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Pharmacists' Knowledge, Attitudes And Beliefs About Attention Deficit And Hyperactivity Disorder And Medical Treatment

Eczacıların Dikkat Eksikliği ve Hiperaktivite Bozukluğu ve Tıbbi Tedavisine İlişkin Bilgi, Tutum ve İnançları

Cansu Mercan Işık[1*], Ayla Uzun Çiçek[1]

[1]Sivas Cumhuriyet Üniversitesi Tıp Fakültesi Çocuk ve Ergen Ruh Sağlığı ve Hastalıkları Anabilim Dalı Türkiye

e-mail: dr.cansumercan@gmail.com, dr.f.ayla@hotmail.com
ORCİD: 0000-0001-9437-3024
ORCİD: 0000-0003-2274-3457

*Sorumlu Yazar / Corresponding Author: Cansu Mercan Işık
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Öz

Giriş ve Amaç: Dikkat eksikliği ve hiperaktivite bozukluğu (DEHB), aile ve toplum için önemli bir yük oluşturan yaygın ve yıkıcı bir hastalıktır. DEHB tedavisi çok yönlüdür ve uzun süreli bakım ve destek gerektirir. Eczacılar ilaçların dağıtımına doğrudan dahil olduklarından dolayı hastalarla iş birliği yapmak, tedavilerini desteklemek, ilaca uyumun önemini belirtmek ve ilacı anlatmak konusunda iyi bir konumdadırlar. Bu anket çalışması, eczacıların DEHB ve tıbbi tedavisi hakkındaki bilgi boşluklarını, tutumlarını ve inançlarını ve DEHB yönetimi konusundaki deneyimlerini belirlemeyi amaçlamıştır.

Gereç ve Yöntemler: Çalışmamızda Sivas Merkez de çalışan eczacılara, eczacının yaşı ve meslek yılı, dikkat sorunu ve/veya hareketliliği olan çocuk ve ergenlerle karşılaştıklarında ne yaptıkları, tanı ve tedavi konusundaki düşünceleri gibi tanımlayıcı soruları içeren bir anket hazırlanmıştır ve yüz yüze uygulanmıştır

Bulgular: Çalışmaya 113 eczacı katılmıştır. Katılımcılara DEHB ile ilgili bilgi düzeyleri sorulduğunda %29,2'si sınırlı bilgiye %14,2'sinin bilgi düzeyinin ise iyi olduğu görülmüştür. Katılımcıların %48,7'si psikostimulanlar hakkında bilgi düzeyinin yetersiz olduğunu belirtmiştir. Katılımcıların %41,6'sı DEHB tedavisinde kullanılan ilaçların bağımlılık yapabileceğini düşünmektedir. Katılımcıların mesleki deneyimlerine göre DEHB ile ilgili ankete verdikleri cevaplar karşılaştırıldığında, daha az mesleki deneyime sahip olan eczacıların DEHB'yi yaşam boyu sorun yaratabilen bir hastalık olarak görmeleri arasındaki ilişki istatistiksel olarak anlamlı bulunmuştur ($p<0,023$).

Sonuç: Çalışmamız ülkemizde eczacıların DEHB konusundaki farkındalıklarını ölçen ilk çalışmadır. Eczacıların hastalara danışmanlık yapmak ve ilacın güvenlik profili ve etki başlangıcı hakkında en sık sorulan soruları yanıtlamak için yeterli bilgiye sahip olması DEHB yönetiminde büyük önem taşımaktadır. Bu nedenle eczacılara yönelik DEHB eğitimlerinin düzenlenmesi yararlı olacaktır.

Anahtar kelimeler: Dikkat eksikliği hiperaktivite bozukluğu, eczacı, tutum, inanç, bilgi

Abstract

Aim: Attention deficit hyperactivity disorder (ADHD) is a common and devastating disorder that poses a significant burden on families and society.ADHD treatment is multifaceted and requires long-term care and support. As pharmacists are directly involved in the distribution of medication, they are well positioned to collaborate with patients, support their treatment, highlight the importance of adherence to medication, and explain the medicine. This survey study aimed to identify pharmacists' knowledge gaps, attitudes and beliefs about ADHD and its medical treatment, and their experience in ADHD management.

