Original article / *Araştırma*

Signs of adult ADHD in university students and related factors

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ABSTRACT

Objective: *The purpose of this research is to determine the prevalence of attention deficit hyperactivity disorder (AADHD) in university students yet continuing during the adulthood, which causes social, individual and mental problems in adults and to contribute to the studies conducted and to examine the relation of AADHD with some factors such as age, gender and class.* ***Methods:*** *1247 students from Cumhuriyet University participated in this study. Adult Attention Deficit and Hyperactivity Self Report Scale (ASRS) Turkish Form as well as socio-demographic information form were filled by all the participants.* ***Results:*** *In total 1247 persons from 11 different departments, and between 18 and 35 years old, mean age 21.88±1.92, and 57.7% women while 42.3% men participated in this study. Mean ASRS scores in the participants were detected to be 27.74±8.96. Upon considering ASRS score over two standard deviations AADHD sign prevalence was detected to be 3.1% (39/1208) while ASRS score over one and half standard deviations, it was detected to be 6.6% (82/1165). AADHD sign prevalence was statistically determined to be lower in those persons presenting with psychiatric disease history compared to those other groups.* ***Conclusion:*** *This study revealed that AADHD signs could be frequently detected in university students and that it could be related to the presence of a psychiatric disorder story and parental attitudes.* ***(Anatolian Journal of Psychiatry 2017; 18(4):353-361)***

Keywords: *adult, ADHD, university students, ASRS Report Scale*

Üniversite öğrencilerinde erişkin DEHB belirtileri ve ilişkili etkenler

ÖZ

Amaç: *Bu araştırmanın amacı, erişkinlerde sosyal, bireysel ve ruhsal alanda sıkıntılara neden olan erişkin dikkat eksikliği ve hiperaktivite bozukluğu (EDEHB) belirtilerinin üniversite öğrencilerinde yaygınlığını belirlemek, bu alanda yapılan çalışmalara katkıda bulunmak ve EDEHB'nin yaş, cinsiyet, sınıf gibi bazı sosyodemografik özelliklerle ilişkisini incelemektir.* ***Yöntem:*** *Çalışmaya Cumhuriyet Üniversitesi'nden 1247 öğrenci katılmıştır. Tüm katılımcılar, Erişkin Dikkat Eksikliği ve Hiperaktivite Bozukluğu Kendi Bildirim Ölçeği Türkçe formu (ASRS) ile Sosyodemografik Bilgi Formu doldurmuştur.* ***Bulgular:*** *Çalışmaya 11 farklı bölümde okuyan, 18-35 yaşları arasında, yaş ortalaması 21.88±1.92 olan, %57.7'si kadın, %42.3'ü erkek toplam 1247 kişi katılmıştır. Çalışmaya katılanlara uygulanan ASRS puan ortalaması 27.74±8.96 olarak bulunmuştur. İki standart sapma üzerindeki ASRS puanını dikkate aldığımızda EDEHB belirti yaygınlığı %3.1 (39/1208), bir buçuk standart sapma üzerindeki ASRS puanını dikkate aldığımızda %6.6 (82/1165) olarak bulunmuştur. Psikiyatrik bozukluk öyküsü olanlarda EDEHB belirtileri yaygınlığının diğer gruplara göre istatistiksel olarak daha düşük olduğu bulunmuştur.* ***Sonuç:*** *Bu çalışma EDEHB belirtilerinin üniversite öğrencilerinde sıklıkla belirlenebileceğini ve psikiyatrik bozukluk öyküsü varlığı, anne-baba tutumları ile ilişkili olabileceğini ortaya koymuştur.* ***(Anadolu Psikiyatri Derg 2017; 18(4):353-361)***

Anahtar sözcükler: *Erişkin, DEHB, üniversite öğrencileri, ASRS Bildirim Ölçeği*

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INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a developmental psychiatric disorder initiating in the early childhood stage and its common signs include distractibility, impulsivity and extreme hyperactivity.[1] ADHD is one of the most frequently seen neuropsychiatric disorders of childhood period. Prevalence ratio during childhood varies between 2-13%.[1-3] ADHD was believed to become pronounced during childhood period and to come to end when the childhood period was over, previously, however, with the further investigations, its course changed and it was demonstrated that ADHD was occurring during adulthood and adolescence period, as well.[4-11] It has been revealed that prevalence ratio of ADHD continuing during the adulthood period is 50.0-80.0%.[12-13] ADHD leads to behavioral, social and academic as well as mental problems during the adulthood period.[14] Those persons presenting with ADHD frequently complain about focusing upon job in work place, and concluding jobs, frequent job change, lack of organization, low self-esteem, lack of achievement, and more typically forgetfulness and lack of focus.[15]

