR59	1	0.338
VAR56	1	0.656	VAR43	1	0.627	--	--	--
VAR59	1	0.441	VAR46	1	0.616	--	--	--
	--	--	VAR49	1	0.535	--	--	--

Table 3. Total variance for dysthymia

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.004	44.489	44.489	4.004	44.489	44.489
2	0.938	10.424	54.913	--	--	--
3	0.846	9.404	64.317	--	--	--
4	0.721	8.016	72.333	--	--	--
5	0.662	7.351	79.685	--	--	--
6	0.607	6.744	86.429	--	--	--
7	0.514	5.709	92.138	--	--	--
8	0.412	4.573	96.710	--	--	--
9	0.296	3.290	100.000	--	--	--

Extraction Method: Principal Component Analysis

Table 4. Total variance for oppositional defiant disorder

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.876	43.072	43.072	3.876	43.072	43.072	2.690	29.886	29.886
2	1.080	12.005	55.077	1.080	12.005	55.077	2.267	25.190	55.077
3	0.842	9.352	64.429	--	--	--	--	--	--
4	0.815	9.060	73.489	--	--	--	--	--	--
5	0.665	7.392	80.881	--	--	--	--	--	--
6	0.533	5.922	86.803	--	--	--	--	--	--
7	0.519	5.769	92.573	--	--	--	--	--	--
8	0.377	4.187	96.760	--	--	--	--	--	--
9	0.292	3.240	100.000	--	--	--	--	--	--

Extraction Method: Principal Component Analysis

Table 5. Total variance for school work problems

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.812	40.177	40.177	2.81	40.177	40.177	2.31	33.117	33.117
2	1.190	16.998	57.175	1.19	16.998	57.175	1.68	24.058	57.175
3	.852	12.169	69.344	--	--	--	--	--	--
4	0.739	10.556	79.900	--	--	--	--	--	--
5	0.527	7.533	87.433	--	--	--	--	--	--
6	0.487	6.951	94.383	--	--	--	--	--	--
7	0.393	5.617	100.000	--	--	--	--	--	--

Table 6. Total variance for conduct disorder

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.329	35.162	35.162	6.329	35.162	35.162	3.142	17.457	17.457
2	1.653	9.181	44.343	1.653	9.181	44.343	3.027	16.818	34.276
3	1.202	6.680	51.023	1.202	6.680	51.023	2.419	13.436	47.712
4	1.044	5.802	56.826	1.044	5.802	56.826	1.640	9.114	56.826
5	0.858	4.768	61.594	--	--	--	--	--	--
6	0.819	4.549	66.143	--	--	--	--	--	--
7	0.725	4.028	70.171	--	--	--	--	--	--
8	0.710	3.947	74.119	--	--	--	--	--	--
9	0.680	3.777	77.896	--	--	--	--	--	--
10	0.628	3.488	81.384	--	--	--	--	--	--
11	0.534	2.967	84.351	--	--	--	--	--	--
12	0.519	2.883	87.235	--	--	--	--	--	--
13	0.482	2.680	89.915	--	--	--	--	--	--
14	0.435	2.416	92.331	--	--	--	--	--	--
15	0.396	2.201	94.531	--	--	--	--	--	--
16	0.372	2.067	96.598	--	--	--	--	--	--
17	0.343	1.903	98.501	--	--	--	--	--	--
18	0.270	1.499	100.000	--	--	--	--	--	--

Table 7. Total variance for anxiety

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.097	34.416	34.416	3.097	34.416	34.416	2.671	29.673	29.673
2	1.092	12.135	46.551	1.092	12.135	46.551	1.327	14.740	44.413
3	1.007	11.190	57.741	1.007	11.190	57.741	1.200	13.328	57.741
4	.852	9.465	67.206	--	--	--	--	--	--
5	.796	8.841	76.046	--	--	--	--	--	--
6	.736	8.175	84.221	--	--	--	--	--	--
7	.587	6.527	90.748	--	--	--	--	--	--
8	.509	5.655	96.403	--	--	--	--	--	--
9	.324	3.597	100.000	--	--	--	--	--	--

