

ADHD in Adult Psychiatric Outpatients: Prevalence and Comorbidity



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SUMMARY

Aim: This study aimed to investigate the prevalence of attention-deficit/hyperactivity disorder (ADHD) in adult psychiatric outpatients. Moreover, comorbid psychiatric diagnoses in adults with ADHD were determined. Patients with and without ADHD were compared regarding DSM Axis I-II comorbidity and sociodemographic characteristics.

Materials and Methods: The study included patients that presented for the first time to a psychiatric outpatient clinic during a 3-month period and were evaluated for adult ADHD. A sociodemographic form, Wender Utah Rating Scale, Turgay's Adult ADD/ADHD Evaluation Scale, Structured Clinical Interview I and II, Symptom Check List-90-R, and Beck Depression Inventory were administered.

Results: The study included 246 patients. Among the 39 patients diagnosed with ADHD, 25 were female (64.1%) and 14 were male (35.9%), and the mean age was 27.38 ± 8.3 years. The prevalence of ADHD in adult psychiatric patients was 15.9%. Adults with ADHD usually presented due to comorbid psychiatric problems; major depression (43%), generalized anxiety disorder (23%), and obsessive-compulsive disorder (17%) were the most common comorbid diagnoses. Substance abuse (58.9%) and attempted suicide (38.5%) were among the most prevalent psychiatric problems.

Conclusion: The present findings show that ADHD is an important comorbidity in adult patients that present to psychiatric clinics, and may cause serious mental health problems or complicate mental illness.

Keywords: ADHD; comorbidity; prevalence

INTRODUCTION

Although attention-deficit/hyperactivity disorder (ADHD) is one of the most extensively studied mental disorders of childhood, ADHD in adults has not been studied to the same extent (Yazgan 2007). Among those diagnosed with ADHD in childhood, 10%-79% have symptoms that persist into adulthood (Shaffer 1994). It was reported that 30%-70% of individuals diagnosed as ADHD continue to experience significant difficulties as adolescents and adults (Spencer et al. 1998; Biederman et al. 1996; Cantwell 1996; Mannuzza et al. 1991).

The worldwide prevalence of ADHD in children is 5%-10% (Faraone et al. 2003), and ADHD persists into adulthood in

1%-6% (Wender 2001). The prevalence of adult ADHD was reported to be 2.5% in a recent meta-analysis (Simon et al. 2009), and 4.4% among 3199 household residents aged 18-44 years in the US (Kessler et al. 2006).

The prevalence of adult ADHD at a general psychiatric clinic was 1.6% in a recent study conducted in Turkey. According to the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), 4 (10.0%) of the ADHD cases had comorbid alcohol addiction, 5 (12.5%) had comorbid substance addiction (other than alcohol), 14 (35%) had comorbid major depressive disorder, and 8 (20%) had comorbid anxiety disorder (Alyanak et al. 2011); however, DSM Axis II diagnoses were not screened in that study. In another

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Turkish study 1.6% of adult psychiatric outpatients were diagnosed as ADHD (Özdemiroğlu 2006). ADHD prevalence rates of 2.6%-15.5% were reported in 3 Turkish studies on adult ADHD in university students (Tufan and Yalug 2010). Although many Turkish studies examined the prevalence of adult ADHD, very few have investigated comorbid Axis II diagnoses. An understanding of how patients diagnosed with ADHD differ from psychiatric patients not diagnosed with ADHD might be useful for determining the possible effects of the additional diagnosis of ADHD. The present study aimed to determine the prevalence of ADHD in adults that presented to a general psychiatry outpatient clinic, the characteristics of ADHD in adulthood, and DSM IV Axis I and II comorbid diagnoses, as well as to compare patients with and without ADHD regarding DSM Axis I-II comorbidity and sociodemographic characteristics.

