Self-harm as the first presentation of attention deficit hyperactivity disorder in adolescents

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Background: Self-harm (SH) in adolescence has previously been shown to significantly overlap with both attention deficit hyperactivity disorder (ADHD) and emotional dysregulation (ED). Our objective as such was to investigate the relationship between self-harm and ADHD in our population and consider its clinical relevance. **Methods:** This case series analysis examined 124 presentations of SH in 13- to 17 year-olds to Accident and Emergency Departments in South West London (97F:27M). Strength and Difficulties Questionnaires (SDQs) were used to screen for ADHD/hyperactivity and ED, and scores were compared with reference data obtained from Meltzer et al. (1999, *International Review of Psychiatry (Abingdon, England)*, 15, 185). **Results:** Mean SDQ ADHD/hyperactivity scores were significantly higher in our SH sample compared to reference data ($p < .0001$). Furthermore, significantly greater ED scores were found in our sample compared with the control reference data. **Conclusion:** Our findings contribute to the evidence for an important link between ADHD and clinical presentations of SH and suggest there to be value in screening girls presenting to A&E with self-harm for ADHD. We speculate that ED plays a role in the evolution of SH in dysregulated ADHD. We recommend that clinicians assessing adolescents have self-harmed to be aware of possible ADHD symptoms and screen as appropriate; however, future research examining the temporal association between ADHD, emotional dysregulation and self-harm is required to establish causal direction.

Key Practitioner Message

- Adolescents diagnosed with ADHD are at increased risk of self-harm and suicidality (as seen in longitudinal studies).
- We demonstrate statistically higher levels of ADHD symptomology and emotional dysregulation in a self-harming population, using a validated questionnaire in a clinical setting.
- Validated questionnaires are a quick and effective way to screen for ADHD and emotional dysregulation. Adolescents with significant scores on screening could then receive further assessment and management, which would help to assuage adverse outcomes of ADHD long term, including recurrent self-harm.
- Further research could be performed to see whether managing adolescents in this way reduces recurrence on self-harm.

Keywords: ADHD; self-harm; adolescence; emotional dysregulation; sex differences

Introduction

Self-harm (SH), encompassing both suicidal and nonsuicidal self-injury, poses a significant clinical challenge in the UK, with there being 19,462 presentations for self-harm in 13- to 17-year-olds to primary care across England between 2019 and 2020 (NHS Digital, 2020). A large proportion of youth who self-harm are girls, with girls making up 83% of recorded admissions for self-harm amongst 11- to 17-year-olds in 2018/19 (NHS Digital, 2019).

[Corrections made on 11 June 2021, after first online publication: In this version, the phrase 'deliberate self-harm (DSH)' has been corrected to 'self-harm (SH)' throughout this article. Following online publication, the Editor-in-Chief noted the use of terminology regarding self-harm that was used in this article. After consultation with experts in self-harm behaviour, the authors agreed to revise the article so that all references to 'deliberate self-harm' were changed to the preferred term 'self-harm'.]

Previous literature suggests that self-harm may be a potential negative outcome of attention deficit hyperactivity disorder (ADHD) in certain patients. The gender ratio in ADHD is almost the opposite of SH, as ADHD is reported more frequently in males than in females (Allely, 2014). However, adolescent girls may be being underdiagnosed with ADHD owing to their predominantly inattentive presentation (Balázs, Győri, Horváth, Mészáros, & Szentiványi, 2018). It is important to note that this inattentive phenotype may still present with higher than population levels of impulsivity and inner restlessness comparable to those of an ADHD combined phenotype, although the presentation of this may vary from the hyperactive phenotype (Miller, Derefinko, Lynam, Milich, & Fillmore, 2010). A recent case–control study has demonstrated that, when comparing adolescent girls with and without ADHD, youth who self-harmed were more likely to have a prior diagnosis of ADHD than those who did not (Meza, Owens, &

Hinshaw, 2020). Furthermore, ADHD underdiagnosis in girls was highlighted by the National Institute of Health and Care Excellence (NICE) as an area for focus in 2018 (NICE, 2018). Therefore, in light of the prior literature, it is possible that there would be value in screening youths presenting with self-harm for ADHD, with specific focus on girls (who are known to self-harm more and receive fewer diagnoses of ADHD).

