University of North Carolina Asheville
Journal of Undergraduate Research
Asheville, North Carolina
Spring 2025

ADHD and Suicide Behavior: Examining the Relationship and Risks

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Abstract

This proposal aims to investigate the correlation between Attention-Deficit/Hyperactivity Disorder (ADHD) and suicide risk, through a comprehensive literary review. ADHD is commonly associated with impulsivity, emotional dysregulation, and other behavioral issues, which may contribute to an increased risk of suicidal behavior. This project aims to address the problem of evidence linking ADHD to mental health challenges, the strength and nature of this relationship remain unclear. This literary review will examine this data to assess the overall effect size of ADHD on suicide risk, while considering factors such as age, gender, comorbidity (e.g., depression, anxiety), and study quality. By examining these variables alongside, it will help further contribute to and identify gaps in current literature regarding this topic. The results aim to provide clearer insights into the ADHD-suicide relationship, and aims to suggest areas for further clinical investigation. This research

aims to educate an raise awareness of the heightened suicide risk among individuals with ADHD and encourage more targeted, preventive interventions in the 21st century.

1. Introduction

1.1 Prevalence of ADHD

According to the CDC, an estimated 7 million (11.4%) U.S. children aged 3–17 years have been diagnosed with ADHD, according to a national survey from 2022. Over the last few years, there has been a significant increase in ADHD diagnosis among children- studies have found that prevalence of ADHD increased from 1997 to 2016 in US children (CDC, 2025). A 2022 CDC study has additionally found that an extra 1 million children have gotten flagged for ADHD diagnosis, when compared to a study from 2016 (Li Y, et. al, 2023). However, these criterias that construct a diagnosis can present themselves differently within various demographics (Danielson, M., 2024). Statistics regarding ADHD vary depending on various factors such as race, gender, and many more. According to a meta-analysis from the NIH, Boys (15%) were more likely to be diagnosed with ADHD than girls (8%). Black children and White children were more often diagnosed with ADHD (both 12%) than Asian children (4%). American Indian/Alaska Native children (10%) were also more often diagnosed with ADHD than Asian children. Additionally, these symptoms prevalent for diagnosis can vary in terms of their severity, and can present themselves differently depending on whether the individual already has another pre-existing condition. About 6 in 10 children are diagnosed with moderate or severe ADHD. Children with both ADHD and another co-occurring condition such as behavioral or conduct problems, learning disorders, anxiety, or depression, more often had severe ADHD than children with ADHD without other co-occurring conditions. This correlation holds one of the highest correlations in regards to neurodevelopmental disorders and suicide. As we see an increase in ADHD prevalance over the past decade, it further stresses the urgency and importance of examining it’s potential relationship with suicide.

2. Symptoms of ADHD

2.1 Defining ADHD and Commonly Experienced Symptoms

Initially among its discovery, there used to be two separate diagnoses of ADHD- Attention Deficit Disorder vs. Attention Deficit Hyperactivity Disorder, the DSM IV

combined this into one disorder (ADHD) with three subtypes: predominantly inattentive, predominantly hyperactive, or combined type. ADHD is defined as a neurodevelopmental disorder, characterized specifically by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with daily functioning in multiple contexts, such as home, school, or work (CDC, 2025). From a neuroanatomical perspective, it is thought that these symptoms are caused by complex alterations in fronto-striatal and fronto-limbic brain circuits, which impact executive and affective processing leading to cognitive disturbances and emotional-motivational difficulties in the brain (Cubillo, 2012).