MATERIALS and METHODS

Sample

The study population included 470 patients with a negative history of any psychiatric treatment that presented for the first time to the psychiatry outpatient clinic of Haydarpaşa Numune Education and Research Hospital (HNERH), Istanbul, Turkey, between 1 April and 30 June 2006. In all, 110 patients were excluded because they met the study's exclusion criteria, 30 were excluded because they did not fully complete the ADHD scales, and 74 did not agree to participate in the study. The study group, as such, included 246 patients that agreed to participate and did not meet the exclusion criteria. The participants were informed about the study and each provided written informed consent. The HNERH Ethics Committee approved the study protocol.

Patients with a psychiatric disorder of organic etiology ($n = 11$), those with a degree of mental retardation precluding the ability to understand and complete the scales used in the study and participate in interviews ($n = 32$), those with a psychotic disorder ($n = 13$), those aged ≤ 18 and > 60 years ($n = 44$), and those that were illiterate ($n = 10$) were excluded from the study.

Procedure

All assessment forms used in the study were administered to the 246 included patients at the outpatient clinic. Then, they were administered SCID-I and SCID-II interviews. The interviews were performed by the investigators under the supervision of a child-adolescent and adult psychiatry instructor that specializes in ADHD. The ADHD scales were evaluated separately and the patients with a score above the cut-off, those with a Wender-Utah Rating Scale (WURS) score > 36 ($n = 75$), and those with a score of 2 or 3 on ≥ 6 of the 9 items in section 1 or section 2 of Turgay's Adult ADD/ADHD

Evaluation Scale ($n = 70$) were considered to have ADHD. The patients' families were also interviewed to obtain information about the patient. As WURS assesses childhood symptoms of attention deficit and hyperactivity, Turgay's Adult ADD/ADHD Scale (Turgay 1995) was also administered to assess adulthood symptoms.

The ADHD group included 39 patients that were diagnosed as ADHD based on ADHD scale scores and clinical assessment, and the control group included 207 patients without ADHD comorbidity. The scales and assessment interviews were administered to the patients with their accompanying relatives in a single session that lasted approximately two hours. The patients without their accompanying relatives were given appointment for another session and the procedure was repeated with the inclusion of their relatives.

Scales

Sociodemographic Data Form: This questionnaire was developed by the researchers for use in the present study to collect the participants' sociodemographic data, in addition to data related to whether they repeated a school year or received any disciplinary actions.

Wender-Utah Rating Scale (WURS): WURS (Ward et al. 1993) is used to assess ADHD-related symptoms and findings in children. WURS originally included 61 items answered using a Likert-type-scale, and was then modified to include only 25 items that could differentiate between ADHD patients and controls. The Turkish version was reported to be valid and reliable, with a cut-off point of 36 (Öncü et al. 2005).

Turgay's Adult ADD/ADHD Diagnosis and Evaluation Scale: This scale was developed by Turgay (1995), and the Turkish version was developed and reported to be valid and reliable by Günay et al. (2006). The first (attention deficit [AD]) and second (hyperactivity [HA]) sections of the Adult ADD/ADHD Scale are based on 18 DSM-IV diagnostic symptoms. The third section is based on symptoms not included in DSM-IV, but reported in various studies on ADHD.

A score of 2-3 for ≥ 6 of the 9 items in the AD section is indicative of AD. A score of 2-3 for ≥ 6 of the 9 items in the HA section is indicative of hyperactivity/impulsivity. The items in the third section are totaled to determine the ADD/ADHD-related characteristics score. Items on the self-report scale are answered using a Likert-type self-report scale.

Symptom Check List (SCL-90R): This self-report scale was originally developed by Derogatis (1974) to assess the distribution and severity of mental symptoms for use in both clinical and research settings, and was revised by Derogatis in 1977. The Turkish version was reported to be valid and reliable by Dağ (1991) for use in Turkey.

