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Age-related psychopathological profiles in children and adolescents presenting with attention deficit: a transdiagnostic perspective

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ABSTRACT

Aims: This study aimed to investigate age-related differences in psychopathological profiles among children and adolescents presenting with attention deficit complaints, emphasizing a transdiagnostic approach.

Methods: This retrospective study reviewed medical records of patients aged 6-17 years admitted to Kastamonu Training and Research Hospital between June 1, 2023, and January 1, 2025. Exclusion criteria included comorbid neurological disorders, incomplete hospital records, absence of attention deficit complaints, and incomplete psychometric data [the Conners Parent Rating Scale-Revised Short Form (CPRS-R:S) and the child behavior checklist (CBCL)]. The final sample consisted of 500 patients divided equally into two age groups: children (6-12 years, n=250) and adolescents (12-17 years, n=250). Psychiatric diagnoses were determined based on DSM-5 criteria and clinical interviews. Statistical analyses included descriptive statistics, independent samples T tests, Chi-square tests, and effect size calculations (Cohen's d and odds ratio).

Results: Psychiatric diagnoses were significantly more prevalent in the child group (96.8%) compared to the adolescent group (91.2%; χ^2=6.950, p=.008). Attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and specific learning disorders were significantly higher in children (p<.001), whereas anxiety disorders, particularly generalized anxiety disorder (GAD; χ^2=17.266, p<.001) and panic disorder (PD; χ^2=6.397, p=.011), along with depressive disorders (χ^2=30.119, p<.001), were significantly more common in adolescents. CBCL and CPRS-R:S results indicated higher externalizing and attention-related problems in children, while adolescents showed significantly elevated internalizing symptoms (p<.05).

Conclusion: Distinct psychopathological profiles emerged for children and adolescents with attention deficit symptoms. Externalizing disorders predominated in younger children, while internalizing disorders became more frequent in adolescents. These findings underline the necessity of age-specific assessments and interventions to improve diagnostic precision and treatment outcomes.

Keywords: Attention deficit, psychopathology, transdiagnostic approach, internalizing disorders, externalizing disorders

INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder defined by core symptoms in the domains of inattention and impulsivity-hyperactivity, with an estimated prevalence of 5-7%.[1] One of the primary domains assessed in ADHD is inattention, which manifests as a cognitive dysfunction characterized by difficulties in planning, sustaining attention, and avoiding effortful tasks.[2] Categorical diagnostic systems often fail to capture the full spectrum of symptom severity and overlook shared features across disorders. Therefore, several transdiagnostic models have been proposed, such as the research domain criteria (RDoC), the hierarchical taxonomy of psychopathology (HiTOP) and the general psychopathology factor (p factor).[3-5] These frameworks conceptualize inattention not solely as a hallmark of ADHD, but as a broader impairment intersecting with diverse psychopathologies, including depression, anxiety, and conduct disorders.[6]

In neurodevelopmental disorders, which are frequently accompanied by comorbidities, the co-occurrence of inattention, behavioral dysregulation, and internalizing symptoms necessitates a dimensional and transdiagnostic approach to understanding psychopathology. According to the RDoC framework, the difficulties specific to ADHD are primarily situated within the Cognitive Systems domain, encompassing deficits in attention, executive functioning, and cognitive control.[3] These impairments are also functionally associated with the arousal/regulatory systems, reflecting difficulties in maintaining alertness and regulating physiological arousal. Failures in attentional regulation may heighten emotional reactivity, thereby activating the negative valence systems, which underlie emotional states such as frustration, perceived loss, and anxiety. This multidimensional interaction offers a neurodevelopmentally grounded framework to explain how self-regulatory impairments

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contribute to the emergence of both externalizing (e.g., aggression) and internalizing (e.g., anxiety, depression) symptoms.

Within the HiTOP model, ADHD is primarily positioned under the externalizing spectrum, specifically within the disinhibited externalizing subfactor, which encompasses traits like impulsivity, hyperactivity, and deficits in behavioral control.[4] However, high comorbidity rates between ADHD and internalizing disorders (e.g., generalized anxiety disorder, major depression) suggest meaningful cross-loading onto the internalizing spectrum as well. This dual alignment supports the view that ADHD reflects not merely a discrete disorder, but rather a transdiagnostic vulnerability extending across higher-order dimensions of psychopathology.

