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Self-Harm in Children under 14: A Comparison of Inpatients Who Self-Harm with Those Who Do Not

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Abstract

This study investigated characteristics and variables associated with self-harm in patients in a psychiatric unit which accepted children aged 7-13 years. It sought specifically to determine the role of emotion regulation as a motivation for self-harm in children. The study involved hypothesis driven examination of case files from 80 in patients admitted between 2003-8 to the Child and Family Therapy Unit (CFTU) at the Royal Children's Hospital, Brisbane, Australia. Inpatients were selected, independent of the researchers, based on scores for HoNOSCA Item 3: 'Non-accidental self-injury'. Forty inpatients ('self-harm group') had been scored on admission by inpatient staff as 2 (mild problem but definitely present), 3 (moderately severe problem) and 4 (severe to very severe problem). Forty inpatients (the 'No self-harm comparison group') had been scored 0 (No problem) or 1 (Minor problem requiring no action).

Most common methods were 'cutting' and 'head-banging'. The self-harm group differed from the comparison group in terms of family-related factors such as living situation, and psychological functioning as measured by the Strengths and Difficulties Questionnaire (SDQ), total HoNOSCA scores, and a history of sexual abuse. Our hypothesis that children engage in self-harm to regulate their emotions was not supported. Explanations for the findings and implications for research, intervention and prevention are discussed.

Keywords: Self-harm; Non-suicidal self-injury; NSSI; Child; Inpatient

Introduction

People across many cultures have engaged in self-harm for thousands of years [1], but from the 1990s society recognised and addressed the behaviour as problematic [2]. Self-harming behaviours are unfortunately common among young people, and may be increasing, though reported rates depend on the questions asked or questionnaires used. In 2004, Muehlenkamp et al. [3] found 15% of their sample of US high school students had engaged in self-injury, with 5% making a suicide attempt. A more recent international review reports a prevalence of 16-18% [4]. In 2002, Hawton et al. [5] reported prevalence for self-harm in 15-16 year olds at 6.9% in 41 UK secondary schools, supported by the later European CASE study (4.3% in males and 13.5% in females) [6]. However the recent European SEYLE study [7] suggests prevalence between 17.1-38.6% for self-injurious behaviour in community adolescents (mean age 14.9yrs) across 11 European countries. While a meta-analysis has disputed any apparent world-wide increase in adolescents [4], suggesting it is likely to be the result of more comprehensive and focused questionnaires, rates of self-harm are high and there is a huge associated economic burden, usually associated with hospitalisation [8,9].

The prevalence of self-harm is higher in clinical populations. DiClemente et al. [10] found 61% of adolescents hospitalised in a psychiatric facility had engaged in cutting behaviour. Jacobsen et al. [11] examined charts for 227 outpatient adolescents (mean age 15.08 yrs) finding 17.6% had 'self-harmed' (self-injury and a suicide attempt), 13.2% self-injured without suicidality, and 16.7% suicide attempters (with no self-injury). Boxer's, [12] study of 476 adolescents admitted for aggressive behaviours (mean age 13.9 yrs), reported figures of 25% Non-Suicidal Self-injury (NSSI), 30.9% self-harming (self-injury and suicide attempts), and 13.4% who had attempted suicide without other self-injury.

There are many reasons why research into self-harm in children is important. First, childhood self-harm is associated with poor outcomes. Sourander et al. [13] found that engagement in self-harm at age 12 years significantly predicted self-harm at 15 years. Self-harm is also the strongest predictor of later suicide [14]. In a study of inpatient adults diagnosed with Borderline Personality Disorder, Zanarini et al. [15] found those who began self-harm in childhood performed the behaviour for longer durations, and reported a greater variety of methods compared to those who began during adolescence or adulthood. Sellar, et al. [16] observed the death rate of adolescents previously admitted to hospital for self-poisoning was significantly higher than in the general population. In a recent representative sample of 12,006 Australians aged between 10-100 years, using computer assisted telephone interviewing (CATI), Martin, et al. [9] found self-injurers of all ages to be nearly 42 times more likely than non-self-injurers to have attempted suicide in the 12 months before survey. They report nine boys and three girls as current self-injurers in the 10-14 year age group and, within the overall sample, 9 subjects claimed to have begun self-injury between the ages 5-9 years.