It should be noted that the severe impacts of unrecognised ADHD must not be underestimated, and greater detection in early life would help to assuage adverse outcomes on education, peer interactions, self-esteem, stigma and psychiatric comorbidity both short and long term, a potential benefit of finding more screening opportunities for ADHD. (Harpin, 2005; McKeague, Hennessy, O'Driscoll, & Heary, 2015; Mueller, Fuermaier, Koerts, & Tucha, 2012; Owens, Zalecki, Gillette, & Hinshaw, 2017).

With regard to the evidence linking SH and ADHD, it has been concluded by several large-scale longitudinal studies and systematic reviews that ADHD carries a veritable risk of SH and suicidality in childhood (Allely, 2014; Giupponi et al., 2018; Swanson, Owens, & Hinshaw, 2014). Statistically, Chou, Lin, Sung, and Kao (2014) estimated the hazard ratio of self-poisoning in children with ADHD at 4.65 times greater when compared to controls, although this may not be replicable in our adolescent population.

With regard to the direction of causality, it has been suggested that there is a trajectory associated with impulsivity that can lead to ADHD, conduct disorder and other externalising disorders (Crowell, Derbidge, & Beauchaine, 2014). The relationship is suggested to be modulated by emotional dysregulation and affective disorder.

Impulsivity, a key trait of ADHD, is frequently implicated as a possible risk factor for SH, to the extent that identifying impulsive behaviour clinically could identify patients at risk of self-harming (in conjunction with other risk factors such as affective disorders) (Lockwood, Daley, Townsend, & Sayal, 2017; Ougrin, Ng, Zundel, Chung, & Kyriakopoulos, 2010). This impulsive behaviour has been linked to lower levels of serotonin in the limbic system through several studies, illustrated through studying serotonin receptor density within the prefrontal cortex in suicide victims, as well as through platelet studies (Crowell et al., 2014; Ougrin et al., 2010). As discussed by Beauchaine, Hinshaw, and Bridge (2019), it is this biological predilection for impulsive behaviour, modulated by protective (e.g. supportive environment) factors and vulnerability (e.g. parental instability) factors, which may lead to later externalising pathology.

However, Beauchaine et al., (2019) also recognise the important role of emotional dysregulation in mediating the relationship between high impulsivity/ADHD and self-harm, particularly in preadolescence. Higher levels of emotional dysregulation in adolescents with ADHD have been found to be associated with greater level of functional impairment, severe psychopathology and social dysfunction (Caro-Cañizares, Serrano-Drozdowskyj, Pfang, Baca-García, & Carballo, 2017; Ryckaert, Kuntsi, & Asherson, 2018). It has been shown that young people who self-harm struggle to express emotions verbally when compared to nonself-injurers (in some cases exhibiting alexithymia) (Klonsky & Glenn, 2009).

Therefore, it is plausible that emotional dysregulation would lead to expression of strong feelings through impulsive acts of self-harm. There is research evidence that in survivors of childhood physical and emotional abuse, as well as in children suffering nightmares, emotional dysregulation was a key modulator in whether these groups of children self-harmed (Ennis et al., 2017; Gratz & Roemer, 2008). Although these studies did not look at ADHD, they both show a capacity of emotional dysregulation to precipitate self-harm, in agreement with the suggestions for interventions for emotional dysregulation made by Beauchaine et al. (2019).

The model of emotional dysregulation acting as a modulator of self-harm in ADHD is evidenced by Deutz, Geeraerts, van Baar, Deković, and Prinzie (2016). In their study of young children, they proposed models of factor structure and tested them against longitudinal data from the Flemish Study on Parenting, Personality and Development. On analysis of the data, a bifactor model of emotional dysregulation and ADHD in SH best matched the data (as opposed to a one factor model or a second-order model). It suggests that, in line with current understanding, dysregulation is a discrete entity to ADHD but, when combined with ADHD, has the propensity for adverse outcomes.

Additionally, higher levels of emotional dysregulation in ADHD contribute to the complexity of clinical presentation. In a longitudinal study of 9- to 12-year-olds, it was found that emotional dysregulation was significant in the development of depression on a background of ADHD (even when oppositional defiant and depressive symptoms were controlled for) (Seymour, Chronis-Tuscano, Iwamoto, Kurdziel, & MacPherson, 2015). Furthermore, it is known that there is high comorbidity of internalising disorders with SH (Bentley, Cassiello-Robbins, Vittorio, Sauer-Zavala, & Barlow, 2015). Others have reported an indirect pathway from ADHD to suicidal ideation, mediated by depression and amplified by emotional dysregulation (Biederman et al., 2008; Chronis-Tuscano et al., 2010; Deutz et al., 2016). This has been explored further in the concept of irritability within ADHD, with a study of children showing that endorsement of irritability or disruptive mood dysregulation disorder (DMDD) within ADHD was associated with greater psychiatric comorbidity (Eyre et al., 2017). These findings warrant the investigation of not only self-harm amongst ADHD, but also whether this triangulation of SH, ADHD and emotional dysregulation may link further to internalising disorders and suicidal ideation.