Beck Depression Inventory (BDI): This self-report scale was developed by Beck (1961) to measure the emotional, cognitive, and motivational components of depression. The Turkish version was reported to be valid and reliable (Hisli 1989), and its cut-off point was reported to be 17.

Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-I-CV): This is semi-structured interview instrument used to assess DSM-IV Axis I psychiatric disorders. The Turkish version of SCID-I CV was reported to be valid and reliable for use in Turkey (Özkürkçigil et al. 1999).

Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II): This interview instrument was developed to diagnose DSM-III-R Axis II personality disorders and is administered by a physician (Sorias et al. 1990). The Turkish version was reported to be valid and reliable for use in Turkey (Sorias et al. 1990).

Statistical Analysis

Data were analyzed using SPSS v.14.0 for Windows. The chi-square test was used to compare quantitative data and the t-test was used to compare statistical values. The level of statistical significance was set at $P < 0.05$. Fisher's exact test was used when the expected value was <5 in chi-square test fourfold tables. Percentages of numerical data were obtained.

RESULTS

In all, 39 patients (15.9%) were diagnosed with ADHD, according to DSM-IV, of which 18 (46%) had the predominantly inattentive type, 4 (10%) had the predominantly hyperactive-impulsive type, and 17 (44%) had the combined type. The mean WURS total score was 52.44 ± 11.92 in the ADHD group and 25.44 ± 12.98 in the control group; the difference was significant ($t = -12.05$, $P < 0.001$). The mean Turgay's Adult ADD/ADHD Scale total score was higher in the ADHD group (35.41 ± 7.87) than in the control group (16.64 ± 8.54), and the difference was significant ($t = -12.72$, $P < 0.001$).

Those in the ADHD group during admission to the psychiatry outpatient clinic complained of nervousness ($n = 12$), sadness ($n = 11$), distress ($n = 10$), forgetfulness ($n = 6$), carelessness ($n = 4$), not enjoying life ($n = 3$), self-harm, sudden bursts of anger, insomnia, palpitations, substance use, physical pain, suicide attempts, nervousness, headache, stress, worry, weight problem, hyperactivity, and dizziness. The vast majority of the patients had combinations of more than one of the above-mentioned complaints during their admission. Mean age of the 39 ADHD patients and 207 controls was 27.38 ± 8.3 years and 30.97 ± 8.6 years, respectively; the difference was significant ($t = 2.4$, $P < 0.05$). There wasn't

Table 1. Sociodemographic characteristics of the ADHD and control groups

		ADHD (n = 39)	Control (n = 207)	t	P
Mean $\pm$ SD Age (years)		27.38 $\pm$ 8.3	30.97 $\pm$ 8.6	2.4	0.01*
				χ^2	P
Gender	Female	25 (64.1%)	125 (60.3%)	11.45	0.72
	Male	14 (35.9%)	82 (39.7%)		
Marital Status	Married	12 (30.7%)	110 (53.1%)	7.18	0.06
	Single	23 (58.9%)	87 (42.0%)		
	Divorced	3 (7.6%)	8 (3.8%)		
	Widowed	1 (2.5%)	2 (1.1%)		
Education	Primary	10 (25.6%)	73 (35.3%)	6.41	0.09
	Secondary	11 (28.2%)	26 (12.5%)		
	High School	13 (33.3%)	80 (38.6%)		
	University	5 (12.9%)	28 (13.6%)		
Repeated a Year of School	Yes	14 (35.9%)	55 (26.5%)	19.31	0.2
	No	25 (64.1%)	152 (73.5%)		
Any Disciplinary Action at School	Yes	8 (20.5%)	9 (4.3%)	35.62	0.002*
	No	31 (79.5%)	198 (95.7%)		
Employment Status	Working	16 (41.1%)	87 (42.0%)	8.54	0.9
	Unemployed	23 (58.9%)	120 (58.0%)		
Monthly Income (Turkish Lira)	No income	21 (53.8%)	114 (55.0%)	4.04	0.25
	<500	8 (20.5%)	22 (10.6%)		
	500-1000	7 (18.0%)	39 (18.9%)		
	>1000	3 (7.7%)	32 (15.5%)		

