ORIGINAL ARTICLE / ÖZGÜN ARAŞTIRMA

DOI: 10.4274/tjcamh.galenos.2024.57442

Turk J Child Adolesc Ment Health 2025;32(2):110-8

Investigation of the Association Between Internalized Stigma and Functional Impairment in Children with Attention-Deficit/Hyperactivity Disorder

Dikkat Eksikliği/Hiperaktivite Bozukluğu Olan Çocuklarda İçselleştirilmiş Damgalanma ile İşlevsel Bozukluk Arasındaki İlişkinin İncelenmesi

Ali Çakır[1], Uğur Takım[2]

[1]University of Health Sciences Türkiye, Erzurum City Hospital, Clinic of Child and Adolescent Mental Health and Diseases, Erzurum, Türkiye
[2]University of Health Sciences Türkiye, Erzurum City Hospital, Clinic of Mental Health and Diseases, Erzurum, Türkiye

ABSTRACT

Objectives: This study aimed to investigate the impact of internalized stigma on functional impairment in children diagnosed with attention-deficit/hyperactivity disorder (ADHD). Additionally, it explored the influence of comorbid conditions, specifically anxiety and depression, on the severity of stigma and functional difficulties experienced by these children.

Materials and Methods: The study sample comprised 75 children with ADHD aged 6-17 years who had been under clinical observation for at least six months. Data were collected using the Weiss Functional Impairment Rating Scale-Parent Form (WFIRS-P), Conners Parent Rating Scale-Revised Short Form, Internalized Stigma of Mental Illness (ISMI) scale, and Revised Child Anxiety and Depression Scale-Child Form. Pearson's correlation analysis was employed to examine the relationships among the variables.

Results: No significant direct correlation was found between internalized stigma and overall functional impairment in children with ADHD. However, those with comorbid anxiety and depression exhibited significantly higher levels of internalized stigma and greater functional difficulties. Notably, the ISMI subscale "alienation" was positively correlated with generalized anxiety disorder ($r=0.385$, $p<0.01$), social phobia ($r= 0.506$, $p<0.01$), and total depression scores ($r=0.477$, $p<0.01$). The "stereotype endorsement" subscale also showed significant correlations with panic disorder ($r=0.276$, $p<0.05$) and major depressive disorder ($r=0.425$, $p<0.01$). These associations were particularly evident in domains such as academic performance, social interactions, and family functioning, as measured by the WFIRS-P.

Conclusion: Although internalized stigma alone did not directly predict functional impairment in children with ADHD, its interaction with comorbid anxiety and depression significantly exacerbated both stigma and functional challenges. These findings suggest that internalized stigma may contribute to a more complex clinical presentation when accompanied by other psychological conditions. Future research should prioritize longitudinal designs and culturally sensitive interventions that address the neurodevelopmental and psychosocial aspects of care.

Keywords: Attention-deficit/hyperactivity disorder, internalized stigma, functional impairment, comorbid conditions, children, anxiety, depression

ÖZ

Amaç: Bu çalışma, dikkat eksikliği ve hiperaktivite bozukluğu (DEHB) olan çocuklarda içselleştirilmiş damgalamanın işlevsel bozukluk üzerindeki etkisini incelemeyi amaçlamaktadır. Ayrıca, anksiyete ve depresyon gibi eşlik eden durumların hem damgalamayı hem de işlevsel zorlukları şiddetlendirmedeki rolü de araştırılmıştır.

Gereç ve Yöntem: Çalışmaya, en az altı ay boyunca takip edilen, 6-17 yaş arası 75 DEHB'li çocuk dahil edilmiştir. Veriler, Weiss İşlevsel Bozukluk Derecelendirme Ölçeği-Ebeveyn Formu (WFIRS-P), Conners Ebeveyn Derecelendirme Ölçeği-Yenilenmiş Kısa Form, Ruhsal Hastalık İçselleştirilmiş Damgalama Ölçeği (ISMI) ve Çocuklar İçin Gözden Geçirilmiş Anksiyete ve Depresyon Ölçeği kullanılarak toplanmıştır.