Method: In our study, a questionnaire was prepared for pharmacists in Sivas Center, covering descriptive questions such as the pharmacist's age and professional year, what pharmacists do when they encounter children and adolescents with attention problems and/or mobility, and their thoughts on the diagnosis and treatment of ADHD, and applied face-to-face.
Results: The study involved 113 pharmacists. Respondents were asked to assess their level of knowledge regarding ADHD. It was observed that 29.2% of the participants had limited knowledge about ADHD and 14.2% had good knowledge. Nearly half (48.7%) of the respondents acknowledged their lack of knowledge on psychostimulants. It was revealed that 41.6% of the pharmacists consider ADHD treatment medication to be potentially addictive. When comparing survey responses on ADHD among participants based on their professional experience, it was discovered that there is a statistically significant relationship ($p<0.023$) between pharmacists with limited professional experience and their beliefs about ADHD as a condition that can lead to lifelong issues.
Conclusion: Our study is the first to measure the awareness of pharmacists about ADHD in our country. Pharmacists have sufficient knowledge to counsel patients and to answer the most frequently asked questions about the drug's safety profile and onset of action is of great importance in the management of ADHD. So it would be useful to organize trainings on ADHD for pharmacists.
Keywords: Attention deficit hyperactivity disorder, pharmacists, attitude, belief, knowledge

1.Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a common and devastating disorder that often co-occurs with other psychiatric disorders and is important for the individual, family and society. ADHD is often associated with aggression, poor peer relationships, disobedience, risk-taking, low self-esteem, depression and social, emotional and cognitive problems. The prevalence of ADHD in children and adolescents has been found to be 5-7.1% worldwide [1,2]. It has been reported to be between 5-13.2% in Turkey [3,4]. The first step in ADHD management is diagnosis. Unfortunately, the time to diagnosis can be prolonged because parents fear stigmatization and believe that their child does not have a disorder. This prolongation can be attributed to a variety of factors, including a lack of knowledge and negative beliefs about what ADHD really is and what it looks like. As ADHD affects functioning in many areas, its treatment should also be comprehensive. It aims to address the cognitive, behavioural, social and family difficulties of the child with ADHD through psychoeducational, medication and psychosocial (parent education programmes, social skills training, psychotherapy) treatment options. Evidence-based medical practice, as recommended by clinical guidelines, has become an important tool for improving the quality of care, the use of resources and the cost-effectiveness of service delivery [5]. These guidelines are the National Institute for Health and Clinical Excellence (NICE) 2018, the Canadian Attention Deficit Hyperactivity Disorder Association (CADDRA) 2018 and the American Association of Child and Adolescent Psychiatry (AACAP) 2007 [6]. Looking at clinical practice guidelines, methylphenidate remains the first-line treatment for ADHD in children and adults, among other central nervous system (CNS) stimulants [7]. For more than two decades, there have been concerns about the abuse of methylphenidate due to its beneficial and stimulant effects, as well as its dopaminergic and noradrenergic activity in reward-related areas of the brain [8]. The use of the drug in Turkey is limited due to its potential for addiction when administered in high doses or rapidly, and its use under medical supervision with a red prescription [9]. Since ADHD is typically a lifelong disorder, information and support is extremely important in the care of people with ADHD. Unfortunately, the myths and stigma associated with the condition result in many patients going undiagnosed or not using their treatment. In relation to ADHD, pharmacists have a variety of roles in providing medical support to patients with ADHD of various ages or at various stages of the disorder. Given the frequency with which pharmacists encounter patients, they may recognize potential ADHD symptoms through casual conversations with a patient or caregiver prior to diagnosis, or through a more extensive consultation, and then refer the patient for a more thorough evaluation by medical professionals. Following an ADHD diagnosis, the pharmacist is a valuable source of information and support for the patient, especially if the patient or family is struggling with fears of stigma associated with ADHD or stigma associated with taking ADHD medicationPharmacists can also support patients with ADHD and their carers to maximize clinical benefits and manage anticipated adverse effects. Figure 1 shows the role of pharmacists in the management of ADHD [10].

Based on studies with pharmacists, a study by Ghanizadeh investigated the use of Ritalin for the treatment of ADHD. Around 70% of participants expressed an unwillingness to use Ritalin for ADHD, stating it should only be recommended for severe cases. In addition, it was concluded that 91% of participants believed that children with ADHD were misbehaving because they refused to follow rules and do homework [11]. A study conducted in

Canada in 2021 concluded that community pharmacists may need additional ADHD training and lack awareness of the evidence-based ADHD clinical guideline [12].