Table 8. Total variance for Attention-Deficitand Hyperactivity Disorder

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.466	33.866	33.866	8.466	33.866	33.866	3.898	15.593	15.593
2	1.626	6.504	40.370	1.626	6.504	40.370	3.719	14.878	30.470
3	1.536	6.144	46.514	1.536	6.144	46.514	3.381	13.525	43.995
4	1.373	5.491	52.005	1.373	5.491	52.005	2.003	8.010	52.005
5	.980	3.918	55.924	--	--	--	--	--	--
6	0.881	3.526	59.449	--	--	--	--	--	--
7	0.852	3.407	62.856	--	--	--	--	--	--
8	0.816	3.262	66.118	--	--	--	--	--	--
9	0.801	3.205	69.322	--	--	--	--	--	--
10	0.694	2.778	72.100	--	--	--	--	--	--
11	0.676	2.704	74.804	--	--	--	--	--	--
12	0.601	2.404	77.208	--	--	--	--	--	--
13	0.586	2.343	79.552	--	--	--	--	--	--
14	0.551	2.204	81.755	--	--	--	--	--	--
15	0.543	2.171	83.927	--	--	--	--	--	--
16	0.516	2.066	85.992	--	--	--	--	--	--
17	0.500	2.000	87.992	--	--	--	--	--	--
18	0.476	1.905	89.897	--	--	--	--	--	--
19	0.451	1.806	91.703	--	--	--	--	--	--
20	0.445	1.780	93.482	--	--	--	--	--	--
21	0.427	1.706	95.188	--	--	--	--	--	--
22	0.366	1.463	96.652	--	--	--	--	--	--
23	0.321	1.283	97.934	--	--	--	--	--	--
24	0.266	1.065	98.999	--	--	--	--	--	--
25	0.250	1.001	100.000	--	--	--	--	--	--

In other words, the results of Initial Eigenvalues Show that all 9 types of items can detect school work problems and therefore can function as the factor loadings for ADHD.

Discussion

Most controlled studies have shown relatively higher risk of ADHD in first and second-degree relatives of ADHD patients (10,25,26). The morbidity rate in (27,28) studies on ADD was estimated 25 percent as compared with 5 percent in the relatives of the psychiatric witness group (29).

Conducted a study titled "A family study of patients with the attention-deficit disorder and normal control". In this study the risk of ADD for the first group was 31.5 percent which was 5.7 percent higher than the second group. In ADD group families, the likelihood of dysthymia and opposite disorders was also higher. These findings show that ADD is a family disorder and is highly related to high risk of other mental family disorders (30).

In the study, the average age was 8.7 for children, 40.1 for mothers and 34.6 for fathers. Only 7.6 percent of boys and 21.7 percent of girls had ADHD without any other mental disorders. The most common type of accompanying disorder was stress disorder. ADHD was common for 45.5% of mothers and 17.7% of fathers (31).

The presence of acute stress disorder was 48.1% and 43% for the mothers and the fathers respectively. On the whole, the results showed that ADHD in children is accompanied by other mental disorders. It is usually accompanied by oppositional defiant disorder in boys and stress disorder in girls. The most common mental disorder in parents was mood disorder (31).

In other study Dysthymia disorder 51.7%, ADHD 48.3%, anxiety disorder41.7%, obsessive compulsive disorder 25%. The most common disorders accompanying ADHD were as follows: bedwetting 38.3%, obsessive compulsive disorder 31.7%, anxiety disorder 30%, tick and Tore disorders 26.7%, and in teenagers age group the prevalence of bipolar disorder was 37.5%. The results of this study are all evidence of the importance of genetic factors in ADHD. The accompanying disorders in the patients and the high prevalence of mood disorders and stress disorder in the family of ADHD patients can point to a common genetic background between ADHD and its subgroups which are different with respect to risk factors, causes and treatment responses (32).