With regard to the clinical utility of this understanding, emotional dysregulation in the context of ADHD has been found to be amenable to pharmacological intervention in adolescents (although it should be noted the duration of this effect is unclear) (Gamli & Tahiroglu, 2018; Winters, Fukui, Leibenluft, & Hulvershorn, 2018). This therefore suggests that treatment of underlying ADHD may also ameliorate emotional dysregulation which may be exacerbating externalising behaviour in ADHD.

Self-harm and ADHD individually pose significant challenges to both patients and healthcare professionals. However, emerging literature suggests a relationship between them that could be useful in managing such presentations in clinical practice.

There is a potential for better recognition and management of both ADHD and SH. However, to date, research

has followed up children with diagnosed ADHD and demonstrated that they are more likely to self-harm. For self-harm to operate as a 'screening opportunity' for potentially undiagnosed ADHD, our paper must demonstrate that there is a considerable rise in hyperactive symptomology and emotional dysregulation in adolescents presenting with self-harm, who have not been selected for study on account of ADHD. The aim of this paper, as such, is to investigate whether there is a clinically identifiable link between self-harm, ADHD and emotional dysregulation in an acute psychiatry setting from the general population. If so, this would have direct implications for the recognition and management of self-harm in ADHD in clinical practice.

Methods

Design

The study design was case series analysis using a pseudo-control group. The pseudo-control group for hyperactivity was publicly available normative SDQ reference data based on UK 11- to 15-year-old children, collected as part of the *Mental Health of Children and Adolescents in Great Britain* report (Meltzer, Gatward, Goodman, & Ford, 1999). We chose this particular data set due to its large size, the fact it is UK-based and that the age range (11–15) approximately matches our sample age range (13–17). Whilst, ideally, we would have selected our own control group from a clinical sample of 13- to 17-year-olds, this was not possible due to financial and practical constraints. For the emotional dysregulation comparison, there are very limited comparative data available using the SDQ emotional dysregulation subscale, and therefore, we referred to Caro-Cañizares et al., (2017) who examined dysregulation in an ADHD clinical sample and have estimated the prevalence of emotional dysregulation in their sample. This is not an ideal comparator, given that the individuals in that sample have ADHD; however, better data were not available for the purposes of analysis.

Sample

The study sample was young people (13–17 years) presenting to Accident and Emergency Departments across South West London on account of self-harm or related presentations (suicidal ideation) between January and May 2018. Other acute psychiatric presentations to A&E were not included in our analysis. Suicidal ideation was included in our analysis owing to association with emotional dysregulation (Al-Dajani, Uliaszek, & Hamdullahpur, 2019). All such presentations are reviewed by the CAMHS Emergency Care Team of South West London and St George's (SWLSTG) Mental Health NHS trust. These patients were identified via electronic records, and basic demographic information was collected (age, gender, ethnicity, care status, previous mood-disorder diagnosis). The data used in this study were readily available to the clinical team and were collected as part of routine clinical work. No patient identifiable data were collected, and no direct contact patient was made.

Materials

Strengths and Difficulties Questionnaire (SDQ). The SDQ is a 25 item questionnaire originally designed to produce subscales for various disorders, including hyperactivity, conduct, prosocial behaviour, mood and peer relations (Goodman, 2014). There are versions that can be completed by the parent/carer or child. With regard to the type of SDQ recorded, 70 cases had Children and Young Person (CYP) SDQs recorded, whilst 54 cases had Parents SDQs. Due to the differences in scoring between the two types of SDQ, parent and CYP SDQs have been reported separately.

Child and adolescent mental health patients within the trust are routinely given SDQs seven days postadmission. The SDQ is shown to have diagnostic validity in ADHD (area under the curve analysis by Algorta, Dodd, Stringaris, & Youngstrom (2016) reports 0.81–0.96 for diagnostic efficiency). With respect to ADHD, 6/10 on the hyperactivity subscale is when more formally screening for ADHD would typically be considered. Therefore, analysing these questionnaires in the context of self-harm was a simple yet effective method of investigating the study population.

