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Frequency of adult attention deficit hyperactivity disorder (ADHD) in outpatient psychiatric clinic, Babol University of Medical Sciences

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Abstract

Introduction: Attention Deficit Hyperactivity Disorder (ADHD) in adulthood is associated with significant impairment in occupational, academic, and social functioning. The aim of this study is to survey the frequency of ADHD in adults referred to psychiatric clinics.

Methods: The present cross-sectional descriptive study includes 300 patients referred to psychiatric clinics affiliated to Babol University of Medical Sciences with an age range of 18-45 years who were selected and included in the study. It is used the adults Attention Deficit Hyperactivity Disorder self-report scale (ASRS V1.1) to diagnose Adult ADHD in these individuals. Logistic regression and P-Paired test were used to analyze the data.

Results: The mean age of the subjects was 30.21 ± 7.794 . Of these, 181 (60.3%) were men and 119 (39.7%) were women. The overall prevalence of Adult ADHD in the study samples was 39.3%. In the logistic regression analysis of crude and adjusted data of study variables, no significant relationship was seen between Adult ADHD and age, education, employment status and marital status ($P \geq 0.05$), but a significant relationship between Adult ADHD and consumption of Cigarettes, alcohol and drugs were observed ($P \leq 0.05$).

Conclusion: The findings of the present study show a relatively high prevalence of Adult ADHD among people with a history of psychiatric disorder, who are more likely to be exposed to smoking, alcohol and drug abuse.

Keywords: Attention Deficit Hyperactivity Disorder, Mental Disorder, Adult

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Introduction

Adult ADHD is a type of psychiatric disorder that often appears in childhood. It is characterized by a stable pattern of attention deficit, hyperactivity, and impulsive behaviors (1). Impulsive behaviors are performed momentarily, without thinking about their results and without analyzing and evaluating positive and negative achievements. Attention-deficit/hyperactivity disorder is known as a childhood disorder that can be improved with supervision and treatment, but many sources have shown that ADHD is stable in adulthood and difficult to treat (2,3). Executive functions that may be abnormal in adults with ADHD include working memory, task switching, self-monitoring, initiation, and self-control. These deficits are related to the attention deficit. Characterize Adult ADHD problems: concentrating on a specific task, especially for long periods, organizing activities, prioritizing tasks, following up and completing tasks, forgetfulness, time management (as example of missing an appointment) (4). Adults with Adult ADHD often report that things only get done at the last minute, often late or not at all. An increase in driving-related problems, including an increase in driving errors, traffic fines, and speeding, may be related to attention deficits (5).

Adults with ADHD have higher rates of employment problems, criminal activity, substance abuse problems, accidents, and vehicular referrals compared to adults without ADHD. It is believed that ADHD-related disorders from childhood such as academic problems, self-esteem problems significantly in family and peer relationships underlie these behavioral problems in adulthood (6). Mortality rates were higher than in people with ADHD compared to people without ADHD in a study in 2015 using Danish national registry data, with accidents being the most common cause of death in people with ADHD (7).

ADHD is a common disorder among young people worldwide. In a study in 2007, a meta-analysis of more than 100 studies estimated the prevalence of ADHD in children and adolescents worldwide at 5.3% (8). Simon et al., found the prevalence of ADHD to be 2.5% in adults based on a meta-analysis of six studies (9). Prospective longitudinal studies support the theory that approximately two-thirds of adolescents with ADHD

retain symptoms of the disorder into adulthood (10). Recent changes in the new DSM-5 diagnostic criteria have increased the prevalence of ADHD, which is less significant for children but has likely had a significant impact on diagnosis rates in adults (11, 12). In a World Health Organization survey, among respondents aged 18 to 44 in ten countries in the Americas, Europe, and the Middle East, the current prevalence of ADHD in adults was assessed 3.4%, which was 1.9% in low-income countries and 4.2% in high-income countries (13).