Considering the prevalence of ADHD, it is very important for pharmacists to have accurate knowledge, beliefs and attitudes about the disease condition and its management in order to provide accurate and up-to-date counseling to patients. It is important for pharmacists to have sufficient knowledge to counsel patients and answer the most frequently asked questions about the drug's safety profile and onset of action in ADHD management. Do pharmacists in our country have sufficient knowledge about attention deficit hyperactivity disorder and its treatment? What are pharmacists' beliefs and attitudes towards the treatment of disease? For this reason, as far as we know, this study, which will be conducted for the first time in Turkey, is planned to investigate pharmacists' knowledge, attitudes and beliefs regarding ADHD and the use of medical treatment.

2. Materials And Methods

Pharmacists who were graduates of the Faculty of Pharmacy at Sivas Centre and who volunteered to participate in the research were included in this study. Auxiliary staff working in the pharmacy were not included in the study. It was emphasised that they were free to participate or not to participate in the study. Volunteer pharmacists were asked by the researchers to complete a questionnaire. The questionnaire was designed by the researchers, taking into account the information in the literature for the purpose of the study, and consists of 3 parts. The first part consists of descriptive questions, such as the pharmacist's age and year in the profession, and then the second part consists of 9 questions about what pharmacists do when they encounter children and adolescents with attention problems and/or hypermobility, and their thoughts about the diagnosis and treatment of ADHD. The third part consists of 25 questions about beliefs about ADHD. The study was approved by the Scientific Ethics Committee of Cumhuriyet University Hospital on 19.08.2021 and 2021-08/52. After oral explanation about the study, written consent form was obtained from the participants.

2.1 Statistical analysis

Statistical analysis was performed with SPSS 22.0 (Statistical Package for the Social Sciences, SPSS Inc, Chicago, USA). The distribution of the characteristics related to the complaints and diagnoses in the children included in the study were determined by descriptive statistics using numbers, rates, percentages and standard deviations. The chi-square test was used to evaluate whether there was a significant difference between the diagnoses received by boys and girls and whether there was a significant difference between the number of health board applications and the number of follow-up visits. $p<0.05$ was considered statistically significant.

3. Result

3.1 Clinical Characteristics and Demographic Variables of the Participants

113 pharmacists participated in the study. 9 pharmacists refused to participate in the study due to lack of time and not finding the study necessary. The mean age of the pharmacists was 29.90±6.86 years and their mean experience was 6.88±6.41 years. 55.8% of the participants had 1-5 years of professional experience and 44.2% of them had 6 years or more of professional experience. The gender distribution was 58.4% male and 44.1% female. The mean clinical characteristics and demographic variables of the participants are shown in Table 1.

Table 1. Sociodemographic characteristics of the participants

Variables	Number (n,%) or mean±SD
Age	29.90±6.86
Vocational experience	6.88±6.41
Vocational experience	
1-5 years	63 (55.8)
6 years and above	50 (44.2)
Gender	
Male	66 (58.4)
Female	47 (41.6)
Marital status	
Married	57 (50.4)
Single	56 (49.6)

3.2 ADHD awareness of participants

When participants were asked about their level of knowledge about ADHD, it was found that 29.2% had little knowledge, 56.6% had moderate knowledge and 14.2% had good knowledge. When asked "What is your source of information about ADHD?", 15.9% of the participants replied that there was no source of information, 37.2% of them were internet and media, 29.2% of them were medical books and newspapers. In response to the

question "If he/she encounters or is consulted by a child with ADHD", 74.3% of pharmacists said that they would refer the child to a paediatric psychiatrist. When asked about their knowledge of current treatment guidelines for ADHD, about half of the respondents said they did not know. When asked which drug he/she knows best for the treatment of ADHD, 61.9% said methylphenidate, 13.3% antipsychotics, 8% atomoxetine and 4.4% citicoline. The answer from 12.4% was I don't know. To the question 'What is your level of knowledge about psychostimulants', 48.7% of pharmacists answered insufficient, 34.5% moderate and 16.8% sufficient. 50.4% rated their knowledge of non-psychostimulants as insufficient, 36.3% as moderate and 13.3% as sufficient. In response to the question 'If the family of a child prescribed medication for ADHD seeks advice', 75.2% of participants answered that they should follow the doctor's advice and 7.1% answered that the medication can be addictive and that drug-free treatment is possible. 81.4% of pharmacists said they had volunteered for the training. The responses in the questionnaires administered to the participants are shown in Table 2.