It is only possible to establish the diagnosis of ADHD in adulthood (AADHD) with clinical assessment. Childhood period related information acquired from the patient relatives and the scale scores are supporting data for the clinical diagnosis.[1,16-18] The prevalence ratio of AADHD has been detected to be 4.4% in a large sized study and it has been reported that it is one of the most common psychiatric disorders.[19] In an epidemiological study, mean prevalence ratio was demonstrated to be 3.4%.[20] Similarly, in the meta analyses evaluating the AADHD, lifelong prevalence ratio of AADHD was reported to be 2.5% and 4.4%, respectively.[21,22]

There has been no large sized epidemiological study held in our country about AADHD. In the study conducted by Yapıcıoğlu et al. in Sivas region on 941 people, the prevalence ratio of AADHD was detected to be 3.8% and this ratio was reduced to 2.7% in clinical negotiations.[23]

AADHD in university students

In the studies in which university students participated, ADHD criteria in DSM were based. Based upon differences in methods and sampling performed in university students in our country, prevalence of AADHD was reported to be 2.6-15.55%.[18,24-28] This ratio was reported to be 2-8% in university students in USA.[14]

The numbers of studies held on ADHD in adults have been gradually increased for the last years and such studies showed that cognitive and behavioral signs were altered with age in ADHD.[29]

It was determined in the studies that questioned the symptoms during the adulthood period, firstly hyperactivity symptoms were decreased and the impulsivity symptoms were reduced afterwards. However, attentions deficit continues to occur significantly. Therefore, attention deficit symptoms in adults and majors must be questioned.[30]

Those parents of whom minors presented with ADHD were detected to have lower academic and occupational success and they presented earlier and impulsive sexual activities, and as their arrest ratios as well as the healthcare expenses were increased, this significant disorder has attached importance for adult psychiatry recently.[31]

It was also reported that psychiatrists should be aware of the forms of ADHD in adults, which is a serious requirement, as well.[32]

Our purpose for this study is to contribute to the present studies by determining the prevalence of AADHD in university students, as well as to analyze the relation with age, gender and class.

METHODS

Population and sample of the study

The population of the study is associate degree and undergraduate students in the faculties and colleges of the Cumhuriyet University. Those unwilling to participate have been excluded from the study. In form has been given to 1320 students, 73 forms have been considered as invalid and the forms of 1247 students have been evaluated.

Application

The population of the study consists of 38,312 students in the Cumhuriyet University. With the help of the formula used, a sample of 1320 people has been established to represent the population (∞=0.01; d=0.02; p=0.09; q=0.91). Stratified sampling method has been used to determine the number of students to be included in the sample. Likewise, faculties and classes have been determined with the stratified sampling method.

Forms have been given to the participants at class during appropriate times.

Approval has been obtained with decision number 2013-03/45 from the Ethics Committee of the Faculty of Medicine of the Cumhuriyet University and necessary permits have been obtained from the Rector's Office of the Sivas Cumhuriyet University. The participants have been provided with information about the study and their written approvals have been obtained.

Statistical analysis

SPSS (Statistical Package for Social Sciences) for Windows 16.0 program has been used for statistical analysis. Mean and standard deviation of measurement variables and ratios of counting variables have been calculated. Chi-square test (Fisher's exact test or Yates correction in case at least one of values expected in the 4 fold table is below 5) has been used to evaluate the data. $p<0.05$ has been considered as significant.

Tools

Attention Deficit and Hyperactivity Disorder Adult Self-Report Scale (ASRS): One of the scales developed by the World Health Organization (WHO) to scan mental disorders.[33] It consists of 18 questions consisting of 18 A group symptoms suggested for ADHD diagnosis in DSM-IV. The scale has two sub-scales, each consisting of 9 questions, as 'attention deficit' and 'hyperactivity/impulsivity'. The questions aim to determine the frequency of each symptom during the last six months. The responses are scored from 0 to 4, with the response never scored as 0, rarely as 1, sometimes as 2, frequently as 3, very often as 4.

The validity and reliability of the ASRS Turkish form has been performed by Doğan et al.[34] Reliability analysis has indicated the scale to have high internal consistency (Cronbach alfa=0.88).[34]

As long evaluation and clinical interview has not been performed in our study; two standard deviations above ASRS total and sub-scale score averages has been determined as the cut-off point and above this value has been taken as 'group with ADHD symptoms (AADHD)'.

