



International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Operating Publisher
SciFormat Publishing Inc.
ISNI: 0000 0005 1449 8214

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Calgary, Alberta, T3E0A7,
Canada
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ARTICLE TITLE	ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND PSYCHIATRIC COMORBIDITY: A REVIEW OF CURRENT EVIDENCE
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DOI	https://doi.org/10.31435/ijitss.3(51).2026.6568
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RECEIVED	02 August 2026
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ACCEPTED	25 September 2026
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PUBLISHED	28 September 2026
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ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND PSYCHIATRIC COMORBIDITY: A REVIEW OF CURRENT EVIDENCE

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ABSTRACT

Background: Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder that frequently persists into adulthood and is associated with substantial psychiatric comorbidity. Co-occurring mental disorders may complicate diagnosis, worsen functional impairment, and negatively affect treatment outcomes.

Objective: This review aimed to summarize and critically analyze current evidence regarding the coexistence of ADHD and other psychiatric disorders in adults, with particular emphasis on depressive disorders, anxiety disorders, bipolar disorder, substance use disorders, sleep disorders, and autism spectrum disorder.

Methods: A comprehensive literature search was conducted using PubMed, the NCBI database, and peer-reviewed biomedical journals. Publications from database inception through July 2025 were considered, with particular emphasis on studies published during the preceding ten years. Systematic reviews, meta-analyses, population-based studies, and longitudinal cohorts were prioritized. The review focused on the prevalence, clinical characteristics, potential shared mechanisms, prognostic implications, and treatment considerations associated with psychiatric comorbidity in adult ADHD.

Results: Psychiatric comorbidity was identified as a frequent characteristic of adult ADHD, with approximately 60–80% of adults experiencing at least one additional psychiatric disorder during their lifetime. Depressive and anxiety disorders were among the most prevalent comorbidities and were associated with greater functional impairment and reduced quality of life. Bipolar disorder presented important diagnostic challenges due to overlapping symptoms, while substance use disorders were associated with poorer psychosocial outcomes and increased treatment complexity. Sleep disorders were highly prevalent and appeared to interact bidirectionally with ADHD symptoms. The frequent co-occurrence of ADHD and autism spectrum disorder further supports shared neurodevelopmental mechanisms. Emotional dysregulation and executive dysfunction emerged as potential transdiagnostic factors contributing to psychiatric vulnerability.

Conclusions: Adult ADHD should be considered a complex, multidimensional disorder that rarely occurs in isolation. Comprehensive assessment of psychiatric comorbidity and integrated, individualized treatment are essential to improve clinical outcomes and quality of life.

KEYWORDS

ADHD, Psychiatric Comorbidity, Depressive Disorders, Anxiety Disorders, Substance Use Disorders, Sleep Disorders

CITATION

Glanert, W., Bajer, J. M., Włodarczyk, A., Kulawinek, H., Obersztyn, J., Kasperek, K. M., Czech, M., Kasperek, G., Szczecińska, A., Mliczek, A., & Mrozek, P. (2026). Attention-deficit/hyperactivity disorder and psychiatric comorbidity: A review of current evidence. *International Journal of Innovative Technologies in Social Science*, 3(51). [https://doi.org/10.31435/ijitss.3\(51\).2026.6568](https://doi.org/10.31435/ijitss.3(51).2026.6568)

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Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with daily functioning and development. Although traditionally considered a childhood condition, ADHD frequently persists into adulthood and remains associated with substantial psychosocial impairment. Current estimates suggest that ADHD affects approximately 5–7% of children and adolescents worldwide and around 2–5% of adults, although the true prevalence is likely higher due to underdiagnosis, particularly among adults. (American Psychiatric Association, 2022; Simon V, et al., 2009; Song P et al., 2021)

Adult patients often seek psychiatric care because of symptoms related to other mental disorders rather than ADHD itself. Consequently, ADHD may remain unrecognized for years, with the diagnosis being established only during a comprehensive psychiatric assessment. Retrospective evaluation frequently reveals the presence of childhood symptoms consistent with ADHD, supporting the developmental nature of the disorder. (Kooij JJS et al., 2019)

A growing body of evidence indicates that ADHD commonly co-occurs with other psychiatric conditions, including depressive disorders, anxiety disorders, bipolar disorder, substance use disorders, sleep disorders, and autism spectrum disorder. Epidemiological studies suggest that approximately 60–80% of adults with ADHD experience at least one additional psychiatric disorder during their lifetime. (Katzman MA et al.,

2017; Kooij JJS et al., 2019) The presence of psychiatric comorbidity is associated with greater symptom severity, poorer treatment outcomes, increased functional impairment, and reduced quality of life.(Katzman MA et al., 2017; Kooij JJS et al., 2019; Roh HJ et al., 2023)

The aim of this review is to summarize and critically analyze current evidence regarding the coexistence of ADHD and other psychiatric disorders in adults, with particular emphasis on depressive disorders, anxiety disorders, bipolar disorder, substance use disorders, sleep disorders, and autism spectrum disorder.

Methodology

A comprehensive literature review was conducted to identify current evidence regarding the comorbidity of attention-deficit/hyperactivity disorder (ADHD) with other psychiatric disorders in adults. The primary sources of scientific literature included PubMed, the National Center for Biotechnology Information (NCBI) database, and peer-reviewed journals indexed in major biomedical databases.

The literature search covered publications from database inception through July 2025. Particular emphasis was placed on studies published within the last ten years in order to reflect contemporary knowledge and current diagnostic concepts. However, older landmark studies were also included when considered essential for understanding the development of research in this field.

Search terms included combinations of the following keywords: “adult ADHD,” “attention-deficit/hyperactivity disorder,” “psychiatric comorbidity,” “depressive disorders,” “anxiety disorders,” “bipolar disorder,” “substance use disorders,” “sleep disorders,” “autism spectrum disorder,” “etiology,” and “treatment.” Boolean operators (AND, OR) were used to optimize the search strategy.

Priority was given to systematic reviews, meta-analyses, large population-based studies, and longitudinal cohort studies. Only articles published in English were included. Studies focusing exclusively on pediatric populations were excluded unless they provided relevant information regarding the persistence of ADHD symptoms and psychiatric comorbidity into adulthood. Particular attention was paid to studies examining prevalence estimates, risk factors, clinical outcomes, and treatment implications of psychiatric comorbidity in adult ADHD populations.

The final review included the most relevant publications identified through the search process, allowing for a comprehensive evaluation of current evidence concerning psychiatric comorbidity in adults with ADHD.

Results

Definition and Diagnostic Criteria of ADHD

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by persistent patterns of inattention and/or hyperactivity-impulsivity that interfere with functioning or development. Although symptoms typically emerge during childhood, ADHD is now recognized as a lifespan disorder that frequently persists into adulthood. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) classifies ADHD into three clinical presentations: predominantly inattentive presentation, predominantly hyperactive-impulsive presentation, and combined presentation. Diagnosis in adults requires the presence of at least five symptoms of inattention and/or hyperactivity-impulsivity for a minimum of six months, with several symptoms having been present before the age of 12 years and causing impairment in at least two settings, such as work, education, or social relationships. (American Psychiatric Association, 2022; Koutsoklenis A & Honkasilta J, 2023; Talarowska M, et al., 2025)

The International Classification of Diseases, 11th Revision (ICD-11), similarly recognizes ADHD as a neurodevelopmental disorder characterized by developmentally inappropriate levels of inattention, hyperactivity, and impulsivity. Both classification systems emphasize the chronic nature of the disorder and the requirement for clinically significant functional impairment.(Koutsoklenis A & Honkasilta J, 2023; Talarowska M, et al., 2025).