Table 2. ADHD awareness of participants

Variables	Number (n,%)
Level of knowledge about ADHD	
Insufficient/none	33 (29.2)
Moderately	64 (56.6)
Adequately	16 (14.2)
Source of knowledge about ADHD	
None	18 (15.9)
Internet and media	42 (37.2)
Medical books and journals	33 (29.2)
Limited to conversations between friends or patients	20 (17.7)
If he/she encounters the child with ADHD or is consulted	
Referral to a child psychiatry	84 (74.3)
Referral to a pediatric neurology	5 (4.4)
Referral to a psychologist	18 (15.9)
He/she does not think of it as a disorder, and he/she thinks it's normal at this age	6 (5.3)
Awareness of current treatment guidelines for ADHD	
I have read and adopted the recommendations	13 (11.5)
I read but didn't take the advice	4 (3.5)
I have news but I haven't read it	40 (35.4)
I don't know	56 (49.6)
The drug he/she knows best for the treatment of ADHD	
Methylphenidate	70 (61.9)
Atomoxetine	9 (8.0)

Antipsychotics	15 (13.3)
Citicoline	5 (4.4)
He/she has no knowledge	14 (12.4)
Level of knowledge about psychostimulants	
Insufficient/none	55 (48.7)
Moderately	39 (34.5)
Adequately	19 (16.8)
Level of knowledge about non-psychostimulant	
Insufficient/none	57 (50.4)
Moderately	41 (36.3)
Adequately	15 (13.3)
If the family of the child who has been prescribed medication for ADHD seeks advice	
I propose following the doctor's recommendation.	85 (75.2)
I say the drug can be addictive and drug-free treatment is possible	8 (7.1)
I do not express any opinion, I say I do not know.	20 (17.7)
Willingness to attend education on ADHD	
Yes	92 (81.4)
No	21 (18.6)

Abbreviations: **ADHD, Attention Deficit Hyperactive Disorder.**

3.3 Participants' answers to questions about ADHD

41.6% of the participants think that the medication used to treat ADHD can be addictive. 34.5% of participants answered the question 'ADHD medication has serious side effects' correctly. 32.7% of pharmacists gave the wrong answer to the question 'The risk of alcohol and drug addiction increases if ADHD patients are not treated'. The question 'Psychological therapy techniques should be used instead of medication to treat ADHD' was answered correctly by 24.8% of pharmacists. The responses in the questionnaires administered to the participants are shown in Table 3.

Table 3. Participants' answers to questions about ADHD

Questions	True	False	No idea
Hyperactivity is a transient state of mischief (n,%)	27 (23.9)	62 (54.9)	24 (21.2)
ADHD is a condition that occurs as a result of wrong family attitudes, it is not a disease (n,%)	28 (24.8)	57 (50.4)	28 (24.8)

ADHD is a recently proposed disorder that did not exist in the past (n,%)	28 (24.8)	65 (57.5)	20 (17.7)
ADHD is inherited genetically (n,%)	67 (59.3)	12 (10.6)	34 (30.1)
Children with ADHD are smarter than average (n,%)	48 (42.5)	41 (36.3)	24 (21.2)
Children that have ADHD are less intelligent than average (n,%)	14 (12.4)	82 (72.6)	17 (15.0)
ADHD is not a condition linked to intelligence (n,%)	69 (61.1)	18 (15.9)	26 (23.0)
ADHD is more common in male (n,%)	42 (37.2)	19 (16.8)	52 (46.0)
ADHD is more common in girls (n,%)	19 (16.8)	42 (37.2)	52 (46.0)
All ADHD patients are hyperactive (n,%)	32 (28.3)	36 (31.9)	45 (39.8)
All ADHD patients are inattentive (n,%)	27 (23.9)	57 (50.4)	29 (25.7)
Children with ADHD can achieve success on par with their peers (n,%)	65 (57.5)	29 (25.7)	19 (16.8)
Children with ADHD need special education (n,%)	69 (61.1)	19 (16.8)	25 (22.1)
ADHD can cause lifelong problems (n,%)	37 (32.7)	62 (54.9)	14 (12.4)
Even if untreated, children with ADHD will improve over time (n,%)	26 (23.0)	71 (62.8)	16 (14.2)
If they choose to, children with ADHD are capable of solving their own issues (n,%)	21 (18.6)	58 (51.3)	34 (30.1)
Lack of treatment for ADHD in children increases the likelihood of alcohol and drug abuse (n,%)	29 (25.7)	37 (32.7)	47 (41.6)
ADHD is incurable (n,%)	16 (14.2)	84 (74.3)	13 (11.5)
Drugs for ADHD are addictive (n,%)	47 (41.6)	42 (37.2)	24 (21.2)
ADHD medications have detrimental side effects (n,%)	39 (34.5)	43 (38.1)	31 (27.4)
Psychological therapy techniques should be used instead of drugs in the treatment of ADHD (n,%)	28 (24.8)	50 (44.2)	35 (31.0)

