



# Analysis of Diagnosis Changes in Patients Followed Up by the Child and Adolescent Psychiatry Clinic in a State Hospital

*Bir Devlet Hastanesinin Çocuk ve Genç Psikiyatri Kliniğinde Takipli Hastalarda Tanı Değişimlerinin İncelenmesi*

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## ABSTRACT

**Aim:** It has been reported that many psychiatric disorders seen in childhood persist into adulthood as well. It is known that accurate diagnosis and early intervention can allow children to catch up with their normal development process and prevent other medical or psychiatric diseases in later developmental stages. Our study, through hospital records, aimed to explore the diagnostic changes in the young population during the initial diagnosis and follow-up processes. Considering the limited data about this subject, we aimed to contribute to the literature by exploring children with neurodevelopmental disorders.

**Material and Method:** The diagnosis and diagnosis change rates of the cases included in the study at the first examination and during the follow-up were analyzed using descriptive statistical analysis. Afterward, the cases were divided into two groups with and without neurodevelopmental disorders according to their diagnoses at the first admission. Later on, the chi-square test was used to compare diagnostic change rates. In this study, changes in the primary diagnoses of the patients were taken into account, and the changes in the secondary diagnoses were not considered diagnostic changes.

**Results:** The group of neurodevelopmental disorders was compared with Chi-Square Test in terms of the rates of diagnostic changes. It was found that other disorders' diagnosis change rates were significantly higher than neurodevelopmental disorders.

**Conclusion:** It was suggested that estimating the diagnostic stability and diagnosis change in the child and young population is crucial to determine the course of psychiatric disorders and the appropriate treatment options. In light of our results, neurodevelopmental disorders may be more stable in the follow-up process. Studies are needed to examine diagnostic changes to prevent inappropriate treatment approaches and harmful interventions in children and young people.

**Keywords:** neurodevelopmental disorders; autism; attention deficit disorder with hyperactivity

## ÖZET

**Amaç:** Çocukluk döneminde görülen birçok psikiyatrik bozukluğun erişkinlik döneminde de devam ettiği bildirilmiştir<sup>1</sup>. Erken müdahaleler ve doğru tanının çocuğun normal gelişimini tamamlamasını ve ileride eşlik edebilecek tıbbi ve psikiyatrik hastalıkların önlenmesini sağlayabileceği bilinmektedir<sup>2</sup>. Çalışmamızda çocuk ve genç popülasyonunda, ilk tanı ve takip sürecinde değişimlerin, hasta kayıtları üzerinden araştırılması ve bu konuda kısıtlı çalışma olan alan yazına katkıda bulunulması amaçlanmıştır.

**Materyal ve Metot:** Çalışmaya dahil edilen olguların, ilk başvuruda ve takip sürecinde aldığı tanı ve tanı değişim oranları tanımlayıcı istatistiksel yöntemler kullanılarak incelenmiştir. Sonrasında olgular, ilk başvuruda aldıkları tanılarına göre, nörogelişimsel bozukluk tanısı alanlar ve almayanlar olmak üzere iki gruba ayrılarak, tanı değişim oranlarını karşılaştırabilmek için ki-kare testi kullanılarak karşılaştırılmıştır. Çalışmada hastaların birincil tanılarının değişimleri dikkate alınmış, ikincil tanıların değişimleri tanı değişimi olarak değerlendirilmemiştir.

**Bulgular:** Nörogelişimsel Bozukluklar (NGB); diğer bozuklukların ile tanı değişim oranları açısından Ki Kare Testi ile karşılaştırılmış, diğer bozuklukların nörogelişimsel bozukluklara göre tanı değişim oranlarının anlamlı olarak daha fazla olduğu saptanmıştır.

**Sonuç:** Çocuk ve genç popülasyonunda tanısız stabilite ve değişimin bilinmesinin, bozukların seyri ve bu seyre uygun tedavinin belirlenmesinde önemli olduğu düşünülmektedir. Çocuk ve gençlerde NGB tanılarının ortak özelliği olarak yaşam boyu devam edebilmesi nedeniyle diğer psikiyatrik tanılarına göre, daha stabil seyirli olduğu, uzun süre takip gerektiği görülmektedir<sup>3</sup>. Çocuk ve gençlerde uygun olmayan tedavilerin ve zarar verebilecek müdahalelerin önüne geçmek için, tanısız değişimlerin incelenmesine yönelik çalışmalara ihtiyaç bulunmaktadır.