*Statistically significant

a significant difference in the distribution of gender gender between the ADHD and control groups ($X^2 = 11.45$, $P = 0.72$), nor in the level of education ($X^2 = 6.41$, $P = 0.09$). The frequency of disciplinary actions were higher in the ADHD group (20.5%) than in the control group (4.3%), and the difference was significant ($X^2 = 35.62$, $P = 0.002$). With respect to legal problems, significantly more of those in the ADHD group (20.5%) than in the control group (7.7%) had trouble with the police (being taken to the police station) ($X^2 = 26.8$, $P = 0.03$). A history of attempted suicide was significantly more common in the ADHD group (38.5%) than in the control group (17.3%) ($X^2 = 34.39$, $P = 0.003$). The other sociodemographic and clinical characteristics of the participants are given in Table 1.

Major depression was the most frequent comorbidity in the ADHD (43.5%) and control (34.3%) groups, and the difference was not significant ($X^2 = 17.86$, $P = 0.27$). The prevalence of dysthymic disorder was significantly higher in the ADHD group (15.4%) than in the control group (5.8%) ($X^2 = 25.81$, $P = 0.04$). With respect to DSM-IV Axis I diagnoses, 13 patients in the ADHD group (33.3%) had 2 comorbidities, 2 (5.1%) had 3 comorbidities, and 1 had (2.6%) had 4 comorbidities. Alcohol (59% versus 34%) and abuse of other substances (%18 versus %5.8) were more common in the ADHD group than in the control group. The distribution of DSM-IV Axis I diagnoses in the participants is given in Table 2. (In terms of DSM-III-R Axis II diagnoses, 2 patients in the ADHD group (5.1%) had 2 comorbidities. There wasn't

Table 2. DSM-IV Axis-I psychiatric comorbidities in the ADHD and control groups

		ADHD (n = 39)	Control (n = 207)	χ^2	P
Major Depression	Yes	17 (43.5%)	71 (34.3%)	17.86	0.27
	No	22 (56.5%)	136 (65.7%)		
Dysthymic Disorder	Yes	6 (15.4%)	12 (5.8%)	25.81	0.046*
	No	33 (84.6%)	195 (94.2%)		
Bipolar Disorder	Yes	2 (5.1%)	3 (1.5%)	19.79	0.18
	No	37 (94.9%)	204 (98.5%)		
Depressive Disorder not Otherwise Specified	Yes	0	9 (4.3%)	16.33	0.36
	No	39 (100%)	198 (95.7%)		
Panic Disorder	Yes	1 (2.5%)	26 (12.5%)	22.73	0.09
	No	38 (97.5%)	181 (87.5%)		
Obsessive-Compulsive Disorder	Yes	7 (18.0%)	28 (13.5%)	15.01	0.45
	No	32 (82.0%)	179 (96.5%)		
Posttraumatic Stress Disorder	Yes	1 (2.5%)	2 (1.0%)	15.73	0.4
	No	38 (97.5%)	205 (99.0%)		
Adjustment Disorder	Yes	3 (7.7%)	13 (6.3%)	11.45	0.72
	No	36 (92.3%)	194 (93.7%)		
Social Phobia	Yes	6 (15.4%)	30 (14.5%)	10.15	0.81
	No	33 (84.6%)	177 (85.5%)		
Specific Phobia	Yes	2 (5.1%)	23 (11.1%)	16.03	0.38
	No	37 (94.9%)	184 (88.9%)		
Generalized Anxiety Disorder	Yes	9 (23.0%)	45 (21.7%)	9.83	0.83
	No	30 (77.0%)	162 (78.3%)		
Somatization Disorder	Yes	1 (2.5%)	6 (3.0%)	8.54	0.9
	No	38 (97.5%)	201 (97.0%)		
Eating Disorder	Yes	1 (2.5%)	4 (2.0%)	14.33	0.5
	No	38 (97.5%)	203 (98.0%)		
Alcohol Abuse	Yes	23 (58.9%)	71 (34.3%)	14.88	0.46
	No	16 (41.1%)	136 (65.7%)		
Other Substance Abuse	Yes	7 (18.0%)	12 (5.8%)	28.81	0.017*
	No	32 (82.0%)	195 (94.2%)		