Abbreviations: **ADHD, Attention Deficit Hyperactive Disorder.**

3.4 Participants' answers to questions about ADHD by vocational experience

When participants' responses to the ADHD questionnaire were compared according to their professional experience, there was a statistically significant association between pharmacists with less professional experience and viewing ADHD as a disease that can cause lifelong problems ($p<0.023$). In addition, the relationship between the participants' answers to the question "There is an increased risk of alcohol-substance abuse in patients with untreated ADHD" and their professional experience was statistically significant ($p<0.001$). The results are presented in Table 4.

Table 4. Participants' answers to questions about ADHD by vocational experience

	Vocational experience: 1-5 years (n=63)			Vocational experience: 6 years and above (n=50)			p-value*
Questions	**True**	**False**	**No İdea**	**True**	**False**	**No İdea**	
Hyperactivity is a transient state of mischief (n,%)	17 (27.0)	32 (50.8)	14 (22.2)	10 (20.0)	30 (60.0)	10 (20.0)	0.587
ADHD is a condition that occurs as a result of wrong family attitudes, it is not a disease (n,%)	14 (22.2)	35 (55.6)	14 (22.2)	14 (28.0)	22 (44.0)	14 (28.0)	0.475
ADHD is a recently proposed disorder that did not exist in the past (n,%)	18 (28.6)	31 (49.2)	14 (22.2)	10 (20.0)	34 (68.0)	6 (12.0)	0.123
ADHD is inherited genetically (n,%)	39 (61.9)	6 (9.5)	18 (28.6)	28 (56.0)	6 (12.0)	16 (32.0)	0.805
Children with ADHD are smarter than average (n,%)	27 (42.9)	24 (38.1)	12 (19.0)	21 (42.0)	17 (34.0)	12 (24.0)	0.796
Children that have ADHD are less intelligent than average (n,%)	6 (9.5)	48 (76.2)	9 (14.3)	8 (16.0)	34 (68.0)	8 (16.0)	0.534
ADHD is not a condition linked to intelligence (n,%)	40 (63.5)	13 (20.6)	10 (15.9)	29 (58.0)	5 (10.0)	16 (32.0)	0.082
ADHD is more common in male (n,%)	25 (39.7)	8 (12.7)	30 (47.6)	17 (34.0)	11 (22.0)	22 (44.0)	0.416
ADHD is more common in girls (n,%)	11 (17.5)	20 (31.7)	32 (50.8)	8 (16.0)	22 (44.0)	20 (40.0)	0.393
All ADHD patients are hyperactive (n,%)	17 (27.0)	20 (31.7)	26 (41.3)	15 (30.0)	16 (32.0)	19 (38.0)	0.921
All ADHD patients are inattentive (n,%)	15 (23.8)	34 (54.0)	14 (22.2)	12 (24.0)	23 (46.0)	15 (30.0)	0.604
Children with ADHD can achieve success on par with their peers (n,%)	38 (60.3)	17 (27.0)	8 (12.7)	27 (54.0)	12 (24.0)	11 (22.0)	0.422
Children with ADHD need special education (n,%)	39 (61.9)	8 (12.7)	16 (25.4)	30 (60.0)	11 (22.0)	9 (18.0)	0.343
ADHD can cause lifelong problems (n,%)	14 (22.2)	41 (65.1)	8 (12.7)	23 (46.0)	21 (42.0)	6 (12.0)	**0.023**