Emotional dysregulation SDQ subscale. Holtmann, Becker, Banaschewski, Rothenberger, and Roessner (2011) created a new subscale of the SDQ, combining items from each previous subscale to produce an emotional dysregulation subscale, which we used in our own analysis. The questionnaires were additionally used to calculate emotional dysregulation scores, using items 2 (restless, overactive), 8 (many worries), 12 (fights with other children), 13 (often unhappy) and 22 (steals) (Holtmann et al., 2011). In their original paper, Holtmann et al. use a cut-off of 5/10, which we applied in our own analysis.

Statistical analysis

Fisher's exact test and Z-testing were used to examine the statistical significance of differences in results when compared to SDQ scores of a standard sample (Caro-Cañizares et al., 2017; Goodman, 2014). This was done as the raw data from the pseudo-control group were not available, and therefore, we used statistical tests that could be calculated using the mean, standard deviation and sample size.

As this study did not involve intervention or primary data collection, ethical approval did not need to be sought. Patient identifiers were removed from each of the cases reviewed, and data were analysed anonymously.

Results

In total, 238 individuals presented to accident and emergencies within the mental health trust during the January to May 2018 period and met inclusion criteria (i.e. presented with self-harm or suicidal ideation). Of these 238 presentations, 124 patients had completed SDQs on record (this may be due to patients already being known to services and therefore not required to complete an SDQ or simply patients who are lost in follow-up). This was not a controllable loss of data in our sample, as data were collected retrospectively.

Demographics of the study sample are given in Table 1. The gender profile was 78% female and 22% male. The mean age was 15.3 years old. The racial profile was predominantly White British; however, there were a range of ethnic minorities amongst the sample. With regard to psychiatric comorbidity, the most common previously diagnosed psychiatric comorbidities were autism spectrum disorder (ASD) (12%), depression (11%), ADHD (6%) and anxiety (6%).

The reasons for presentation to A&E during the period are detailed in Table 2. Suicide-related presentations (i.e. suicidal thoughts, ideation and attempted suicide) were included in accordance with the literature reviewed in this paper. The most common individual presentations were overdose, suicidal thoughts and self-harm by sharp object.

Table 3 illustrates the mean SDQ scores and the percentages of people in each group who fell above and below the critical value of 6 (the point at which SDQ Hyperactivity scores would indicate a possibility of ADHD). The sample column refers to the results for our sample, whilst the UK column refers to reference data for UK 11- to 15-year-olds (chosen as it is the closest demographic match to the sample we investigated) (Goodman, 2014).

Table 1. Demographics of sample population

Item	n = 124
Gender (*n*)	
Male	27
Female	97
Mean age (SD)	15.3 (1.3)
Ethnicity (*n*)	
White British	69
British Asian	8
Black British	6
Mixed Other	4
White Other	4
Mixed (White, Caribbean)	3
Asian	3
Mixed (White, Asian)	3
Black African	2
Other	2
Mixed (White, African)	2
Unknown	15
Psychiatric Comorbidity (*n*)	
Autism Spectrum Disorder	15
Depression	14
Attention Deficit Hyperactivity Disorder	8
Anxiety Disorder	7
Low Mood	5
Substance Abuse	5
Obsessive Compulsive Disorder	4
Eating Disorder	3
Oppositional Defiance Disorder	3
Body Dysmorphic Disorder	1
Posttraumatic Stress Disorder	1
Sensory Processing Disorder	1
Tourette's Syndrome	1
SDQs (*n*)	
Children and Young People SDQs	70
Parent SDQs	54

Table 2. Reasons for presentation amongst the sample

Reason for presentation	Counts of diagnosis
Overdose	42
Suicidal Thoughts	41
Self-harm by sharp object	23
Low mood, self-harm and suicidal thoughts	18

The mean SDQ hyperactivity score was 6.6 in both the CYP and parent groups. This was statistically significantly greater than the mean SDQ hyperactivity score for the UK population sample (3.8 for the UK CYP sample and 3.2 for the UK Parent sample). First, this demonstrates that the both the parent and the CYP sample means were above the diagnostic threshold of 6 and that the sample had statistically significantly higher scores on ADHD items on the SDQ.