Bulgular: Bulgular, DEHB'li çocuklarda içselleştirilmiş damgalama ile işlevsel bozukluk arasında anlamlı bir doğrudan ilişki göstermemiştir. Ancak, anksiyete ve depresyon gibi eşlik eden durumları olan DEHB'li çocuklar, daha yüksek düzeyde içselleştirilmiş damgalama yaşamış ve daha belirgin işlevsel zorluklar sergilemiştir. Özellikle, ISMI'nin bir alt ölçeği olan "yabancılaşma", yaygın anksiyete bozukluğu ($r=0,385$; $p<0,01$), sosyal fobi ($r=0,506$; $p<0,01$) ve toplam depresyon ($r=0,477$; $p<0,01$) ile pozitif korelasyon göstermiştir. "Stereotip onaylama" alt ölçeği

Address for Correspondence/Yazışma Adresi: Uğur Takım, MD, University of Health Sciences Türkiye, Erzurum City Hospital, Clinic of Mental Health and Diseases, Erzurum, Türkiye

E-mail: ugurtakim@gmail.com **ORCID:** orcid.org/0000-0003-1108-9437

Received/Geliş Tarihi: 05.08.2024 **Accepted/Kabul Tarihi:** 09.10.2024 **Publication Date/Yayınlanma Tarihi:** 14.07.2025

Cite this article as/Atıf: Çakır A, Takım U. Investigation of association between internalized stigma and functional impairment in children with attention-deficit/hyperactivity disorder. Turk J Child Adolesc Ment Health. 2025;32(2):110-8

ÖZ

de panik bozukluk (r=0,276; p<0,05) ve majör depresif bozukluk (r=0,425; p<0,01) ile anlamlı korelasyonlar göstermiştir. Bu korelasyonlar, WFIRS-P ile ölçülen akademik performans, sosyal etkileşimler ve aile dinamiklerinde özellikle belirgindir.

Sonuç: İçselleştirilmiş damgalamanın diğer psikiyatrik rahatsızlıklarda işlevselliği olumsuz etkilediği bilinmesine rağmen, bu çalışmada DEHB'li çocuklarda doğrudan bir etkisi saptanmamıştır. Ancak anksiyete ve depresyon gibi eşlik eden durumların varlığı, damgalama ve işlevsel bozukluğu belirgin şekilde artırmıştır. Bu bulgular, içselleştirilmiş damgalamanın diğer psikolojik faktörlerle etkileşime girerek DEHB'li çocuklarda klinik tabloyu karmaşıklaştırabileceğini göstermektedir. İçselleştirilmiş damgalama, DEHB'li çocuklarda doğrudan işlevsel bozukluğa katkıda bulunmayabilir, ancak eşlik eden durumların varlığında etkisi önemlidir. Gelecek araştırmalar, bu ilişkileri anlamak ve DEHB'li çocukların nörogelişimsel ve psikososyal ihtiyaçlarına yönelik kültürel açıdan duyarlı müdahaleler geliştirmek üzere uzunlamasına çalışmalara odaklanmalıdır.

Anahtar Kelimeler: Dikkat eksikliği ve hiperaktivite bozukluğu, içselleştirilmiş damgalanma, işlevsellikte bozulma, eşlik eden durumlar, çocuklar, anksiyete, depresyon

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is one of the most prevalent neurodevelopmental disorders of childhood, characterized by symptoms of inattention, hyperactivity, and impulsivity that are inconsistent with the developmental level and can persist into adulthood.[1,2] ADHD diagnosis relies not only on the presence of symptoms in the individual but also on significant impairment in functionality across at least two different settings. Children with ADHD often struggle with academic performance, social relationships, and family interactions, leading to clinical referrals primarily due to these functional impairments rather than symptoms alone.[2-4] Consequently, ADHD treatment focuses on both symptom management and functionality improvement, emphasizing the critical nature of addressing functional impairments in therapeutic interventions.

Stigmatization is a complex and multifaceted phenomenon that occurs at the personal, interpersonal, community, and institutional levels. It encompasses a range of interconnected attitudes and behaviors, including public stigma, societal stereotypes, discrimination, marginalization, and self-stigmatization.[5] At the individual level, internalized stigma, also known as self-stigmatization, involves a person recognizing negative societal stereotypes, integrating them into their personal value system and self-concept, and ultimately accepting them as truths. This process often leads to negative outcomes, such as reduced self-esteem and feelings of shame, resulting in social withdrawal.[6] Compared to other forms of stigma, internalized stigma is more strongly associated with a range of adverse psychological consequences.[7]

Stigmatization is particularly significant in psychiatric disorders, including ADHD. Internalized stigma in these conditions refers to the adoption of negative societal beliefs about oneself, leading to negative self-perceptions.[8] This internalization can result in profound emotional consequences, such as shame, social withdrawal, and decreased self-esteem.[9] In adult patients, internalized stigma is associated with impaired social and occupational functioning, reduced income, lower adherence to treatment, and greater severity of psychiatric symptoms.[10,11] Although much of the research on stigma has focused on conditions such as schizophrenia and depression,[12] ADHD also faces societal skepticism and negative stereotypes. Individuals with ADHD are often perceived as inattentive, lazy, or indifferent, and biases exist about the medications used in their treatment, all of which contribute to the stigma surrounding ADHD.[12,13] Societal skepticism towards the diagnosis of ADHD, the perception of individuals with ADHD as indifferent, lazy, or uncaring, and the presence of prejudices surrounding the medications used in its treatment specifically contribute to the stigma associated with ADHD.[14,15]