Clinical Presentation in Adults

The clinical manifestation of ADHD changes throughout the lifespan. While overt hyperactivity is often prominent during childhood, adults more commonly experience internal restlessness, difficulties with attention regulation, impaired executive functioning, disorganization, forgetfulness, procrastination, and poor time management. Emotional dysregulation, although not included among the core diagnostic criteria, is frequently reported and may contribute substantially to functional impairment. Adults with ADHD often experience academic difficulties, occupational instability, interpersonal conflicts, financial problems, and reduced quality of life.(American Psychiatric Association, 2022; Bogdańska-Chomczyk E, et al., 2025; Katzman MA et al., 2017)

Adult ADHD is also associated with increased risk-taking behaviors, impaired decision-making, and difficulties maintaining long-term relationships. These impairments frequently contribute to psychological distress and may increase vulnerability to the development of additional psychiatric disorders.(Cabral MDI et al., 2020; Katzman MA et al., 2017)

Epidemiology

ADHD is one of the most common neurodevelopmental disorders worldwide. The prevalence among children and adolescents is estimated at approximately 5–7%, whereas adult prevalence varies depending on diagnostic methodology and population characteristics. A large global meta-analysis estimated the prevalence of persistent adult ADHD at 2.58%, while symptomatic adult ADHD was estimated at 6.76%, corresponding to more than 360 million affected individuals worldwide.(Song P et al., 2021)

Despite its high prevalence, ADHD remains substantially underdiagnosed in adults. Many individuals are first referred for assessment because of symptoms related to depression, anxiety, substance misuse, or other psychiatric conditions, while the underlying ADHD remains unrecognized. This diagnostic delay may contribute to poorer psychosocial outcomes and increased psychiatric burden.(Fu X, et al., 2025; Katzman MA et al., 2017)

Definition of Psychiatric Comorbidity

Psychiatric comorbidity refers to the coexistence of two or more mental disorders within the same individual. In ADHD, comorbidity may arise from shared genetic and neurobiological mechanisms, overlapping symptom profiles, common environmental risk factors, or the secondary consequences of chronic functional impairment. The presence of comorbid disorders often complicates the diagnostic process because symptoms of ADHD may overlap with those of mood, anxiety, personality, or substance use disorders.(Katzman MA et al., 2017; Ohnishi T, et al., 2019)

The concept of psychiatric comorbidity is particularly important in adult ADHD because co-occurring disorders frequently influence symptom severity, treatment response, prognosis, and overall quality of life. Accurate identification of comorbid conditions is therefore essential for effective clinical management.(Katzman MA et al., 2017)

Overall Prevalence of Comorbid Disorders in Adults with ADHD

Psychiatric comorbidity is the rule rather than the exception among adults with ADHD. Epidemiological studies consistently demonstrate that approximately 60–80% of adults with ADHD experience at least one additional psychiatric disorder during their lifetime.(Choi WS et al., 2022; Fu X, et al., 2025; Katzman MA et al., 2017)

The most commonly reported comorbid conditions include depressive disorders, anxiety disorders, bipolar disorder, substance use disorders, sleep disorders, and personality disorders. A systematic review by Choi et al. found that substance use disorders, mood disorders, anxiety disorders, and personality disorders occurred significantly more frequently among individuals with ADHD than among non-ADHD populations.¹⁰ Similarly, large population-based studies have reported that nearly half of adults with ADHD meet criteria for an anxiety disorder, while mood disorders affect more than one-third of patients.(Ohnishi T, et al., 2019)

The coexistence of psychiatric disorders is associated with greater functional impairment, increased healthcare utilization, poorer treatment adherence, and worse long-term outcomes compared with ADHD alone. Consequently, assessment of psychiatric comorbidity should constitute an integral component of the diagnostic evaluation of every adult patient with ADHD.(Katzman MA et al., 2017; Ohnishi T, et al., 2019).

ADHD and Depressive Disorders

Depressive disorders represent one of the most common psychiatric comorbidities observed in adults with attention-deficit/hyperactivity disorder (ADHD). Numerous epidemiological and clinical studies have demonstrated that individuals with ADHD are at substantially increased risk of developing major depressive disorder (MDD) and other depressive conditions compared with the general population. The coexistence of ADHD and depression is associated with greater symptom severity, increased functional impairment, poorer treatment outcomes, and elevated risk of suicidal behavior.(Katzman MA et al., 2017; Meinzer MC, et al., 2014; Fu X, et al., 2025)

The relationship between ADHD and depressive disorders appears to be multifactorial. Shared genetic susceptibility, overlapping neurobiological mechanisms, and common environmental risk factors have all been proposed as contributing factors. Dysregulation of dopaminergic and noradrenergic neurotransmission, which plays a central role in ADHD pathophysiology, has also been implicated in the development of depressive symptoms. Furthermore, chronic academic, occupational, and interpersonal difficulties associated with untreated ADHD may contribute to low self-esteem, feelings of failure, and subsequent depressive episodes.(Faraone SV & Larsson H, 2019; Kooij JJS et al., 2019)

Several large-scale studies have reported significantly higher rates of depression among adults with ADHD. A systematic review by Choi et al. found that mood disorders were consistently more prevalent in individuals with ADHD than in non-ADHD populations across multiple countries and study designs.(Choi WS et al., 2022) Similarly, Katzman et al. reported that lifetime prevalence estimates of depressive disorders in adults with ADHD range from approximately 18% to over 50%, depending on the population studied and diagnostic criteria used.(Katzman MA et al., 2017) More recently, Fu et al. highlighted that adults with ADHD exhibit substantially increased rates of depressive symptoms and major depressive disorder, with the coexistence of both conditions contributing to greater psychosocial dysfunction and lower quality of life.(Fu X, et al., 2025)

Recent evidence suggests that the association between ADHD and depressive disorders extends beyond simple coexistence and may reflect a bidirectional relationship. A population-based study conducted by Chen et al. demonstrated that adults with ADHD exhibited significantly higher rates of mood disorders compared with the general population, highlighting the substantial psychiatric burden associated with the disorder.(Chen Q et al., 2018) Furthermore, a review by Riglin et al. suggested that ADHD may represent an independent risk factor for the subsequent development of depression, with both conditions sharing genetic and environmental determinants.(Riglin L et al., 2021) These findings support the hypothesis that ADHD and depression may arise, at least in part, from common underlying neurobiological pathways.