Given that transdiagnostic symptoms-such as inattention-are shared across multiple psychiatric disorders, an expanded perspective is necessary for diagnosis and intervention.[7-9] From a developmental standpoint, systematic evaluation of transdiagnostic risk factors at individual (e.g., temperament), familial (e.g., parental psychopathology), and environmental (e.g., peer relationships) levels is particularly important in children and adolescents, where symptoms often overlap and full clinical syndromes may not yet be consolidated.[10] Moreover, it has been emphasized that variables frequently overlooked in the current DSM-such as age, sex, and developmental stage-should be more thoroughly integrated into child and adolescent psychiatric assessment.[8]

The symptom domains accompanying attention deficit complaints have been shown to differ by developmental stage: childhood is typically marked by cognitive delays, behavioral dysregulation, and hyperactivity, whereas adolescence is more often associated with difficulties in mood regulation, including anxiety and depressive symptoms.[3,11] Notably, these developmental symptom patterns are evident not only behaviorally but also neurobiologically. A large-scale longitudinal neuroimaging study demonstrated that both internalizing and externalizing symptoms observed in childhood are associated with decreased fractional anisotropy in white matter and reduced development of subcortical gray matter structures.[12] These findings highlight the reciprocal relationship between brain development and psychopathological symptoms, emphasizing the importance of tracking these interactions across developmental periods.

This study aims to investigate differences in the psychopathological profiles of children (aged 6-12) and adolescents (aged 12-17) who present to child psychiatry outpatient clinics with attention-related complaints. It is hypothesized that learning difficulties and externalizing behavioral problems will be more pronounced in younger children, while internalizing symptoms, including anxiety and depression, will be more frequently observed in adolescents. By revealing the transdiagnostic nature of attention deficits, this study aims to provide age-specific psychopathological patterns and clinically relevant implications. The findings are expected to contribute meaningfully to diagnostic and intervention processes and guide the development of more tailored treatment approaches for individuals at different stages of development.

METHODS

Participants

Ethical approval for the study was obtained from the Kastamonu University Clinical Researches Ethics Committee (Approval Date: 10.12.2024, Decision No: 2024-KAEK-122). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. In this study, medical records of patients presenting to Kastamonu Training and Research Hospital between June 1, 2023, and January 1, 2025, were retrospectively reviewed, yielding a total of 5,124 cases. The study included patients who presented to the child psychiatry outpatient clinic for the first time with complaints of attention difficulties, as reported either by the parents or the child/adolescent. Attention deficit was the primary reason for referral and guided the subsequent clinical evaluation conducted by a child and adolescent psychiatrist. To ensure diagnostic consistency and minimize the influence of prior interventions, individuals with a history of previous psychiatric diagnoses or follow-up visits were excluded. Exclusion criteria included the presence of comorbid neurological disorders and incomplete hospital records. Additionally, patients who did not present with attention deficit complaints (n=3,816), patients outside the age range of 6-17 years (n=582), and patients lacking data from the Conners Parent Rating Scale-Revised Short Form (CPRS-R:S) and the child behavior checklist (CBCL) completed by parents (n=226) were excluded from the study. After applying these exclusion criteria, the final sample consisted of 500 patients aged between 6 and 17 years (**Figure 1**).

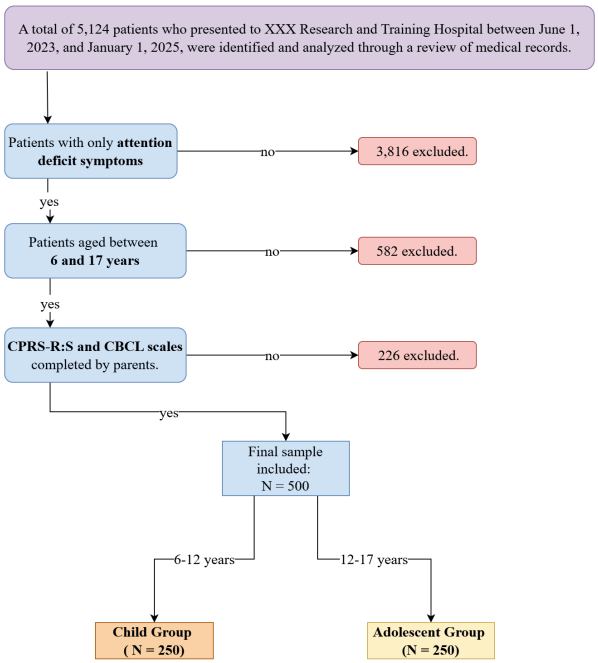

Figure 1. Participant flow diagram for child and adolescent groups

CPRS-R:S: Conners Parent Rating Scale-Revised Short Form, CBCL: Child behavior checklist