The functionality of individuals with ADHD is crucial in distinguishing the disorder from other transient or minor issues and is a key factor in designing effective treatment plans, setting realistic goals, and predicting future adaptive functioning.[16] Comorbid conditions such as anxiety, depression, oppositional defiant disorder, and learning disabilities are common in individuals with ADHD, further complicating their clinical presentation and impacting their overall functionality.[17] These comorbidities necessitate a comprehensive treatment approach that addresses a broad spectrum of symptoms and functional impairments, highlighting the importance of evaluating and supporting functionality in these patients.

The relationship between ADHD, functional impairment, and stigmatization is complex and multifaceted. Psychological factors such as self-esteem and perceived public stigma play a crucial role in shaping the outcomes for individuals with ADHD.[18] Internalized stigma, in particular, is linked to lower self-esteem and higher levels of functional impairment.[19] In a study conducted with adults diagnosed with ADHD, 23% of the participants exhibited internalized stigma, 88.5% reported high levels of anticipated stigma, and 69.3% experienced perceived societal stigma.[12] This indicates that interventions aimed at reducing stigma and enhancing self-esteem could potentially improve functional outcomes for individuals with ADHD.[20,21] Understanding these relationships is vital for developing effective therapeutic strategies that address both the psychological and functional aspects of ADHD.

Given the significant impact of stigmatization and functional impairment on individuals with ADHD, this study aimed to investigate the interplay between internalized stigma and functional impairment in children with ADHD. Specifically, this study explored how internalized stigma affects functional outcomes in children with ADHD and aimed to identify potential targets for therapeutic interventions to mitigate these

effects. This research is crucial for developing comprehensive treatment plans that can address both the symptoms and broader psychosocial challenges faced by children with ADHD.

Materials and Methods

Participants and Procedures

The study included a sample of 75 children aged 6-17 years and their parents who sought care at University of Health Sciences Türkiye, Erzurum City Hospital between June 2022 and June 2023. These children were diagnosed with "ADHD" according to the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) criteria. To maintain the specific focus of the study, children with Wechsler Intelligence Scale for Children-Revised scores below 85 and those with chronic physical conditions (e.g., cerebral palsy or epilepsy) were excluded from the study. The participants included volunteer children who had been under follow-up for ADHD for at least six months and met the sampling criteria, as well as their volunteer parents. The children were treated with either methylphenidate or atomoxetine. Informed consent was obtained from all participants. Data were collected using the Weiss Functional Impairment Rating Scale-Parent Form (WFIRS-P), Conners Parent Rating Scale-Revised Short Form (CPRS-RS), Internalized Stigma of Mental Illness (ISMI) scale, and Revised Child Anxiety and Depression Scale-Child Form (RCADS-C). Ethical approval for the study was obtained from University of Health Sciences Türkiye, Erzurum Regional Training and Research Hospital Clinical Research Ethics Committee (approval no: 2022/12-134, date: 15.08.2022).

Data Collection

Sociodemographic Data Form: This form, prepared by the researcher, was used to collect sociodemographic information about the children and their parents (e.g., child's age and level of education, parents' age, level of education, and occupation).

Weiss Functional Impairment Rating Scale-Parent Form: The WFIRS-P form was developed by Weiss and is used to assess ADHD-specific functionality. It consists of 50 items on a 4-point Likert scale, which was completed by the parents in the current study. The scale includes subdomains such as family, social activities, school, child's self-perception, life skills, and risky behaviors. Total and subdomain scores were calculated by summing the marked items. If there was at least one item scored as 3 or two items scored as 2 in any subdomain, that subdomain was considered to indicate "functional impairment." The validity and reliability of the scale in Türkiye were established by Tarakçıoğlu et al.[22] with a total scale Cronbach's alpha coefficient of 0.93.

