

The Impact of ADHD on Adolescents' Academic Performance and Social Relationships

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Abstract. Attention deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders in adolescence, and ADHD significantly impact adolescents' academic performance and social interactions. This paper reviews recent studies to test the negative impact of ADHD on adolescents' core academic skills and performance in social domains. This literature review systematically summarized the main mechanisms associated with ADHD, including the spiral academic failure model and the social rejection cycle. Due to cognitive and emotional regulation deficits, adolescents with ADHD are often trapped in a vicious cycle of academic inefficiency and social withdrawal, as evidenced by the results. To achieve this objective, this paper proposes a multimodal intervention that combines pharmacological interventions, behavioral therapy, family support, and school adjustment. The study emphasizes the importance of early identification and multidimensional support systems to promote the holistic development of adolescents with ADHD and calls for a more inclusive school and social environment. This review concludes that ADHD leads to a reinforcing cycle of academic underperformance and social difficulties, highlighting the urgency of early, multimodal interventions to disrupt these patterns.

Keywords: Attention deficit hyperactivity disorder, multimodal intervention, early identification, multidimensional support systems.

1. Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most diagnosed neurodevelopmental disorders in children and adolescents. According to Faraone et al. (2021), the popularity of ADHD in adolescents is about 5% worldwide, and the symptomatic manifestations such as difficulty concentrating, impulsive behavior, and hyperactivity significantly impair an individual's functional performance in several areas of life. Cheung et al. (2016) analyzed several longitudinal studies ranging from 4 to 16 years in their review on the persistence of ADHD, and most of these studies began in childhood. The results showed that a significant percentage of those affected (around 50-70%) continued to have core symptoms such as inattention and impulse control difficulties, which affected their academic development and social adjustment. These studies emphasize that ADHD is not a "short-term childhood problem", but a neurodevelopmental disorder with significant developmental continuity.

The development of an individual's cognitive, emotional, and social functioning is crucial during adolescence. Neurological plasticity and remodeling provide opportunities for behavioral regulation but also increase the likelihood of symptom exacerbation (Steinberg, 2005). During this time, adolescents with ADHD not only face academic pressures, but also must adapt to physical changes, changes in social relationships, and other challenges, which can exacerbate their difficulties with behavioral and emotional regulation. These challenges may result in anxiety, depression, and social withdrawal.

The impact of ADHD on adolescents is multifaceted, particularly in terms of academic performance and social relationships. Academically, adolescents with ADHD often have difficulty completing academic tasks because their executive functions are impaired, which affects their grades, motivation and confidence in learning. Socially, ADHD can lead to parent-child conflict, peer rejection, and interpersonal communication disorders, which can weaken the adolescent's ability to fit into society.

This paper aims to provide an overview of the mechanisms by which ADHD affects academic performance and social relationships in adolescence in two ways, to examine the symptoms and

intervention strategies that emerge from the existing empirical studies, and to make suggestions for future research and practice.

2. Key concept

2.1. Definition and diagnostic criteria for ADHD

According to the Diagnostic and Statistical Manual of Mental Disorders (5th edition), attention-deficit/hyperactivity disorder (ADHD) is a mental developmental disorder categorized into three main types: inattentive, impulsive, hyperactive and mixed. The actual diagnosis requires a combination of behavioral manifestations in various situations that last for at least six months and result in significant impairment in academics, interpersonal relationships, or daily living to be officially diagnosed as ADHD. The DSM-5 also states that symptoms of ADHD usually appear before the age of twelve, but often worsen, change, and persist during adolescence. Diagnosis should not exclusively rely on parental and teacher observations but should also include clinical rating scales and multidimensional behavioral observations to ensure the reliability and accuracy of the diagnosis.