Clinical and Psychometric Measures

Psychiatric diagnoses and comorbid conditions were determined based on DSM-5 criteria by a trained child and adolescent psychiatrist, through clinical interviews and psychiatric evaluations conducted with both the child and the parent. Symptom assessments were primarily based on standardized parent-report rating scales, such as the CPRS-R:S and the CBCL, which were completed by the parents. Additionally, developmental and intelligence test results were used when necessary to support the diagnostic process. To assess participants' ADHD symptoms and cognitive, emotional, and behavioral issues, the CBCL and CPRS-R:S were employed. The CBCL is a 118-item scale evaluating

emotional and behavioral problems experienced by children over the past six months.[13] It includes internalizing and externalizing problem subscales. Internalizing problems encompass social withdrawal, somatic complaints, and anxiety/depression subscales, while externalizing problems include delinquent behavior and aggression subscales. Social problems, thought problems, and attention problems subscales are not categorized into either group. Scores from these subscales yield a total problem score, reflecting the general level of issues. The CPRS-R:S, developed specifically to assess ADHD symptoms, consists of 27 items covering subscales such as oppositional behavior, cognitive problems/inattention, hyperactivity, and an ADHD Index.[14] The Turkish validity and reliability study of CPRS-R:S was conducted by Kaner et al.[15] in 2013.

Statistical Analysis

All data analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version [26.0]. Descriptive statistics were calculated for demographic and clinical characteristics. Categorical variables were presented as frequencies and percentages, and continuous variables were expressed as means with standard deviations. Normality was assessed using the Kolmogorov-Smirnov test, which indicated that the continuous variables followed a normal distribution. Given the large sample size, group comparisons between children and adolescents were conducted using independent samples T tests. For continuous variables with statistically significant differences, effect sizes were calculated using Cohen's D (small effect=0.2, medium=0.5, large ≥0.8). For categorical variables, statistically significant differences were quantified using odds ratios to represent the strength of association. These effect size measures provided a more comprehensive interpretation of group differences. Categorical variables were compared using the Chi-square test or Fisher's exact test, as appropriate. A p-value of <.05 was considered statistically significant throughout all analyses.

RESULTS

The demographic and clinical characteristics of the child group (6-12 years, n=250) and the adolescent group (12-17 years, n=250) were compared (**Table 1**). Gender distribution was similar between groups, with females making up 42.8% in the child group and 46.0% in the adolescent group, and males comprising 57.2% and 54.0%, respectively (χ^2=0.519, p=.471). The prevalence of known medical conditions was slightly higher in the child group (8.4%) than in the adolescent group (6.8%), though the difference was not significant (χ^2=0.456, p=.500). Mothers of adolescents had a significantly higher age than those of children (t=-12.923, p<.001). However, maternal education levels were similar across both groups (t=-1.250, p=.212). The prevalence of psychiatric illness in mothers was also comparable between the two groups (child: 18.4%, adolescent: 16.8%, χ^2=0.221, p=.639). Fathers in the adolescent group were significantly older than those in the child group (t=-12.713, p<.001). Paternal education levels were similar (t=0.508, p=.612), and the prevalence of psychiatric illness in fathers showed no significant difference, though it approached significance (child: 11.2%, adolescent: 6.4%, χ^2=3.589, p=.058).

Behavioral and attentional metrics were evaluated using the CBCL and CPRS-R:S (**Table 2**). Total CBCL scores were nearly identical for both groups (t=0.02, p=.985). However, adolescents had significantly higher anxiety and depression scores than children (t=-2.39, p=.017). Social withdrawal, depression, and somatic complaints were also significantly higher in adolescents (p<.001). Children exhibited higher levels of aggressive behaviors than adolescents (t=3.38, p=.001) and had more attention problems (t=3.04, p=.002). Externalizing problems were also more pronounced in children compared to adolescents (t=3.39, p=.001). In contrast, internalizing problems were higher in adolescents than in children (t=-2.08, p=.038). No significant differences were found for rule-breaking behavior or social problems. However, thought problems were significantly higher in adolescents than in children (t=-3.01, p=.003). On the Oppositional Behavior subscale of CPRS-R:S, no significant difference was observed (t=0.87, p=.385). Children scored higher on the Cognitive Problems/Inattention subscale than adolescents (t=2.64, p=.009), and also on the Hyperactivity subscale (t=2.16, p=.032). Finally, ADHD Index scores were significantly higher in children than in adolescents (t=2.04, p=.042).

The comparison of psychiatric diagnoses between the child (6-12 years) and adolescent (12-17 years) groups revealed significant differences across various categories (**Table 3**). Overall, psychiatric diagnoses were more prevalent in the child group (96.8%) than in the adolescent group (91.2%), a statistically significant difference (χ^2=6.950, p=.008). ADHD was significantly more common in children (65.2%) than in adolescents (33.2%; χ^2=51.213, p<.001). Similarly, oppositional

Table 1. Demographic and clinical characteristics between child and adolescent groups

