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Long-term outcomes of females with ADHD: increased risk for self-harm

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Summary:

Although long-term outcomes of girls with ADHD are understudied, high risk for adolescent and young-adult self-harm is salient. We present data on predictors and mediators of such risk, highlighting a recent dual-process model involving trait impulsivity plus family- and peer-related contributors. We conclude with recommendations for assessment and preventive intervention.

Keywords

Attention Deficit Hyperactivity Disorders; Deliberate Self-harm; Suicide; Psychosocial Interventions; Comorbidity

Attention-deficit/hyperactivity disorder (ADHD), one of the most commonly diagnosed neurodevelopmental conditions, is associated with high risk for a range of negative outcomes beyond childhood. These include accidental injury, poor academic achievement, relationship problems, unemployment or underemployment, criminality, and substance misuse, among many others.^{1, 2} In particular, population-based studies reveal that ADHD is associated with significantly increased mortality rates, notably higher in females than males with ADHD. Included here are suicide attempts and deaths as well as high risk for non-suicidal self-injury (NSSI).¹ Although death by suicide is higher in males than females, rates of attempts in females are rising.

At the same time, the preponderance of research on ADHD centers on males, with relatively few investigations of females with ADHD—despite the aforementioned data demonstrating increased mortality rates for girls and women with this condition. Because of the gender-related research gap—supplemented by the still-common bias that females are unlikely to present with ADHD—clinicians may be prone to dismiss the possibility of an ADHD diagnosis in girls presenting for evaluation; they may also underappreciate nuances in symptom presentation by gender. Clinicians may also believe that ADHD in females—with a lowered likelihood of externalizing and delinquent behavior patterns compared to males²

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—is a relatively mild condition. The unfortunate result may be insufficient intervention, fueling even greater rates of detrimental long-term outcomes for girls with ADHD.

Predictors and Mediators of Self-Harm in Females with ADHD

A generation ago, ADHD was thought to be an almost exclusively male disorder.² Like nearly all neurodevelopmental conditions, ADHD is more common in boys than girls (ADHD male:female sex ratio of 2.5:1, although lower by adulthood). When ADHD does present in females, it is associated with significant life-long impairments, including poor health-related outcomes, low achievement (especially in mathematics), key problems with employment beyond secondary education, and high rates of unplanned pregnancy.² Even more, many girls with ADHD (particularly those with high impulsivity in childhood) follow a heterotypically continuous developmental pathway, such that they are at strikingly high risk for self-harm, including both NSSI and suicide attempts.^{2, 3}

Given the high rates of suicide globally, escalating in many countries (and especially among adolescent girls), a serious public health issue is at hand. Of even further concern, internalizing disorders and suicide rates may well spike in the next few years given increases in economic stress, social isolation, and other toxic psychosocial stressors associated with the COVID-19 pandemic. Herein, we focus on factors related to the pronounced rates of self-harm in girls with ADHD as they mature into adolescence and early adulthood.

The Berkeley Girls with ADHD Longitudinal Study (BGALS) represents the largest prospectively followed sample of girls with ADHD (plus an age- and ethnicity-matched comparison sample) in existence.² The investigation began during the sample's childhood and features 92–95% retention rates throughout three follow-up evaluations, extending through the age range of mid-to-late 20s.

At every evaluation, girls with ADHD showed core impairments, often in areas commensurate with those of boys with ADHD followed over time (e.g., increased need for special school services; high rates of comorbidity; excess parental distress and peer rejection). Specifically regarding self-harm: by the end of adolescence participants who had entered the study with the Combined presentation of ADHD (i.e., displaying clinically significant inattention plus hyperactivity/impulsivity) had rates of attempted suicide (22%) and engagement in moderate/severe NSSI (51%) two-and-one-half to three-and-one-half times the rates found in the comparison sample (for whom rates were statistically equivalent to rates within the childhood Inattentive presentation). Crucially, girls with ADHD who had also experienced childhood maltreatment (physical abuse, sexual abuse, and/or neglect) had a substantially higher risk of attempted suicide (fully 33% had made an attempt) by early adulthood than did those without a maltreatment history (13%) or than the matched comparison sample (6%).^{2, 3} Thus, even for a condition as heritable as ADHD, exposure to early abuse experiences substantially compounds risk for self-harm. Such findings parallel another condition with strong heritability, bipolar disorder. The core message is that heritable risk is compounded by psychosocial adversity in predicting self-harm-related outcomes.