2.2. Introduction to the core dimensions of academy competence

Academic competence is a comprehensive demonstration of an adolescent's academic performance that encompasses not only the ability to acquire and apply knowledge but is also strongly influenced by psychological and behavioral habits. For adolescents with ADHD, the following three dimensions are the key assessment criteria for academic competence:

Executive function: refers to the brain's ability to plan, organize, suppress impulses, and sustain attention while completing complex tasks; adolescents with ADHD often exhibit deficits in executive function and are unable to effectively manage their time, develop a learning plan, and complete sequential learning tasks (Barkley, 1997).

Initiative: This reflects the student's initiative, persistence and motivation for learning activities. It has been found that adolescents with ADHD find it harder to sustain learning over a longer period and that they tend to be bored and avoid learning, making it difficult to stay on task (Smith et al., 2020).

Learning efficiency: This includes concentration, speed in recalling information and language organization. Pupils with ADHD often miss gaps in their knowledge during lessons because they cannot concentrate for long periods of time or are often distracted when writing tasks, which greatly impairs their learning efficiency.

2.3. Structural dimensions of social relationships

The social relationships of adolescents consist primarily of parent-child relationships, relationships with peers and intimate relationships in the early stages of adolescence, whereby the social structures of adolescents with ADHD often show a certain weakness due to the disorder caused by the symptoms

ADHD adolescents who are overly criticized or punished for their behavior problems can develop insecure attachment patterns that lead to communication barriers and family conflict.

The quality of interactions with peers is a significant factor in adolescent social identity. Adolescents with ADHD are often ostracized or isolated due to their abrupt behavior or lack of social skills (McKay et al., 2023). Intimacy in adolescents: As adolescents enter puberty, they begin to explore intimate relationships, and ADHD symptoms such as impulsive behavior, difficulty controlling emotions, or deficits in communication skills may limit their ability to form and maintain such relationships.

3. Effects of ADHD on academic performance

The persistent disruption of the learning process is caused by the main symptoms of ADHD, which include attention deficit, hyperactivity, and impulsivity, creating a multifaceted, cascading effect on

the academic performance of adolescent students. Research has shown that adolescents with ADHD not only lag their peers in academic performance but also show significant disadvantages in the psychological dimensions of academic attitude, motivation, and confidence in learning (Smith et al., 2023).

Adolescents with ADHD are often unable to perform complex academic tasks efficiently due to delays in the development of executive functions. In a three-year follow-up study, Smith et al. (2023) found that adolescents with ADHD showed significant disadvantages in cognitive flexibility and planning tasks compared to peers without ADHD due to executive function deficits, resulting in long-term performance deficits. Almutairi and Ahmed (2022) also found that even college-aged ADHD students continue to show significant disadvantages in cognitive flexibility and planning tasks. This persistent dysfunction suggests that the academic impact of ADHD is not a short-term fluctuation, but rather a long-term cumulative cognitive gap.

In addition to cognitive executive problems, adolescents with ADHD show significant deficits in learning motivation. They typically lack interest and enthusiasm for learning and are unable to actively engage in prolonged learning tasks. Smith et al. (2020), in a study of 229 adolescents aged 12 to 16 years (of whom approximately 65% were male), found that the ADHD group was more likely to avoid learning tasks requiring delayed rewards in learning tasks, show boredom with learning, lack a sense of purpose and high sensitivity to failure compared to the control group. This lack of intrinsic motivation is partly due to the delayed response of the reward system at the neural level in ADHD individuals and is also closely related to their early and repeated negative educational experiences such as learning failures and negative evaluations. Constant failures weaken their confidence in learning and lead to the development of self-descriptions such as "I can't learn" or "I can't do it", and this psychological mechanism of "learned helplessness" will further suppress initiative.

Difficulty sustaining attention is one of the most central manifestations of ADHD. Adolescents with ADHD are often unable to maintain their concentration in the classroom and tend to engage in frequent outside distractions or fall into a pattern of hyper focused immersion. Smith et al. (2020) discovered that academic performance was significantly linked to the ability to maintain attention in a study of 243 adolescents aged 13 to 17 years (approx. 60% male). Students with ADHD had lower scores on attention assessments and generally lower grades, suggesting that attention deficits are an important factor in their academic performance. Those with more severe attention deficits were less likely to complete their homework and showed poorer test performance. Brenlla and Durán (2024) found that the relationship between attention and performance significantly influenced self-efficacy (which is confidence in one's ability to complete academic tasks). In other words, if a person has confidence in their ability to learn, their performance can be somewhat mitigated even if there are problems with attention.