Conners Parent Rating Scale-Revised Short Form: The CPRS-RS is a tool used to assess the severity of ADHD symptoms and gauge the effectiveness of treatment during follow-up in children with ADHD. The scale includes 27 items, each rated on a 4-point Likert scale ranging from 0-3. The CPRS-RS was adapted for use in Türkiye and comprises several subscales that assess various dimensions of child behavior. These subscales include oppositional, cognitive problems/inattention, hyperactivity, and the ADHD index, in addition to the global index, which provides a general overview of the child's behavioral difficulties. These subscales were utilized in the present study, and the Turkish adaptation allowed for culturally relevant assessment.[23]

Internalized Stigma of Mental Illness Scale: The ISMI was developed by Ritsher et al.[24] and is a self-report scale that is used to assess internalized stigma in children with ADHD. The ISMI was completed by the children themselves in the current study, as it aimed to capture their personal experiences with stigma. The scale includes five subscales: "alienation," "stereotype endorsement," "perceived discrimination," "social withdrawal," and "stigma resistance," with a total of 29 items. It is rated on a 4-point Likert scale from 1 to 4, with items in the "stigma resistance" subscale being reverse-scored. Higher scores indicate more severe internalized stigma. The Turkish validity and reliability study was conducted by Ersoy and Varan.[25]

Revised Child Anxiety and Depression Scale-Child Form: The RCADS-C scale was designed to screen for DSM-IV-based symptoms of anxiety disorders and depression in children and adolescents. It comprises 47 items distributed across six subscales and uses a scoring system ranging from 0-3. The subscales specifically assess symptoms related to generalized anxiety disorder, separation anxiety disorder, panic disorder, obsessive-compulsive disorder (OCD), social phobia, and major depressive disorder.[26] The Turkish validity and reliability of the scale were established by Gormez et al.[27] in 2017, with a Cronbach's alpha coefficient of 0.95.

Statistical Analysis

The clinical characteristics and demographic data of the participants were analyzed using descriptive statistics, including frequencies and percentages (n%), and means and standard deviations (mean±standard deviation). Pearson's correlation tests were employed to assess the relationships between variables for data that met parametric assumptions. The significance threshold was set at $p<0.05$ for all statistical tests. All analyses were performed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA).

RESULT

Sample Caracteristics

The study involved 75 children diagnosed with ADHD according to the DSM-5 criteria and their parents. The children were monitored for at least six months. The average age of the participants was 13.68±1.69 years. Among the participants, 53 were female and 22 were male. The average age at the time of ADHD diagnosis was 9.84±2.55 years. The mean age of the mothers was 40.24±5.47 years, while the fathers had a mean age of 44.78±6.19 years. In terms of medication, 78.7% of the children were treated with methylphenidate, and 14.7% were treated with atomoxetine. Four participants came from fragmented families. Developmental milestones were reported to be normal in 96% of the children. Additionally, 50.7% of

the children were born through vaginal delivery (Table 1). The sociodemographic data and clinical characteristics of patients with ADHD are shown in detail in Table 1.

A Comparison of the Factors Associated with the Level of Internalized Stigma in Children with ADHD

The current study examined the correlations between the scores obtained using the CPRS-RS form, WFIRS-P, ISMI, and RCADS (Table 2).

The global index from the CPRS-RS showed significant positive correlations with the cognitive problems subscale (r=0.660, p<0.01), hyperactive/impulsive behaviors subscale (r=0.592, p<0.01), and ADHD index (r=0.661, p<0.01). The scores for cognitive problems were also strongly correlated with the hyperactive/impulsive behavior subscale scores (r=0.581, p<0.01) and the ADHD index (r=0.909, p<0.01), indicating close associations between these measures.

The WFIRS-P school learning subscale scores showed significant positive correlations with the CPRS-RS global index (r=0.438, p<0.01), cognitive problems (r=0.693, p<0.01), hyperactive/impulsive behaviors (r=0.478, p<0.01), and the ADHD index (r=0.673, p<0.01). School behavior was also positively associated with cognitive problems (r=0.430, p<0.01) and the ADHD index (r=0.382, p<0.01). The life skills subscale of the WFIRS-P was significantly correlated with the CPRS-RS global index (r=0.423, p<0.01), cognitive problems (r=0.402, p<0.01), and ADHD index (r=0.452, p<0.01). These findings indicate that the school learning, school behavior, and life skills subscales of the WFIRS-P all demonstrated positive correlations with the global index, cognitive problems, hyperactive/impulsive behaviors, and ADHD index subscales of the CPRS-RS.

Additionally, the child's self-concept score was positively associated with the global index (r=0.316, p<0.01), cognitive problems (r=0.337, p<0.01), ADHD index (r=0.317, p<0.01), and life skills (r=0.511, p<0.01). Social activities scores demonstrated positive correlations with the global index (r=0.279, p<0.05), cognitive problems (r=0.270, p<0.05), hyperactive/impulsive behaviors (r=0.241, p<0.05), and ADHD index (r=0.285, p<0.05). Risky activities were also significantly associated with all subscales of the CPRS-RS, including the global index (r=0.309, p<0.01), cognitive problems (r=0.341, p<0.01), hyperactive/impulsive behaviors (r=0.353, p<0.01), and ADHD index (r=0.374, p<0.01).