Even if untreated, children with ADHD will improve over time (n,%)	15 (23.8)	38 (60.3)	10 (15.9)	11 (22.0)	33 (66.0)	6 (12.0)	0.787
If they choose to, children with ADHD are capable of solving their own issues (n,%)	13 (20.6)	30 (47.6)	20 (31.7)	8 (16.0)	28 (56.0)	14 (28.0)	0.659
Lack of treatment for ADHD in children increases the likelihood of alcohol and drug abuse (n,%)	8 (12.7)	28 (44.4)	27 (42.9)	21 (42.0)	9 (18.0)	20 (40.0)	**<0.001**
ADHD is incurable (n,%)	9 (14.3)	48 (76.2)	6 (9.5)	7 (14.0)	36 (72.0)	7 (14.0)	0.758
Drugs for ADHD are addictive (n,%)	26 (41.3)	22 (34.9)	15 (23.8)	21 (42.0)	20 (40.0)	9 (18.0)	0.726
ADHD medications have detrimental side effects (n,%)	21 (33.3)	25 (39.7)	17 (27.0)	18 (36.0)	18 (36.0)	14 (28.0)	0.920
Psychological therapy techniques should be used instead of drugs in the treatment of ADHD (n,%)	16 (25.4)	27 (42.9)	20 (31.7)	12 (24.0)	23 (46.0)	15 (30.0)	0.946

***The chi-square test was used to test group differences.**

Bold font indicates statistical significance: $p < 0.05$.

Abbreviations: **ADHD, Attention Deficit Hyperactive Disorder.**

4.Discussion

Non-adherence to medication is common in psychiatry. At least half of patients (depending on the type of mental illness and the method of measuring adherence) are likely to stop taking their medication at some point during their lifetime.[13]. Furthermore, medication non-adherence has numerous consequences such as treatment resistance, re-hospitalisation, risk of self-harm, social disruption and community costs [14]. Educating patients about their mental illness is an important tool for improving their ability to cope with it. The aim is patient empowerment. Due to pharmacists' direct involvement in dispensing medications, they are able to collaborate with patients, support their treatment, assess medication adherence, and promote medication use. In our country, a study evaluating physicians' attitudes and beliefs towards ADHD was conducted by Özge et al. [15]. However, it is the first study conducted for pharmacists. In our study, when the participants were asked about their level of knowledge about ADHD, 29.2% answered that they had little knowledge, 56.6% had moderate knowledge, and 14.2% had good knowledge. In a study conducted in Canada, a scale scoring the participants' knowledge level out of 10 was distributed to 238 participants and the knowledge level was evaluated as 5.8 [12]. To the question "What is your source of information about ADHD?", 15.9% of the participants answered that there was no source of information, 37.2% of them were internet and media, 29.2% of them were medical books and newspapers. When these rates are examined, it has been seen that very few of the information sources of pharmacists about ADHD consist of up-to-date evidence-based information. ADHD education provided by pharmacists can help patients better understand ADHD management, especially in terms of drug side effects, onset of action, administration instructions, monitoring frequency and requirements [16-18].

Psychoeducation, medication and psychosocial (parent education programmes, social skills training, psychotherapy) treatment options are applied to solve the difficulties in the cognitive, behavioural, social and familial areas of the child with ADHD. Evidence-based medical practice recommended by clinical guidelines has become an important tool for improving quality of care, better use of resources and cost-effective service delivery [5]. Three of these guidelines are the National Institute for Health and Clinical Excellence (NICE) 2018, the Canadian Attention Deficit Hyperactivity Disorder Association (CADDRA) 2018 and the

American Association of Child and Adolescent Psychiatry (AACAP) 2007 [6]. When asked about their awareness of current treatment guidelines for ADHD, about half of the participants said they didn't know. In addition, 81.4% of pharmacists reported that they volunteered for the training. A study by Yuen et al. concluded that community pharmacists may need additional training in ADHD and also lack awareness of the evidence-based ADHD clinical guideline [12]. A study conducted among Toronto pharmacists observed that the majority of pharmacists were not very familiar with ADHD medications and treatment. This result suggests that many pharmacists still need more support to equip themselves with basic knowledge and skills [12].