It is worth noting that ADHD's effects on academic performance are not one-sided but rather a vicious cycle with a downward spiral.

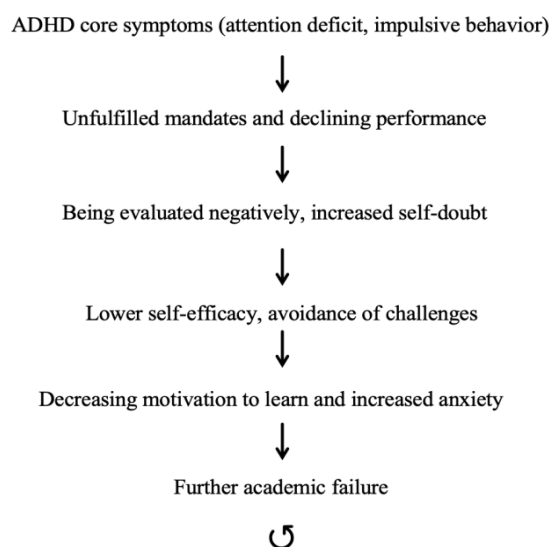


Figure 1. The vicious circle of core system in ADHD (Photo/Picture credit: Original)

This cycle underscores that the academic problems of adolescents with ADHD cannot simply be attributed to a lack of effort but should be viewed from a multidimensional behavioral and cognitive perspective (see Figure 1). In particular, "negative evaluations" and "self-denial" play a reinforcing role and cause simple academic difficulties to develop into complete pervasive self-doubt, academic disengagement and functional withdrawal.

It is therefore particularly important to recognize ADHD at an early stage and provide appropriate support. Only if people break this negative cycle can they effectively prevent the problem from building up and worsening.

4. Effects Of Adhd On Social Relationships

In addition to the challenges in academy settings, adolescents with ADHD often experience resistance in their interpersonal relationships. The development of social skills is closely linked to emotion regulation, self-awareness and external feedback - areas that ADHD sufferers have weaknesses in. The symptoms not only affect the ability to build stable relationships with loved ones and friends but also increase the risk of social dysfunction such as peer rejection and frustration with intimacy.

The family is the first classroom for the social development of adolescents, and the ADHD-related behavioral problems often have a direct impact on the quality of parent-child interactions. In a meta-analysis summarizing 50 studies of family interventions for children who have made a definite diagnosis of ADHD, Chronis-Tuscano et al. (2021) found that families with children with ADHD often have high rates of conflict, communication breakdowns, and weakened emotional relationships, among other problems. Parents are often caught in a vicious cycle of blame and punishment for their children's disobedient, inattentive or impulsive behavior, ignoring the underlying psychological and neurological mechanisms. This chronic negative interaction weakens the child's sense of secure attachment and leads to behavioral patterns such as mistrust, resistance or emotional avoidance. Adolescents with ADHD who grow up in an environment that lacks emotional support tend to exhibit defensiveness and anxiety in other social situations, exacerbating their social difficulties. In addition, it has been found that ADHD adolescents often show stronger emotional outbursts and lower emotional resilience in the face of negative social feedback. Graziano and Garcia (2016) found in a meta-analysis that individuals with ADHD scored significantly lower than their peers in terms of emotion recognition, regulation and delayed response, and were particularly likely to show inappropriate behaviors such as anger, crying or impulsive reactions in social conflict scenarios or inappropriate behaviors such as impulsive reactions. These dysregulated reactions not only hindered interpersonal repair but also led to further alienation from peers.