Furthermore, when examining the proportions of people above and below the diagnostic threshold of 6, Fisher's exact testing was used to deduce that the proportional differences were significant. On crude analysis, one can see that the groups have almost inverse proportions of people below and above 6. On statistical analysis, there are significantly greater proportions of adolescents above the threshold in the sample

Table 3. Comparing sample results against UK data for 11- to 15-year-olds. SDQ hyperactivity refers to the hyperactivity items (maximum 10). SDQ Hyp <6 and ≥6 refer to the proportions of people in each sample who were above and below (i.e. the critical value)

	Self-reported		Parent	
Item	Sample (*n* = 70)	UK (*n* = 4228)	Sample (*n* = 54)	UK (*n* = 4443)
Mean SDQ Hyperactivity	6.6****	3.8	6.6****	3.2
SDQ Hyp <6 (%)	27.1	79	31.5	80.1
SDQ Hyp ≥6 (%)	72.9****	21	68.5****	19.9

****Significant at $p < .0001$ (Z-Testing was used for Mean SDQ Hyperactivity scores. Fisher's Exact Test was used for proportions of SDQ scores ≥6).

population compared to the UK population data ($p < .0001$). In practice, our data show that adolescents who self-harm are 10.1 times more likely to score 6 or greater on the CYP SDQ hyperactivity scale than the UK population (95% CI: 5.9, 17.1). Furthermore, adolescents were 8.1 times more likely to score 6 or greater on the parent SDQ hyperactivity scale than the UK population (95% CI: 4.99, 15.6).

Analyses were done comparing differences in SDQ score by gender and by reason for presentation. Differences in mean SDQ hyperactivity and dysregulation scores were nonsignificant both when comparing between self-reported and parent-reported SDQ scores.

Owing to the lack of preexisting data sets on SDQ dysregulation scores for a control group, analysis was made by examining the proportion of subjects with a dysregulation score equal to or greater than 5 in our sample compared to a clinic sample of ADHD patients. 57% of the parent sample had noted dysregulation (a score ≥5 (35)), compared to 28% of the clinic sample (calculated with SDQ parent scores). This difference between populations was statistically significant ($p < .0001$).

Discussion

The aim of this paper was to ascertain whether, in line with previous research regarding ADHD, emotional dysregulation and self-harm, a clinical population of adolescents who self-harm would exhibit greater hyperactive and emotional dysregulation symptomology than control populations. Our data, although studied retrospectively, suggest that self-harming adolescents have greater hyperactive and emotional dysregulation symptomology when measured using the SDQ, in comparison with previous studied samples.

The mean SDQ hyperactivity scores show greater ADHD symptomology amongst young persons presenting with SH in an acute psychiatry setting. With regard to the prior literature, our study provides further evidence that ADHD traits are associated with self-harm, given that greater ADHD traits were discernible amongst youth with a history of self-harm versus those without (Chou et al., 2014; Giupponi et al., 2018). This is an important distinction, as we do not know how similar adolescents with diagnosed ADHD are to adolescents with undiagnosed ADHD/high ADHD traits, and this question cannot be addressed by studying a population

selected for ADHD. In clinical practice, although high hyperactivity does not confirm a diagnosis of ADHD, our results support vigilance for hyperactive-impulsive and inattentive symptoms in adolescents presenting with self-harm, to identify adolescents whose self-harm may be linked to unrecognised ADHD. Our study also shows that this vigilance of ADHD symptoms could be aided by using the SDQ, as has been done in the trust we studied, given that it is free, brief, easily completed and that our study has shown that it is feasible to perform within the acute psychiatry setting. In the context of NICE's call for greater recognition of ADHD amongst girls, this could possibly form a new avenue for identifying girls with symptoms of ADHD has been identified.

Furthermore, the greater levels of emotional dysregulation detected by the SDQ in our acute psychiatry sample when compared to a clinic sample of adolescents with ADHD, we speculate, may be due to an interaction of high ADHD traits in conjunction with emotional dysregulation which is conducive to self-harm. However, this link cannot be inferred from our data given that they are single time point retrospective data, and longitudinal data with questions to disentangle hyperactive, emotional dysregulation and internalising symptoms would be required to this end.

Furthermore, Kutlu, Akyol Ardic, and Ercan (2017) found that methylphenidate effectively reduces emotional dysregulation in ADHD. If the relationships between SH, ADHD and emotional dysregulation are valid, this may suggest a potential pharmacological therapy for self-harm in this context. However, this would require further investigation and the role of medication in self-harm cannot be spoken to from our results.