Although these studies, by implication, provide some understanding of self-harm in children and pre-adolescents, there have been few dedicated studies of children under 14 years.

The first aim of the present study was to investigate characteristics and variables associated with self-harm in child inpatients. Given the paucity of prior studies looking at self-harm in children specifically, hypotheses were informed by research on self-harm in adolescents.

Adolescents engage in a range of self-harming methods which include drug and alcohol overdose [17,18]. However, the most common forms of self-injury found among adolescents include hitting, cutting, scratching and burning [19].

The most commonly reported precipitants for self-harm involve problems with family members. Sourander et al. [13] observed that parent-reported aggression in 12 year olds predicted self-harm in adolescence, and that not living with two biological parents at the age of 12 predicted self-harm at 15yrs. Hawton, et al. [17] found that 77% of children under the age of 15 presenting with self-harm to an English hospital, reported relationship problems with family members prior to self-harm. Bjarehed, et al. [20] found the absence of positive feelings towards parents was significantly associated with self-harm in 14 year olds. More recently Baetens, et al. [21] have investigated the mediating role of depression and self-criticism between Parental Expressed Emotion and adolescent Non-suicidal Self-injury. Chitsabesan, et al. [22] found that parental mental health problems significantly predicted repeat self-harm in children who deliberately poisoned themselves.

Other common social problems involve relationships with friends, and issues at school [17], and feeling overpowered [23].

Taylor, et al. [24] found children admitted to hospital for self-poisoning had more psychological symptoms compared to a psychiatric control group. Resch, et al. [25] confirmed this, showing children and adolescents with suicidal behaviour reported significantly more mental health problems than those not demonstrating suicidal behaviour. Bjarehed, et al. [20] found that frequency of alcohol consumption was associated with self-harm in 14-year-old males.

Prior sexual and physical abuse have also been associated with self-harm in young people Finzi et al. [26] found that children who had been physically abused demonstrated higher levels of suicidality compared to children who had been neglected or neither abused nor neglected. A reported history of sexual abuse predicted engagement in first-time self-harm in a community sample of adolescents [27].

Of note, all studies examining self-harm in child inpatients [23,24] have been descriptive studies of children who attempted suicide, and there were no comparison groups. This demonstrated to us the need for a study with a comparison group.

The second aim of the present study was to examine motivations behind self-harm in child inpatients; specifically whether self-harm was a way of regulating emotions. Favazza, et al. [1] were the first to report that self-mutilation provided patients with relief from anger, anxiety and depression. Currently, 'emotion regulation' is the most commonly reported motivation behind adult and adolescent self-harm [9,19]. No previous studies have set out to examine the role of emotion regulation as a motivating factor behind child self-harm.

As so little is currently known about the nature, type, and intent of both self-injury and self-harm child inpatients, and given possible small numbers in the design of our study, we preferred the broader definition 'self-harm' in order to thoroughly investigate the range of behaviours in this population.

Method

Participants

The sample comprised 80 inpatients (36 females, 44 males) admitted between 2003 and 2008 to the Child and Family Therapy Inpatient Unit (CFTU) at the Royal Children's Hospital, Brisbane. Mean age was 11.79 ± 1.91 years (range=7-14 years). Cases were randomly sampled until we had 40 patients scoring between 2, 3 or 4 on HoNOSCA Item 3: Non-accidental self-injury, indicating clinically significant self-harm. In addition we gained a comparison group of 40 patients scoring 0 or 1 on the same question, indicating no engagement in clinically significant self-harm.

Case records were selected independently by Royal Children's Hospital medical records staff according to set criteria; the researchers had no role in case file selection. To check the random nature of selection, the first 20 self-harming cases selected were compared to the last selected 20 cases on all variables relevant to our hypotheses, as well as scores on HoNOSCA Item 3: Non-accidental self-injury. Chi-Square, Fisher's Exact, and Mann-Whitney analyses revealed no significant differences between the groups, except on aggression (α=0.05) where the first 20 participants appeared to be less aggressive than the last 20 selected.

The comparison sample was randomly selected from the 322 inpatients admitted between 2003 and 2008 scoring 0 or 1 on Item 3 of HoNOSCA. For two selected cases, files were not available at the time of data collection; they were replaced with the next two randomly selected cases. The 40 case files included in the sample did not differ from those not included (280) on any variables examined (α=0.05) (full details of analyses available from the authors).