Adolescents with ADHD are often labeled as "troublemakers", "unruly" and "attention-deficient" in social situations at school. These labels often stem from their unregulated behavior, impulsive language, and inability to follow rules in group activities. McKay et al (2023) found that ADHD individuals were significantly less accepted in peer groups than non-ADHD individuals, particularly among boys. This experience can affect a person's social self-confidence in the long term and even affect the development of intimate relationships in adulthood. This risk is particularly acute for adolescents with ADHD. They are more likely to be excluded by their peers because of their impulsive behavior and lack of respect for social rules, which can cause them to feel isolated and self-doubt. Often, these experiences cause individuals to develop an avoidant social style and a tendency to social withdrawal and reluctance to form deep relationships, which has a lasting impact on their social functioning.

In summary, adolescents with ADHD not only face systemic difficulties academically, but their social development is also impaired by core symptoms. The intersection of parent-child relationships, peer relationships, and emotional regulation results in higher levels of stress for social adjustment, providing multiple entry points for intervention.

5. Suggestions

The dual impact of ADHD on adolescents' academic and social functioning suggests that single interventions are often ineffective and that multidimensional models of intervention need to be developed. Current empirical research supports the following categories of primary strategies:

Medication (e.g. methylphenidate-based stimulants) significantly improves attention and suppresses impulsivity in the short term and constitutes the foundation of most ADHD interventions. However, when relying on medication alone, it is difficult to treat non-core symptom areas such as emotion regulation, motivation and interpersonal interactions. Therefore, a combination of cognitive-behavioral therapy (CBT) or organizational training can help adolescents develop good study and life habits (Antshel & Barkley, 2020). Research has shown that stimulating intrinsic motivation and training self-management skills are crucial for improving learning persistence. For example, goal management, immediate reward systems and engaging forms of learning can help students with ADHD to increase their engagement and performance in learning (Smith et al., 2020). In addition, emotion regulation training, such as emotion recognition and breathing relaxation, can improve self-control during socialization (DuPaul et al., 2020).

The family is an important ecosystem that influences the development of adolescents with ADHD. Parents who lack knowledge about ADHD often take a high-pressure or critical approach to behavior problems, resulting in a deterioration of the parent-child relationship. Therefore, training parents on ADHD knowledge and behavior management skills (e.g., positive parenting, empathic communication, etc.) can effectively improve family climate and reduce conflict (Chronis-Tuscano et al., 2021).

As the most important place in young people's daily lives, school offers great potential for intervention and support. Teachers should be flexible in their instructional strategies, such as extending time, simplifying tasks, and providing step-by-step instructions, while establishing regular feedback and individualized support mechanisms (DuPaul et al., 2020). More importantly, schools should strive to create a non-discriminatory, non-labeling school culture that promotes empathy and inclusion among peers and acceptance, and establish "learning buddies" or social support programs to set the stage for positive interactions for students with ADHD.

6. Conclusions

In summary, the impact of ADHD on adolescents goes far beyond the behavioral level and penetrates deeply into multiple dimensions of their academic development and social adjustment. In the academic domain, executive dysfunction, intrinsic motivation and attentional fluctuation together

form the key mechanism for the decline in performance and can form a spiraling negative cycle. In the area of socialization, adolescents with ADHD face numerous challenges, such as parent-child relationship tensions, peer rejection, and difficulty regulating their emotions, which seriously limit the healthy development of their social functioning.

To manage the problems caused by ADHD, it is necessary to go beyond a single treatment pathway and pursue a "multimodal" intervention strategy: This includes a combination of medication and behavioral therapies, family support and parent-child communication training, building understanding and adjustment mechanisms at the school level, and creating a tolerant atmosphere at the sociocultural level. Future research should concentrate more specifically on the long-term effects of ADHD interventions, how adaptation occurs in various cultural contexts, and the innovative approaches to interdisciplinary collaboration. Building an ecological environment of understanding, acceptance, and support for adolescents with ADHD - from one person to the entire family, school, and society - is the key to ensuring their comprehensive and well-adjusted development.

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