It is important to discuss the comorbidity within our sample. There were eight prior diagnoses of ADHD (6%); however, the significance of this is unclear, given that this is not particularly large. Six of these ADHD diagnoses were in girls; however, the significance of this cannot be commented on given our largely female sample. Furthermore, there were 14 individuals with diagnosed depression (11%). It is known that depression and self-harm are linked; however, it would be unwise to solely attribute self-harm to the depression, given the interplay between ADHD and depression (Seymour et al., 2015). Further analysis using SDQ mood scores to understand the role of mood disorders in the relationship may have provided benefit to this effect. It is curious that autism spectrum disorder was a common comorbidity recorded in the cases. Whilst it is not within the scope of this paper to investigate this relationship, the mean SDQ hyperactivity score was 7.9 amongst those with a confirmed ASD diagnosis in our sample. It is of note that in a paper a study of 6- to 8-year-olds concluded that ADHD sufferers with symptoms of ASD exhibited greater difficulties in conduct, emotional, peer and hyperactivity/inattention domains (Clayton, Green, Rinehart, & Sciberras, 2016).

There are effective pharmacological treatments available for ADHD; however, this depends on sufferers being recognised. The same, however, cannot be said for self-harm, with the latest Cochrane review illustrating few evidence-based treatments for children and young people (Hawton et al., 2015). Moreover, the benefits of pharmacological treatment for ADHD may not simply be found in amelioration of behavioural symptoms, as evidenced by the results of a large-scale Swedish cohort study, which shows significantly decreased levels of criminality in adults with ADHD during periods of medication (Lichtenstein et al., 2012). Furthermore, atomoxetine has been shown to be beneficial in ADHD comorbid with conduct disorders (Pringsheim, Hirsch, Gardner, & Gorman, 2015). This research shows that treating ADHD is beneficial in the management of its comorbidities, of which SH may be included. With respect to our sample, it does beg the question of whether treating a diagnosis of ADHD is the same as treating high ADHD traits.

There are a number of limitations to the study design. First, the sample size is limited as not all those who presented to A&E were given an SDQ, which resulted in 114 cases being excluded from the study. In addition, the UK sample data, whilst a useful resource, were not matched for sample size, age, gender or locality. Furthermore, it is not known whether these individuals self-harmed, and given the prevalence of self-harm it is likely that some of the control population would have self-harmed. Ideally, comparisons would have been made with local data on a matched sample. Furthermore, in the ADHD clinic sample data used for comparative analysis for emotional dysregulation, it is impossible to know whether there were youth who self-harmed included in the results, which would skew our analysis. Furthermore, we ideally would have used emotional dysregulation data for a non-ADHD population, for a pure comparison of whether there is increased emotional dysregulation, however, unfortunately data sets such as this do not exist. Whilst these issues make the interpretability of our emotional dysregulation results difficult, the statistical significance of the difference suggests that there would be merit in further investigation of emotional dysregulation in self-harm with respect to ADHD. It should also be noted that the dysregulation scale used has one overlapping item with the hyperactivity scale used, which may falsely cause association between the two items. Owing to this, however, we did not examine the correlation between hyperactivity and emotional dysregulation as this would have been a biased analysis.

There are also some questions to be raised regarding the efficacy of screening tools in such a nuanced context. However, it has been demonstrated when using a six item ADHD symptom screening scale in adults, higher scores were significantly associated with increased attempted suicide and ideation within the past 12 months (Stickley, Koyanagi, Ruchkin, & Kamio, 2016). This shows the efficacy of using screening tools for ADHD in such a context as ours. Importantly, this was found to be independent of sex, age, ethnicity, education, ethnicity, stressful life events, income, common mental disorders and substance abuse in cases of suicidal ideation.

Strengths of this study are that it examines a large sample of youth presenting with self-harm and related conditions across a mixed demographic area of South West London. Furthermore, we have examined group of individuals presenting with self-harm that are predominantly female and highlight the issue of potentially undiagnosed ADHD in girls.

Future research in this area could take advantage of longitudinal development studies which have used the SDQ to view the relationship between SDQ scores and self-harm across time.

Conclusion

Our findings point towards a clinically significant link between ADHD symptoms and SH, which can be assessed with SDQ screening, followed by clinical assessment. Our largely female sample also points towards this being a potential mechanism for the identification of a cause of recurrent self-harm in females. Furthermore, we speculate that emotional dysregulation plays a role in the evolution of SH in a dysregulated ADHD phenotype, although causality cannot be confirmed from the results we have produced. We recommend that clinicians assessing presentations of SH be vigilant for signs of hyperactive/impulsive and manage these as appropriate.

Acknowledgements

Ethical information

There was no ethical approval required for this paper as it is noninterventional, based on anonymised patient records.

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