The parents of ADHD children show the history of having ADHD more than those of normal children.

In the study, there was a history of this disorder in 76% of parents. In 20% of cases both parents and in 56% one of them had ADHD. The prevalence of this disorder was more in fathers (56%) than in mothers (40%). As a result, genetic factors can have an important role in determining the causes of this disorder (33).

In an attempt to analyze familial risk factors first-degree relatives were categorized based on the existence or non-existence of ADHD, drug abuse, alcoholism and dependence on medicine. Results of the study revealed a strong connection between the existence of this disorder in children and their relatives (34).

In a study comparing, mental health of parents of ADHD children and that of parents of normal children, the results of Wender Utah Rating Scale revealed a significant difference between parents of ADHD children and parents of normal children (35).

The results of past investigations all show the prevalence of ADHD in the history of parents with ADHD children is significantly higher than parents with normal children. Therefore, this study tried to investigate the normalization of Wender Utah Rating Scale and its reliability and validity in evaluating ADHD and its co-occurring disorders. The results in table 8 show that the WURS is sensitive in detecting ADHD correctly. It was shown that only 4 factors accounted for 52.005 percent of the variance. In other words, the results showed that all 25 items can detect the subscale of ADHD correctly (35).

In an analysis of the German version of the Wender Utah rating scale (WURS) for the retrospective diagnosis of attention-deficit/hyperactivity disorder (ADHD) in adults, Data were obtained from 703 subjects. Item selection according to item-total correlation scores, frequency, and plausibility led to a short version of the scale that includes 21 items with item-total correlations from 0.19 to 0.61. Retest reliability of the WURS-k was r=0.9 (36). The results of the present study corroborate the findings of this study.

In a study titled "Reliability and validity of the Wender-Utah-Rating-Scale short form, Retrospective assessment of symptoms for attention deficit/hyperactivity disorder" (24) the validity of the WURS-k was investigated in a population of 63 adult ADHD patients (according to ICD-10 and DSM-IV criteria) and 303 male controls. The analysis indicated a sensitivity of 85% and specificity of 76% at a cutoff of 30 points. In ADHD patients, seven individual factors explained 70.3% of the variance. The highest diagnostic precision was demonstrated using the WURS-k total score. The seven extracted factors of the WURS-k did not differ in diagnostic value. Significant correlations were found between impulsivity according to Eysenck's Impulsivity Questionnaire (EIQ) and excitability,

aggression, emotional liability, and satisfaction on the Freiburg Personality Inventory (FPI-R) in ADHD patients. Concerning a 30-50% persistence of ADHD symptomatology in adults, these correlations underline the diagnostic validity of the WURS-k. The scale manifested excellent internal consistency (alpha=0.91) and a split-half correlation of r (12) =0.85. The results of the present study support the findings of this study (24).

In the other study, the results proved that the correlations obtained between WURS scores and Parents' Rating Scale scores were moderate but impressive. The ability of WURS scores to predict response to methylphenidate replicated the authors' finding regarding the ability of Parents' Rating Scale scores to predict response to pemoline (23).

In normalization [Attention deficit hyperactivity disorder in adults. Benchmarking diagnosis using theWender-Reimherr adult rating scale] examining the factor structure of the ADHD psychopathology represented by seven WRI and three ADHD-SR subscales, the researchers found a two-factor solution explaining for 63% of the variance. Factor 1 was designated by impulsivity, affective liability, hyperactivity, and hot temper; factor 2 consisted of inattention, disorganization, and over reactivity (37).