			Statistics*	
	Child group (n=250)	Adolescent group (n=250)	t or χ^2	Sig.
Age (years), mean (SD)	8.48 (1.48)	13.48 (1.48)	-37.829	<.001
Gender, n (%)				
Female	107 (42.8%)	115 (46.0%)	.519	.471
Male	143 (57.2)	135 (54.0%)		
Grade, mean (SD)	2.68 (1.56)	7.73 (1.60)	-35.774	<.001
Medical condition, n (%)	21 (8.4%)	17 (6.8%)	.456	.500
Mother's age, mean (SD)	36.27 (5.14)	42.30 (5.29)	-12.923	<.001
Mother's education (years), mean (SD)	9.60 (4.59)	10.11 (4.50)	-1.250	.212
Mother with psychiatric illness, n (%)	46 (18.4%)	42 (16.8%)	.221	.639
Father's age, mean (SD)	39.40 (5.61)	45.63 (5.34)	-12.713	<.001
Father's education (years), mean (SD)	10.52 (4.07)	10.34 (4.04)	.508	.612
Father with psychiatric illness, n (%)	28 (11.2%)	16 (6.4%)	3.589	.058

SD: Standard deviation, *Continuous variables were analyzed using the Mann-Whitney U test, and categorical variables were analyzed using Pearson's Chi-square test

Table 2. Comparison of CBCL and CPRS-R:S subscales scores between child and adolescent groups

	Child group (n=250) mean (SD)	Adolescent group (n=250) mean (SD)	t*	p	Cohen d
CBCL total	76.78 35.61	76.72 40.08	.02	.985	-
Anxiety/depression	5.94 4.35	7.00 5.46	-2.39	.017	.215
Social withdrawal /depression	2.38 2.46	3.26 2.45	-4.01	< .001	.358
Somatic complaints	2.46 2.72	3.93 3.87	-4.92	< .001	.439
Rule-breaking behavior	4.80 3.73	4.94 4.08	-.41	.681	-
Aggressive behaviors	13.80 7.11	11.54 7.88	3.38	.001	.301
Social problems	6.29 3.78	6.45 3.99	-.46	.646	-
Thought problems	3.50 3.50	4.50 3.95	-3.01	.003	.268
Attention problems	7.43 3.34	6.49 3.59	3.04	.002	.271
Externalizing problems	19.41 9.63	16.30 10.82	3.39	.001	.304
Internalizing problems	10.78 8.04	12.32 8.48	-2.08	.038	.186
CPRS-R:S					
Oppositional behavior	10.05 5.68	9.60 5.74	.87	.385	-
Cognitive problems/inattention	12.00 5.62	10.60 6.23	2.64	.009	.236
Hyperactivity	8.82 5.82	7.73 5.46	2.16	.032	.193
ADHD Index	23.09 10.10	21.16 11.06	2.04	.042	.182

*Independent samples T tests were used, CBCL: Child behavior checklist, CPRS-R:S: Conners Parent Rating Scale-Revised Short Form, SD: Standard deviation, ADHD: Attention deficit hyperactivity disorder

Table 3. Comparison of psychiatric diagnoses between child and adolescent groups

			Statistics*		
	Child group (n=250)	Adolescent group (n=250)	χ^2	Sig.	Odds ratio
Psychiatric diagnoses	242 (96.8%)	228 (91.2%)	6.950	.008	2.919[a]
Attention deficit hyperactivity disorder	163 (65.2%)	83 (33.2%)	51.213	<.001	3.770[a]
Oppositional defiant disorder	52 (20.8%)	23 (9.2%)	13.192	<.001	2.592[a]
Conduct disorder	7 (2.8%)	14 (5.6%)	2.436	.119	-
Specific learning disorders	50 (20%)	20 (8%)	14.950	<.001	2.875[a]
Tic disorders	7 (2.8%)	9 (3.6%)	.258	.611	-
Enuresis nocturna	22 (8.8%)	5 (2.0%)	11.315	.001	4.728[a]
Speech sound disorder	8 (3.2%)	2 (.8%)	3.674	.056	-
Speech fluency disorder	15 (6.0%)	4 (1.6%)	6.620	.010	3.926[a]
Depressive disorders	30 (12.0%)	81 (32.4%)	30.119	<.001	3.515[b]
Anxiety disorders	61 (24.4%)	95 (38.0%)	10.771	<.001	1.899[b]
Separation anxiety disorder	26 (10.4%)	10 (4.0%)	7.663	.006	2.786[a]
Social anxiety disorder	23 (9.2%)	36 (14.4%)	3.248	.072	-
Performance anxiety	6 (2.4%)	16 (6.4%)	4.755	.029	2.781[b]
Generalized anxiety disorder	3 (1.2%)	24 (9.6%)	17.266	<.001	8.743[b]
Panic disorder	2 (.8%)	11 (4.4%)	6.397	.011	5.707[b]
Specific phobia	9 (3.6%)	10 (4.0%)	.055	.815	-
Obsessive compulsive disorder	17 (6.8%)	19 (7.6%)	.120	.729	-
Skin-picking disorder	-	2 (.8%)	-	.499	-
Dissociative disorders	1 (.4%)	11 (4.4%)	8.538	.003	11.460[b]
Somatic symptom disorder	5 (2.0%)	9 (3.6%)	1.176	.278	-
Illness anxiety disorder	3 (1.2%)	8 (3.2%)	2.324	.127	-
Functional neurological symptom disorder	6 (2.4%)	15 (6.0%)	4.026	.045	2.596[b]
Eating disorders	-	4 (1.6%)	-	.124	-
Sleep disorders	2 (.8%)	3 (1.2%)	.202	.653	-
Substance use disorders	-	2 (.8%)	-	.499	-