Procedure

With ethics approval from the University of Queensland School of Psychology Behavioural and Social Sciences Ethical Review Committee, as well as the Royal Children's Hospital Human Research Ethics Committee, each case file was individually examined at the Royal Children's Hospital. Case files were assessed using a question sheet developed a priori, and based on the hypotheses (question sheet available from authors on request). To complement the information gained from the case file review, scores on standardised measures and information on demographic and background characteristics were obtained from two electronic databases: the Client Event Service Application (CESA - for demographic details and service episode history) and the Outcome Information System (OIS - for patients' diagnoses, and scores on HoNOSCA, SDQ and CGAS). If a child had been admitted more than once, their most recent record of admission was used.

Measures

Question sheet: This consisted of nine items addressing variables predicted to be related to self-harm in children, and four items examining characteristics of self-harm. The question used to address mental health in the child's family, for example, was: Is there a recorded history of mental health problems in the child's immediate family? (Mother, father or siblings only). If no problems were noted, this was scored as 'a'; if problems were present, but no diagnosis provided, this was scored as 'b', and if problems were noted with a diagnosis provided, this was recorded as 'c'.

For each question, answers were determined based entirely on information from case files. In cases where an answer was uncertain, for example if the occurrence of sexual abuse was likely but not certain, this was recorded accordingly. Case record data pertaining to frequency of self-harm was only available for six cases, and could not be analysed in detail.

Construct validity of the questionnaire was determined by comparing participants' scores on questionnaire items to their scores on HoNOSCA items measuring similar constructs. As examples, scores obtained on aggression from case-note enquiry were compared to scores on HoNOSCA Item 1: Disruptive, antisocial or aggressive behaviour. Scores on drug and alcohol use were compared to HoNOSCA Item 4: Alcohol, substance or solvent misuse. Scores on language problems were compared to HoNOSCA Item 5: Problems with scholastic or language skills. Chi-square and Fisher's exact analyses revealed no significant differences (α=0.05) for all mentioned variables except alcohol use, suggesting differences between participants observed on the questionnaire items corresponded well to those observed on relevant items of the HoNOSCA.

Demographic and background characteristics: Age, gender, living situation, and number and length of admissions to CFTU were obtained from CESA. Age was calculated from the birth date recorded at most recent admission. Living situation was coded in terms of whether children lived with two biological parents or not.

Primary diagnosis: Primary diagnoses were based on the International Classification of Disease tool for Community-based Mental Health Services [28]. Where a child's diagnosis for mental and behavioural disorders had changed over time, the most recent diagnosis was recorded.

HoNOSCA: A 15-item clinician-rated measure providing an indication of a child's level of functioning in several areas, HoNOSCA is derived from the adult HoNOS [29]. Items 1-13 of HoNOSCA concern the child's mental health, whilst items 14, 15 address problems with caregiver access to information and services. Each item is rated on a five-point scale from 0 (no problem) to 4 (very severe problem). Scores of 0,1 indicate problems are not clinically significant; scores from 2-4 indicate clinical significance. 'Total clinical severity' is the score calculated by summing items 1-13 [30]. HoNOSCA shows evidence of face validity, good inter-rater reliability, and sensitivity to change [27].

The strengths and difficulties questionnaire [31]: A behavioural screening tool assessing psychological attributes in 4-17 year olds, the SDQ contains 25 items measuring five constructs: Emotional symptoms, Conduct problems, Hyperactivity/inattention, Peer relationship problems and Pro-social behaviour. Each item is rated by the parent, and/or child, on a three-point scale 0 (Not true) to 2 (Certainly true). A Pro-social example item from the self-rated version of the SDQ for 11-17 year olds is: "I try to be nice to other people. I care about their feelings". The SDQ demonstrates concurrent validity [31], internal and external validity and moderate to strong internal reliability (α 0.59-0.80) [32]. Scores were taken from either the parent- or child-reported measures, depending on availability for each case. If a child had scores on child- and parent-reported measures, an average of the two measures was recorded.

The Children's Global Assessment Scale [33] is a clinician-rated measure of a child's overall level of functioning ranging from 1-100, with 1 representing a most severe level of functional impairment, and 100 representing full health. The CGAS demonstrates strong inter-rater reliability (α=0.84), test-retest reliability, and discriminant and concurrent validity [33].