The alienation subscale of the ISMI was positively correlated with separation anxiety disorder (r=0.229, p<0.05), generalized anxiety disorder (r=0.385, p<0.01), panic disorder (r=0.357, p<0.01), social phobia (r=0.506, p<0.01), OCD (r=0.428, p<0.01), major depressive disorder (r=0.347, p<0.01), total anxiety (r=0.479, p<0.01), and total depression (r=0.477, p<0.05), all of which were measured using the RCADS. The stereotype endorsement subscale was positively correlated with panic disorder (r=0.276, p<0.05), social phobia (r=0.340, p<0.01), OCD (r=0.379, p<0.01), major depressive disorder (r=0.425, p<0.01), total anxiety (r=0.344, p<0.01), and total depression (r=0.390, p<0.01). The perceived discrimination subscale also showed significant positive correlations with generalized anxiety disorder (r=0.244, p<0.05), panic disorder (r=0.256, p<0.05), social phobia (r=0.331, p<0.01), OCD (r=0.424, p<0.01), major depressive disorder (r=0.264, p<0.05), total anxiety (r=0.351, p<0.01), and total depression (r=0.352, p<0.01).

Social withdrawal from the ISMI, was significantly associated with separation anxiety disorder (r=0.328, p<0.01), generalized anxiety disorder (r=0.245, p<0.05), panic disorder (r=0.299, p<0.01), social phobia (r=0.390, p<0.01), OCD (r=0.469, p<0.01), Major depressive disorder (r=0.286, p<0.05), total anxiety (r=0.424, p<0.01), and total depression (r=0.417, p<0.01), all of which were measured using the RCADS. The stigma resistance subscale of the ISMI showed positive correlations with generalized anxiety disorder (r=0.261, p<0.05), social phobia (r=0.359, p<0.01), OCD (r=0.304, p<0.05), major depressive disorder (r=0.452, p<0.01), total anxiety (r=0.294, p<0.05), and total depression (r=0.356, p<0.01).

Table 1. Basic characteristics of the participants with ADHD

	ADHD (n=75) [Mean±SD, n (%)]
Age	13.68±1.69
Education (years)	8.03±2.05
Age of diagnosis	9.84±2.55
Maternal age	40.24±5.47
Paternal age	44.78±6.19
Maternal education (years)	10.72±4.19
Paternal education (years)	12.00±4.04
Gender	
Male **Famale**	22 (29.3) 53 (70.7)
Medication	70 (93.3)
Methylphenidate	59 (78.7)
Atomoxetine	11 (14.7)
Fragmented family (yes)	4 (5.3)
Maternal employment (no/irregular)	54 (72.0)
Maternal mental health disorders (yes)	9 (12.0)
Paternal employment (no/irregular)	48 (64.0)
Paternal mental health disorders (yes)	7 (9.3)
Complication of pregnancy (yes)	8 (10.7)
Type of delivery (vaginal)	38 (50.7)
Term birth (yes)	60 (80.0)
Admission neonatal intensive care unit (yes)	13 (17.3)
Stages in the normal development of childhood (yes)	72 (96.0)

SD: Standard deviation, ADHD: Attention-deficit/hyperactivity disorder

Table 2. Correlation analysis between internalized stigma, anxiety, depression, and functional impairment in children with ADHD