ADHD symptoms usually begin to present themselves at a young age, typically beginning as early as 3 years old (NIH, 2025). Developmentally, children with ADHD tend to struggle with low self-esteem, forming and maintaining relationships and will often exhibit poor performance when placed in an academic environment. This can be due to a multitude of reasons- inconsistent engagement/attention, lack of motivation, and most commonly experiencing difficulty “sitting still” in class (Staff A. et al, 2023). A 2023 study elaborates on this stating that when observing 55 ADHD students alongside 34 typically developing peers (between ages 6-12 years), studies observed higher levels of hyperactive behavior in children with ADHD (Lauth et al., 2006; Steiner et al., 2014; Zentall, 1980). In an academic environment, the role ADHD plays in disruption was very prevalent, as children in the ADHD group were more off-task than typically developing children across settings. Inattention as well as (motor and verbal) hyperactivity of both groups were similarly affected by setting. Results showed that motor as well as verbal hyperactivity of all children increased during classroom transitions as compared to group lessons or individual seatwork (Staff A. et al, 2023). These challenges could significantly impact their developmental path and potentially lead to long-term effects as they transition into early adulthood. With the diagnosis of ADHD, there are three subtypes; Predominantly inattentive, Predominantly hyperactive/impulsive, and Combined. Let's examine the three primary ways in which ADHD can present itself.

Predominantly inattentive

An individual with inattentive ADHD does not experience the hyperactive or impulsive aspects of the disorder, but rather the inattentive components that center on a lack of awareness. This subset of ADHD can present itself through a variety of different symptoms. It is important to note that these symptoms exhibited are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions (De la Peña, 2020). One of the main components is the failure to provide close and full attention- including having trouble staying focused, getting bored with an activity quickly, forgetfulness, and experiencing difficulty following instructions. Another primary component is one not seeming to listen when spoken to directly (e.g., mind

seems elsewhere, even in the absence of any obvious distraction). It can also present itself among disorganization (this is often flagged in an academic setting due to high demand) in which one often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).

These symptoms are examined typically on having a negative impact on social, academic, and occupational activities. They also often have difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines). Additionally, they will often tend to avoid engaging in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, more refined tasks, such as preparing reports, completing forms, reviewing lengthy papers) (De la Peña, 2020). A meta-analysis examined 86 ADHD studies in children and adolescents and 11 studies in adults across the world, and reported that this subtype (ADHD-PI) was the most prevalent subtype in these community samples (Willcutt, E., 2012).

Predominantly hyperactive/impulsive

Predominantly hyperactive/impulsive ADHD consists of symptoms that are more centered around restlessness, and the inability to sit still. People who have this type are often “on the go,” acting as if they are driven by some kind of motor. This can also present itself as being unable to be still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with (De la Peña, 2020). In children, it often shows itself behaviorally, through the act of running about or climbing in situations where it is deemed inappropriate. Most commonly, it is apparent in an academic setting. Students who have this subtype of ADHD often fidget with or tap their hands or feet or squirms in their seat. They may also often leave their seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place (De la Peña, 2020). However in adolescents or adults, this act may be limited to just feeling restless. All around, individuals with predominantly hyperactive/impulsive ADHD may talk excessively, and have trouble waiting for their turn without intruding on others or causing disruption. Additionally, a person with impulsiveness may have more accidents and injuries than others (CDC, 2025).

Combined

The criteria for identifying combined ADHD is examined more meticulously, as these symptoms present themselves through a combined presentation: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6

months. Even with this subtype, one of the two additional types can be more dominant over the other one, which in turn, makes it more difficult to flag as well. This can consist of a predominantly inattentive presentation- being if criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months; or through predominantly hyperactive/impulsive presentation- if criterion A2 (hyperactivity-impulsivity) is met but Criterion A1 (inattention) is not met over the past 6 months.