*Statistically significant

Table 3. DSM-III-R Axis-II comorbid personality disorders in the ADHD and control groups

Personality Disorder		Control (n = 207)	ADHD (n = 39)	χ^2	P
Avoidant	Yes	26 (12.5%)	6 (15.4%)	12.77	0.62
	No	181 (77.5%)	33 (84.6%)		
Dependent	Yes	11 (5.3%)	4 (10.0%)	18.05	0.26
	No	196 (94.7%)	35 (90.0%)		
Obsessive-Compulsive	Yes	40 (19.3%)	4 (10%)	18.24	0.25
	No	167 (80.7%)	35 (90.0%)		
Passive-Aggressive	Yes	12 (5.8%)	2 (5.0%)	7.26	0.9
	No	195 (94.2%)	37 (95.0%)		
Self-Defeating	Yes	5 (2.4%)	0	7.56	0.94
	No	202 (97.6%)	39 (100%)		
Schizoid	Yes	0	0	-	-
	No	207 (100%)	39 (100%)		
Schizotypal	Yes	0	0	-	-
	No	207 (100%)	39 (100%)		
Paranoid	Yes	4 (2.0%)	0	6.91	0.96
	No	203 (98.0%)	39 (100%)		
Histrionic	Yes	12 (5.8%)	2 (5.0%)	5.98	0.98
	No	195 (94.2%)	37 (95.0%)		
Narcissistic	Yes	16 (7.7%)	2 (5.0%)	11.03	0.75
	No	191 (92.3%)	37 (95.0%)		
Borderline	Yes	6 (2.9%)	2 (5.0%)	12.90	0.61
	No	201 (97.1%)	37 (95.0%)		
Antisocial	Yes	6 (2.9%)	1 (2.5%)	6.91	0.96
	No	201 (97.1%)	38 (97.5%)		

Table 4. WURS, Turgay's Adult ADD/ADHD Scale, SCL-90R, and BDI scores in the ADHD and control groups

		ADHD (mean $\pm$ SD)	Control (mean $\pm$ SD)	P	t
WURS	Total score	52.44 $\pm$ 11.923	25.44 $\pm$ 12.988	<0.001	-12.05
	Total attention deficit section	19.51 $\pm$ 4.784	9.07 $\pm$ 5.305	<0.001	-11.43
	Number of criteria in the attention deficit section	7.03 $\pm$ 1.871	2.41 $\pm$ 2.263	<0.001	-11.97
Turgay's ADD/ADHD Evaluation Scale	Number of criteria in the hyperactivity section	5.72 $\pm$ 2.139	2.03 $\pm$ 2.017	<0.001	-10.36
	Total Hyperactivity Score	15.9 $\pm$ 5.009	7.54 $\pm$ 5.049	<0.001	-9.48
	Total number of ADHD criteria	13 $\pm$ 3.524	4.41 $\pm$ 3.485	<0.001	-14.08
	Total ADHD score	35.41 $\pm$ 7.876	16.64 $\pm$ 8.547	<0.001	-12.72
	Total ADHD-specific score	52.58 $\pm$ 14.256	30.85 $\pm$ 14.972	<0.001	-8.27
SCL-90R	Somatic symptoms	2.18 $\pm$ 0.93	1.51 $\pm$ 0.86	<0.001	-4.39
	Anxiety symptoms	2.36 $\pm$ 0.83	1.49 $\pm$ 0.84	<0.001	-5.87
	Obsessive-compulsive symptoms	2.51 $\pm$ 0.71	1.67 $\pm$ 0.79	<0.001	-6.17
	Depressive symptoms	2.49 $\pm$ 0.85	1.79 $\pm$ 0.89	<0.001	-4.51
	Interpersonal relationship sensitivity	2.60 $\pm$ 0.88	1.68 $\pm$ 0.92	<0.001	-5.73
	Psychotic symptoms	1.76 $\pm$ 0.90	1.02 $\pm$ 0.71	<0.001	-5.6
	Paranoid symptoms	2.20 $\pm$ 0.86	1.51 $\pm$ 0.84	<0.001	-4.66
	Anger	2.40 $\pm$ 1.10	1.42 $\pm$ 0.92	<0.001	-5.84
	Phobia	1.67 $\pm$ 0.97	0.91 $\pm$ 0.85	<0.001	-4.97
BDI		28.76 $\pm$ 10.52	18.42 $\pm$ 9.85	<0.001	18.42