		1	2	3	4	5	6	7	8	9	10	11	12
CPRS-RS	**1. Global index**	1											
	2. Cognitive problems	0.660**	1										
	3. Hyperactive/ impulsive	0.592**	0.581**	1									
	4. ADHD index	0.661**	0.909**	0.643**	1								
WFIRS-P	**5. School learning**	0.438**	0.693**	0.478**	0.673**	1							
	6. School behaviour	0.324**	0.430**	0.375**	0.382**	0.375**	1						
	7. Life skills	0.423**	0.402**	0.373**	0.452**	0.375**	0.259*	1					
	8. Child's self-concept	0.316**	0.337**	0.071	0.317**	0.376**	0.340**	0.511**	1				
	9. Social activities	0.279*	0.270*	0.241*	0.285*	0.304**	0.120	0.294*	0.347**	1			
	10. Risky activities	0.309**	0.341**	0.353**	0.374**	0.343**	0.412**	0.311**	0.220	0.264*	1		
ISMI	**11. Alienation**	0.060	0.050	-0.073	0.024	0.202	0.087	-0.043	0.047	0.065	-0.015	1	
	12. Stereotype endorsement	0.035	0.079	-0.027	0.015	0.141	0.054	-0.147	-0.001	-0.026	-0.025	0.603**	1
	13. Perceived discrimination	0.081	0.016	0.042	0.003	0.089	0.196	-0.121	-0.005	0.201	0.014	0.643**	0.511**
	14. Social withdrawal	0.089	0.014	-0.044	-0.047	0.021	0.004	-0.029	0.112	0.008	-0.131	0.765**	0.608**
	15. Stigma resistance	0.127	0.080	0.027	0.067	0.063	0.116	0.036	0.077	-0.147	0.002	0.324**	0.536**
	16. Total	0.099	0.060	-0.020	0.015	0.130	0.113	-0.075	0.060	0.024	-0.041	0.845**	0.819**
RCADS	**17. SAD**	0.081	-0.028	0.039	-0.064	0.189	-0.123	0.016	0.112	0.130	-0.152	0.229*	0.163
	18. Generalised anxiety	-0.046	-0.056	-0.151	-0.086	0.069	0.002	-0.109	0.157	0.174	-0.074	0.385**	0.210
	19. Panic disorder	0.115	0.071	-0.010	0.005	0.207	0.172	-0.033	0.268*	0.126	0.144	0.357**	0.276*
	20. Social phobia	0.067	0.091	-0.115	0.120	0.159	-0.020	0.041	0.289*	0.138	-0.127	0.506**	0.340**
	21. OCD	0.114	0.036	-0.049	0.004	0.133	0.049	0.062	0.255*	0.237*	0.001	0.428**	0.379**
	22. MDD	0.076	0.070	-0.072	0.009	0.073	0.215	0.047	0.197	0.062	0.172	0.347**	0.425**
	23. Total anxiety	0.087	0.041	-0.072	0.010	0.191	0.034	-0.003	0.279*	0.192	-0.038	0.479**	0.344**
	24. Total depression	0.090	0.052	-0.078	0.010	0.173	0.085	0.010	0.276*	0.171	0.015	0.477**	0.390**

Table 2. Continued

		13	14	15	16	17	18	19	20	21	22	23	24
CPRS-RS	**1. Global index**												
	2. Cognitive problems												
	3. Hyperactive/ impulsive												
	4. ADHD index												
WFIRS-P	**5. School learning**												
	6. School behaviour												
	7. Life skills												
	8. Child's self-concept												
	9. Social activities												
	10. Risky activities												
ISMI	**11. Alienation**												
	12. Stereotype endorsement												
	13. Perceived discrimination	1											
	14. Social withdrawal	0.594**	1										
	15. Stigma resistance	0.316**	0.449**	1									
	16. Total	0.769**	0.868**	0.661**	1								
RCADS	**17. SAD**	0.159	0.328**	-0.018	0.220	1							
	18. Generalised anxiety	0.244*	0.245*	0.261*	0.340**	0.464**	1						
	19. Panic disorder	0.256*	0.299**	0.221	0.356**	0.518**	0.649**	1					
	20. Social phobia	0.331**	0.390**	0.359**	0.487**	0.413**	0.771**	0.550**	1				
	21. OCD	0.424**	0.469**	0.304**	0.506**	0.448**	0.674**	0.643**	0.623**	1			
	22. MDD	0.264*	0.286*	0.452**	0.447**	0.223	0.609**	0.710**	0.530**	0.556**	1		
	23. Total anxiety	0.351**	0.424**	0.294*	0.479**	0.666**	0.872**	0.845**	0.845**	0.826**	0.666**	1	
	24. Total depression	0.352**	0.417**	0.356**	0.503**	0.593**	0.862**	0.867**	0.819**	0.811**	0.803**	0.980**	1

The numbers in the rows of Table 2 correspond to specific subscales or parameters from various psychological assessment tools. 1. Global index (CPRS-RS), 2. Cognitive problems (CPRS-RS), 3. Hyperactive/impulsive (CPRS-RS), 4. ADHD index (CPRS-RS), 5. School learning (WFIRS-P), 6. School behaviour (WFIRS-P), 7. Life skills (WFIRS-P), 8. Child's self-concept (WFIRS-P), 9. Social activities (WFIRS-P), 10. Risky activities (WFIRS-P), 11. Alienation (ISMI), 12. Stereotype endorsement (ISMI), 13. Perceived discrimination (ISMI), 14. Social withdrawal (ISMI), 15. Stigma resistance (ISMI), 16. Total (ISMI), 17. Separation anxiety disorder (RCADS), 18. Generalized anxiety (RCADS), 19. Panic disorder (RCADS), 20. Social phobia (RCADS), 21. Obsessive-compulsive disorder (RCADS), 22. Major depressive disorder (RCADS), 23. Total anxiety (RCADS), and 24. Total depression (RCADS).