**Anahtar Kelimeler:** nörogelişimsel bozukluklar; otizm; dikkat eksikliği hiperaktivite bozukluğu

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## Introduction

Psychiatric disorders observed in children and adolescents may cause difficulties in the individual's life and their immediate surroundings in social, emotional, academic, and financial areas<sup>1</sup>. In a meta-analysis to identify the prevalence of psychiatric disorders in children and adolescents, covering data from more than 20 countries, the rate of psychiatric disorders in children and adolescents was 15.8%<sup>2</sup>. It has been reported that many psychiatric disorders in childhood persist in adolescence as well<sup>3</sup>. Another study said that the severity of psychiatric symptoms in early childhood predicts the severity of psychiatric symptoms in later periods<sup>3</sup>. Therefore, the early diagnosis and treatment of child and adolescent psychiatric disorders are particularly important. It has been reported that early interventions and accurate diagnoses can be helpful for the typical development of children and prevent medical and psychiatric conditions which may accompany other symptoms in the future<sup>4</sup>.

In general, Neurodevelopmental Disorders (NDD) are a group of developmental problems that emerge with neurological and psychiatric symptoms that result from various factors during the development of the brain<sup>5</sup>. It is stated that the most common characteristic of these disorders may appear in a wide range, and the diagnosis covers neurological problems, birth anomalies, and behavior problems whose initial symptoms are seen in the early childhood period<sup>6</sup>. In addition, it is reported that psychiatric and other medical problems associated with NDD can cause problems in specific areas, such as learning and communication and affective-cognitive functions or social communication<sup>7</sup>. The most common neurodevelopmental disorders we come across in clinical practice are Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), and Intellectual Disability (ID)<sup>5</sup>.

Attention Deficit Hyperactivity Disorder is a neurodevelopmental disorder with symptoms of carelessness, impulsivity, and hyperactivity that are inconsistent with the developmental level and begin in the early childhood period<sup>5</sup>. Impulsivity, hyperactivity, behavioral and emotional domains are clinical symptoms that may appear commonly with ADHD and many other psychiatric disorders and have clinical similarities, especially with conduct disorder, oppositional defiant disorder, and elimination disorders that should be analyzed carefully<sup>8</sup>. When the literature was reviewed, it was seen that a study determined that at least one

mental disorder at the rate of 73.7% and two or more mental disorders at the rate of 55.6% accompanied children and adolescents diagnosed with ADHD<sup>9</sup>. In the same research, it was reported that the most frequently seen diagnoses are, respectively, oppositional defiant disorder (43.6%), enuresis (21.1%), specific phobia (17.3%), social anxiety disorder (14.3%), and major depression (7.5%)<sup>9</sup>. In addition, it is reported that in the childhood period, MDD can progress differently compared to adults in the form of unrest, temper tantrums, hyperactivity, and attention problems and that anxiety disorders should be considered in the differential diagnosis of ADHD due to their symptoms such as fidgeting and not being able to gather attention<sup>10</sup>. In a study about the clinical course of ADHD, it was reported that in 60% of children and adolescents diagnosed with ADHD, symptoms persist in their adulthood, and 10% of their symptoms get worse<sup>11</sup>. In another study in which subjects diagnosed with ADHD were followed up for four years, it was concluded that 40% of the patients were still diagnosed<sup>12</sup>.

Autism Spectrum Disorder is a neurodevelopmental disorder whose symptoms include inadequate verbal and non-verbal communication, repetitive behaviors, and interests. It is known that most children diagnosed with ASD are followed up with the same diagnosis in the forthcoming years. In a longitudinal study of children diagnosed with ASD, it was reported that only 1.5% of children with ASD had sufficient functionality in their later years<sup>13</sup>. Recent studies have reported that positive results are achieved through early diagnosis and new intervention programs in adaptive functions and the core symptoms of ASD<sup>14-15</sup>. Clinicians should consider cases that may be misdiagnosed as ASD and that in the differential diagnosis are reported as language impairments, ID, reactive attachment disorder, very early-onset schizophrenia, disorders accompanied by sight-hearing impairments, and selective mutism<sup>16</sup>. Thus, it is possible to change the diagnosis due to inadequate initial assessment.