ADHD: Attention-deficit hyperactivity disorder, WURS: Wender Utah Rating Scale, BDI: Beck Depression Inventory, SCL-90R: Symptom Checklist, mean $\pm$ SD: Mean $\pm$ standard deviation

a significant difference in the rate of DSM-III-R Axis II diagnoses between the 2 groups ($P > 0.05$). In all, 56% of the ADHD group and 57% of the control group did not have a personality disorder. The distribution of DSM-III-R Axis II diagnoses in the participants is shown in Table 3. There was a significant difference in all the BDI and SCL-90R subscale scores between the 2 groups ($P < 0.001$) (Table 4).

DISCUSSION

The prevalence of ADHD in the present study was 15.9% among the patients not previously diagnosed as ADHD that presented to a general psychiatry outpatient clinic for the first time, which is significantly higher than the 1.6% reported by Özdemiroğlu (2006) in adult psychiatric outpatients, but similar to the 16.3% reported by Tamam et al. (2008) in bipolar disorder patients and 17% reported by Danişmant (2007) in alcoholics (17%). Although the present study's 15.9% ADHD rate is lower than that reported by Lomas and Gartside (1999) (50%), it is higher than the prevalence rate in the general population (Simon et al. 2009). When the prevalence reported by general population studies is considered (1%-6%), a prevalence of psychiatric diseases in a psychiatry outpatient clinics being 3-4-fold higher is predictable. Nevertheless, this rate may also be considered as high in a patient group that referred for the first time in their adulthood. As ADHD is a disease with an onset during childhood that progresses with loss of functioning, the adult ADHD patients in our study would be expected to have received psychiatric help as children. The Perception of this disorder, which starts in childhood, as personal characteristics of the child and getting used to living with them, inadequate knowledge about ADHD diagnosis and referring with comorbidities accompanying ADHD in adulthood may explain the reason for this rate having been found high in the present study (Yazgan 2007).

It was reported that hyperactivity symptoms in ADHD might decrease as age increases or it may have common symptoms with other psychiatric diseases; these symptoms include untidiness, forgetfulness, distractibility, and academic and occupational failure (Nierenberg et al. 2005). It has been shown that more than 90% of adults with ADHD present due to attention problems, rather than hyperactivity (Wilens et al. 2003; Schmidt 1990). In the present study 4 of 39 ADHD patients (10%) presented due to attention problems. Looking at general complaints at their referral, patients refer more with comorbidity complaints than ADHD symptoms, which supports the fact that hyperactivity symptoms are more obscure in adulthood and that adult patients more frequently present due to comorbidity (Nierenberg et al. 2005).

In the present study mean age in the ADHD group was 27 years, versus 31 years in the control group. ADHD may spontaneously remit as age increases and is more common in early

adulthood, but in some cases, adult ADHD patients may show symptoms at advanced ages to the extent to receive a diagnosis for it (Bitter et al. 2010).