The clinical presentation of comorbid ADHD and depression may pose significant diagnostic challenges. Symptoms such as impaired concentration, reduced motivation, psychomotor slowing, irritability, and executive dysfunction can occur in both disorders, making differential diagnosis difficult. However, unlike depression, ADHD symptoms typically originate in childhood and demonstrate a chronic course across multiple life domains. Careful assessment of developmental history is therefore essential for distinguishing primary ADHD from cognitive symptoms secondary to depressive illness.(American Psychiatric Association, 2022; Katzman MA et al., 2017)

The coexistence of ADHD and depression has important implications for prognosis and treatment. Studies indicate that patients with both disorders experience greater functional impairment than individuals diagnosed with either condition alone. Comorbidity has been associated with poorer academic achievement, reduced occupational performance, increased healthcare utilization, and diminished social functioning. Moreover, several investigations have identified a significantly increased risk of suicidal ideation, suicide attempts, and self-harm behaviors among individuals with comorbid ADHD and depressive disorders.(Balázs J & Keresztény Á., 2017; Furczyk K & Thome J, 2014; Meinzer MC, et al., 2014)

Particularly concerning is the elevated risk of suicidal behavior observed in individuals presenting with both conditions. The presence of ADHD-related impulsivity, emotional dysregulation, and executive dysfunction may amplify vulnerability to self-harm and suicidal acts. A systematic review by Balázs and Keresztény concluded that ADHD is consistently associated with increased suicidality across different age groups and clinical populations.(Balázs J & Keresztény Á., 2017) Similarly, Furczyk and Thome emphasized that comorbid depression may further increase suicide risk in adults with ADHD, underscoring the need for careful psychiatric assessment and monitoring.(Furczyk K & Thome J, 2014)

From a therapeutic perspective, recognition of both conditions is crucial for achieving optimal treatment outcomes. Evidence suggests that untreated ADHD may reduce the effectiveness of depression treatment and increase the likelihood of recurrent depressive episodes. Current clinical recommendations emphasize comprehensive assessment and individualized treatment strategies that address both disorders simultaneously. Depending on symptom severity and clinical presentation, treatment may involve stimulant or non-stimulant ADHD medications, antidepressant pharmacotherapy, psychotherapy, or a combination of these approaches. (American Psychiatric Association, 2022; Fu X, et al., 2025; Katzman MA et al., 2017)

Emerging evidence also indicates that effective treatment of ADHD may reduce the long-term risk of depressive symptoms and improve overall psychosocial functioning. In a nationwide longitudinal cohort study involving more than 38,000 individuals with ADHD, Chang et al. found that pharmacological treatment was associated with a significantly lower risk of subsequent depression compared with periods when patients were not receiving medication. (Chang Z et al., 2016) These findings suggest that early recognition and treatment of ADHD may have preventive effects extending beyond the core symptoms of the disorder and may contribute to improved psychiatric outcomes throughout adulthood.

Taken together, current evidence indicates that depressive disorders are among the most prevalent and clinically significant comorbidities of adult ADHD. Their coexistence is associated with greater functional impairment, increased suicide risk, and poorer long-term outcomes, underscoring the importance of early diagnosis and integrated treatment strategies.

ADHD and Anxiety Disorders

Anxiety disorders constitute one of the most prevalent psychiatric comorbidities in adults with attention-deficit/hyperactivity disorder (ADHD). The association between ADHD and anxiety has been consistently demonstrated across epidemiological, clinical, and neurobiological studies, with prevalence rates of anxiety disorders among adults with ADHD substantially exceeding those observed in the general population. The coexistence of these conditions is clinically significant, as it is associated with increased symptom burden, greater functional impairment, poorer quality of life, and more complex treatment requirements. (Choi WS et al., 2022; Fu X, et al., 2025; Katzman MA et al., 2017)

Current evidence suggests that approximately 40–60% of adults with ADHD meet diagnostic criteria for at least one anxiety disorder during their lifetime, compared with an estimated lifetime prevalence of approximately 15–20% in the general adult population. (Katzman MA et al., 2017; Kessler RC et al., 2006) Anxiety disorders commonly associated with ADHD include generalized anxiety disorder (GAD), social anxiety disorder (SAD), panic disorder, agoraphobia, and specific phobias. Among these, generalized anxiety disorder and social anxiety disorder appear to be the most frequently reported. (Fu X, et al., 2025; Simon V, et al., 2009)

The relationship between ADHD and anxiety disorders is complex and likely multifactorial. Several mechanisms have been proposed to explain this association, including shared genetic vulnerability, overlapping neurobiological pathways, and the cumulative psychosocial consequences of living with untreated ADHD. Twin and family studies indicate that both disorders exhibit moderate heritability and may share common genetic risk factors affecting emotional regulation, executive functioning, and stress responsiveness. (Faraone SV & Larsson H, 2019) In addition, neuroimaging studies have identified abnormalities in frontostriatal and frontolimbic circuits in both ADHD and anxiety disorders, suggesting partially overlapping neural substrates. (Cortese S et al., 2012)

Psychological and environmental factors may further contribute to the development of anxiety symptoms in individuals with ADHD. Persistent difficulties in academic, occupational, and social functioning often expose affected individuals to repeated experiences of failure, criticism, and interpersonal conflict. Over time, these experiences may promote excessive worry, anticipatory anxiety, avoidance behaviors, and reduced self-efficacy. Consequently, anxiety symptoms may emerge as secondary complications of chronic ADHD-related impairment rather than as entirely independent psychiatric conditions. (Katzman MA et al., 2017; Kooij JJS et al., 2019)

The presence of anxiety disorders may significantly alter the clinical presentation of ADHD. While ADHD is typically characterized by impulsivity and behavioral disinhibition, comorbid anxiety may lead to increased caution, avoidance, indecisiveness, and perfectionistic tendencies. In some patients, anxiety symptoms partially mask ADHD manifestations, contributing to delayed diagnosis and underrecognition of the underlying neurodevelopmental disorder. Conversely, symptoms such as restlessness, concentration

difficulties, sleep disturbances, and irritability overlap substantially between ADHD and anxiety disorders, creating important diagnostic challenges.(American Psychiatric Association, 2022; Fu X, et al., 2025)

Several large-scale epidemiological studies have quantified the magnitude of this association. In a systematic review of psychiatric comorbidities in adult ADHD, Choi et al. reported significantly elevated odds of anxiety disorders among individuals with ADHD compared with non-ADHD populations across multiple countries and study settings.(Choi WS et al., 2022) Similarly, Katzman et al. identified anxiety disorders as one of the most common psychiatric comorbidities encountered in clinical practice, with prevalence estimates frequently exceeding 50% in treatment-seeking adult populations.(Katzman MA et al., 2017)

Recent evidence further supports the clinical importance of this relationship. Fu et al. emphasized that adults with ADHD and comorbid anxiety exhibit greater overall psychopathology, lower psychosocial functioning, and poorer health-related quality of life than individuals diagnosed with ADHD alone.(Fu X, et al., 2025) Furthermore, patients with both conditions frequently present with more severe emotional dysregulation, increased levels of perceived stress, and higher rates of depressive symptoms, suggesting substantial interaction between anxiety, mood disturbances, and ADHD symptomatology.(Fu X, et al., 2025; Ohnishi T, et al., 2019)

The coexistence of ADHD and anxiety disorders has important implications for treatment. Historically, concerns existed regarding the potential exacerbation of anxiety symptoms by stimulant medications. However, contemporary evidence indicates that stimulant treatment is generally well tolerated in patients with comorbid anxiety and may lead to improvements in both ADHD symptoms and anxiety-related impairment when ADHD is adequately managed.(Katzman MA et al., 2017; Sobanski E., 2006) Current clinical guidelines recommend comprehensive assessment of both disorders and individualized treatment planning based on symptom severity and functional consequences. Cognitive-behavioral therapy (CBT), psychoeducation, and pharmacological interventions may be used either alone or in combination depending on the patient's clinical presentation.(American Psychiatric Association, 2022; Sobanski E., 2006)

Emerging research has also highlighted the role of emotional dysregulation as a potential mediator linking ADHD and anxiety disorders. Emotional dysregulation, characterized by excessive emotional reactivity, poor frustration tolerance, and impaired emotional control, is highly prevalent among adults with ADHD and has been associated with increased risk of anxiety, depression, and other psychiatric conditions.(Shaw P et al., 2014) Some authors have proposed that emotional dysregulation may represent a transdiagnostic mechanism contributing to the high rates of psychiatric comorbidity observed in adult ADHD.(O et al., 2019; Shaw P et al., 2014)

Overall, anxiety disorders represent one of the most frequent and clinically significant comorbidities in adults with ADHD. Their coexistence is associated with increased psychopathological burden, greater functional impairment, and more complicated diagnostic and therapeutic processes. Recognition of anxiety symptoms in adults with ADHD is therefore essential for optimizing treatment outcomes and improving long-term quality of life.