*Pearson Chi-square test or Fisher's exact test was used for statistical analyses. Odds ratios marked with (a) indicate higher odds in the child group compared to the adolescent group, while those marked with (b) indicate higher odds in the adolescent group compared to the child group

defiant disorder (ODD, 20.8% vs. 9.2%; χ^2=13.192, p<.001) and specific learning disorders (SLD, 20% vs. 8%; χ^2=14.950, p<.001) were more prevalent in children. Conversely, some disorders were more common among adolescents. Depressive disorders (DD) were significantly higher in the adolescent group (32.4%) compared to the child group (12%; χ^2=30.119, p<.001). Anxiety disorders (AD) were also more prevalent in adolescents (38%) than in children (24.4%; χ^2=10.771, p<.001), with specific conditions such as generalized anxiety disorder (GAD, 9.6% vs. 1.2%; χ^2=17.266, p<.001) and panic disorder (PD, 4.4% vs. 0.8%; χ^2=6.397, p=.011) being significantly more frequent. Additional findings included a higher prevalence of enuresis nocturna in the child group (EN, 8.8% vs. 2%; χ^2=11.315, p=.001) and dissociative disorders in the adolescent group (DisD, 4.4% vs. 0.4%; χ^2=8.538, p=.003). Speech fluency disorders were more common in children (SfD, 6% vs. 1.6%; χ^2=6.620, p=.010), while functional neurological symptom disorder was more frequent in adolescents (FND, 6% vs. 2.4%; χ^2=4.026, p=.045). No statistically significant differences were observed for conduct disorder (CD), tic disorders (Tic D.), or obsessive-compulsive disorder (OCD).

Figure 2 illustrates distinct patterns in the distribution and comorbidities of psychiatric diagnoses across the child and adolescent groups, emphasizing developmental differences in diagnostic prevalence. On the left side of the figure, neurodevelopmental disorders dominate in the child group, with ADHD as the central diagnosis. Among the 163 children diagnosed with ADHD, strong associations were noted with ODD (34 cases) and CD (4 cases), reflecting a focus on externalizing behaviors. ADHD was also linked to SLD (43 cases) and speech sound disorders (SsD, 5 cases), highlighting developmental challenges in communication, learning, and behavior. In contrast, the right side of the figure shows a more diverse diagnostic profile for adolescents. While ADHD (83 individuals) remains a key diagnosis, its associations with behavioral disorders, such as ODD (23 cases) and CD (4 cases), are less pronounced. Instead, internalizing disorders like AD and DD are more prevalent, reflecting the increasing importance of emotional and psychological concerns in adolescence. AD form significant clusters, including subtypes such as GAD (24 individuals), PD (16 individuals), and social anxiety disorder (SoAD, 36 individuals). DD (81 individuals) are a dominant cluster in adolescents, strongly associated with both AD and other comorbid conditions like FND (15 individuals). These patterns indicate a developmental shift from predominantly externalizing behaviors in childhood to increased internalizing disorders and emotional dysregulation during adolescence.

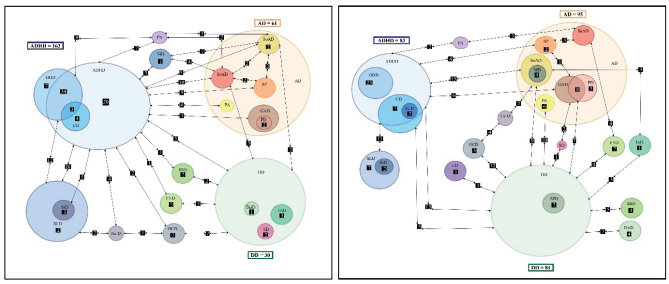

Figure 2. Distribution and comorbidity of psychiatric diagnoses in the child (left) and adolescent (right) group

AD: Anxiety disorders, GAD: Generalized anxiety disorder, PA: Performance anxiety, PD: Panic disorder, SeAD: Separation anxiety disorder, SoAD: Social anxiety disorder, SP: Specific phobia, ADHD: Attention-deficit hyperactivity disorder, CD: Conduct disorder, DisD: Dissociative disorder, ED: Eating disorder, EN: Enuresis nocturna, FND: Functional neurological disorder, IAD: Illness anxiety disorder, OCD: Obsessive compulsive disorder, ODD: Oppositional defiant disorder, SD: Sleep disorder, SLD: Specific learning disorder, SfD: Speech fluency disorder, SPD: Skin picking disorder, SSD: Somatic symptom disorder, SsD: Speech sound disorder, SUD: Substance use disorder