Clinical studies reported that the frequency of the hyperactivity/impulsivity type of ADHD is more common in children of preschool and early primary school age, the combined type is more common among those of high school age, and the type characterized carelessness is more common in those of late primary and high school age (Lahey 1994). Generally, 50%-75% of individuals with ADHD have the combined type, 20%-30% have the attention deficit subtype, and approximately 15% have the hyperactive/impulsive subtype (Wilens et al. 2003). It is suggested that the hyperactive subtype of ADHD gradually decreases in severity as age increases, converting to the impulsive form, but that the symptoms of attention deficit continue although in decreasing severity (Wilens 2003; Lalonde et al. 1998). In the present study 18 of the 39 ADHD patients (46%) were diagnosed with the predominantly inattentive type, 17 (44%) with the combined type, and 4 (10%) with the predominantly hyperactive/impulsive type. The predominantly inattentive type and combined type of ADHD were the most frequent in the present study's adulthood ADHD patients, which is in agreement with the literature (Wilens et al. 2003).

The male:female ratio in the present study's ADHD group was 3:5. Although ADHD is more common in males, it does affect both genders. While the male:female ratio can range from 2:1 to 10:1 in children, in clinical settings it can be 6:1, because males more commonly exhibit anger and antisocial behaviors (Goldstein 2002; Turgay 2001; Chang et al. 2000). There is no epidemiologic study in the literature reporting on the distribution of ADHD between the genders in the adolescent population, but the ratio is thought to be 1:1 (Smith et al. 2002), which is higher than that noted in the present study. In terms of marital status, the number of single and divorced participants was higher in the ADHD group than in the control group, but the differences were not significant. Contrary to expectations, there wasn't a significant difference in level of education, repeating a school year, employment status, job change during the previous 2 years, and income between the 2 groups. The ADHD group had a statistically higher rate than the control group of receiving disciplinary actions at school and having trouble with the police. Earlier studies have shown that adults with ADHD are of lower socioeconomic level, experience problems more frequently at work, change jobs more frequently, have a lower level of education and academic performance, more often repeated a school year, matured later and experience marital problems more frequently than those without ADHD (Faraone et al. 2008). In the present study the control group was older than the ADHD group, which may have resulted in there not being a difference between the 2 groups in terms of some characteristics, such as

level of education and income; however, various tendencies towards offense; such as having disciplinary actions in school and having trouble with the police are distinctly more common in the ADHD group and this is in agreement with the study performed by Eyestone and Hovel in 1994. In this study which was investing convicts with legal problems and ADHD, 25% of 100 males, aged between 16-64, were diagnosed with ADHD (Eyestone and Howel 1994).

In the present study alcohol abuse (59% versus 34%) and abuse of other substances (%18 versus %5.8) were more common in the ADHD group than in the control group but only the difference in substance abuse was statistically significant. It was reported earlier that 34% of ADHD patients had alcohol abuse and that 30% had substance abuse (Faraone et al. 2007), which is similar to the rates observed in the present study. Attempted suicide was significantly more common in the present study's ADHD group (29.4%). Studies have shown that 10% of adults with ADHD have attempted suicide, and that 5% died due to suicide or accident, and it was suggested that the frequent occurrence of such comorbidities as depression and failure to prevent suicidal behavior due to weak impulse control were contributory (Goldstein 2002; Schmidt 1990). Although there wasn't a difference in terms of psychiatric diagnoses other than dysthymic disorder between the ADHD group and control group in the present study, the higher frequency of attempted suicide in the ADHD group highlights the importance of diagnosis and treatment of ADHD in adults.