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed), RCADS: Revised Children's Anxiety and Depression Scale, ISMI: Internalized stigma of mental illness inventory, WFIRS-P: Weıss Functıonal Impaırment Ratıng Scale-Parent Report, OCD: Obsessive-compulsive disorder, SAD: Separation anxiety disorder, MDD: Major depressive disorder, CPRS-RS: Conners' Rating Scale

The total ISMI score was positively correlated with generalized anxiety disorder (r=0.340, p<0.01), panic disorder (r=0.356, p<0.01), social phobia (r=0.487, p<0.01), OCD (r=0.506, p<0.01), major depressive disorder (r=0.447, p<0.01), total anxiety (r=0.479, p<0.01), and total depression (r=0.503, p<0.01), all of which were measured Notably, OCD was significantly and positively correlated with all subscales of the ISMI, as well as with the child's self-concept score (r=0.255, p<0.05) and the social activities score (r=0.237, p<0.05) from the WFIRS-P.

Separation anxiety disorder, as measured by the RCADS, was positively correlated with the alienation (r=0.229, p<0.05) and social withdrawal (r=0.328, p<0.01) subscales of the ISMI. Generalized anxiety disorder was significantly correlated with alienation (r=0.385, p<0.01), perceived discrimination (r=0.244, p<0.05), social withdrawal (r=0.245, p<0.05), stigma resistance (r=0.261, p<0.05), and the total ISMI score (r=0.340, p<0.01).

Panic disorder was correlated with alienation (r=0.357, p<0.01), stereotype endorsement (r=0.276, p<0.05), perceived discrimination (r=0.256, p<0.05), social withdrawal (r=0.299, p<0.01), and the total ISMI score (r=0.356, p<0.01). Social phobia demonstrated positive correlations with alienation (r=0.506, p<0.01), stereotype endorsement (r=0.340, p<0.01), perceived discrimination (r=0.331, p<0.01), social withdrawal (r=0.390, p<0.01), stigma resistance (r=0.359, p<0.01), and the total ISMI score (r=0.487, p<0.01).

The total anxiety score was correlated with alienation (r=0.479, p<0.01), stereotype endorsement (r=0.344, p<0.01), perceived discrimination (r=0.351, p<0.01), social withdrawal (r=0.424, p<0.01), stigma resistance (r=0.294, p<0.05), and the total ISMI score (r=0.479, p<0.01). Similarly, the total depression score was positively correlated with alienation (r=0.477, p<0.01), stereotype endorsement (r=0.390, p<0.01), perceived discrimination (r=0.352, p<0.01), social withdrawal (r=0.417, p<0.01), stigma resistance (r=0.356, p<0.01), and the total ISMI score (r=0.503, p<0.01).

Discussion

The most significant finding of our study was the lack of a direct association between internalized stigma and functional impairment in children with ADHD. Although we hypothesized that higher levels of internalized stigma might be linked to greater difficulties in areas such as academic performance, social interactions, and family dynamics, our results did not reveal any significant correlations between these variables. This suggests that while internalized stigma may play a role in other psychiatric conditions, its direct impact on functionality in children with ADHD remains unclear based on our data.

Lebowitz[28] suggested that stigma has negative effects on daily functioning; however, our study did not find evidence of this link in children with ADHD. The differences between Lebowitz's[28] study and ours are primarily related to the scales used and the participant groups involved. Lebowitz[28] examined ADHD-related stigma by examining public perceptions and societal attitudes, which may have highlighted the direct impact of external stigma on daily functioning of patients with ADHD. In contrast, our study focused on internalized stigma and its effects on functioning, suggesting that internal processes may exert a more indirect influence on quality of life. Additionally, differences in age groups and cultural contexts may have influenced the results. Younger children, for example, may have lower social awareness, which could reduce the impact of internalized stigma on their functioning. Therefore, methodological and participant differences may account for the divergent findings regarding the impact of stigma on functional impairment.

Our findings show that children with ADHD who also experience comorbid conditions such as generalized anxiety, social phobia, and depression tend to exhibit much higher levels of internalized stigma and related functional impairments. This is in line with previous studies that have found that comorbid conditions often worsen the clinical symptoms of ADHD and lead to more significant functional challenges.[29] What stands out in our exploratory analysis is the particular influence of generalized anxiety and social phobia on driving these elevated levels of internalized stigma. This insight goes beyond our initial hypothesis, shedding light on the distinct impact of these specific conditions on the compounding of the difficulties faced by children with ADHD. For example, past research in adults has shown that internalized stigma is associated with reduced income, lower treatment adherence, and greater severity of psychiatric symptoms.[30] Our findings support this and highlight how comorbid conditions, especially generalized anxiety and social phobia, can significantly exacerbate the challenges for children with ADHD.