ADHD and Substance Use Disorders

Substance use disorders (SUDs) are among the most prevalent and clinically significant comorbidities observed in adults with attention-deficit/hyperactivity disorder (ADHD). The association between ADHD and problematic substance use has been consistently demonstrated across epidemiological, clinical, and longitudinal studies. Individuals with ADHD are at substantially increased risk of initiating substance use at an earlier age, progressing more rapidly to problematic use, and developing substance dependence compared with the general population.(Choi WS et al., 2022; Katzman MA et al., 2017; van Emmerik-van Oortmerssen K et al., 2012) The coexistence of ADHD and SUD is associated with poorer psychosocial functioning, increased psychiatric burden, reduced treatment adherence, and worse long-term outcomes.

Current evidence indicates that ADHD is significantly overrepresented among individuals receiving treatment for substance use disorders. Meta-analytic studies estimate that approximately 20–25% of adults undergoing treatment for SUD meet diagnostic criteria for ADHD, a prevalence several times higher than that observed in the general adult population.(van de Glind G, et al., 2014) Conversely, adults with ADHD exhibit markedly elevated rates of alcohol use disorder, nicotine dependence, cannabis use disorder, stimulant misuse, and polysubstance use.(Choi WS et al., 2022; Ohlmeier MD et al., 2008)

The relationship between ADHD and substance use disorders is multifactorial and likely reflects the interaction of neurobiological, genetic, psychological, and environmental factors. Dysregulation of dopaminergic reward pathways is considered a central mechanism underlying both disorders. Neurobiological models suggest that reduced dopaminergic activity within mesocorticolimbic circuits may contribute to impaired reward processing, increased sensation-seeking behavior, and heightened vulnerability to substance use as a form of behavioral compensation.(Koob GF & Volkow ND, 2016; Sullivan MA, & Rudnik-Levin F. Attention, 2001)

Genetic studies further support the existence of shared biological susceptibility. ADHD and SUD demonstrate moderate genetic correlations, with several risk loci implicated in neurotransmitter regulation, impulsivity, and reward sensitivity.(Faraone SV & Larsson H, 2019) In addition, executive dysfunction, impaired inhibitory control, delay aversion, and emotional dysregulation—core features of ADHD—may predispose affected individuals to experimentation with psychoactive substances and difficulties maintaining abstinence.(Shaw P et al., 2014)

Several longitudinal studies have demonstrated that ADHD is associated not only with higher rates of substance use disorders but also with an earlier onset of substance-related problems. Lee et al., in a meta-analysis of prospective studies, reported that childhood ADHD significantly increased the risk of nicotine dependence, alcohol abuse, cannabis use disorders, and other illicit drug use during adolescence and adulthood.(Lee SS et al., 2011) Individuals with ADHD were found to initiate smoking earlier, develop nicotine dependence more rapidly, and experience greater difficulty achieving long-term smoking cessation compared with non-ADHD controls.(Groenman AP et al., 2017)

Among all substances, nicotine appears to exhibit one of the strongest associations with ADHD. Epidemiological studies have consistently reported smoking rates that are two to three times higher among adults with ADHD than in the general population.(Pomerleau OF et al., 1995) One proposed explanation is the self-medication hypothesis, according to which nicotine temporarily improves attention, arousal, and executive functioning through stimulation of dopaminergic and cholinergic neurotransmission. Although this mechanism may contribute to increased tobacco use, evidence suggests that nicotine ultimately worsens long-term health outcomes and does not adequately address core ADHD symptoms.(Gehricke JG et al., 2011)

Alcohol use disorders are also highly prevalent among individuals with ADHD. Research indicates that adults with ADHD are more likely to engage in binge drinking, develop alcohol dependence, and experience alcohol-related social and occupational consequences.(Choi WS et al., 2022) Similarly, cannabis use disorder has emerged as a particularly important clinical concern. Recent studies suggest that individuals with ADHD not only exhibit increased rates of cannabis use but may also be more vulnerable to adverse cognitive effects associated with chronic cannabis exposure, including impairments in attention, memory, and executive functioning.(Bidwell LC et al., 2014)

The coexistence of ADHD and SUD has important implications for diagnosis. Active substance use may mimic or exacerbate symptoms of ADHD, including inattention, impulsivity, emotional instability, and executive dysfunction. Conversely, ADHD symptoms may be mistakenly attributed solely to substance use, leading to underdiagnosis of the underlying neurodevelopmental disorder. Current guidelines therefore emphasize the importance of obtaining a detailed developmental history and, whenever possible, evaluating symptoms during periods of sustained abstinence.(Kooij JJS et al., 2019)

Comorbid SUD is associated with a more severe clinical course of ADHD. Studies have reported higher rates of psychiatric hospitalization, unemployment, criminal behavior, interpersonal difficulties, and treatment discontinuation among patients presenting with both conditions.(Choi WS et al., 2022; Katzman MA et al., 2017) Furthermore, the coexistence of ADHD and substance use disorders has been associated with increased rates of mood disorders, anxiety disorders, antisocial personality disorder, and suicidal behavior, suggesting a cumulative effect of multiple psychiatric comorbidities.(Ohnishi T, et al., 2019)

Historically, clinicians expressed concerns regarding the use of stimulant medications in individuals with ADHD and concurrent substance misuse because of the potential risk of abuse and diversion. However, contemporary evidence indicates that appropriately prescribed stimulant treatment does not increase the risk of developing substance use disorders and may, in some cases, reduce long-term substance-related outcomes. A large population-based study by Chang et al. demonstrated that ADHD medication was associated with a significant reduction in criminality and substance-related adverse outcomes.(Chang Z et al., 2016) Similarly, several systematic reviews have concluded that effective treatment of ADHD may decrease the risk of substance misuse by improving executive functioning, impulse control, and psychosocial adjustment.(Cunill R et al., 2015)

Current treatment recommendations emphasize integrated management of both disorders. Optimal care typically combines pharmacotherapy, cognitive-behavioral interventions, motivational interviewing, psychoeducation, and relapse prevention strategies. Treatment plans should address both ADHD symptoms and substance-related behaviors simultaneously, as failure to recognize one condition may negatively affect outcomes for the other.(Cunill R et al., 2015; Kooij JJS et al., 2019)

Overall, substance use disorders represent one of the most common and clinically consequential comorbidities in adults with ADHD. The association is supported by robust epidemiological, genetic, neurobiological, and longitudinal evidence. Given the substantial impact of this comorbidity on prognosis, functioning, and treatment response, routine screening for substance use disorders should be considered an essential component of ADHD assessment and management in adult populations.