'What is your level of knowledge about psychostimulants?' 48.7% of the participants answered the question as insufficient, 34.5% medium and 16.8% adequate. The answers of the pharmacists to the question 'Thedrug he/sheknowsbestforthetreatment of ADHD' were 61.9% methylphenidate, 13.3% antipsychotic, 8% atomoxetine and 4.4% citicoline. The answer of 12.4% was as "I don't know". In the study of Ghanizadeh et al., they reported that the drug that pharmacists know best is ritalin [11]. Psychostimulants have been the drugs of choice for the treatment of ADHD for more than 60 years. Methylphenidate is the drug most commonly used as first-line therapy for ADHD [19]. Non-adherence to prescribed medication among ADHD patients is a multifactorial problem, and one of the reasons for this is that patients are not fully aware of the most appropriate way to manage the condition and the pharmacotherapy prescribed [20]. In children aged 12 to 18 years with ADHD, it is estimated that it takes approximately four months for patients to discontinue their medication, so targeted interventions and education to children and carers are needed to promote adherence to treatment [21]. It is the duty of pharmacists to provide information to carers as well as patients about the negative consequences of a forgotten dose, to explain the correct way to consume prescription medication and what to avoid, especially inappropriate use of medication and possible overdose situations [22]. However, it is noteworthy that 48.7% of the participants answered the question of knowledge level as insufficient. In order to develop the capacity among pharmacists to undertake the role of patient education, it is critical to provide disease-specific education including the latest evidence-based clinical guidelines [23]. In our study, 81.4% of pharmacists stated that they volunteered for training. Like other healthcare professionals, pharmacists need to participate in continuous professional development and stay up-to-date on disease-specific information and recommendations that will help them provide optimal patient care [24]. Another finding of our study was that although 75.2% of the pharmacists recommended that the families continue the medication recommended by the physician, 7.1% stated that the medication could be addictive and they should not continue. In our country, many children do not receive the necessary diagnosis and treatment due to concerns about receiving unnecessary ADHD diagnosis and treatment and have difficulty in continuing treatment. As a result of objections to the diagnosis of ADHD by health professionals, it becomes difficult for children with ADHD to receive diagnosis and treatment in primary health care services. In a study investigating parents' views on medication initiation, it was found that parental concern about their child's ADHD diagnosis may affect treatment motivation and clarity in decision-making. It has been emphasised that it is critical to understand specific parental opinions about the "pros and cons" of drug treatment and to determine what kind of information and encouragement parents will need before approving a drug trial [25]. Therefore, the fact that most of the participants in our study recommended that parents continue with the drug recommended by the physician is a positive development in terms of the diagnosis and treatment continuation of ADHD patients in our country.

41.6% of participants believe that medications used to treat ADHD have addictive properties. Since the development of psychostimulants in 1937, many studies, particularly short-term studies involving children have investigated their use in ADHD treatment. These studies have conclusively shown the marked effectiveness of stimulants [26]. An NIMH report examining the long-term effects of stimulants in children with ADHD proves that these drugs' reliability and safety in the short and medium term are well-documented and may be considered the most effective and best-tolerated drugs in pediatric psychopharmacology [27]. However, the use of stimulants in treating ADHD remains controversial, with ongoing public concern, especially when administered to children [26]. Nonetheless, long-acting forms of these drugs are known to possess a low risk of addiction [28]. There are also data indicating the use of psychostumulants in the treatment of cocaine addiction, although definitive results have not been obtained [29]. In our study, 34.5% of pharmacists expressed concern over the serious side effects of ADHD medication. When considering the side effects of drugs used in ADHD treatment, it is noteworthy that the usual symptoms are insomnia, decreased appetite, sedation, dizziness, anxiety, abdominal pain, and headache [30]. The incidence of severe movement disorders, obsessive-compulsive disorder, or psychotic symptoms are rare and will go away upon terminating the medication [31]. The consensus statement on the therapeutic treatment of ADHD by