ADHD is associated with a number of psychiatric illnesses. It has been reported that approximately 80% of adult ADHD patients have at least one lifelong psychiatric illness in adults. Major depressive disorder (MDD) is the most common comorbidity (prevalence 24.4 to 31%) (14). Anxiety disorders are also a common disease of adult ADHD patients. In the general population, the prevalence of any anxiety disorder approaches 20%, while this figure increases to 47% in adults with Adult ADHD (15). In addition, 65% of adult patients with adult ADHD and concurrent bipolar disorder have a history of at least one anxiety disorder during their lifetime (16). Substance abuse is another common comorbidity seen in adult ADHD patients, who may use alcohol, drugs, and nicotine as a form of self-medication (17). It has been estimated that approximately one-fourth of people with substance use disorder (SUD) have co-occurring ADHD, and in addition, they have a worse treatment prognosis compared to substance abusers without adult ADHD (18). There is evidence that ADHD treatment in childhood or adolescence may reduce the severity and course of substance use disorders in adulthood (19).

Perhaps the most serious aspect of ADHD lies in its tendency to be associated with disorders, some of which affect not only behavior but also personality. This not only endangers the well-being and life of ADHD sufferers but also their social environment. These comorbidities are seen in children and if not resolved in late puberty, they can turn into personality disorders such as antisocial personality disorder or continue as extroversion disorders until adulthood (20). Sleep disorders are another comorbidity that affects children with ADHD at a much higher level than developing children (21). In addition, these sleep

disturbances can exacerbate ADHD symptoms such as inattention and motor dysfunction even more (22).

Vnukova et al., in 2020 conducted a study in the Czech population to investigate the prevalence of ADHD among adults. It was observed that 119 (7.84%) of 1518 people were diagnosed with ADHD based on the ASRS questionnaire. Also, the rate of ADHD was higher in men than in women. The age of subjects was also related to ASRS score (23). In 2018, Valsecchi et al conducted a study to determine the prevalence and clinical correlates of Adult ADHD in a sample of psychiatric outpatients. Their study included 634 outpatients and they used the ASRS questionnaire and DIVA specialized calculator to diagnose ADHD. The findings of the study showed that 12.8% of people were considered ADHD-positive in the ASRS questionnaire and 6.9% of people based on the DIVA specialized interview (24). According to the mentioned issues, Adult ADHD has a great psychological and social burden for the individual and society. On the other hand, due to the relationship between Adult ADHD and various comorbidities, it is possible to reduce the psychological and social burden of the disease in people who go to the doctor because of other psychiatric disorders. In addition, due to its relatively high prevalence in adults and the fact that in many children, the symptoms continue until adulthood, and in the adult period, less importance is given to its diagnosis and treatment, and this issue can have many consequences for the affected person, his/her family and the community and cause problems such as job problems, marital problems and delinquency. The present study aims to investigate the frequency of adult attention deficit hyperactivity disorder (Adult ADHD) in outpatients of the psychiatric clinic of Babol University of Medical Sciences.

Methods

The current descriptive-cross-sectional study was conducted with the aim of investigating the frequency of adult attention deficit hyperactivity disorder (Adult ADHD) in the outpatients of the psychiatric clinic of Babol University of Medical Sciences. The research samples were selected using available sampling method, including 300 patients who visited the psychiatric clinics of Babol University of Medical Sciences as outpatients in the period of autumn 2019.

Inclusion criteria include the age range of 18 to 45 years, absence of severe mental disability and psychotic disorder, cognitive impairment, willingness and consent to participate in the study. The only exclusion criterion of the study includes unwillingness to continue cooperating in the study.

Sample volume calculation formula:

$n = \text{sample size} = 300$

$$n = \frac{z_{1-\alpha/2} \times p(1-p)}{d^2}$$

(1)

In relationship (1)

$\alpha = 0.05$

$p = 0.1$

$d = 0.025$

z = percentage of standard error of the acceptable confidence factor

p = proportion of the population with a given trait

$q = 1 - p$ A proportion of the population without a certain trait

α = degree of confidence or desired possible accuracy

d = maximum sampling accuracy

Sampling and distribution of the questionnaire was done after obtaining permission from the Vice-Chancellor of Research and obtaining a research permit and code of ethics IR.MUBABOL.REC.1399.242 and obtaining permission from the responsible director and head of the psychiatric clinic of Babol University of Medical Sciences and explaining the research objectives to them. The questionnaires were completed by the researcher himself, and in order to preserve the confidentiality of the information of the research samples, the questionnaires were without names. The reason for using this method is that if the samples had problems in understanding the sentences of the questionnaire, sufficient explanations would be given to them. First, the research samples were talked to and the necessary explanations were given to these people about the research, its necessity and benefits.

