

Editorial

Long-term outcomes of females with attention-deficit hyperactivity disorder: increased risk for self-harm

Sinclair M. O'Grady and Stephen P. Hinshaw

**Summary**

Although long-term outcomes of girls with attention-deficit hyperactivity disorder 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; self-harm; suicide; psychosocial interventions; comorbidity.

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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 centres 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 externalising and delinquent behaviour patterns compared with males,² is a relatively mild condition. The unfortunate result may be insufficient intervention, fuelling 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 (the ADHD male/female ratio is 2.5:1, although this is 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 Further, many girls with ADHD (particularly those with high impulsivity in childhood) follow a heterotypically continuous developmental pathway, such that they are at a 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, internalising 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 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 and/or impulsivity) had rates of attempted suicide (22%) and engagement in moderate-to-severe NSSI (51%) 2.5–3.5 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 (33% had made an attempt) by early adulthood than 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 internalising and externalising 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 externalising symptoms and difficulties with response inhibition mediated the link between childhood ADHD and NSSI, whereas adolescent internalising symptoms mediated the link from childhood ADHD to suicide attempts. In addition, peer victimisation 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, victimisation) 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 behaviours and 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 high levels of (heritable) impulsivity, and 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 link 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 end-points, 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 programmes for self-harm currently exist for preadolescents.³ Once established, self-harmful behaviours are self-reinforcing and difficult to treat. Access to specialised treatment (e.g. dialectical behaviour 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 programmes as a public health priority.

Existing interventions for ADHD include behavioural, pharmacologic and multi-modal treatments that typically yield improvements in core symptoms but are often time-limited and tend not to alter fundamental developmental trajectories. We believe that treating trait impulsivity and inattention, the core components of

ADHD, is needed. Further, emotion dysregulation—the inability to modulate negative affective states such as anger, fear and sadness, in the service of goal-directed behaviour—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 victimisation/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 emphasise 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 internalising/externalising comorbidities (and thus subsequent self-harm) may be attenuated.

Recommendations for assessment

It is critical to educate clinicians to recognise 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.⁶

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 Fig. 1 in Beauchaine *et al.*³), particularly regarding suicidal and self-injurious behaviour. We contend that recognition of the reality of ADHD in girls and engagement in preventive interventions targeting emotion dysregulation and family/peer contexts are essential clinical directions.

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First received 28 May 2020, final revision 7 Jul 2020, accepted 17 Jul 2020

Author contributions

S.M.O. originated the idea for this editorial. S.M.O. and S.P.H. equally contributed to the drafting and critical revision of this work.

Funding

Core funding for the research cited in this editorial was funded by National Institute of Mental Health grant R0145064.

Declaration of interest

S.P.H. reports grants from the National Institute of Mental Health, outside the submitted work.

ICMJE forms are in the supplementary material, available online at <https://doi.org/10.1192/bjp.2020.153>.

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reflection

Even the longest summer ends

Kacper Niburski 

I want to tell you of the summer I went crazy. It was hot, and I was raw with wilderness the way the ocean was when seaweed choked the beach and he hadn't quite killed himself yet. My feet were wet. I was sure I had a runny nose. And my dad would tell me that we do not go crazy. Nor was there an ocean nearby. Nor were the waters where he drowned anything more than a shallow lake. In it, there were no fish anymore, but there was a man for a little bit, at least.

It was during a summer that crept with a slow evolutionary crawl, that chattered about something mutated on the horizon. The sun was bent, lopsided. I could smell snow years away.

I was very sane, I want to tell you. I knew what led to what. Where one thing would happen instead of another. It was easy. First, wake up. Shower. Shave. Brush teeth. Eat. Wonder why I didn't eat then brush.

We do not go crazy, I was told. I come from a family of those who daringly lived. I am brutal ancient history packed into a human hot dog, a testament to the pinnacle of a species wrapped into sandals with smelly holes in them. My grandfather hid Jews. I sometimes hide that I am Jewish. My other grandfather delivered milk. I think I am lactose intolerant.

We do not go crazy, I was told. It was a bad word to say – *crazy* – one whose letters were pregnant with more than can be imagined. But it was mine and I needed to own a thing more than myself. This, of course, was the problem: I wanted to own it all. Did I not deserve it? Was it not summer? Wasn't there a chance to invent new language unimaginable? Could I go back and still save him?

We do not go crazy. The mental hospital was nice. I was nicer. I was going to be, to live, and this would help me. I stood at a wall for 3 days straight. It was nice, as I said.

I do not tell you this. I am seeing my first patient as a medical student in the psychiatric ICU. You have done the impossible task of pulling out your toilet in your room. Water weeps on the floor as you bang your head against the wall, promising to destroy this whole thing. I step in the water. I tell you that this is a nice hospital.

My feet are wet. My nose is runny. Your blood from your forehead seeps into the toilet water.

I want to tell you that I was you, that I am you too some days. I want to clarify that I did not have multiple personality disorder, and that I learned that some psychiatrists question the authenticity of the diagnosis. I want to say that the diagnosis matters less. I want to say you matter.

I do none of this. I suggest Acuphase for agitation immediately. I watch you struggle against the code white team. I watch them inject you. I watch the summer horizon drift its last bits of day on your face softly, a gold crown showing to anyone that you could rule the sun if only you woke up and got out.

The wound on your forehead is shallow. It is a little, red lake. You sleep like the dead. I do not. My place is cold. Is it winter, already?

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The British Journal of Psychiatry (2021)
218, 6. doi: 10.1192/bjp.2020.209