Results

Data were analysed using PASW Statistics 17. All tests were two-tailed with alpha level 0.05. Differences between groups on categorical variables were examined using Chi-Square. Fisher's exact test was used for variables containing cells with expected counts of less than five, as recommended. Groups were compared on continuous variables using Independent-Samples T-tests or Mann-Whitney tests for variables with significant skew or kurtosis. A visual examination of the histogram for the SDQ total scores variable, the only continuous variable, revealed no outliers.

Missing data

Ten participants in the self-harming group and six participants in the comparison group were not diagnosed with a primary mental disorder. Precipitants of self-harm were not identified for nine cases in the self-harming group, while methods were not recorded for six cases. One self-harmer was missing data on their living situation. SDQ total scores could not be obtained for 19 cases, overall, due to missing data. SDQ emotional symptoms subscale scores could not be obtained for 18 cases, including 12 self-harmers and 6 in comparison group. Sixteen participants were missing data on all items of the SDQ, including 10 self-harming cases and 6 in the comparison group. Total scores could not be obtained for a further 3 self-harmers. For two comparison cases subscale scores could be pro-rated, as recommended by Goodman, et al. [29], given at least three items had been completed.

Participants with missing data on the SDQ total difficulties score did not differ from those without missing data; on gender (57% male, 47% female, χ^2 (1, N=80)=0.59, p=0.444); age (mean 11.80 ± 2.05yrs and 11.80 ± 1.89yrs respectively, (t(78)=0.15, p=0.995); and HoNOSCA total score means (23.50 ± 11.00 and 19.80 ± 9.01 respectively, t (69)=1.37, p=0.174).

HoNOSCA total scores could not be computed for nine participants (7 self-harmers, 2 comparison) due to missing data. One comparison group participant was missing data on Item 9: Problems with emotional and related symptoms. The two groups did not differ on gender (56% males without total scores, 55% males with), or age (without, mean age 11.21 ± 2.31 versus with 11.87 ± 1.87, t (78)=-0.97, p=0.337).

Participant and admission characteristics

Self-harmers were significantly older than non-self-harmers (mean ranks 47.98 and 33.03, respectively, U=501.00, z=-0.29, p=0.004), had been admitted to CFTU more often (mean ranks 44.71 and 36.29, respectively, U=631.50, z=-2.08, p=0.038), but had shorter admissions, (mean ranks=31.60 and 49.40, respectively, U=444.00, z=-3.43, p=0.001). More females self-harmed (60%), compared to non-self-harmers (30%), (χ^2 (1, N=80)=7.27, p=0.007). Fifteen self-harmers (38%) scored 2 on HoNOSCA Item 3, 22 (55%) scored 3, and 3 (7%) scored 4). Thirty-nine non-self-harmers (97%) scored zero, and one child (3%) scored 1 (Tables 1 and 2).

	Self-harming group			Comparison group			
	Males (n=12) %*	Females (n=19)%*	Total (n=31)%*	Males (n=24) %*	Females (n=10) %*	Total (n=34) %*	Overall total (n=65)%*
Conduct & mixed affective/ conduct disorders	17	21	19	17	10	15	18
Anxiety disorders	8	11	10	17	20	18	14
Obsessive compulsive disorder	8	5	6	13	20	15	11
Disturbance of activity and attention	25	5	13	13	0	9	11
Mood disorders	0	16	10	0	0	0	5
Pervasive developmental disorders	17	5	10	4	0	3	6
Reactive attachment disorder of childhood	0	11	6	4	10	6	6
Post traumatic stress disorder	8	5	6	4	0	3	5
Nonorganic encopresis	0	0	0	13	0	9	5
Adjustment disorders	0	11	6	4	0	3	5
Anorexia nervosa	0	0	0	4	10	6	3
Other	17	10	13	8	30	15	14
%*=percentage of participants for whom primary diagnoses were given							

Table 1: Primary Diagnoses (as percentage).

Primary diagnoses were given for 12 male and 18 female self-harmers, and for 24 male and 10 female non-self-harmers. Most common diagnosis for self-harmers was conduct disorder, then mixed disorder of conduct and emotions, followed by disturbance of activity and attention. Most common diagnosis in the comparison group was anxiety disorder, followed by conduct disorder, then mixed disorder of conduct and emotions, and then obsessive-compulsive disorder.