Sociodemographic Information Form: Information about age, gender, faculty, class, monthly income, parental consanguinity, parental attitudes, psychiatric disorder history, presence of psychiatric disorder in family, presence of any another disease, alcohol-substance use and mode of delivery have been asked on the form.

RESULTS

The ASRS score average of participants of the study has been found to be 27.74±8,96. Observing the score at two standard deviation above average (45.64) AADHD symptom prevalence has been found to be 3.1% (39/1208), and when the score one and a half standard deviation above average (41.17) was taken into consideration, it was found to be 6.6% (82/1165) (Table 1).

Table 1. ASRS score averages of the groups and prevalence of AADHD

ASRS score averages		Number	%
Mean±SD	27.74±8.95		
2 SD above ADHD	45.64	39	3.1
1.5 SD above ADHD	41.17	82	6.6

A total of 1247 persons studying in 11 different faculties, having an age distribution between 18 and 35, with an age average of 21.88±1.92, consisting of 718 (57.7%) women and 529 (42.3%) men have participated in our study. The sociodemographic characteristics of the participants have been shown in Table 2.

Observing the correlation between age and AADHD, a significant relation could not be detected ($p=0.052$) despite the fact that frequency was observed to be higher at age 20 (6.9%) and decrease in AADHD symptoms at increasing ages.

Comparison of groups in terms of presence of AADHD symptoms according to related factors, have been shown in Table 3. Accordingly, no statistically significant relation could be found between groups in terms of presence of AADHD symptom, according to gender, faculty, class, income level, parental consanguinity, presence of psychiatric disorder in family, presence of any another disease, alcohol-substance use and

Table 2. The sociodemographic features

		Number	%
Age (n=1247) (range:18-35) Mean±SD	21.88±1.92		
Gender	Female	718	57.6
	Male	529	42.4
Faculty	Engineering	221	17.7
	Economics	156	12.5
	Literature	136	10.9
	Education	52	4.2
	Theology	54	4.3
	Sports school	50	4.0
	Vocational school	247	19.8
	Medical	78	6.3
	Science	98	7.9
	Health scienses	109	8.7
	Dentistry	46	3.7
Class	1	46	3.7
	2	339	27.2
	3	499	40.0
	4	250	20.0
Monthly income (Turkish liras)	<1000	296	23.7
	1000-3000	716	57.4
	>3000	235	18.8
Parental attitude	Democratic	819	65.7
	Repressive	84	6.7
	Overprotective	294	23.6
	Unconcerned	50	4.0
Blood relationship between parents	+	234	18.8
	-	1013	81.2
Psychiatric disorder in participant	+	93	7.5
	-	1154	92.5
Psychiatric disorder in family	+	134	10.7
	-	1113	89.3
Other health conditions in participant	+	181	14.5
	-	1066	85.5
Alcohol-substance use	+	110	8.8
	-	1137	91.2
Method of delivery	Vaginal delivery	1119	89.7
	Abdominal delivery	96	7.7
	Preterm delivery+vacuum	32	2.6

mode of delivery (p>0.05).

A statistically significant difference has been detected between the groups in terms of presence of AADHD symptom, according to parental attitude variable (p=0.001). Accordingly, it has been determined that presence of AADHD symptom was 1.7% in those with democratic parental attitude, 4.0% in disinterested, 4.8% in oppressive and 6.5% in overprotective parents. Information on parental attitude has been obtained from the participants.

A statistically significant difference has been detected between the groups in terms of presence of AADHD symptom, according to presence of a psychiatric disorder history (p=0.022). Accordingly, prevalence of AADHD symptom was determined as 7.5% in those with psychiatric disorder history, and as 2.9% in those without such history.