Enuresis is defined as involuntary urinary incontinence, which can emerge due to numerous factors, repeats at least twice a week, and continues for at least three months<sup>5</sup>. In a study done in Türkiye, its frequency was found as 12.4%, decreasing with age<sup>17</sup>. In another study by Biederman et al., it was reported that enuresis and ADHD could be seen together at the rate of 30–45%<sup>18</sup>. Another study done with children diagnosed with enuresis found that they experienced

more attention and behavior problems after age ten compared to their peers and that their anxiety level was much higher<sup>19</sup>.

It is reported in children and adolescent psychiatry clinics that one of the most frequent diagnoses is major depressive disorder (MDD), particularly in adolescents<sup>20</sup>. The prevalence of MDD has increased in recent years, and it can vary between 5 to 15.8% in the adolescence period<sup>21-22</sup>.

Another clinical picture whose prevalence increases in adolescence, like MDD, is early-onset schizophrenia (EOS). It is reported that it can be seen much more in subjects with negative psychotic symptoms and affective blunting<sup>23</sup>. Additionally, many subjects diagnosed with EOS apply to clinics with non-specific prodromal symptoms<sup>24</sup>. It is stated that making an EOS diagnosis is difficult since its symptoms, such as behavior problems, social withdrawal, or unreasonable decrease in school performance, can be misdiagnosed as MDD<sup>25</sup>.

Anxiety disorders (AD) are one of the most commonly seen psychiatric disorders, which generally begin in childhood and adolescence with a prevalence of 8–30%<sup>25</sup>. It has been reported that it can be seen more frequently in children diagnosed with NDD. Furthermore, given that some symptoms seen in ADHD, such as irritability or anger tantrums, can be mistaken for AD in the early period, ADHD should be considered in the differential diagnosis. In studies on AD and MDD, it has been stated that because of the underlying common genetic and psychosocial predisposition, these two psychiatric disorders can persist over time with frequent transformation into each other and that both disorders can be antecedents of each other in adolescence and early adulthood<sup>26-27</sup>.

Child and adolescent psychiatry is very important in finding solutions for public health problems like mental disorders that emerge early in life. However, psychiatric conditions displaying many similar symptoms within the developmental process and emerging other comorbid psychiatric disorders, especially between NDDs, make the diagnostic process challenging. Thus, diagnostic changes and the development of additional comorbid conditions may take place during the follow-up periods. To avoid treatments that are not suitable and interventions that may be damaging for children and adolescents, there is a need for studies that analyze diagnostic changes. When the literature was reviewed, it was seen that there is limited data on changes in

diagnosis in the follow-up periods in the area of child and adolescent psychiatry. Therefore, our study was planned to analyze the initial diagnoses and changes made in the follow-up period in the child and adolescent population through patient records.

## Material and Methods

After the approval of the Ethics Committee of Kars Kafkas University, our study received approval from Kars Harakani State Hospital Chief Physician's Department. The study was conducted by retrospective scanning of electronic patient files containing the records of child and adolescent subjects whose follow-up has been done regularly for at least three years between January 2011 and December 2019.

Through the subjects' files, the subjects' age, gender, average follow-up time, initial diagnosis, comorbid diagnosis, diagnosis, and comorbid diagnosis changes throughout the follow-up period were analyzed. Subjects with insufficient data in the electronic patient files and subjects who have not come regularly for follow-up were excluded from the study. Subjects who had not been diagnosed or for whom follow-up was suggested with pre-diagnosis were also excluded from the study. Only subjects whose diagnosis has been finalized through clinical examination or semi-structured tests have been included in the study. Two evaluators evaluated and recorded the files as a blind review to analyze the data. Subjects whose treatments had been completed and files had been closed with full recovery were excluded from the study.

In the study, the changes in the patients' initial diagnosis were considered, and changes in their secondary diagnosis were not evaluated as diagnosis changes. If the initial diagnoses were not changed, the new diagnoses made were evaluated as comorbidity. The patient's follow-up duration was determined through literature reviews and in line with the average data in the literature.