2.2 ADHD and demographics

One area of research that requires further exploration, are the varying demographics related to ADHD and its diagnosis. This becomes particularly important when considering other minority groups or demographics, and how different biopsychosocial factors play a role in the onset of ADHD. This is an important factor to consider in research because if we expand our criteria and examine diagnostics from a more multifaceted perspective, we will be able to account for more symptoms cross-culturally, and not gear diagnostic attention towards the white majority. A 2021 cohort study analyzing diagnosis rates across different demographics provides further insight into this, examining 238,011 children and the association between race/ethnicity and the diagnosis of ADHD. Asian, Black, and Hispanic children were significantly less likely to be diagnosed with ADHD compared with White children. White children were also more likely to receive treatment for ADHD (Shi, Y. 2021). This study emphasized the lack of research towards these minority groups, as there is limited data on the racial disparities in the incidence of attention-deficit/hyperactivity disorder (ADHD) diagnosis in children at the national level. Other disparities in diagnosis that need to be examined include gender- as women are often more underdiagnosed than men. This is due to differences in symptom presentation, decreased self-esteem, more difficulty in peer relationships, increased likelihood of anxiety and other affective disorders, the development of coping strategies that mask symptoms of ADHD, and gender based societal expectations (Shi, Y. 2021). In terms of transgender individuals, a 2018-2022 study examined the causal relationship between laws surrounding anti LGBTQ+ legislation, and suicide risk over this five-year time period, using national survey data collected from more than 61,000 transgender and nonbinary youth. There is a high correlation among individuals who identify as LGBTQ, and also having an ADHD diagnosis (Shi, Y. 2021). Results concluded that, during this time period, anti-transgender laws significantly have increased incidents of past-year suicide attempts among transgender and nonbinary youth by as much as 72% (The Trevor Project, 2022). With this correlation, there may be a potential correlation among transgeneder individuals who are diagnosed with ADHD, and suicide.

3. Suicide

3.1 Defining Suicide

Suicide is defined as death caused by injuring oneself, with the intent to die. A suicide attempt is a self-directed, potentially injurious behavior with intent to die as a result of the behavior. Nonfatal suicidal thoughts and behaviors are classified more specifically, into three categories- suicide ideation, which refers to thoughts of engaging in behavior intended to end one's life; suicide plan, which refers to the formulation of a specific method through which one intends to die; and suicide attempt, which refers to engagement in potentially self-injurious behavior in which there is at least some intent to die (Nock, 2006). A suicide attempt might not result in death or injury. While many people do not experience suicide, it is more common than people think- as each year over 30,000 people in the United States and approximately 1 million people worldwide die by suicide, making it one of the leading causes of death (Nock, M. 2008).

Reports from the World Health Organization (WHO) indicate that suicide accounts for the largest share of intentional injury burden being recorded in developed countries, and that suicide is projected to become an even greater contributor to the global burden of disease over the coming decades. This has been especially prevalant over the last five years, as the total age-adjusted suicide rate in the United States increased to 14.0 per 100,000 in 2021 and then increased again to 14.2 per 100,000 in 2022. (NIH, 2025). In terms of examining gender as a demographic, in 2022 the suicide rate among males was 4 times higher (22.9 per 100,000) than among females (5.9 per 100,000) (NIH, 2025).

3.2 Symptoms of Suicide

Suicide (and suicidal behavior) will often manifest through a wide range of emotional, psychological, and physical symptoms that can vary greatly from person to person. Warning signs may present themselves as all or at least one of the following; Talking about suicide — for example, making statements such as "I'm going to kill myself," "I wish I were dead" or "I wish I hadn't been born", getting the means to take your own life, such as buying a gun or stockpiling pills, withdrawing from social contact and wanting to be left alone, or having mood swings, such as being emotionally high one day and deeply discouraged the next (NIH, 2025). Additionally, they can also be experiencing suicidal thoughts- thoughts surrounding the idea of ending one’s life or harming themself in a fatal manner. This can include being preoccupied with death,

dying or violence, and/or feeling trapped or hopeless about a situation. This can also present itself behaviorally, in ways that set oneself up for potentially engaging in the act of suicide. This can include doing risky or self-destructive things, such as using drugs or driving recklessly, or giving away belongings or getting affairs in order when there's no other logical explanation for doing this (Mayo Foundation, 2022). Previously, there have also been studies suggesting that a large percentage of suicide acts are done impulsively, along with the interaction of multiple factors, indicating that individuals predisposed to suicide interact with precipitating events leading up to this impulsivity experienced. Warning signs surrounding suicide aren't always obvious, and may not appear as straightforward-they may vary greatly from person to person. Some people make their intentions clear, while others keep suicidal thoughts and feelings secret.