Additional childhood predictors of later self-harm included severity of ADHD symptoms, low self-esteem, comorbidity with internalizing and externalizing conditions, negative parent-child interactions with fathers (but not mothers), and poor executive functioning.⁴ With respect to adolescent mediator processes, pathways to self-harm were relatively specific to self-harm type. That is, adolescent externalizing symptoms and difficulties with response inhibition mediated the link between childhood ADHD and NSSI, whereas adolescent internalizing symptoms mediated the link from childhood ADHD to suicide attempts. As well, peer victimization mediated the link between childhood ADHD and NSSI by early adulthood, whereas peer rejection mediated the link to suicide attempts. Overall, beyond intraindividual factors (impulsivity, comorbidity), contextual processes related to families (maltreatment) and peer groups (rejection, victimization) are crucial regarding developmental pathways. We hasten to add, however, that adolescent NSSI is a potent risk factor for later suicide attempts, so that any distinction between non-suicidal behaviors vs. frank suicide attempts is not absolute.

Evidently, females with ADHD show significant impairments with respect to a cascading set of problems from childhood through adulthood. Moreover, evidence is converging on the finding that vulnerabilities conferred by (a) high levels of (heritable) impulsivity and (b) negative family and peer-related environments and experiences can precipitate significant impairment and psychopathology, particularly in the realm of self-harm.

We highlight, as well, that females with ADHD are at increased risk for unplanned pregnancy. The key adolescent mediator underlying the linkage between childhood ADHD and eventual unplanned pregnancy is low academic performance.⁵ Thus, in addition to such factors as comorbid psychopathology, executive functions, family factors, and peer-related processes, promotion of academic achievement appears to be a core target for preventive intervention.

Still, too little is known about later-adult outcomes of females with ADHD. Indeed, more distal endpoints such as the development of borderline personality disorder (e.g., affective instability, chronic suicidality) in adulthood require additional longitudinal research to supplement existing cross-sectional research.³ Moreover, the intergenerational transmission of risk for similar negative outcomes in the *offspring* of females with ADHD remains a priority area for future research efforts. Overall, we contend that the extraordinarily high risk for self-harm incurred by girls with ADHD as they mature requires a shift in clinical perspective.

Clinical Value

Despite the growing body of evidence that females with ADHD are at high risk for self-harm, no evidence-based prevention programs for self-harm currently exist for preadolescents.³ Once established, self-harmful behaviors are self-reinforcing and difficult to treat. Access to specialized treatment (e.g., Dialectical Behavior Therapy) remains low because of the limited number of providers, expense, and significant time requirements.

Recent research suggests that the age of initiation of NSSI may occur before the teenage years.³ We therefore contend that preventive interventions should occur in late childhood, *before* the initiation of self-harm. The extreme pain and suffering associated with self-harm, along with cascading problems related to untreated psychopathology, support the development of early self-harm prevention programs as a public health priority.

Existing interventions for ADHD include behavioral, pharmacological, and multimodal treatments that typically yield improvements in core symptoms but that (a) are often time-limited and (b) tend not to alter fundamental developmental trajectories. We believe that treating trait impulsivity and inattention, the core components of ADHD, is needed. Even more, however, emotion dysregulation—the inability to modulate negative affective states such as anger, fear, and sadness, in the service of goal-directed behavior—should be a core preadolescent prevention target for individuals at risk.³ Emotion dysregulation is shaped through negative environmental experiences such as maltreatment—a critical prevention target within itself—along with peer victimization/rejection and negative parenting practices including invalidating family environments. When coupled with underlying vulnerabilities (e.g., trait impulsivity), such contextual factors promote high levels of self-harm.³ By focusing on emotion dysregulation as a prevention target, intervention must emphasize increasing emotion-related skills, along with improving parent-child relationship dynamics and enhancing peer relationships. Furthermore, by increasing emotion regulation capacities in preadolescence, cascading problems such as the risk for the development of internalizing/externalizing comorbidities (and thus subsequent self-harm) may be attenuated.

Recommendations for Assessment

It is critical to educate clinicians to recognize ADHD, and its different presentations, particularly for girls. Accurate, early diagnoses may prevent long-term, detrimental, and cascading deficits, including self-harm. Medical practitioners prescribing stimulants for ADHD, as well as psychologists providing parent management, should make screening for emotion dysregulation and early signs of self-harm a common practice, following similar steps taken toward universal depression screening for adolescents recommended in 2018 by the American Academy of Pediatrics.

Conclusions

ADHD is a surprisingly common neurodevelopmental disorder in females, often resulting in serious impairments across the lifespan, particularly high risk for self-harm. As noted throughout, developmental pathways and outcomes of females with ADHD may well differ in key ways from those of their male counterparts (see Beauchaine et al., 2019, Figure 1), particularly regarding suicidal and self-injurious behavior. We contend that (a) recognition of the reality of ADHD in girls and (b) engagement in preventive interventions targeting emotion dysregulation and family/peer contexts are essential clinical directions.

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