Table 3. Comparison of groups based upon the sociodemographic features*

	Total (n)	ADHD (+)		ADHD (-)		p
		n	%	n	%	
Gender						0.402
Female	718	25	3.5	693	96.5	
Male	529	14	2.6	515	97.4	
Faculty						0.533
Engineering	221	8	3.6	213	96.4	
Economics	156	8	5.1	148	94.9	
Literature	136	1	0.7	135	99.3	
Education	52	0	0	52	100.0	
Theology	54	2	3.7	52	96.3	
Sports school	50	2	4.0	48	96.0	
Vocational school	247	9	3.6	238	96.4	
Medical	78	4	5.1	74	94.9	
Science	98	3	3.1	95	96.9	
Health scienses	109	1	0.9	108	99.1	
Dentistry	46	1	2.2	45	97.8	
Class						0.815
1	159	5	3.1	154	96.9	
2	339	12	3.5	327	96.5	
3	499	13	2.6	486	97.4	
4	250	9	3.6	241	96.4	
Monthly income (Turkish liras)						0.559
<1000	296	8	2.7	288	97.3	
1000-3000	716	21	2.9	695	97.1	
>3000	235	10	4.3	225	95.7	
Parental attitude						0.001
Democratic	819	14	1.7	805	98.3	
Repressive	84	4	4.8	80	95.2	
Overprotective	294	19	6.5	275	93.5	
Unconcerned	50	2	4.0	48	96.0	
Blood relationship between parents						0.894
+	234	7	3.0	227	97.0	
-	1013	32	3.2	981	96.8	
Psychiatric disorder in participant						0.022
+	93	7	7.5	86	92.5	
-	1154	32	2.8	1122	97.5	
Psychiatric disorder in family						0.300
+	134	6	4.5	128	95.5	
-	1113	33	3.0	1080	97.0	
Other health conditions in participant						0.876
+	181	6	3.3	175	96.7	
-	1066	33	3.1	1033	96.9	
Alcohol-substance use						0.147
+	110	6	5.5	104	94.5	
-	1137	33	2.9	1104	97.1	
Method of delivery						0.060
Vaginal delivery	1119	31	2.8	1088	97.2	
Abdominal delivery	96	6	6.2	90	93.8	
Preterm delivery+vacuum	32	2	6.2	30	93.8	

Fisher exact test or Yates correction was applied

DISCUSSION

Our purpose in this study was to determine the prevalence of AADHD symptoms in university students and its relation to some related factors. Accordingly, AADHD symptom prevalence was found as 3.1%, taking into consideration two standard deviations above the ASRS score

average, in this study performed with 1247 university students. This ratio increases to 6.6% when 1.5 standard deviations above ASRS score average is taken into consideration (Table 1).

The results of our study are similar to the ratios in studies in the literature performed with university students.[14,35]

Again examining studies performed in our country using ASRS, the study by Doğan et al.[18] has found similar results to our study, with ratios of %2.6 and %6.1 in 579 students. In the study by Kavakçı et al.[27] performed with 980 persons, the result was found as 6.1%, while the study again by Kavakçı et al.[36] with 171 faculty of medicine students has reported this ratio as 4.1%.

In the overall society study by Yapıcıoğlu et al.[23] performed at province, considering above ASRS cut-off score as possible AADHD, they have found AADHD prevalence as 3.8% in the sample group and this ratio decreased to 2.7% with clinical interview.

Examining the literature, it is observed that in studies on university students AADHD symptom prevalence varies between 6.3% and 15.5%.[24-26,28] The results of these ratios could be explained with differences in methods and sample size. In our study, AADHD symptom prevalence was determined in a large sample (1247 persons) group using ASRS, based on their own statements. A retrospective evaluation and clinical interview has not been performed.

Secondarily, relation between certain related factors and AADHD symptom presence has been evaluated (Table 3).

Among the related factors, significant difference has been found between groups in terms of AADHD symptom presence, according to the variables parental attitude and presence of psychiatric disorder history. No statistically significant difference has been found in terms of the other variables.

In terms of parental attitude, AADHD symptom prevalence was found to be statistically lower in those with democratic attitude, compared to other groups. Accordingly, it has been determined that presence of AADHD symptom was 1.7% in those with democratic parental attitude, 4.0% in disinterested, 4.8% in oppressive and 6.5% in overprotective parents. Attention problems may have been reported more often, depression is more frequently observed in children of over protective parents.

No study has been found in the literature comparing parental attitude in AADHD. However, although psychosocial factors do not have direct effect in ADHD formation, it is considered that they prepare or accelerate the disorder. It has been shown that parental conflict had more effect than long term emotional deprivation on ADHD diagnosis.[37] It has been determined that parents of hyperactive children are more instructive, use more imperative sentences and make more corrections.[38] Biederman et al.[39] have shown that chronic family conflict, weakening of family ties and psychopathology in parents, especially in the mother, are observed more frequently in families with ADHD. It can be said that indifferent, oppressive and overprotective behavior against children causes loss of self-confidence, decrease of attention span and increase in hyperactivity in children. The point to be considered here is that information regarding parental attitude has been obtained from the participants. As the ability to establish relations is affected in persons with AADHD, they cannot be expected to have good relations with parents. This point should be considered during evaluations.