3.3 Suicide and the role of impulsive behavior

In suicide research, it has been proposed that impulsivity bears a direct causal relation with fatal suicide behaviour. Many researchers hypothesize that impulsivity associated with the act of suicide typically manifests within a short time frame following an incident, with the intention emerging in response to the situation, rather than being the result of a long-standing, premeditated plan. Models surrounding this theory conceptualize impulsivity as a personality trait as the data surrounding the assessment of impulsivity in suicidal behaviour was derived from patients who have either attempted suicide or experienced suicidal ideation (McHugh and Balaratnasingam, 2018). Impulsive traits in suicide have been associated with greater prevalence of mental disorder (the following paragraph will explore the correlation in detail) and the cumulative effects of negative life stressors and familial factors (Turecki, 2005). Additionally, in suicide research the traits of impulsivity and aggression are often grouped into one category, to the extent that they are sometimes used interchangeably as part of the same dimension of impulsive aggression. Impulsivity and aggression have been proposed to serve as feedback for one another: impulsivity would increase the likelihood of engaging in various risk behaviours, including aggression, while aggression would function as a catalyst for heightened impulsivity. However, there are instances of clinical data where aggression takes the lead, rather than impulsivity being associated with increased suicidality. This could also be due to the case that with suicide attempts in the context of major depressive disorder, aggression is statistically more likely to surface rather than impulsive behavior.

4. ADHD and Suicide

4.1 Exploring the progression to suicide among individuals with ADHD

Those living with ADHD, specifically adults, face multiple challenges in daily life due to the symptoms that arise from this disorder. Regardless of the subtype, they often experience the core symptoms of ADHD, including distraction, forgetfulness, restlessness, impulsiveness, and emotional irritability that accompany its prevalence. Several research studies over the past few decades have focused on ADHD as a possible psychiatric disorder that may serve as a suicide risk factor as well. One of the of the main reasons for this being that a primary part of the disorder is the construct of impulsivity, which is a well-known personality trait. Impulsivity is a core symptom of ADHD, and can increase these risks of attempting suicide, particularly when combined with other factors like mood disorders or psychosocial adversity, by increasing the likelihood of actually acting on these negative thoughts being experienced, without proper reflection. Impulsivity is a multidimensional concept that encompasses a broad range of behaviors that reflect poor planning, premature responding before considering consequences, sensation-seeking, risk-taking, an inability to inhibit responses, and preference for immediate over delayed rewards (Whiteside, 2001). The difficulty to control one's behavior is thought to stem from specific deficits in self-regulation, motivation arousal and deficits in working memory and higher order cognitive functions, all similar deficits experienced in ADHD. This impulsivity experienced in ADHD can make it harder to control urges and resist regulation among negative thoughts or emotions.

Additionally, individuals with ADHD have been statistically shown to react impulsively over stressful situations. As opposed to working them out carefully, suicide attempts generally follow these psychologically stressful situations and mental states, from which attempters 'do not see a way out', with more than 90% of suicides ascribable to ADHD, as well as psychiatric disorders (Ziegler, 2024). Female sex, psychosocial adversity, psychiatric disorders, and also somatic morbidities (e.g. cardiovascular and pulmonary diseases) are some of the demographics that have been identified as general risk factors for suicidality (Ziegler, 2024). Klonsky has also speculated that one reason for the limited progress that we have in research surrounding in suicide prevention might be a lack of knowledge about the actual transition from suicidal ideation to suicidal actions. What causes the progression, and the shift in intention. Most people who consider suicide do not necessarily put their thoughts into action, as data from the 2008 National Survey on Drug Use and Health report that although 3.7% of adults age 18 and older in the United States had thought about suicide, 1.0% had made plans to commit suicide, and only 0.5% had actually attempted suicide (Gvion, 2022). Understanding the potential factors that contribute to the escalation from suicidal ideation to actions, particularly among individuals with

ADHD, is crucial to keep in mind when examining the preexisting data and research we have surrounding it.