ADHD and Bipolar Disorder

Bipolar disorder (BD) is among the most clinically significant psychiatric comorbidities associated with attention-deficit/hyperactivity disorder (ADHD). The coexistence of these disorders has attracted considerable research interest because of their overlapping symptomatology, shared neurobiological mechanisms, and substantial impact on clinical outcomes. Comorbid ADHD and bipolar disorder are associated with earlier illness onset, increased symptom severity, poorer psychosocial functioning, higher rates of substance use, and greater risk of suicidal behavior compared with either disorder occurring alone.(Balázs J & Keresztény Á., 2017; Faraone SV & Larsson H, 2019; Instanes JT et al., 2018)

The relationship between ADHD and bipolar disorder is complex and remains the subject of ongoing investigation. Both conditions are characterized by impairments in attention, emotional regulation, impulsivity, and executive functioning. As a result, differentiating between ADHD and bipolar disorder may be challenging, particularly during the diagnostic assessment of adults. Symptoms such as distractibility, excessive talkativeness, psychomotor agitation, and impulsive behavior may occur in both disorders. However, an important distinction is that ADHD symptoms are generally chronic and trait-like, whereas bipolar symptoms tend to occur episodically, with periods of mania, hypomania, or depression interspersed with relative euthymia.(Katzman MA et al., 2017; Kooij JJS et al., 2019)

Several studies suggest that ADHD and bipolar disorder share common genetic and neurobiological vulnerabilities. Family and twin studies have demonstrated significant genetic overlap between the two disorders, particularly in genes involved in dopaminergic neurotransmission, emotional regulation, and executive control.(Faraone SV & Larsson H, 2019) Neuroimaging studies have also identified abnormalities in frontostriatal, frontolimbic, and reward-processing networks in both ADHD and bipolar disorder, supporting the hypothesis of partially shared pathophysiological mechanisms.(Cortese S et al., 2012; Faraone SV & Larsson H, 2019)

Epidemiological research consistently demonstrates elevated rates of bipolar disorder among individuals with ADHD. A meta-analysis by Instanes et al. reported that ADHD is significantly overrepresented in patients with bipolar disorder compared with the general population.(Instanes JT et al., 2018) Similarly, a systematic review conducted by Faraone et al. estimated that approximately 10–20% of adults with ADHD meet criteria for bipolar spectrum disorders, while ADHD is present in approximately 15–25% of adults diagnosed with bipolar disorder.(Faraone SV & Larsson H, 2019; Wingo AP & Ghaemi SN., n.d.) Although prevalence estimates vary across studies due to methodological differences, the association remains consistently stronger than would be expected by chance alone.

The coexistence of ADHD and bipolar disorder has important implications for illness course and prognosis. Several longitudinal studies have demonstrated that patients with both disorders tend to experience an earlier onset of mood symptoms, more frequent mood episodes, greater psychiatric comorbidity, and increased functional impairment.(Balázs J & Keresztény Á., 2017; Perugi G & Vannucchi G, 2015) Comorbid ADHD has also been associated with higher rates of rapid cycling, mixed affective states, hospitalization, and treatment resistance in bipolar disorder.(Skirrow C et al., 2012)

One of the most clinically relevant aspects of this comorbidity is its impact on suicide risk. Both ADHD and bipolar disorder independently increase the likelihood of suicidal ideation and suicide attempts. When these disorders coexist, the risk appears to be even greater. A large body of evidence suggests that impulsivity, emotional dysregulation, and recurrent depressive episodes may contribute to elevated suicidality in this patient population.(Balázs J & Keresztény Á., 2017; Furczyk K & Thome J, 2014) Therefore, careful assessment of suicidal risk should be considered an essential component of clinical evaluation.

Diagnostic challenges are common in patients presenting with symptoms suggestive of both ADHD and bipolar disorder. Misdiagnosis may occur in either direction. Chronic emotional instability associated with ADHD may be mistaken for bipolar disorder, whereas episodic hypomanic symptoms may be overlooked and attributed solely to ADHD. Experts therefore emphasize the importance of obtaining a detailed developmental and longitudinal psychiatric history, with particular attention to symptom onset, temporal course, and family psychiatric history.(Katzman MA et al., 2017; Kooij JJS et al., 2019)

The presence of bipolar disorder significantly influences treatment strategies in patients with ADHD. Current clinical guidelines recommend that mood stabilization should be prioritized before initiating pharmacological treatment for ADHD. This recommendation is based on concerns that stimulant medications may potentially precipitate or exacerbate manic symptoms in vulnerable individuals. However, recent evidence suggests that once mood stability has been achieved through appropriate treatment with mood stabilizers or atypical antipsychotics, ADHD medications can often be introduced safely and effectively under close clinical supervision.(Altınbaş K., 2021; Kooij JJS et al., 2019)

A review by Nierenberg et al. highlighted that untreated ADHD may contribute substantially to persistent functional impairment in patients with bipolar disorder, even when mood symptoms are adequately controlled.(Nierenberg AA et al., 2005) Consequently, comprehensive treatment approaches addressing both disorders are increasingly recognized as essential for optimizing long-term outcomes. Multimodal management typically involves pharmacotherapy, psychoeducation, cognitive-behavioral interventions, and psychosocial support aimed at improving executive functioning, emotional regulation, and occupational performance.(Kooij JJS et al., 2019)

Overall, bipolar disorder represents one of the most challenging psychiatric comorbidities encountered in adults with ADHD. The substantial overlap in symptomatology, shared biological vulnerabilities, and adverse effects on prognosis underscore the importance of accurate diagnosis and integrated treatment. Early identification of comorbid bipolar disorder may improve clinical outcomes, reduce functional impairment, and decrease the risk of severe psychiatric complications, including suicidality.

ADHD and Sleep Disorders

Sleep disorders represent one of the most common yet frequently underrecognized comorbidities in adults with attention-deficit/hyperactivity disorder (ADHD). Growing evidence suggests that sleep disturbances are not merely secondary consequences of ADHD symptoms but may constitute an integral component of the disorder's pathophysiology. Adults with ADHD report significantly higher rates of insomnia, delayed sleep phase syndrome, circadian rhythm disturbances, excessive daytime sleepiness, restless legs syndrome, sleep-disordered breathing, and poor overall sleep quality compared with individuals without ADHD.(Bijlenga D et al., 2019; Coogan AN et al., 2016; Díaz-Román A et al., 2018) The coexistence of ADHD and sleep disorders is associated with increased symptom severity, impaired cognitive functioning, emotional dysregulation, and reduced quality of life.

The relationship between ADHD and sleep disturbances appears to be bidirectional. On one hand, core ADHD symptoms such as hyperactivity, restlessness, racing thoughts, and emotional dysregulation may interfere with sleep initiation and maintenance. On the other hand, chronic sleep deprivation and disrupted sleep architecture can exacerbate attention deficits, executive dysfunction, impulsivity, and emotional instability, thereby worsening ADHD symptomatology.(Becker SP, 2020) This reciprocal interaction may contribute to a self-perpetuating cycle of sleep impairment and daytime dysfunction.