In our study the participants have been asked if they currently have or have had in the past any psychiatric disorders. AADHD symptom presence was found to be statistically higher in those with psychiatric disorder history compared to those without such history (7.5% vs. 2.8%, p=0.022). Although request was made to specify the name of psychiatric disorder on the sociodemographic information form, most of the participants have left this section empty and thus the psychiatric disorders could not be taken into consideration in the evaluations. Association of AADHD and other psychiatric disorders have been shown in many publications in the literature.[23,40-43] The result of our study is compatible with high association between AADHD symptoms and other psychiatric disorders. However, the psychiatric disorder history itself could also be related to the reported attention problems.

Evaluating other important related factors; it has been determined that according to the age variable, symptom prevalence was higher at age 20 (6.9%) and AADHD symptom prevalence decreased with age. No significant relation could be determined when the correlation between age and AADHD scores were examined (p>0.05).

In the study by Yılmaz et al.,[44] performed with 1954 university students, it has been reported that on the average, attention deficit lower dimension levels and ADHD related characteris-

tics and problems lower dimension levels of students at age 23 or above, were lower with respect to groups at lower age, however the difference was not significant in terms of hyperactivity/impulsivity lower dimension total scores. Faraone et al.[45] have observed that ADHD symptoms decreased with age, similar to our study. These results suggest that ADHD symptoms change with age and decrease with increasing age.

No significant difference has been detected in our study between women and men in terms of AADHD symptoms, according to the gender variable. Women/men ratio has been found as approximately 1.8/1 (25/718 women 3.5%, 14/529 men 2.6%). In conformity with our study, no statistically significant difference was found between genders in studies in the literature performed on university students and adults.[17,18,46-48] Women/men ratio has been reported to be close in many studies.[8,18,20] Unlike these data, there are studies showing that there is significant difference between genders in terms of frequency and that this difference is higher both in women[23] and in men[25,49,50] on the average. In one study, it has been suggested that men/women ratio of AADHD became equal with increasing age.[51] Clase gender ratios for AADHD symptoms could be associated with considering the own statement of the person experiencing the problem at older age, in contrast with information obtained from parents for children.

No significant relation could be found in our study between the department and class of participants and presence of AADHD symptoms. In one study, it has been reported that lower dimension levels of attention deficit, hyperactivity/impulsivity and ADHD related characteristics and problems in 4th grade students, were lower than the other three grade groups. In the same study, it has been reported that lower dimension levels of attention deficit in students in basic fields of science were lower with respect to students in other departments.[44]

Although presence of AADHD symptoms was higher at users of alcohol-substance, no statistically significant relation could be found. There are studies in the literature showing higher ADHD ratios at users of alcohol-substance.[18,52]

No significant relation could be found in our study between monthly income and presence of AADHD symptoms. Consistent with our study, it has been reported in the literature that socioeconomic level does not have a significant contribution to AADHD development.[47,53] In society-oriented studies have indicated that those with AADHD had lower socioeconomic levels.[23] We can explain this difference with the fact that participants of our study were not employees but from a group of students.

Based upon the birth history variable, the AADHD in adults was not detected to be statistically significant in terms of signs. On the other hand, prevalence of signs in those individuals born with normal delivery was detected to be 2.8% while the signs of AADHD in adults in those individuals who were born with cesarean section, premature delivery and vacuum technique were detected to be 6.2%. It was reported in literature that prenatal toxic effects, premature delivery as well as the physical damages during the prenatal period .contributed to the development of AADHD.[54]

Limitations of study

We can add up that ASRS was applied as a score, vertical evaluation and as the clinical negotiation was not done we could not differentiate whether AADHD diagnosis or another psychiatric disease was associated with the diagnosis of high score from ASRS.

Also, the limitations of our study are taking only college students as a sample group, variables such as family attitudes and psychiatric history are evaluated only by questionnaire interms of methodological aspect.

CONCLUSION

With the application of ASRS, a scanning scale, on the participants, it was found out that AADHD was frequently detected and that disorder could be associated with some other factors. Upon considering the prevalence of other psychiatric disorders the adults experience in the society we live, it is revealed that prevalence of AADHD is significantly higher compared to the others. Despite being almost the most frequently detected psychiatric disease, its diagnosis and treatment is generally neglected.

We intend to stress out the significance of diagnosis and treatment of AADHD by contributing to the researches. The studies with final diagnosis establishing methods are required in this field.

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