## Statistical Analysis

The study analyzed the rate of the subjects' diagnoses and diagnoses changes during their first evaluation and the follow-up period using descriptive statistics methods. Afterward, the subjects were separated into two groups, those diagnosed with and without neurodevelopmental disorders, and were compared with the Chi-Square Test to compare their rates of diagnosis change.

The IBM Statistical Package for Social Sciences (SPSS) program version 24 was used for the analysis.

## Results

In this study, the age, initial diagnosis, and changes in diagnosis within the process and comorbid diagnosis of 48 subjects who fulfilled all of the inclusion-exclusion criteria out of 92 subjects and whose follow-up has been done regularly for at least three years in the child psychiatry outpatient clinic were analyzed retrospectively using their recorded files and the age, gender, initial diagnosis, new diagnoses, follow-up duration and diagnosis change duration of the patients were recorded. In our study, it was determined that the average age of the subjects was 14.37 ( $\pm 2.73$ ), the average follow-up duration was 5.83 years ( $\pm 2.20$ ), and 64.6% of the subjects were male (Table 1). When the subjects were analyzed according to their initial diagnosis, it was seen that the highest rate of diagnosis was ADHD (52.1%) and this was followed by Intellectual Disability (10.4%), Specific Learning Disorder (8.4%), and Anxiety Disorders (8.4%) (Table 2). When the subjects were analyzed in terms of diagnosis change during follow-up, it was seen that the initial diagnosis of 22.9% of the subjects changed, changes have been made during follow-up in 12% of the ADHD patients

**Table 1.** Average age and sex rates of the sample

Variable	Average	Standard deviation
Age	14.37	2.73
Average follow-up duration	5.83	2.20
Sex	N	%
Male	31	64.6
Female	17	35.4

**Table 2.** Rates of the initial diagnoses of the subjects in their first examination and follow-up period

Diagnoses	First consultation	
	N	%
ADHD	25	52.1
Growth retardation/mental incompetence	5	10.4
Specific learning disability	4	8.4
Anxiety disorder	4	8.4
Enuresis/encopresis	3	6.3
Autism spectrum disorder	2	4.2
Major depression	2	4.2
Conduct disorder	1	2.1
Schizophrenia	1	2.1
Bipolar disorder	1	2.1
Obsessive compulsive disorder	0	0

\* Diagnosis change or comorbidity did not take place in 52.1% of the subjects.

**Table 3.** Diagnosis change rates according to the initial diagnoses and new diagnoses of the subjects

Initial diagnoses	Change rate*		New diagnoses		
	N	%**		N	%***
ADHD (n=25)	3	12.0	Major depression	2	66.6
Growth retardation/Mental incapacity (n=5)	0	0	Anxiety disorder	1	33.3
Specific learning disability (n=4)	0	0	-	-	-
Anxiety disorder (n=4)	2	50.0	-	-	-
Enuresis/Encopresis (n=3)	3	100	ADHD	1	50
Autism spectrum disorder (n=2)	0	0	Major depression	1	50
Major depression (n=2)	2	100	ADHD	3	100
Conduct disorder (n=1)	1	100	-	-	-
Schizophrenia (n=1)	0	0	Schizophrenia	2	100
Bipolar disorder (n=1)	0	0	ADHD	1	100
Obsessive compulsive disorder (n=0)	0	0	-	-	-
Whole sample	11	22.9	-	-	-

\* Average diagnosis change time: 1.18 years ( $\pm 1.81$ ).

\*\* Shows the rate of change in the subjects' initial diagnoses.

\*\*\* Shows the rate of new diagnoses in subjects whose initial diagnoses were changed.

**Table 4.** Comparison of neurodevelopmental disorders and other disorders in terms of diagnosis change

Initial diagnoses	Diagnosis change		X <sup>2</sup>	p
	Yes	No		
Neurodevelopmental disorders	3	33	17.337	0.000
Other disorders	8	4		
Total	11	37		

\* Chi-Square Test.