Then, if they were satisfied and completed the written consent form, they answered the study questionnaires. In the present study, there are two questionnaires, in which form number 1 deals with the demographic characteristics of the individual, and in form number 2, all patients completed the self-report questionnaire of adult attention deficit hyperactivity disorder (ASRS-v.1.1).

Demographic information including age, sex, occupation, education, as well as clinical records such as physical illness records, psychiatric illness and hospitalization records, history of referral or treatment for ADHD in childhood, duration of drug use, type of drug used were collected from all patients. The Adult Attention Deficit Hyperactivity Disorder Self-Report Scale (ASRS-v.1.1) was developed by the World Health Organization (WHO) and a working group consisting of teams of psychiatrists and researchers from the World Health Organization. ASRS scale questions are consistent with DSM-5 criteria. This scale includes two dimensions and 18 questions, which are divided into two parts, A and B. There are 9 questions for the dimension of inattention and 9 questions for the dimension of hyperactivity/impulsivity. Research questions are scored on a 5-point Likert scale from never (1 point) to almost always (5 points). In a study conducted in Iran by Mokhtari et al., the reliability of the questionnaire using Cronbach's alpha method was 87%. Also, the sensitivity of this questionnaire with a cut-off point of 50 for diagnosing ADHD in adults is 70% and the specificity of this questionnaire is 99% (25).

After completing the questionnaires by the research samples, the score of the ASRS questionnaire is calculated and people with a score less than 50 are considered not suffering from Adult ADHD, and people with a score of 50 and above are considered suffering from Adult ADHD.

The resulting data were entered into SPSS statistical software version 24 and evaluated quantitatively and

qualitatively. The significant level of the test will be less than 0.05 ($p < 0.05$). P-Paired and Chi-square statistical tests were used to analyze the data.

Results

This cross-sectional study was conducted on 300 people who referred to psychiatric clinics affiliated to Babol University of Medical Sciences to determine the frequency of Adult ADHD in adults. All the study samples have answered the answer letters completely and are in accordance with the entry and exit criteria of the study. For this reason, we did not have a sample excluded from the study.

The average age of the subjects was 30.21 years with a standard deviation of 7.94. 181 cases (60.3%) were men and 119 cases (39.7%) were women. 43 cases (14.3%) had a bachelor's degree, 103 cases (34.3%) had diploma education and 154 cases (51.3%) had higher education. 214 cases (71.3%) were employed and the rest were unemployed, 157 cases (52.3%) were single and 143 cases (47.7%) were married. In addition, 51 cases (17%) had a history of using at least one of tobacco, alcohol or drugs. In connection with the use of the mentioned items, 49 cases (16.3%) used tobacco, 17 cases (5.7%) used alcohol, and 15 cases (5%) also used drugs.

Logistic regression analysis was used to investigate adult ADHD and risk factors affecting it. People with a score of 50 and above were considered to have Adult ADHD and people with a score below 50 were considered not to have Adult ADHD. Also, the average adult ADHD score of people in general was 46.7 with a standard deviation of 11.08 and 118 people (39.3%) had adult ADHD and 182 people (60.7%) did not have adult ADHD.

The findings related to data analysis and their relationship with adult ADHD are given in Table 1 and Figure 1.

Table 1. Review of risk factors related to Adult ADHD as raw data and adjusted data.

Variable	ADHD		Crude		Adjusted		
	+	-	OR	CI 95%	OR	CI 95%	
Gender	Male	76 (42%)	105 (58%)	1		1	
	Female	42 (35.3%)	77 (64.7%)	0.75	0.24 (0.1-46.21)	1.09	0.79 (0.2-55.15)

Education	Diploma	42 (40.8%)	61 (59.2%)	1	-	1	-
	High school	19 (44.2%)	24 (55.8%)	0.87 (0.1-42.78)	0.70	0.57 (0.1-25.25)	0.16
	Above diploma	57 (37%)	97 (63%)	0.74 (0.1-37.47)	0.39	0.46 (0.1-21.01)	0.055
Employment	Unemployed	27 (31.4%)	59 (68.6%)	1		1	
	Employed	91 (42.5%)	123 (57.5%)	1.61 (0.2-95.74)	0.07	1.36 (0.2-62.98)	0.43
Marital Status	Single	71 (45.2%)	86 (54.8%)	1		1	
	Married	47 (32.9%)	96 (67.1%)	0.59 (0.0-37.94)	0.02	0.65 (0.1-34.24)	0.20
Substance abuse	+	29 (56.9%)	22 (43.1%)	2.371 (1.4-28.36)	0.005	2.37 (1.4-24.53)	0.009
	-	89 (35.7%)	160 (64.3%)				
Age		-	-	0.97 (0.1-94)	0.051	0.97 (0.1-94.02)	0.31