Epidemiological studies consistently demonstrate a high prevalence of sleep-related problems among adults with ADHD. A systematic review by Bijlenga et al. reported that approximately 60–80% of adults with ADHD experience clinically significant sleep disturbances, a prevalence substantially higher than that observed in the general population.(Bijlenga D et al., 2019) Similarly, Brevik et al. found that adults with ADHD exhibited significantly poorer subjective sleep quality, longer sleep latency, shorter sleep duration, and greater daytime sleepiness compared with healthy controls.(Brevik EJ et al., 2017)

Insomnia is the most frequently reported sleep disorder in adults with ADHD. Difficulties initiating sleep, frequent nocturnal awakenings, and non-restorative sleep are commonly described in both clinical and community-based samples. Several studies suggest that insomnia symptoms affect more than half of adults diagnosed with ADHD.(Bijlenga D et al., 2019; Instanes JT et al., 2018) Sleep-onset insomnia appears

particularly common and may be related to increased evening cognitive activity, emotional arousal, and delayed circadian rhythms.(Hvolby A, 2015)

Circadian rhythm disturbances have emerged as a particularly important area of research. Adults with ADHD frequently demonstrate a delayed chronotype, characterized by later sleep onset, delayed melatonin secretion, and difficulty awakening in the morning. Some investigators have proposed that ADHD may involve alterations in circadian regulation, potentially mediated by abnormalities in clock genes, dopaminergic neurotransmission, and melatonin pathways.(Bijlenga D et al., 2013; Coogan AN et al., 2016) This hypothesis is supported by findings showing delayed dim-light melatonin onset and increased prevalence of delayed sleep-wake phase disorder among individuals with ADHD.(Bijlenga D et al., 2013)

Restless legs syndrome (RLS) and periodic limb movement disorder have also been reported more frequently in individuals with ADHD than in the general population. Shared dopaminergic dysfunction has been proposed as a possible neurobiological link between these disorders.(Cortese S et al., 2005) In addition, iron deficiency—implicated in both ADHD and RLS—may contribute to the observed association.(Konofal E et al., 2004)

Another clinically relevant comorbidity is obstructive sleep apnea (OSA). Although traditionally associated with obesity and advancing age, growing evidence suggests that sleep-disordered breathing may contribute to attentional deficits, executive dysfunction, and daytime fatigue in adults with ADHD.(Youssef NA, et al., 2011) Symptoms of OSA may overlap substantially with ADHD manifestations, potentially complicating differential diagnosis. Consequently, screening for sleep-disordered breathing should be considered in adults presenting with treatment-resistant ADHD symptoms, excessive daytime sleepiness, or significant fatigue.(Surman CBH, et al., 2006; Youssef NA, et al., 2011)

The coexistence of ADHD and sleep disorders has important implications for cognitive and emotional functioning. Sleep disturbances have been associated with worsening attention deficits, impaired working memory, reduced processing speed, and greater emotional dysregulation.(Becker SP, 2020; Shaw P et al., 2014) Several studies have demonstrated that poor sleep quality predicts increased severity of ADHD symptoms independent of other psychiatric comorbidities.(Díaz-Román A et al., 2018) Furthermore, chronic sleep disturbances may contribute to the development of depression, anxiety disorders, and substance use disorders, thereby amplifying the overall psychiatric burden experienced by affected individuals.(Accardo JA, et al., 2012)

Pharmacological treatment of ADHD may influence sleep in both positive and negative ways. Historically, stimulant medications were believed to worsen insomnia because of their activating properties. However, contemporary research suggests a more nuanced relationship. While some patients experience sleep difficulties during treatment, others demonstrate improved sleep quality as a result of better daytime symptom control, reduced evening hyperactivity, and enhanced emotional regulation.(Kooij JJS et al., 2019) The effects of medication appear to depend on individual factors, dosage, formulation, and timing of administration. Non-stimulant medications such as atomoxetine and guanfacine may represent useful alternatives for selected patients experiencing significant sleep-related adverse effects.(Faraone SV & Larsson H, 2019; Kooij JJS et al., 2019)

Current clinical guidelines emphasize the importance of routine assessment of sleep in adults with ADHD. Evaluation should include sleep duration, sleep quality, circadian preferences, symptoms of insomnia, excessive daytime sleepiness, restless legs syndrome, and sleep-disordered breathing. Appropriate management may involve sleep hygiene interventions, cognitive-behavioral therapy for insomnia (CBT-I), chronotherapy, melatonin supplementation, treatment of underlying sleep disorders, and optimization of ADHD pharmacotherapy.(Bijlenga D et al., 2019; Faraone SV & Larsson H, 2019)

Overall, sleep disorders are highly prevalent among adults with ADHD and contribute significantly to functional impairment, cognitive difficulties, and emotional dysregulation. Increasing evidence suggests that sleep disturbances are not merely secondary manifestations of ADHD but may represent an important component of its clinical and neurobiological profile. Early recognition and treatment of sleep disorders may therefore improve both sleep-related outcomes and the overall management of ADHD.

ADHD and Autism Spectrum Disorder

The relationship between attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) has become one of the most intensively investigated topics in contemporary psychiatric research. Historically, diagnostic systems did not permit the simultaneous diagnosis of ADHD and ASD, leading to an underestimation of their coexistence. The publication of the DSM-5 in 2013 represented a major paradigm shift by formally allowing dual diagnosis, thereby facilitating extensive research into the epidemiology, genetics, neurobiology, and clinical implications of this comorbidity. (American Psychiatric Association, 2022) Current evidence indicates that ADHD and ASD frequently co-occur and share substantial genetic, neurodevelopmental, and cognitive overlap while remaining distinct clinical entities.

Autism spectrum disorder is a neurodevelopmental condition characterized by persistent deficits in social communication and social interaction, accompanied by restricted, repetitive patterns of behavior, interests, or activities. Although ADHD and ASD are classified as separate disorders, both are associated with atypical neurodevelopment, executive dysfunction, emotional dysregulation, sensory processing abnormalities, and impairments in adaptive functioning. (Antshel KM et al., 2016; Lord C et al., 2020) Increasing evidence supports the concept that ADHD and ASD may be better understood as overlapping dimensions within a broader neurodevelopmental continuum rather than completely independent diagnostic categories. (Rommelse NNJ et al., 2010)

Epidemiological studies consistently demonstrate high rates of comorbidity between ADHD and ASD. Meta-analyses estimate that approximately 30–50% of individuals with ASD meet diagnostic criteria for ADHD, while ASD traits are significantly overrepresented among individuals with ADHD compared with the general population. (Lai MC et al., 2019; Rong Y et al., 2021) In adult populations, prevalence estimates vary considerably due to methodological differences, but studies consistently report rates far exceeding those expected by chance alone. A large systematic review conducted by Antshel and Russo concluded that ADHD represents one of the most common psychiatric comorbidities observed in ASD across the lifespan. (Antshel KM & Russo N, 2019)

The remarkable degree of co-occurrence has prompted investigations into shared etiological mechanisms. Twin studies and genome-wide association studies (GWAS) have demonstrated substantial genetic correlations between ADHD and ASD. Recent molecular genetic research suggests that approximately 50–70% of genetic influences contributing to ADHD overlap with those implicated in ASD. (Ghirardi L et al., 2018; Ronald A, et al., 2008) Shared genetic variants have been identified in pathways involved in synaptic development, neuronal migration, dopamine signaling, glutamatergic neurotransmission, and cortical maturation. (Faraone SV & Larsson H, 2019) These findings support the hypothesis that both disorders arise, at least in part, from common neurodevelopmental vulnerabilities.