	Males%	Females%	Total%
Family-related factors	50	58	55
Internal precipitants*	42	47	45
Friend/peer-related factors	25	32	29
Transfer to new school/grade	25	16	19
Death/serious illness in family	17	16	16
Trauma	8	21	16
Other	0	16	10
*Internal precipitants=factors related to the child's internal state, for example, feelings of frustration or depression.			
Note. Participants for whom precipitants were not identified are not included in calculation of percentages. Percentages total more than 100%, as multiple precipitants were identified for many participants.			

Table 2: Precipitants of Self-harm.

Precipitants of self-harm were identified for 12 males and 19 females. Multiple precipitants were recorded for 18 cases, the most common being family-related factors, followed by internal precipitants and friend-related factors.

Methods of self-harm were recorded for 21 females and 13 males (Table 3). Most common methods reported were cutting, followed by head-banging, overdosing, hitting and biting.

	Females% (n)	Males% (n)	Total% (n)
Cutting	71 (15)	23 (3)	53 (18)
Head-banging	14 (3)	54 (7)	29 (10)
Overdosing	24 (5)	8 (1)	18 (6)
Hitting part of body on something	10 (2)	23 (3)	15 (5)
Biting	5 (1)	31 (4)	15 (5)
Suffocating self	5 (1)	23 (3)	12 (4)
Scratching	10 (2)	8 (1)	9 (3)
Punching self	0 (0)	23 (3)	9 (3)
Running in front of cars	5 (1)	15 (2)	9 (3)
Running into walls	5 (1)	15 (2)	9 (3)
Sore or skin picking	10 (2)	8 (1)	9 (3)
Pulling hair	5 (1)	8 (1)	6 (2)
Pinching skin	0 (0)	15 (2)	6 (2)
Attempting to access power points	0 (0)	8 (1)	3 (1)

Kicking something	0 (0)	8 (1)	3 (1)
Burning self	5 (1)	0 (0)	3 (1)
Vomiting/laxative use	5 (1)	0 (0)	3 (1)
Attempting to drown	5 (1)	0 (0)	3 (1)
Attempting to jump off roof	5 (1)	0 (0)	3 (1)
Note. Participants for whom no method was identified are not included in the calculation. Percentages total more than 100% as many participants used multiple methods.			

Table 3: Methods of Self-harm.

Variables associated with self-harm

There were two major positive findings: Self-harmers were significantly more likely to live in other than two-biological-parent families compared to the comparison group (χ^2 (1, N=79)=5.64, p=0.018). Similarly, self-harmers were significantly more likely to have been sexually abused, or suspected to have been sexually abused, compared to the comparison group (χ^2 (1, N=80)=10.32, p=0.001).

The groups did not differ in terms of: alcohol use (p=0.201), drug use (p=0.057), aggression (χ^2 (1, N=80)=1.29, p=0.256), suspected or confirmed physical abuse (χ^2 (1, N=80)=0.67, p=0.412), or family mental health problems (χ^2 (1, N=80)=0.91, p=0.340). Percentages for the categorical variables predicted to be associated with self-harm are displayed in Table 4.

	Self-harmers%	Comparison%	Total%
Children living in other than two biological-parent families	67	40	42
Sexual abuse	38	7	22
Physical abuse	25	17	17
Alcohol use	12	2	6
Drug use	17	2	8
Aggression	65	52	47
Family mental health problems	72	62	67
Note. Percentages represent proportion of children for whom the variable is present. For example, 47% of all participants are reported to show aggression.			

Table 4: Categorical Variables Associated with Self-harm.

Self-harmers scored higher on the SDQ (total) (M=23.46 ± 4.74 versus M=20.38 ± 4.16, t (59)=2.71, p=0.009, r=0.33). Similarly, HoNOSCA total scores for the self-harming children (mean rank 45.50) were significantly higher than for non-self-harmers (mean rank 27.75), U=313.5, z=-3.62, p<0.001, r=-0.43. There was no difference between self-harmers and the comparison group on CGAS scores (mean ranks=39.96 and 41.01, respectively), U=778.50, z=-0.208, p=0.835, r=-0.02.