4.2 Examining the Correlation between ADHD and Suicide

There have been many studies and meta-analyses conducted on the current body of literature surrounding this topic. In efforts to further analyze the extent of this correlation, papers have leaned towards also considering important variables such as age, gender, comorbid conditions, and the impact of ADHD treatment on suicide risk. Among this research, one of the most evident correlations is the role that impulsivity plays as a response in these already pre existing factors of ADHD, in relation to suicide. A 2015 study further examines this correlation among an elderly age range, through fMRI scans surrounding impulsivity and the The Suicide Intent Scale. It reported that Higher impulsivity, predicted exaggerated responses to stressful situations (in this study, the response of angry faces) in fronto-opercular and dorsomedial prefrontal cortex (Vanyukov, 2015), the data reflecting that aside from ADHD as a variable, those who have had a history with suicide attempts may reflect a higher general impulsivity level, and lower tolerance, to emotional disturbances being presentied to them (Vanyukov, 2015). Another variable when examining this to consider is the distinction between the state and trait dimensions of the impulsivity-suicide relationship, that is, impulsivity of the attempt (state) and impulsivity of the attempter (trait). A 1996 study examines this, suggesting that lower serotonergic (amounts of serotonin being emitted in the brain) activity is associated with both impulsive personality traits, and the lethality of the act. 478 individuals who attempted suicide were studied in a general hospital in Madrid, Spain. Impulsivity was measured by combining 2 items of Beck's Suicidal Intent Scale (active preparation for attempt and degree of premeditation), and lethality of the attempt was assigned 1 of 4 levels according to the need for medical and/or psychiatric treatment. The data reported that more than half of the attempts were impulsive (55%; 95% confidence interval [CI], 51% to 59%), and that regardless of the specific level of impulsivity, the act of engaging in suicide emerged as the outcome (Baca-Garcia et. al, 2001). This in turn, suggests that impulsivity plays a significant role in suicidal behavior, highlighting the need for early intervention and strategies to manage these tendencies that may arise as a result.

Additional research suggests that in terms of components of ADHD characteristics, alongside impulsivity, poor decision-making should also be considered as a factor. Individuals with ADHD generally struggle with planning, impulse control, attention, and emotional regulation. As a result, these deficits can make it challenging for people with ADHD to assess long-term consequences, and think through their choices- making it easier for them to act on these sudden feelings of impulsivity. A research article from 2024 suggests that individuals with ADHD are more likely to make

poor decisions due to the core symptoms of the disorder, particularly surrounding impulsivity and challenges in executive functioning (Sorenson, 2024). Additionally, they tend to engage in Narrow Framing- debating whether to do or buy something, and end up building an argument for it, rather than taking the time to consider arguments against it or coming up with alternatives (Sorenson, 2024). A research paper from 2018 further emphasizes this correlation, and proposed the suggestion that decision-making deficits in ADHD are driven by less-informed and thorough decision-making, and not by the specific desire to engage in risk seeking (Dekkers, 2018). A research study was performed in response to this idea, measuring the extent to whether ADHD individuals can adjust their choices to more-or-less-risky options by integrating external information with internal value systems. The study examined children between 11-14 years of age, and found that poor decision-making due to a fear of delays showed significance in the data, and could be an important factor to explore in future research on interpersonal skills in ADHD (Sorenson, 2024). Another study found that in a cohort of 53 participants it was found that impulsivity and a history of suicide attempts (particularly poorly planned ones) were associated with a weakened expected reward signal in the paralimbic cortex, which is the area of the brain responsible in regulating emotions, social behavior, and motivation (Dombroski et. al, 2013).