Neuroimaging studies provide additional evidence for overlapping pathophysiology. Structural and functional abnormalities involving frontostriatal, frontoparietal, and frontolimbic networks have been observed in both conditions. Individuals with ADHD and ASD demonstrate atypical connectivity within large-scale neural systems responsible for attention regulation, executive control, reward processing, and social cognition. (Ameis SH & Catani M, 2015; Cortese S et al., 2012) Nevertheless, important differences remain. While ADHD is more strongly associated with dysfunction within attentional and inhibitory control networks, ASD appears to involve greater impairment of neural systems underlying social cognition, theory of mind, and social communication. (Ameis SH & Catani M, 2015)

From a neuropsychological perspective, both disorders are characterized by deficits in executive functioning, although the specific cognitive profiles may differ. ADHD is typically associated with impairments in inhibitory control, sustained attention, working memory, and cognitive flexibility. In contrast, ASD is more commonly linked to difficulties in social cognition, cognitive rigidity, and information integration. (Craig F et al., 2016) Individuals with comorbid ADHD and ASD frequently demonstrate more severe executive dysfunction than those diagnosed with either condition alone, suggesting additive or synergistic effects of the two disorders. (Tye C et al., 2019)

The coexistence of ADHD and ASD is associated with substantial clinical complexity. Compared with individuals diagnosed with ASD alone, patients with comorbid ADHD often exhibit greater emotional dysregulation, increased impulsivity, more pronounced behavioral difficulties, and poorer adaptive functioning. (Leitner Y, 2014) Furthermore, several studies have reported higher rates of anxiety disorders, depressive disorders, sleep disturbances, and challenging behaviors among individuals presenting with both

diagnoses.(Lai MC et al., 2019) These findings indicate that ADHD symptoms may significantly contribute to overall functional impairment in ASD populations.

Particularly noteworthy is the role of emotional dysregulation as a potential transdiagnostic mechanism linking ADHD and ASD. Emotional dysregulation, characterized by excessive emotional reactivity, poor frustration tolerance, and difficulties modulating emotional responses, has been increasingly recognized as a core contributor to psychosocial impairment in both disorders.(Shaw P et al., 2014) Emerging evidence suggests that emotional dysregulation may partially mediate the association between ADHD symptoms and psychiatric comorbidity in individuals with ASD, thereby contributing to elevated rates of depression, anxiety, and self-injurious behaviors.(O et al., 2019)

The relationship between ADHD and ASD also has important implications for diagnostic assessment. Symptoms of inattention, social disengagement, communication difficulties, and executive dysfunction may overlap, increasing the risk of diagnostic overshadowing. In adults, these challenges are particularly pronounced because many individuals have developed compensatory strategies that partially mask core symptoms. Consequently, comprehensive assessment should incorporate developmental history, collateral information, standardized diagnostic instruments, and evaluation of both current and lifetime symptom patterns.(Kooij JJS et al., 2019)

Pharmacological management of ADHD symptoms in individuals with ASD remains an area of active investigation. Although stimulant medications are generally considered first-line treatment for ADHD, response rates among patients with co-occurring ASD may be lower than those observed in individuals with ADHD alone.(Antshel KM & Russo N, 2019) Nevertheless, multiple controlled trials have demonstrated that stimulant and non-stimulant medications can produce clinically meaningful improvements in attention, hyperactivity, and impulsivity in appropriately selected patients.(Rodrigues R, et al., 2020) Behavioral interventions, psychoeducation, social skills training, and cognitive-behavioral approaches may further enhance functional outcomes and quality of life.(Lord C et al., 2020)

Recent advances in psychiatric genetics and developmental neuroscience increasingly support a dimensional rather than categorical understanding of ADHD and ASD. The concept of a shared neurodevelopmental continuum has gained considerable attention, emphasizing overlapping biological mechanisms while acknowledging important disorder-specific features.(Faraone SV & Larsson H, 2019; Rommelse NNJ et al., 2010) This perspective may ultimately contribute to more individualized approaches to diagnosis and treatment, moving beyond traditional diagnostic boundaries toward precision psychiatry models based on underlying neurobiological characteristics.

In summary, ADHD and ASD exhibit one of the strongest and most extensively studied patterns of psychiatric comorbidity within neurodevelopmental psychiatry. Their coexistence reflects substantial overlap in genetic architecture, neurobiological mechanisms, and cognitive dysfunction, while simultaneously contributing to increased clinical complexity and functional impairment. Recognition of this comorbidity is essential for accurate diagnosis, individualized treatment planning, and optimization of long-term psychosocial outcomes.

Discussion

The present review demonstrates that psychiatric comorbidity is a fundamental characteristic of adult attention-deficit/hyperactivity disorder (ADHD) rather than an exception. Across all examined conditions—including depressive disorders, anxiety disorders, bipolar disorder, substance use disorders (SUDs), sleep disorders, and autism spectrum disorder (ASD)—individuals with ADHD consistently exhibited substantially higher prevalence rates than those observed in the general population. These findings support previous literature suggesting that approximately 60–80% of adults with ADHD experience at least one additional psychiatric disorder during their lifetime.(Choi WS et al., 2022; Katzman MA et al., 2017)

Among the comorbidities reviewed, depressive and anxiety disorders emerged as the most prevalent. The available evidence indicates that both conditions contribute significantly to functional impairment, reduced quality of life, and increased healthcare utilization.(Fu X, et al., 2025; Ohnishi T, et al., 2019) Importantly, the relationship between ADHD and mood or anxiety disorders appears to be bidirectional. While shared genetic and neurobiological mechanisms may increase vulnerability to both conditions, chronic psychosocial difficulties associated with untreated ADHD—including academic failure, occupational

instability, interpersonal conflicts, and low self-esteem—may further contribute to the development of depressive and anxiety symptoms.(Kooij JJS et al., 2019; Riglin L et al., 2021)

The findings concerning bipolar disorder highlight the diagnostic challenges associated with psychiatric comorbidity in ADHD. Significant symptom overlap between ADHD and bipolar disorder, particularly regarding impulsivity, distractibility, emotional instability, and increased activity levels, may result in misdiagnosis or delayed diagnosis.(Skirrow C et al., 2012) Several studies reviewed in this paper suggest that individuals with comorbid ADHD and bipolar disorder experience a more severe clinical course, characterized by earlier onset of mood symptoms, increased psychiatric burden, and greater functional impairment.(Wingo AP & Ghaemi SN., n.d.) These observations emphasize the importance of obtaining a detailed developmental history when assessing adults presenting with mood instability.