the National Institutes of Health (2000) concluded that there was insufficient evidence to suggest that stimulant drugs used in therapy cause harm [32]. Also, the 2002 practice parameter set by the American Academy of Child and Adolescent Psychiatry indicated that the side effects of stimulant drugs mentioned for adolescents and children with ADHD are typically uncommon, and depend on drug dosage and timing. Minor side effects were frequently noted, and severe side effects were minimal and brief when reducing or discontinuing the dosage. This presents a critical situation, given the significance of the information provided to patients and their families regarding necessary drug administration. 32.7% of pharmacists marked the 'wrong' answer to the question 'If ADHD patients are not treated, the risk of alcohol and drug addiction increases'. Furthermore, the study revealed that pharmacists with limited professional experience and individuals with ADHD believe that not receiving treatment does not heighten the risk of alcohol and substance dependency. In a study conducted in the USA, pharmacists without psychiatric training or experience in Arizona stated that one of the difficulties of giving psychotropic drugs to patients was lack of knowledge about psychiatric disorders [33]. In our study, this result may have been due to the fact that pharmacists with less professional experience had more lack of knowledge about ADHD than pharmacists with more professional experience. Furthermore It's plausible that pharmacists with more experience have encountered a broader range of patients and therefore recognize the multifaceted challenges associated with untreated ADHD, including the heightened risk of substance abuse The use of medication in ADHD treatment is more efficient and safer in comparison with pharmacological treatments used in the management of numerous other psychiatric, as well as common medical disorders, and proven to be effective [34-36]. The International Consensus Statement from the World ADHD Federation asserts that pharmacological therapy alleviates several negative outcomes typically associated with ADHD, including accidental injuries, traumatic brain damage, drug addiction, smoking, poor academic performance, bone fractures, and sexually transmitted infections.The World ADHD Federation International Consensus Statement highlights that psychostimulant treatment for ADHD does not elevate the risk of substance and alcohol use [37]. Instead, early and intensive stimulant therapy during childhood diminishes the likelihood of developing substance and alcohol use disorders. As per a meta-analysis conducted by Wilens et al., this approach is highly effective [38-39]. It has been reported that the risk of alcohol and substance use is 1.9 times lower in individuals with ADHD who use methylphenidate compared to those who do not receive treatment. However, a thorough analysis of 109 studies has determined that the misuse of prescription stimulants for academic and performance enhancement, which is prevalent amongst university students, poses a significant public health concern [40]. With regards to the inquiry of whether psychological therapy methods ought to be prioritised over medication for treating ADHD, just 24.8% responded correctly. The position of behavioural therapy in the ADHD treatment process is still the subject of ongoing debate. Numerous studies have examined whether behavioural therapy should be the primary form of treatment for all patients, or whether a combination of behavioural therapy and medication is the optimal approach. The results of these studies suggest that while non-pharmacological treatments, such as cognitive behavioural therapy, are effective, they are relatively less effective than drug-based treatments and thus may be more beneficial when combined with pharmacological interventions. Furthermore, it was determined that behavioural therapy may be a viable alternative if the medication is not well tolerated or if the patient declines to use it [37]. A statistically significant relationship was found between pharmacists with less professional experience and their perception of ADHD as a disease that can cause lifelong problems. ADHD is not a static childhood disorder and each child may have a different course throughout life. Some people will experience improvement in childhood or adolescence, while others will continue to experience symptoms and impairments into adulthood. In a meta-analysis studyfound that 40-60% of ADHD symptoms persist into adulthood, with 15% meeting diagnostic criteria [41].This suggests a possible generational shift in the understanding of ADHD, where new professionals may be more in tune with recent advances in ADHD research, emphasizing its persistent nature and the importance of early intervention.

In 2017, a retrospective assessment aimed to examine the impact of a collaborative approach involving pharmacists providing counseling and psychological assistance. The evaluation revealed significant improvements in adherence to clinical monitoring and medication policies. Patients who received services from both pharmacists and psychiatrists demonstrated enhanced adherence to scheduled clinical appointments. The study emphasizes the positive outcomes of the joint approach, underscoring the importance of collaboration between pharmacists and psychiatrists in improving patient care and ensuring compliance with guidelines [42].

5. Conclusion

In our study, the positive outcomes include pharmacists referring families to the physician who

originally prescribed the medication and offering to undergo training on ADHD when providing advice on medication. However, negative consequences are evident in the moderate level of knowledge regarding ADHD among pharmacists and the majority believing that the medication used to treat ADHD has addictive properties Considering the importance of pharmacists' advice to families in the treatment of children and adolescents with ADHD, it may be useful to organize regular training for pharmacists for counseling and monitoring of pharmacological treatment on ADHD. More comprehensive studies are needed in this area.

Limitations of study; although this study is among the rare studies evaluating pharmacists' knowledge, attitudes and beliefs regarding ADHD and its treatment, considering the quantitative nature of the surveys applied and limiting the participants' answers to only selecting survey options, the small number of samples and the low number of questions in the survey are the limitations of our study. In addition, due to the location of the study in the centre of Sivas, it is not feasible to generalise the findings to the whole country. Further research is recommended in other cities throughout the country to provide a more comprehensive understanding of this subject matter. The professional duration of pharmacists was assessed and categorized as either 0-5 years or 6 years and over, as demonstrated in Table 4. It is important to note that one limitation of our study is that we treated this data as categorical rather than numerical, and therefore did not subject it to regression analysis.

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