In the factor structure and discriminant validity of the Wender Utah Rating Scale (WURS) in adults seeking evaluation for the attention-deficit/hyperactivity disorder (ADHD) were examined. Three factors (Dysthymia, Oppositional/Defiant Behavior, and School Problems) accounted for 59.4% of the variance. In a stepwise discriminant function analysis, age and childhood school problems emerged as significant variables. The classification procedure correctly classified 64.5% of patients. Among those who did not have ADHD, only 57.5% were correctly classified compared with 72.1% among those with ADHD. The WURS is sensitive in detecting ADHD, but it misclassifies approximately half of those who do not have ADHD. The results of the present study corroborate the findings of this study (38).

The Wender Utah Rating Scale (WURS) has been translated and adapted with the purpose of validating it in the Spanish population. The questionnaire was administered to 266 patients of an Addictive Behaviors Unit. In 82 cases, a clinical diagnosis of ADHD in early age was realized, and the other 184 cases did not show antecedents of this disorder.

25 items which better discriminate cases from controls were chosen. The Cronbach's s coefficient for this subscale was 0.94. The cut off 32 optimized sensitivity (91.5%) and specificity (90.8%). The positive and negative predictive values were 81% and 96% respectively. The total of incorrectly classified subjects was 9%. The results of the present study lend support to the findings of this study (39).

In the studyThe Wender, Utah Rating Scale was administered to 59 patients who were diagnosed as having ADHD according to DSM-IV criteria after comprehensive psychiatric and neuropsychological assessments in outpatient clinics of University of Ankara Medical School, Department of Psychiatry. Control groups consisted of 59 patients with dysthymia, 44 patients with bipolar affective disorder in remission, and 145 healthy controls. Subjects who were illiterate and younger than 18 years of age were excluded from the study. WURS was re administered to 63 of the healthy controls after 4 weeks.

Principal components analysis revealed 5 factors explaining 61.3% of the variance. The factors were labeled as Irritability, Dysthymia, School Problems, Behavioral Problems/Impulsivity and Attention Deficits. Mean factor scores of ADHD group was higher than all groups except Dysthymia factor. Turkish form of WURS demonstrated excellent internal consistency (Cronbach's alpha= 0.93), and the test-retest coefficient for the WURS (total score) was 0.81. Item-total score correlations varied between 0.31-0.75. At a cut off of 36, it identified 82.5% of adults with ADHD (sensitivity), 90.8% of the healthy controls (specificity), 66% of patients with dysthymia, and 64.3% of patients with bipolar affective disorder correctly (40).

Turkish form of the WURS is a reliable and valid scale in assessing childhood symptoms in adults for ADHD. However overlapping mood disorder items lowers specificity of the scale (40).

based on the findings of the present study, since the value of KMO was 86.5% for dysthymia, 86.9% for oppositional defiant disorder, 77.5 for school work problems, 90.9% for conduct disorder, 79.6% for stress, 93.5% for ADHD and also on the other hand the *Chi* square value based on Bartlett's Test was 2242.947 with 36 df for dysthymia, 2239.112 with 36 df for oppositional defiant disorder, 1221.917 with 21 df for school work problems, 5031.511 with 153 df for conduct, 1421.1 with 36 df for stress, and 7644.122 with 300 df for ADHD and since these values were larger than the chi square critical values table ($P<0.05$), one can conclude that the factor correlation matrix for factor analysis is appropriate.

Considering the convergence of the results of the present study and those of (37- 40), one can contend that

this scale is appropriate for predicting dysthymia, oppositional defiant disorder, school work problems, conduct disorder, stress, and ADHD in adults. It is more economical than the previous scales and can be administered by non-experts. Therefore, the diagnosed disorders can be treated reducing individual and social damages, educational and learning problems and enhancing the behavior and health of the family. This scale can be used as filtering in schools and all health centers.