Examining these two critical components of ADHD-impulsivity and poor decision making- and how they play into the act of suicide, provides valuable insight into the underlying processes associated with suicide risk. The combination of impulsivity and impaired decision-making can lead to rash, poorly planned actions in response to emotional stress, increasing the likelihood of suicidal behavior (Vanyukov, 2015). Additionally, when examining this combination through a neurological perspective, these traits-such as altered brain activity in areas like the prefrontal cortex and paralimbic system, further show that these individuals may also struggle with reward processing and future-oriented thinking. These traits, when in a time of crisis, are critical for making life-saving decisions. By understanding specifically how impulsivity and impaired decision-making interact with these emotional and cognitive factors, we can better grasp how individuals with ADHD may respond to stressors or emotional disturbances, potentially leading to impulsive, high-risk behaviors such as suicide.

5. Discussion

5.1 Limitations in research

One major shortcoming when analyzing pre existing research surrounding this topic is that individuals who successfully take their own lives cannot provide any insight

or account of their experiences leading up to the act (Ziegler, 2024). As a result, all available data comes from survivors or those who have made attempts but were unsuccessful. Because of this, we develop a limited depth of understanding we can gain from firsthand accounts, and it can skew our interpretation of the factors that contribute to suicide. These choices to engage in the act are influenced by individual differences, the personal beliefs and attitudes towards oneself and their environment, moral values, and spontaneous emotions and urges. These factors being examined through research data depend on the individual's biological, environmental, and socio-cultural background, a lot of which might not be empirically accessible. The aspects of suicidal behavior and action that are being driven by cognition, motivation, and impulses driving suicidal behavior can only be analyzed by statistical methods, due to their complexity (Ziegler, 2024). Another potential shortcoming when analyzing pre existing research is that the use of sudden death as a control sample can be interpreted in a myriad of different ways as a variable. A study by Ross et al., 2017 stood out as the sole study to utilize a sudden death control sample, and its inclusion may have skewed the results, as people who die by sudden death may share overlapping factors with those who die by suicide, particularly in terms of impulsive traits, and may have overshadow its effect in that specific meta-analysis (Ziegler, 2024).

5.2 Why is research surrounding this topic important?

Continuing to research, examine, and build off of pre-existing data surrounding this topic is vital for so many reasons. ADHD is an extremely common neurodevelopmental disorder, and affects a significant amount of the population worldwide. How we examine ADHDs core components, and how they interact with suicide not only promotes harm reduction for individuals of all demographics struggling worldwide, but brings us as a society to closer and better understanding how these thoughts process can be enhanced with pre-existing mental health disorders. By studying the specific ways ADHD interacts with suicide risk, we can better understand the unique challenges these individuals face, such as emotional dysregulation, poor decision-making, and impulsivity, which may increase vulnerability to self-harm and suicidal thoughts. This issue is extremely multifaceted and complex, and while this research may seem hyper-specific- having enough of it to provide solid empirical evidence can help mental-health professionals identify early warning signs and risk factors specific to people with ADHD, resulting in earlier and more effective forms of intervention. Recognizing this intersection between ADHD and suicide risk can lead to more personalized treatment plans-depending on different cultures, demographics, and can overall reduce the likelihood of tragic outcomes.

6. Acknowledgment

This paper, and all of my research is dedicated to my late friend Ellie, who passed away earlier this year. They are the reason that I have been inspired into looking into this topic further, and I will continue to channel my grief into something meaningful. This topic is extremely important to me, and I believe that with enough research and education surrounding this topic, we can work to make this issue preventable.

I would also like to thank Dr. Patrick Foo, for advising, supporting, and encouraging my research as I worked passionately on this literary analysis.

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