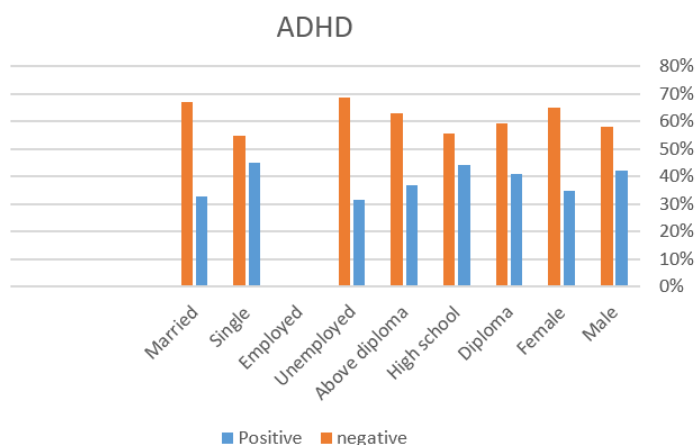


Figure 1: Review of risk factors related to Adult ADHD.

Discussion and Conclusion

The data obtained from the present study show the prevalence of Adult ADHD in psychiatric clinic outpatients at 39.3%. The prevalence rate obtained in the present study is higher than in similar studies. In a study conducted by Valsecchi et al. on Italian psychiatric outpatients, the overall prevalence of adult ADHD was reported as 6.9% (24). In order to evaluate patients with Adult ADHD, they subjected the patients who were diagnosed with Adult ADHD in the ASRS-V1.1 questionnaire to a specialized interview. So, patients were screened more intensively than using a questionnaire alone.

In other community-based studies, the observed prevalence is lower than in the present study. Polyzoi et al., and 2018 (26) On a Swedish population, the prevalence rate in people aged 18 years and older was estimated to be 3.54 per 1000 people. Vňuková et al., in 2021 (23). In the Czech Republic, the prevalence of Adult ADHD was assessed as 7.84% based on the 6-item ASRS questionnaire. On the other hand, the 6-item ASRS questionnaire shows that the reported rate is lower than the actual level (27), for this reason, the predicted prevalence in this study was evaluated as 14%. De Zwaan et al., in 2012, the raw prevalence rate of ADHD was evaluated as 4.7% (28). Ghoreishizadeh et al., in 2014, the prevalence rate in adults aged 18-45 years was evaluated as 3.8% (29).

The relatively high prevalence of observation in the present study can have various reasons. The people who entered the study were selected as available and from the population with psychiatric disorders. On the other hand, in a random sample of people who have a psychiatric illness, they may have a high percentage of Adult ADHD. According to the studies, Adult ADHD can be associated with other psychiatric diseases such as substance use disorder, mood disorders (such as depression and bipolar disorder) and anxiety disorders. ADHD and dysthymic disorder/depression are commonly associated, and the prevalence of depression in individuals with ADHD varies from 18.6% to 53.3%

in different studies (30, 31). Similarly, studies have reported comorbid ADHD in individuals with depression at rates of 9% to 16% (32), with an average incidence of 7.8% (33). The risk of anxiety disorders in people with ADHD is higher than in the general population, approaching 50% (28). Probably the most common comorbidity with ADHD is substance use disorder (SUD), especially alcohol or nicotine, cannabis, and cocaine (34).

Reports indicate that personality disorders are present in more than 50% of adults with Adult ADHD, usually cluster B and C personality disorders, and 25% of individuals have two or more personality disorders (35).

Also, there are studies showing the relationship between ADHD and bipolar disorder (36), sleep disorders (21), obesity (37), Internet addiction, virtual networks and video games (38). In other studies that have been conducted on adults with Adult ADHD, the age limit was 18 years and above, which also included the elderly, based on previous studies, with increasing age, especially in old age, the rate of adult ADHD decreases, while in the present study, the upper age limit of the people who entered the study was 45 years. Also, the average age of the people included in the present study was lower compared to the reviewed studies (20,21,39). The error in the answer should also be taken into account.