While both groups show interconnected psychiatric diagnoses, the focus shifts from neurodevelopmental disorders and externalizing behaviors in children to internalizing disorders and complex comorbidities in adolescents. In the left side of Figure 2, AD form a smaller cluster with limited representation. In contrast, the right side of Figure 2 highlights a stronger presence of AD in adolescents, with close links to ADHD and DD. Similarly, DD, which are minimally represented in children, become a central feature in adolescents, reflecting a developmental progression in symptomatology. Smaller clusters, such as tic disorders, SfD, and speech sound disorders (SsD), appear in both groups but with differing prevalence and significance. These conditions are less frequent and show fewer associations in children but become more integrated into the network of comorbidities in adolescents, suggesting either increased diagnostic complexity or improved recognition with age. The comparison underscores key developmental trends: the left side emphasizes the dominance of neurodevelopmental disorders and externalizing behaviors in childhood, while the right side demonstrates a shift toward internalizing disorders and more extensive comorbidities in adolescence.

DISCUSSION

The findings of this study demonstrate that psychopathological profiles among children and adolescents presenting with attention-related complaints differ systematically by age and undergo developmental restructuring. Psychiatric diagnoses were more prevalent in the child group (96.8%) than in the adolescent group (91.2%). Öner and Öncü[16] reported that 83.7% of cases with attention complaints received a diagnosis, while Fettahoğlu and Özatalay[17] found that 78.9% of those with hyperactivity and/or attention complaints were diagnosed. Compared to these earlier studies, the higher rates observed in our sample may be attributable to changes in diagnostic criteria in DSM-5, the greater severity of presenting symptoms, or socioeconomic differences across samples.

Diagnostic distribution varied significantly between age groups. In line with our hypothesis, ADHD was the most common diagnosis in the child group (65.2%), followed by oppositional defiant disorder (20.8%) and specific learning disorder (20%). In contrast, anxiety disorders were most prevalent in adolescents (38%), with generalized anxiety disorder (9.6%) and panic disorder (4.4%) showing significantly higher rates in this group (Table 2). The increased likelihood of adolescents with attentional complaints receiving diagnoses such as GAD and panic disorder aligns with developmental psychopathology literature, which suggests that anxiety disorders often peak during adolescence.[18] Within the RDoC framework, the Negative Valence Systems domain encompasses neural circuits involved in processing threat, loss, and potential punishment. During anxiety states, attention systems often become hypervigilant toward threat-related stimuli-a phenomenon known as "threat-related attentional bias".[7] This suggests that disruptions in attentional networks interact with negative valence systems, potentially contributing to the emergence of anxiety-related psychopathology during adolescence.

In this age group, ADHD remained the second most common diagnosis (33.2%), followed by depressive disorders (32.4%). As hypothesized, both anxiety (38%) and depressive disorders (32.4%) were more prevalent in adolescents than in children.

Öner et al.[16] reported that among adolescents with attention complaints, 25.6% had ADHD, 27.9% had a depressive disorder, 9.3% had an anxiety disorder, 7.0% had both anxiety and depression, and 11.7% were diagnosed with both ADHD and depression. The higher rates observed in our study may be explained by the use of DSM-5 criteria, the inclusion of comorbidities, and the broader age range represented in the sample.

The predominance of externalizing disorders (e.g., ADHD, ODD) in the child group corresponds with the disinhibited externalizing factor described in the HiTOP model, while the increase in internalizing symptoms (e.g., anxiety, depression) among adolescents supports the view that ADHD represents a transdiagnostic vulnerability extending into the internalizing spectrum. Furthermore, the pervasive presence of attentional deficits across both age groups suggests a developmental continuity in dysfunctions related to the cognitive systems and arousal/regulatory systems, as described by the RDoC framework.

Males were overrepresented in both age groups, consistent with earlier studies reporting male rates between 51.7% and 60.8%. In our sample, 57.2% of children and 54.0% of adolescents were male. Neurodevelopmental difficulties and externalizing behaviors are more frequently observed in boys, which may lead to greater clinical recognition.[19] In contrast, girls may require higher genetic loading or be less influenced by early environmental stressors due to hormonal, psychosocial, and experiential factors. This phenomenon is referred to in the literature as the "female protective effect".[22] Among genetically predisposed girls, increasing environmental stress during adolescence may trigger clinical manifestations, thereby reducing sex differences in psychopathology during this developmental period.