References

1. Anderson JC, Williams S, McGee R, et al. DSM-III disorders in preadolescent children. Prevalence in a large sample from the general population. Arch Gen Psychiatry 1987;44(1):69-76.
2. Costello EJ, Costello AJ, Edelbrock C, et al. Psychiatric disorder in pediatric primary care. Prevalence and risk factors. Arch Gen Psychiatry 1988;45(12):1107-16.
3. Oftiord DR, Boyle MH, Szatmari P, et al. Ontario child health study. II. Six-month prevalence of disorder and rates of service utilization. Arch Gen Psychiatry 1987;44(9):832-6.
4. Arcia E, Conners CK. Gender ditferences in ADHD? Dev Behav Pediatr 1998;19(2):77-83.
5. Biederman J, Faraone SV, Spencer T, et al. Gender differences in a sample of adults with attention deficit hyperactity disorder. Psychiatry Res 1994;53(1):13-29.
6. American Psychiatric Association, editor. Diagnostic and statistical Manual of mental disorders. 4th ed. Arlington, US: American Psychiatric Association; 2000: p 943.
7. Ernst M, Zametkin A. The interface of genetics,neuroimageing and neurochemistry in attention-deficit disorder. In: Bloom FE, Kupfer DJ, editors. Psychophannacology: The Fourth Generation of Progress. New York, NY: Lippincott Williams & Wilkins; 1995: p. 1643-52.
8. Zamtkin AJ, Rapoport JL. Neurobjology of Attention deficit disorder with hyperactivity: where have we come in 50 years? J Am Acad Child Adolesc Psychiatry 1987;26(5):576-86.
9. Zamtkin AJ, Liotta W. The neurobiology of attention–deficit hyperactivity disorder. J Clin Psychiatry 1998;59(Suppl 7):17-23.
10. Biederman J, Faranone SV, Keenan K, et al. Family-genetic and psychoaocial risk factors in DSM-III attention deficit disorder. J Am Acad Chid Adolesc Psychiatry 1990;29(4):526-33.
11. Shekim WO, Kashani J, Beck N, et al. The prevalence of attention deficit disorders in a rural Midwestern community sample of nine -year-old children. J Am Acad Chid Psychiatry 1985;24(6):765-70.
12. Rec-Grant N, Thomas BH, Offord DR, et al. Risk, protective factors, and the prevalence of behavioral and emotional disorders in children and adolescents. J Am Acad Child Adolesc Psychiatry 1989;28(2):262-8
13. Mclntosh DE, Mulkins RS, Dean RS. Utilization maternal perinatal risk indicators in the differential diagnosis of ADHD and UADD children. Int J Neurosci 1995;81(1-2):35-46.
14. Murphy K, Barkley RA. Prevalence of DSM-IV symptoms of ADHD in adult licensed drivers: Implications for clinical diagnosis. J Atten Disord 1996;1(3):147-61.
15. Weiss G, Trokenberg Hechtman L, editors. Hyperactive children grown up: ADHD in children, adolescents, and adults. 1st ed. New York: Guilford; 1993: p. 473.
16. Wender PH, editor. Attention-deficit hyperactivity disorder in adults. 1st ed. Oxford: Oxford Univ Press; 1995: p. 295.
17. Goldstein S, Goldstein M, editors. Mmanaging attention deficit hyperactivity disorder in children: A guide for practitioners. 2nd ed. New York, NY: Wiley; 1998: p. 876.
18. Barkley RA, editor. Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment. New York, NY: Guilford Pub; 1990: p. 747.
19. Faraon SV, Biederman J. Do attention deficit hyperactivity disorder and major depression share familial risk factors? J Nerv Ment Dis 1997;185(9):533-41.
20. Biederman J, Newcom J, Sprich S. Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. Am J Psychiatry 1991;148(5):564-77.
21. Spencer T, Biederman J, Wilens T. Tricyclic antidepressant treatment of children with ADHD and tic disorders. J Am Acad Cild Adolesc Psychiatry 1994;33(8):1203-4.
22. Hinshaw SP, editor. Attention deficits and hyperactivity in children. 1st ed. Thousand Oaks, CA: sage; 1994: p 155.
23. Ward MF, Wender PH, Reimherr FW. The Wender Utah Rating Scale: An aid in the retrospective diagnosis of childhood attention deficit disorder. Am J Psychiatry 1993;150(6):885-90.
24. Retz-Junginger P, Retz W, Blocher D, et al. Reliability and validity of the Wender-Utah-Rating-Scale short form. Retrospective assessment of symptoms for attention deficit/hyperactivity disorder. Nervenarzt 2003;74(11):987-93.
25. Sadock BJ, Sadock VA, editors. Comprehensive-textbook of psychiatry. 7th ed. Philadelphia: Lippincott Williams & Wilkins; 2000: p. 2679-93.
26. Faraone SV, Biederman J, Milberger S. An exploratory