Substance use disorders represent another particularly important area of concern. The literature consistently demonstrates elevated rates of nicotine dependence, alcohol use disorder, cannabis use disorder, and polysubstance abuse among individuals with ADHD.(Lee SS et al., 2011; van Emmerik-van Oortmerssen K et al., 2012) Longitudinal studies further indicate that ADHD is associated with earlier initiation of substance use and a greater likelihood of progression to dependence.(Groenman AP et al., 2017) Neurobiological models suggest that dysregulation of dopaminergic reward pathways may partially explain this relationship, while impulsivity and deficits in executive functioning may contribute to increased vulnerability to addictive behaviors.(Sullivan MA, & Rudnik-Levin F. Attention, 2001) The reviewed evidence also challenges historical concerns regarding stimulant treatment, indicating that appropriately managed ADHD pharmacotherapy does not appear to increase the risk of substance misuse and may even reduce adverse long-term outcomes.(Chang Z et al., 2016)

Sleep disorders constitute another highly prevalent but often underestimated comorbidity. The reviewed studies indicate that sleep disturbances affect a substantial proportion of adults with ADHD and may contribute directly to worsening cognitive performance, emotional dysregulation, and psychiatric symptoms.(Becker SP, 2020; Díaz-Román A et al., 2018) The observed associations between ADHD and circadian rhythm disturbances, insomnia, restless legs syndrome, and obstructive sleep apnea support the hypothesis that sleep dysfunction may represent an important component of ADHD pathophysiology rather than merely a secondary consequence of the disorder.(Bijlenga D et al., 2019)

The relationship between ADHD and ASD provides particularly compelling evidence for the existence of shared neurodevelopmental mechanisms. Recent genetic and neuroimaging studies demonstrate considerable overlap between these disorders, suggesting common biological pathways involving synaptic development, executive functioning, and neural connectivity.(Faraone SV & Larsson H, 2019; Rommelse NNJ et al., 2010) The high rates of co-occurrence observed across multiple studies challenge traditional categorical approaches to psychiatric diagnosis and support contemporary dimensional models of neurodevelopmental psychopathology.(Antshel KM & Russo N, 2019)

One of the most notable findings emerging from the reviewed literature is the recurring role of emotional dysregulation. Although emotional dysregulation is not included among the core diagnostic criteria for ADHD, it appears repeatedly across multiple psychiatric comorbidities, including depression, anxiety disorders, bipolar disorder, substance use disorders, and ASD.(O et al., 2019; Shaw P et al., 2014) Increasing evidence suggests that emotional dysregulation may represent a transdiagnostic mechanism linking ADHD with a broad range of psychiatric conditions. This observation is consistent with contemporary models of psychopathology that emphasize shared underlying dimensions rather than strictly separated diagnostic categories.(Faraone SV & Larsson H, 2019)

Another recurring theme identified throughout the reviewed studies is the contribution of executive dysfunction. Deficits in attention regulation, inhibitory control, working memory, planning, and cognitive flexibility are not only central features of ADHD but also appear to influence the development and maintenance of many psychiatric disorders. Executive dysfunction may therefore represent an important pathway through which ADHD contributes to adverse psychosocial outcomes and increased psychiatric vulnerability.(Craig F et al., 2016)

From a clinical perspective, the findings of this review underscore the importance of comprehensive psychiatric assessment in adults with ADHD. Failure to identify co-occurring disorders may result in incomplete treatment, persistent symptoms, and poorer long-term outcomes. Conversely, ADHD itself frequently remains undiagnosed when patients initially seek treatment for depression, anxiety, sleep disturbances, or substance use problems.(Choi WS et al., 2022; Skirrow C et al., 2012) Consequently,

clinicians should routinely screen for ADHD in adults presenting with these conditions, particularly when symptoms have been longstanding and associated with functional impairment beginning in childhood.

The literature reviewed also highlights several limitations of current research. First, substantial heterogeneity exists regarding diagnostic criteria, assessment tools, and study methodologies, making direct comparisons between studies challenging. Second, many investigations rely on self-report measures, which may be susceptible to recall bias and diagnostic inaccuracies. Third, the majority of available studies are cross-sectional, limiting the ability to establish causal relationships between ADHD and psychiatric comorbidity. Finally, women, older adults, and individuals from non-Western populations remain underrepresented in much of the existing literature, potentially limiting the generalizability of findings. (Simon V, et al., 2009; Song P et al., 2021)

Future research should prioritize longitudinal studies capable of clarifying causal pathways linking ADHD with psychiatric comorbidity. Further investigation of genetic, neurobiological, and environmental mechanisms may improve understanding of shared etiological factors and facilitate the development of more personalized treatment approaches. Advances in psychiatric genetics, neuroimaging, and precision psychiatry may ultimately contribute to more accurate identification of high-risk individuals and more effective intervention strategies. (Lord C et al., 2020; Rommelse NNJ et al., 2010)

Overall, the findings of this review indicate that adult ADHD should be viewed as a complex and multidimensional condition frequently accompanied by significant psychiatric comorbidity. Recognition of these comorbid disorders is essential for accurate diagnosis, effective treatment planning, and optimization of long-term outcomes. Improved understanding of the shared mechanisms underlying psychiatric comorbidity may contribute to more integrated and individualized approaches to the care of adults with ADHD.

Conclusions

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder that frequently persists into adulthood and is associated with a substantial burden of psychiatric comorbidity. The findings presented in this review indicate that comorbid mental disorders are highly prevalent among adults with ADHD and should be considered a central component of its clinical presentation rather than an exception.

Among the psychiatric conditions examined, depressive disorders and anxiety disorders emerged as the most common comorbidities, contributing significantly to functional impairment and reduced quality of life. Bipolar disorder represents a particularly challenging comorbidity because of substantial symptom overlap and important diagnostic implications. Substance use disorders are strongly associated with ADHD and are linked to poorer psychosocial outcomes, increased healthcare utilization, and greater treatment complexity. Sleep disorders appear to play an important role in both the manifestation and exacerbation of ADHD symptoms, while the high rate of co-occurrence between ADHD and autism spectrum disorder highlights the existence of shared neurodevelopmental mechanisms.

A recurring theme across the reviewed literature is the presence of common underlying factors, including genetic susceptibility, executive dysfunction, emotional dysregulation, and alterations in neural systems involved in attention, reward processing, and self-regulation. These shared mechanisms may partly explain the high rates of psychiatric comorbidity observed in adults with ADHD and support contemporary dimensional models of psychopathology.

The reviewed evidence also emphasizes the importance of early recognition and accurate diagnosis of ADHD in adulthood. Many individuals initially seek treatment for secondary psychiatric symptoms, while the underlying ADHD remains undetected. Failure to identify co-occurring disorders may result in delayed diagnosis, inadequate treatment, and persistent functional impairment. Therefore, comprehensive psychiatric assessment should routinely include screening for ADHD as well as its most common comorbid conditions.

From a clinical perspective, effective management of adult ADHD requires an integrated and individualized approach that addresses both core ADHD symptoms and accompanying psychiatric disorders. Recognition of comorbidity is essential for optimizing treatment strategies, improving long-term outcomes, and enhancing quality of life.

Future research should focus on longitudinal investigations capable of clarifying causal relationships between ADHD and psychiatric comorbidity, as well as on the identification of biological markers that may facilitate earlier diagnosis and more personalized interventions. A better understanding of the mechanisms

underlying psychiatric comorbidity may contribute to the development of more effective and comprehensive treatment approaches for adults with ADHD.

In conclusion, ADHD should be viewed as a complex and multidimensional disorder that rarely occurs in isolation. Awareness of its frequent coexistence with other psychiatric conditions is essential for accurate diagnosis, effective treatment, and improved long-term prognosis in adult patients.

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