(n=3), and that these subjects were diagnosed with MDD (n=2) and AD (n=1) (Table 3). It was found that the patients whose initial diagnoses have been ID, SLD, or ASD have not changed during the follow-up period (Table 3). In addition, Neurodevelopmental Disorders, which include ADHD, ASD, ID, and SLD groups, were compared with the Chi-Square Test in terms of the rates of other disorders and diagnosis change. It was found that other disorders' diagnosis change rates were significantly higher compared to neurodevelopmental disorders ( $p < 0.001$ ) (Table 4).

## Discussion

The diagnostic stability of psychiatric disorders during the follow-up period presents important information in estimating the course and prognosis of a particular disorder. It also provides treatment-based evidence<sup>28</sup>.

Our study aimed to analyze the initial diagnoses and diagnostic changes in the follow-up period of the child and adolescent population over patient records and contribute to the literature in which there is a limited amount of studies in this area.

Attention deficit hyperactivity disorder is one of the most frequent psychiatric disorders seen in the childhood period<sup>29</sup>. When the initial diagnoses of children and adolescents included in our study were analyzed, ADHD was the most frequent clinical diagnosis (52.1%), in line with the literature. It was seen that while 22 (88%) of the 25 patients diagnosed with ADHD continued to be diagnosed with ADHD in their follow-up period, 3 (12%) patients' diagnoses changed. This finding was in line with the fact that ADHD symptoms begin during childhood and that it is a disorder that persists into adolescence (60–80%) and adulthood (40–60%)<sup>30</sup>. In studies that children diagnosed with ADHD were followed long-term, it is reported that the rate of comorbid psychiatric diagnoses increases over time, and there is a risk of experiencing

more problems in social, academic, and work areas<sup>31–32</sup>. In another study in which ADHD patients were followed, it was shown that the group which was regularly followed up and treated experienced fewer social, academic, and work problems in their adulthood<sup>33</sup>. Although ADHD is a disorder that can last throughout life and follow a chronic course, it is considered that long-term follow-up and treatment of the patients are important since one of the most important factors determining the prognosis is an accurate diagnosis, efficient treatment, and follow-up.

It has been stated that although hyperactivity symptoms decrease with age in some patients diagnosed with ADHD, difficulties such as organization problems and difficulty in focusing may be more permanent in future periods, and for this reason, even if the subjects are partially in remission between the ages of 12–20, substance abuse and mood disorders may accompany the clinical picture<sup>34</sup>. Our study found that 2 (8%) subjects diagnosed with ADHD were followed up with MDD diagnosis later on. Although clinical remission can be seen in ADHD symptoms, this finding is important considering the psychosocial burden in ADHD diagnosis may cause MDD in follow-up. In addition, some publications show that depressive symptoms can cause attention problems in children and thus may cause misdiagnosis as ADHD and SLD<sup>35–36</sup>. In light of these findings, it would be crucial to consider that MDD's phenomenology in children may be mistaken for symptoms of attention deficit.

In our study, we found that no diagnosis change in children and adolescents have been initially diagnosed with intellectual disability (n=5), autism spectrum disorder (n=2), and specific learning disorder (n=4) in the follow-up period, which covers a period of an average 5.83 years. In a study on the analysis of children who received ASD in the early period and research on ASD prognosis, it was reported that one of the most important prognostic factors is early diagnosis and intervention<sup>37</sup>. In another study that involved subjects aged 15–25 years with ASD diagnosis, one of the reasons for the late diagnosis of these subjects was that their language and cognitive development were close to the normal level<sup>38</sup>. It was also reported that ASD cases with verbal deficiency are diagnosed at earlier ages<sup>39</sup>. In our study, since verbal and non-verbal communication skills of children diagnosed with ASD were assessed only in clinical evaluations, it was considered that their rate of misdiagnosis might be lower compared to the

literature. A review that involved studies analyzing the reliability of diagnostic criteria concluded that early diagnosis of ASD was reliable, and the diagnostic criteria were useable<sup>40</sup>. In line with the literature, we found that ASD subjects (n=2) diagnosed at an early age continued to be diagnosed with ASD in their follow-up period. There is a need for longitudinal studies with wider samples on the reliability of ASD diagnosis.