study of ADHD among second-degree relatives of ADHD children. Biol Psychiatry 1994;35(6):398-402.

27. Biederman J, Faraone SV, Keenak K, et al. Further evidence for family-genetic risk factors in attention deficit hyperactivity disorder: patterns of comorbidity in probands and relatives in psychiatrically and pediatrically referred samples. Arc Gen Psychiatry 1992;49(9):728-38.
28. Dulcan M. Practice parameters for assessment and treatment of children, adolescents, and adults with ADHD. American Academy of Child and Adolescent Psychiatry. J Am Acad Child Adolesc Psychiatry 1997;36(10 Suppl):85S-121S.
29. Johnston Ch, Gmesh E. The families of children with attention deficit and hyperactivity disorder. Translated by Ghadir F, Najafi M. J Educ Retard Child 2006;55(1):3-16.
30. Biederman J, Munir K, Knee D, et al. A family study of patients with the attention-deficit disorder and normal control. J Psychiatr Res 1986;20(4):263-74.
31. 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(2):149-55.
32. Hebrany P, Alaqheband Rad J, Mohammadi, M. Psychiatric disorders in families of children with attention deficit – hyperactivity disorder. Q J 2002;9(1):12-8.
33. Sadri Kermani K, Shirazi E, Nohesara Sh. Prevalence of attention deficit hyperactivity disorder in the history of parents of children with the same disorder. Iran J Psychiatr Clin Psychol 2006;44(1):55-8.
34. Biederman J, Petty CR, Wilens TE, et al. Familial risk analysis of attention-deficit / hyperactivity disorder and substance use disorders. Am J Psychiatry 2008;165(1):107-15.
35. Mohammadi, M., Farokhzadi F, et al. The Comparison of Atecedent Attention-Deficit/Hyperactivity Disorder (ADHD) and Substance Abuse Disorders in the Parents of ADHD Children, and Parents of Normal Children. ***Acta Medica Iranica*** **2012 Vol. 50, No. 5 .**
36. Retz-Junginger P, Retz W, Blocher D, et al. Wender Utah rating scale. Wender Utah rating scale. The short-version for the assessment of the attention-deficit hyperactivity disorder in adults. Nervenarzt 2002;73(9):830-8.
37. Rösler M, Retz W, Retz-Junginger P, et al. Attention deficit hyperactivity disorder in adults. Benchmarking diagnosis using the Wender-Reimherr adult rating scale. Nervenarzt 2008;79(3):320-7.
38. McCann BS, Scheele L, Ward N, et al. Discriminant validity of the Wender Utah Rating Scale for attention-deficit/hyperactivity disorder in adults. J Neuropsychiatry Clin Neurosci 2000;12(2):240-5.
39. Rodríguez-Jiménez R, Ponce G, Monasor R, et al. Validation in the adult Spanish population of the Wender Utah Rating Scale for the retrospective evaluation in adults of attention deficit/hyperactivity disorder in. Rev Neurol 2001;33(2):138-44.
40. Oncü B, Olmez S, Sentürk V. Validity and reliability of the Turkish version of the Wender Utah Rating Scale for attention-deficit/hyperactivity disorder in adults. Turk Psikiyatri Derg 2005;16(4):252-9.