According to CBCL findings, aggressive behavior, attention problems, and externalizing symptoms were more prominent in the child group. On the CPRS-R:S, the child group scored significantly higher on cognitive problems/inattention, hyperactivity, and the ADHD Index. In contrast, adolescents exhibited higher levels of internalizing problems such as social withdrawal, anxiety/depression, and somatic complaints (Table 3). These findings align with symptom clusters described in the HiTOP model and functional correlates outlined in the RDoC framework. According to RDoC, attentional deficits fall under "cognitive systems," depressive and anxious symptoms under "negative valence systems," and aggression and behavioral dysregulation under "arousal/regulatory systems." The HiTOP model, on the other hand, organizes symptoms dimensionally along internalizing and externalizing spectra. Our results-elevated internalizing symptoms in adolescents and more prominent externalizing symptoms in children-mirror these frameworks. The developmental shift from externalizing to internalizing symptomatology, including the decline of hyperactivity and the persistence or intensification of inattention and emotional problems, is consistent with longitudinal patterns reported in twin and population-based studies.[13,24]

A latent class analysis demonstrated that with age, the hyperactivity/impulsivity subtype declines while the inattention subtype remains stable. Twin studies by Larsson et al.[25] found that hyperactivity symptoms decrease over time, whereas inattention may become more pronounced due to environmental interactions. A GWAS conducted in Denmark identified four genetic loci associated with childhood-onset ADHD, while late-onset ADHD cases showed lower polygenic risk scores and greater genetic overlap with depression.[26] While in early childhood attention deficits are typically linked with hyperactivity and externalizing behaviors, adolescence is marked by a shift toward internalizing symptoms and emotional dysregulation. This developmental transition highlights the necessity of adopting a dimensional approach to symptom evaluation and tailoring interventions accordingly. Therefore, age-specific assessment and treatment strategies are crucial in individuals presenting with attention complaints.

Limitations

Despite the study's clinical utility, several limitations must be acknowledged. The sample was drawn from a single center, potentially limiting generalizability. In addition, due to the retrospective nature of the data, some clinical variables could not be adequately controlled. Another limitation was the absence of objective cognitive performance measures such as continuous performance tests (CPT), which may have introduced subjective bias, particularly in adolescents whose attentional complaints may be influenced by emotional factors. Future research incorporating such objective tools may enhance the validity of attention assessments.

CONCLUSION

As a result, this study reveals developmentally meaningful differences in the psychopathological profiles of children and adolescents presenting with attentional complaints. Interpreting these findings through transdiagnostic frameworks such as RDoC and HiTOP may not only refine diagnostic processes but also inform age-, sex-, and developmentally sensitive intervention strategies. The systematic identification of age-specific symptom patterns provides a scientific basis for future personalized treatment approaches.

ETHICAL DECLARATIONS

Ethics Committee Approval

This study was approved by the Kastamonu University Clinical Researches Ethics Committee (Approval Date: 10.12.2024, Decision No: 2024-KAEK-122).

Informed Consent

As this was a retrospective study, formal written informed consent was not required and was therefore not obtained.

Peer Review Process

This manuscript was subject to external peer review.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

Financial Disclosure

The authors received no financial support for the conduct or publication of this research.

Author Contributions

All authors contributed significantly to the study's conception, design, data acquisition, analysis, and interpretation. All

authors reviewed and approved the final version of the manuscript.

Data Availability

The datasets analyzed during the current study are available from the corresponding author upon reasonable request.