Besides being one of the most frequently seen psychiatric disorders in the adolescent period, it is important to know that MDD's symptoms can be mistaken for EOS's symptoms. In EOS, there may be prodromal symptoms such as behavior problems, social withdrawal, decrease in academic performance, which begin insidiously weeks and months before the beginning of positive symptoms<sup>41</sup>. In our study, two subjects were diagnosed with MDD, and it was seen that both were diagnosed as EOS in their follow-up period. Besides the difficulty in making an accurate diagnosis in childhood and adolescence, it is considered that having information about other disorders that may cause similar clinical appearance is important since EOS symptoms are quite heterogeneous. A meta-analysis by Daz et al. found that the length of time without treatment is the most important factor that predicts remission. Due to the importance of the period without any treatment in EOS patients, follow-up of the subjects and their families with repeating visits may play a key role in early diagnosis and treatment.

Epidemiological studies on the diagnostic stability of anxiety disorders present contradictory results. In a study conducted by Cohen et al., which worked with adolescents with anxiety disorder, it was reported that diagnosis stability during a two-year observation period was at the medium level<sup>42</sup>. In another study by Biedel et al., which involved a shorter observation period and a smaller sample group, a similar result was achieved<sup>43</sup>. Four subjects in our study were initially diagnosed with AD; diagnosis change was observed in two in the follow-up period. This finding aligns with previous studies that report that anxiety disorders and depressive symptoms can follow a heterotypical course<sup>44-45</sup>.

Thus, we suppose that anxiety disorders and depressive symptoms may be a precursor to each other. However, it is considered that further studies with wider samples are needed to understand the heterotypical course of AD and MDD.

In epidemiological studies on enuresis, it has been reported that while enuresis is seen in 15% of children

aged 5, 5% of children aged 10, and 1% of children aged 15, spontaneous remission is seen in 15% of children diagnosed with enuresis within one year period<sup>46</sup>. Three of the subjects included in our study were diagnosed with enuresis, and it was seen that they were no longer diagnosed in their follow-up period. This finding is in line with the literature. In addition, it can be seen that all children followed up with enuresis diagnosis are later diagnosed with ADHD. In a study involving children diagnosed with enuresis, it was seen that these children were accompanied by ADHD diagnosis at a rate of 30–45%. Therefore, it is considered that the ADHD diagnosis of children included in our study, who were diagnosed with enuresis, during the follow-up period and after treatment/spontaneous remission, is caused by the high comorbidity rates between these two disorders. In addition, it was seen that it is necessary to analyze children diagnosed with enuresis in detail regarding ADHD comorbidity at the time of initial diagnosis and during their follow-up period.

There are various limitations in our study. Firstly, the sociodemographic and diagnostic information of the patients were obtained retrospectively by scanning their files. Since the data were analyzed retrospectively, the data of all patients could not be reached. Secondly, the cases whose data were obtained were evaluated cross-sectionally, and the average follow-up period was 5.83 years. Therefore, studies need to be conducted in which the diagnosis change rate is observed for a more extended period. Thirdly, the sub-groups of the patients' psychiatric illnesses could not be evaluated since the small sample size and the data were analyzed retrospectively. Fourthly, the sample size was small. Although this is due to applying strict inclusion-exclusion criteria, it may decrease reliability and statistical power. Despite the small sample size, the percentage distribution of the illnesses is close to that of the general population. Additionally, changes in diagnostic criteria between the years the study was carried out, the experience level of the physician who made the evaluation, a medication used during the follow-up period or before the follow-up period, and their effects on the symptoms and not including whether the subjects other psychiatric illnesses or not in the evaluation may be listed as the other limitations. As a result, it is considered that information about diagnostic stability and change in the child and adolescent population is important in identifying the course of the disorders and the treatment suitable for their course. Since NDD diagnoses in children and adolescents follow a more stable course compared to other psychiatric diagnoses, they

can continue throughout life as a common characteristic; it is considered that they need to be followed up for longer periods. It is also believed that in addition to the heterotypical course of AD and MDD, clinicians should keep EOS and MDD's common clinical symptoms in mind during the follow-up period. To prevent unsuitable treatments for children and adolescents and interventions that may cause damage, studies need to analyze diagnostic changes<sup>47</sup>. Advanced follow-up studies with large sample sizes will be important in predicting the transition between illnesses and differentiating diseases with common symptomology in the young population.

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