In terms of DSM-IV Axis I comorbidity in the present study, major depression was the most common (43%) in the ADHD group, followed by generalized anxiety disorder (23%), obsessive-compulsive disorder (18%), and dysthymic disorder (15%). In the present study only the frequency of dysthymic disorder was significantly higher in the ADHD group. Comorbidity in ADHD is the rule, rather than an exception (Masi et al. 2006). It was reported that 16%-31% of the adults with ADHD have major depressive disorder (Fisher et al. 2007; Barkley 1996; Biederman 1993) and that 19%-37% of all adults with ADHD have dysthymia (Murphy 1996). Depression and dysthymic disorder may be a consequence of low self-esteem and general unhappiness associated with the expectation of failure and difficult social relationships, which occur beginning in childhood. Moreover, the fact that a neurodevelopmental disorder increases susceptibility to other psychiatric disorders could be another cause for comorbidity rates being so high (Horing 1998; Shekim 1990). Many studies indicate that there is high prevalence rates of bipolar disorder comorbidity in ADHD (Sentissi et al. 2008; Tamam 2008, 2006). The rate of comorbid bipolar disorder in the present study's ADHD group was 5%. Tamam et al. (2008) reported that among 159 patients with bipolar disorder in Turkey the rate of comorbid ADHD was 16.3%. Comorbid

ADHD also negatively affects the prognosis and treatment of bipolar disorder (Klassen 2010). In the light of such data, we think that ADHD symptoms must be meticulously investigated in cases of bipolar disorder.

In the general population the life-long prevalence of anxiety disorder is 30.5% in females and 19.2% in males. According to some studies, generalized anxiety disorder is seen in 21% of ADHD patients, specific phobia in 12%, panic disorder in 11%, and obsessive-compulsive disorder in 7% (Goldstein 2002; Pary et al. 2002). Anxiety disorders are more common in those with the attention deficit type of ADHD (Dinn et al. 2001). The anxiety disorder comorbidity rate of the ADHD group in the present study was similar to that reported in earlier studies (Goldstein 2002; Pary et al. 2002).

Considering comorbidity of personality disorders, no personality disorders were noted in 56% of the ADHD group, versus 57% in the control group. The most frequent diagnosis in the ADHD group (15%) was avoidant personality disorder, followed by dependent (%10) and obsessive personality disorder (10%). Williams et al. (2010) studied 47 adult ADHD patients and reported that 62% had a personality disorder, based on SCID-II. In the present study the most frequent personality disorders were cluster C disorders (28%). The rate of comorbid antisocial personality disorder in the present study was lower than previously reported. According to the results of a follow-up study, antisocial personality disorder was comorbid in 18% of adults with ADHD, versus 2% in the control group (Mannuzza 2000; Barkley 1998). The fact that all of the children included in this study were male could cause this high rate of antisocial personality. The majority of the patients in our study were female and attention deficit subtype was more frequent than hyperactive subtype and these might be the reason why there were fewer cases with antisocial personality disorder (Miller et al. 2007).

SCL-90-R and BDI scores were significantly higher in the present study's ADHD group, indicating that as the severity of ADHD symptoms increased the severity of depressive, anxiety and general psychopathology also increased. Those with ADHD may be prone to fill out the scales incompletely due to their disorders. In all, 30 patients in the present study that did not fully complete the scales that were administered did not undergo SCID interviews, which is a limitation. Among the excluded patients there may have been some that would have been diagnosed as ADHD, although they could not exceed the prerequisite cut-off scores; the lack of diagnostic interviews for these patients could be considered another limitation. One more limitation of the present study is that mean age in the ADHD and control groups were not equal; however, another possibility may be that the comorbidity of ADHD could cause early referral or early onset of comorbid diseases via increasing the severity of mental symptoms. Despite these limitations, examination of DSM-III-R Axis-II

diagnoses and use of a control group bolster the usefulness of the present findings.

In conclusion, ADHD is an important comorbidity in patients that present to adult psychiatry clinics, and it can cause serious mental problems or complicate existing mental disorders. The present findings show that ADHD is an important clinical condition and physicians must be knowledgeable about its diagnosis.

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