In the present study, the prevalence of adult ADHD was not statistically related to the age of the subjects. While in the study of Valsecchi et al., (24) in 2021, people with Adult ADHD were younger than people without Adult ADHD. Also, in a study, De zwaan et al. reported a decrease in the prevalence of ADHD with increasing age. However, De Zwaan et al., (29) observed a significant difference between the age groups of 18 to 24 years and 55 to 64 years, while the other age groups did not have a significant difference, which is similar to the age group of present study (28).

In the present study, there was no correlation between the prevalence of adult ADHD and gender. There is evidence that shows that the rate of ADHD in boys is 2 to 3 times higher than that of girls, but in adults, this ratio tends to equalize in the studies conducted (24). Also, in the study of Polyzoi et al., similar findings

were observed with the present study, and no difference was observed in the incidence of Adult ADHD between men and women (26). On the other hand, a study conducted by Zetterqvist et al., (24) showed a higher prevalence in adult men. Because Zetterqvist's study was conducted between 2006 and 2009, it can be concluded that the proportion of women with adult ADHD has increased over time.

However, these results do not mean that the graduate education level is a protective factor against Adult ADHD. Various studies show a moderate association between IQ and attention deficits (40), and the diagnosis of ADHD has the same validity among children with high IQ and children with average IQ. It can be concluded that people diagnosed with Adult ADHD who have a high level of education compensate for their functional deficit due to ADHD with a lower IQ compared to their peers.

In the present study, a significant relationship between drug use and adult ADHD was observed, and 56.9% of people who use drugs have adult ADHD. This finding is expected, as ADHD is typically associated with risky behaviors and decision-making problems (41). The present finding has also been shown in various studies (24, 28, 42) In descriptive reports and demographic studies, adult ADHD patients have described marijuana as helpful in controlling inattention and impulsivity (43, 44). In a study conducted by Notzon et al. (45), the prevalence of marijuana use was estimated at 34-46%. ROMO et al. also observed a higher rate of marijuana use, alcohol use, and gambling in people with Adult ADHD (46).

In examining the relationship between marital status and adult ADHD, our findings did not show a significant relationship, which is consistent with the observations of Valsecchi et al. (24). But they observed that most people with Adult ADHD are single and less likely to have a partner. In some previous studies, no significant relationship between marital status and adult ADHD has been observed (2, 13, 29). Some studies show that the prevalence of Adult ADHD is higher in divorced people (15, 47). Also, in another study, the prevalence of Adult ADHD was higher in widowed, divorced and single people (48). But, considering the effect of Adult ADHD in adults and in their intimate relationships, which leads to less stability

and higher divorce rates, judging the impact of this disorder on marital status may require longer follow-ups. In the investigation of being employed, no significant relationship between being employed and Adult ADHD was observed, as some studies had similar results (24, 28). While other studies have shown a higher prevalence of Adult ADHD in unemployed people (15, 48). The main limitation of the present study is the absence of a secondary follow-up for the additional examination of people who are diagnosed with Adult ADHD in the ASRS-v1.1 questionnaire due to the COVID-19 pandemic and quarantine restrictions, as well as the lack of cooperation of the patients in the circumstances. Considering the high prevalence that was observed, maybe a more detailed investigation by dedicated interviews could have brought us more accurate results. For example, Valsecchi et al. (24) subjected patients who scored above 50 in the ASRS-v1.1 questionnaire to a dedicated DIVA interview. The next limitation is the insufficient sample size, which may have caused the variables related to Adult ADHD to not be evaluated correctly. On the other hand, we did not have any information about the underlying disease and the history of ADHD or ADHD symptoms in the childhood of these people. The findings of the present study show that the prevalence of Adult ADHD is high among patients who refer to the Babol Psychiatric Clinic as an outpatient. This shows the importance of using appropriate screening methods in these people, early diagnosis and treatment. Also, people who have a history of using tobacco and/or alcohol and/or especially drugs, or are currently using them, should be screened for Adult ADHD so that we can prevent more problems for them with early diagnosis.

Authors contributions

SJ conceived and designed the analysis, **SMZ** collected the data, **MA** contributed data or analysis tools, **HGH** wrote the paper, **AM** performed the analysis.

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