Our findings indicate that children with ADHD who reported elevated levels of internalized stigma also demonstrated significant functional impairments, particularly in academic performance, social interactions, and family dynamics. However, it is important to note that while these difficulties appeared to co-occur, our study did not establish a direct causal link between internalized stigma and specific impairments. This finding is consistent with broader research on psychiatric disorders, where internalized stigma has been linked to decreased self-esteem and overall functionality.[19,31] However, ADHD presents distinct challenges, especially given societal misconceptions that often misinterpret symptoms such as inattentiveness and hyperactivity as personal failings rather than manifestations of a neurodevelopmental disorder.[32] These misinterpretations may contribute to the stigmatization process; however, our study did not establish a direct link between internalized stigma and functional impairment in children with ADHD. Despite this, the potential for stigma to negatively impact these children remains a concern for many.

Our study explored the link between comorbid disorders and children's self-concept, particularly concerning functional impairments. Given that many participants are adolescents, a period when self-concept is still developing, this association is particularly important. Adolescents are vulnerable to internalizing societal perceptions, and comorbid conditions can

significantly affect their self-concept and functional outcomes. These findings emphasize the need for public education to challenge misconceptions about ADHD, as stigma may adversely affect self-concept and overall functioning of individuals with ADHD. Addressing stigma through increased awareness could improve both self-concept and well-being among adolescents with ADHD.

Additionally, our study highlights the cultural variations in the experience of stigma. While the general trends observed in the current study align with global findings, the specific expressions of stigma and its impact can vary significantly. Research in different cultural contexts, such as the study by Mak and Cheung[33] Hong Kong, demonstrates how cultural beliefs and societal attitudes can shape the experience and internalization of stigma. Cultural factors can influence both the perception and impact of ADHD-related stigma, affecting the degree to which children internalize these negative views and their subsequent impact on functioning. This underscores the importance of culturally tailored interventions that address the specific needs and contexts of different populations.

In summary, our study provides valuable insights into the complex relationship between internalized stigma and functional impairment in children with ADHD, highlighting the nuanced role that comorbid conditions and cultural factors play in shaping these outcomes. Future research should focus on further exploring these associations to inform more targeted interventions aimed at reducing stigma and improving overall functioning in this population group.

Study Limitations

The methodological strengths and limitations of this study must be acknowledged when interpreting its results. Although the use of validated scales provided reliable measures of key variables, the cross-sectional design limited causal inferences. Future longitudinal research is necessary to clarify the temporal relationships between internalized stigma, comorbid conditions, and functional impairment. Although the sample size was sufficient, larger studies are needed to validate these findings and investigate moderating factors, such as socioeconomic status and parental support. Additionally, reliance on self-report measures introduces potential bias, suggesting the need for future research to incorporate multiple informants and objective assessments of functionality. Notably, this study did not identify a direct association between internalized stigma and functional impairment in children with ADHD, underscoring the importance of further investigation into this relationship.

Conclusion

In conclusion, our study sheds light on the nuanced relationship between internalized stigma, comorbid conditions, and functional impairment in children with ADHD. While we did not establish a direct link between internalized stigma and functional impairment, the presence of comorbidities, such as generalized anxiety and social phobia, clearly contributes to greater challenges in areas such as academic performance and social functioning. These findings highlight the importance of addressing the broader context of comorbid conditions when considering the impact of stigma on ADHD symptoms. Additionally, cultural and developmental factors appear to play a crucial role in shaping the experience and effects of stigma, suggesting the need for interventions tailored to specific populations. Overall, reducing stigma and improving societal understanding of ADHD are essential for promoting better outcomes for children and adolescents, particularly in terms of their self-concept and overall functioning. Future research should explore these complex interactions across diverse age groups and cultural contexts to develop more effective support strategies.

Ethics

Ethics Committee Approval: Ethical approval for the study was obtained from University of Health Sciences Türkiye, Erzurum Regional Training and Research Hospital Clinical Research Ethics Committee (approval no: 2022/12-134, date: 15.08.2022).

Informed Consent: Informed consent was obtained from the patients who agreed to participate in the study.

Acknowledgement

The authors thank the patients and their families.

Footnotes

Authorship Contributions

Concept: A.Ç., U.T., Design: A.Ç., U.T., Data Collection or Processing: A.Ç., Analysis or Interpretation: A.Ç., U.T., Literature Search: A.Ç., U.T., Writing: A.Ç., U.T.

Conflict of Interest: The author(s) declare no potential conflicts of interest with respect to the research, authorship, or publication of this article.

Financial Disclosure: The author(s) received no financial support for the research, authorship, or publication of this article.

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