REFERENCES

1. Faraone SV, Asherson P, Banaschewski T, et al. Attention-deficit/hyperactivity disorder. *Nat Rev Dis Primers*. 2015;1:15020. doi:10.1038/nrdp.2015.20
2. Barkley RA. Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychol Bull*. 1997;121(1):65-94. doi:10.1037/0033-2909.121.1.65
3. Insel T, Cuthbert B, Garvey M, et al. Research domain criteria (RDoC): toward a new classification framework for research on mental disorders. *Am J Psychiatry*. 2010;167(7):748-751. doi:10.1176/appi.ajp.2010.09091379
4. Kotov R, Waszczuk MA, Krueger RF, et al. The hierarchical taxonomy of psychopathology (HiTOP): a dimensional alternative to traditional nosologies. *J Abnorm Psychol*. 2017;126(4):454-477. doi:10.1037/abn0000258
5. Caspi A, Houts RM, Belsky DW, et al. The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clin Psychol Sci*. 2014;2(2):119-137. doi:10.1177/2167702613497473
6. Rodriguez-Seijas C, Eaton NR, Krueger RF. How transdiagnostic factors of personality and psychopathology can inform clinical assessment and intervention. *J Pers Assess*. 2015;97(5):425-435. doi:10.1080/00223891.2015.1055752
7. Torous J, Onnela JP, Keshavan M. New dimensions and new tools to realize the potential of RDoC: digital phenotyping via smartphones and connected devices. *Transl Psychiatry*. 2017;7(3):e1053. doi:10.1038/tp.2017.25
8. Hudziak JJ, Achenbach TM, Althoff RR, Pine DS. A dimensional approach to developmental psychopathology. *Int J Methods Psychiatr Res*. 2007;16(Suppl 1):S16-S23. doi:10.1002/mpr.217
9. Krueger RF, Bezdjian S. Enhancing research and treatment of mental disorders with dimensional concepts: toward DSM-V and ICD-11. *World Psychiatry*. 2009;8(1):3-6. doi:10.1002/j.2051-5545.2009.tb00197.x
10. Racer KH, Dishion TJ. Disordered attention: implications for understanding and treating internalizing and externalizing disorders in childhood. *Cogn Behav Pract*. 2012;19(1):31-40. doi:10.1016/j.cbpra.2010.06.005
11. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 2013.
12. Muetzel RL, Blanken LME, van der Ende J, et al. Tracking brain development and dimensional psychiatric symptoms in children: a longitudinal population-based neuroimaging study. *Am J Psychiatry*. 2018;175(1):54-62. doi:10.1176/appi.ajp.2017.16070813
13. Achenbach TM. Manual for the Child Behavior Checklist/4-18 and 1991 profile. Burlington, VT: University of Vermont, Department of Psychiatry.
14. Conners CK. Conners Rating Scales-Revised. Multi-Health Systems; 1997.
15. Kaner S, Buyukozturk S, Iseri E. Conners Parent Rating Scale-Revised Short: Turkish standardization study. *Arch Neuropsychiatry*. 2013;50(2):100-110.
16. Öner Ö, Öncü B, Sağduyu G, Canat S. Dikkatsizlik yakınmasıyla başvuran ergenlerin aldıkları tanılar. *Turk J Child Adolesc Ment Health*. 2002;9(3):167-171.
17. Fettahoğlu Ç, Özatalay E. Çocuklarda hareketlilik ve/veya dikkatsizlik yakınmaları ve dikkat eksikliği hiperaktivite bozukluğu tanısı. *Turk J Child Adolesc Ment Health*. 2006;13(1):13-18.
18. Martel MM, Levinson CA, Langer JK, Nigg JT. A network analysis of developmental change in ADHD symptom structure from preschool to adulthood. *J Abnorm Child Psychol*. 2016;44(4):721-734. doi:10.1007/s10802-015-0064-4
19. Zahn-Waxler C, Shirtcliff EA, Marceau K. Disorders of childhood and adolescence: gender and psychopathology. *Annu Rev Clin Psychol*. 2008;4:275-303. doi:10.1146/annurev.clinpsy.3.022806.091358
20. Harpaz-Rotem I, Rosenheck RA. Changes in outpatient psychiatric diagnosis in privately insured children and adolescents from 1995 to 2000. *Child Psychiatry Hum Dev*. 2004;34(4):329-340. doi:10.1023/B:CHUD.0000020683.08514.2d
21. Ercan ES, Polanczyk G, Akyol Ardıc U, et al. The prevalence of childhood psychopathology in Turkey: a cross-sectional multicenter nationwide study (EPICPAT-T). *Nord J Psychiatry*. 2019;73(2):132-140. doi:10.1080/08039488.2019.1574892
22. Hinshaw SP. Attention deficit hyperactivity disorder (ADHD): controversy, developmental mechanisms, and multiple levels of analysis. *Annu Rev Clin Psychol*. 2018;14:291-316. doi:10.1146/annurev-clinpsy-050817-084917
23. Merikangas KR, He JP, Burstein M, et al. Lifetime prevalence of mental disorders in U.S. adolescents: results from the national comorbidity survey replication-adolescent supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry*. 2010;49(10):980-989. doi:10.1016/j.jaac.2010.05.017
24. Martel MM, Levinson CA, Langer JK, Nigg JT. A network analysis of developmental change in ADHD symptom structure from preschool to adulthood. *Clin Psychol Sci*. 2016;4(6):988-1001. doi:10.1177/2167702615618664
25. Larsson H, Anckarsater H, Råstam M, Chang Z, Lichtenstein P. Childhood attention-deficit hyperactivity disorder as an extreme of a continuous trait: a quantitative genetic study of 8,500 twin pairs. *J Child Psychol Psychiatry*. 2012;53(1):73-80. doi:10.1111/j.1469-7610.2011.02467.x
26. Rajagopal VM, Duan J, Vilar-Ribó L, et al. Differences in the genetic architecture of common and rare variants in childhood, persistent and late-diagnosed attention-deficit hyperactivity disorder. *Nat Genet*. 2022;54(8):1117-1124. doi:10.1038/s41588-022-01143-7