In 42% of self-harmers and 37% of non-self-harmers, clear evidence of language impairment had been diagnosed (no significant difference, p=0.946). Similarly, impulsivity was present in 50% of self-harmers and 35% of non-self-harmers (no significant difference, χ^2 (1, N=80)=1.84, p=0.175.

The self-harming group had positive scores on HoNOSCA Item 9: 'Problems with emotional and related symptoms' (3% scored 1, 15% scored 2, 58% scored 3 and 25% scored 4. For the comparison group 10% scored 1, 21% scored 2, 46% scored 3, and 18% scored 4 (differences not significant, p=0.296). There was no significant difference between self-harmers (mean rank=32.45) and the comparison group (mean rank=30.76) on the emotional symptoms subscale of the SDQ (U=449.50, z=-0.378, p=0.705, r=-0.05).

Discussion

We explored characteristics and variables associated with self-harm in a randomly chosen group of child inpatients compared to a non-harming inpatient group, seeking to determine whether children engage in self-harm as a way of regulating emotions, as occurs in adolescents and adults.

The self-harming group were older than the comparison group, and had been admitted more often, but with shorter lengths of stay. Longer admission is generally believed to be not helpful [1,5] which may account for the brevity of stay. Our self-harming group included more females. This did not appear to be a sampling bias, and is consistent with other studies. Hawton, et al. [17], for instance, observed females aged 12-14 years were over six times more likely than males to present to hospital for self-harm.

The higher rate of mood disorders in our self-harmers reflects previous research on adolescents [24,34,35]. Haw et al. [34] for instance, found over 70% of those over age 15 years presenting to hospital for self-harm had affective disorder. In contrast, the lower rate of anxiety in our study did not fit expectations or the literature. Our finding could be an artefact of small numbers, or a feature of children (as opposed to self-injuring adolescents). Given implications of accurate diagnosis for accurate treatment, this warrants further exploration.

From the literature we predicted most common precipitants of self-harm would involve problems with family members, followed by problems with friends, and issues at school. This was supported in our study. Family-related precipitants were identified for over half the self-harmers, echoing adolescent studies [17,23,36]. Our study appears to be the first to demonstrate this relationship in a clinical sample of child inpatient self-harmers.

Self-harm in girls was more likely precipitated by family-related factors, internal-factors, friend-related factors and trauma. In contrast, self-harm in boys was commonly precipitated by the external factor of transfer to a new school or grade. These conclusions could have been an artefact of small numbers, and warrant confirmation. A better understanding of differential precipitants of self-harm for boys and girls may inform clinical practice.

Despite an absence of studies unique to child inpatients, we predicted the most common forms of self-harm among child inpatients would include hitting, cutting, scratching, burning and overdose. Overall, it appears that, similar to adolescent self-harmers [19], the majority of child inpatient self-harmers use cutting. We did find head-banging in our sample; this may be more common in children than in adolescents [20,37]. Males appeared more likely to engage in physical, aggressive methods of self-harm such as head-banging, biting, suffocating and punching, while females were more likely to engage in cutting, overdosing and picking sores.

The literature on young community adolescents suggests self-harm in children will be associated with parental mental health problems, living situation, alcohol and drug use, aggression, psychological functioning, and sexual and physical abuse. Our results show self-harmers were less likely to live in families with two biological parents, had poorer psychological functioning (as measured by the SDQ and HoNOSCA total scores), and were more likely to have been sexually abused, compared to non-self-harmers. Cases of sexual abuse, reported in the notes, were often perpetrated by a member of the child's immediate or extended family.

Hypotheses regarding parental mental health, aggression, and physical abuse were not supported. This lack of difference between self-harmers and others may relate to the fact that both self-harmers and the comparison group had clinically significant psychopathology. This, in itself, has been shown to relate to clinically significant parental psychopathology [38,39]. Our two clinical groups also had similar levels of general functioning and competencies, reflected in similar CGAS scores [40].

Previous studies have found alcohol and drug use associated with self-harm, predominantly in adult or adolescent populations [9,20,35]. Our self-harming sample did demonstrate higher rates of alcohol and drug use compared to the comparison sample, but differences were not significant, and age may be a factor in this result.

Given the literature on adolescents and adults, we predicted children would also engage in self-harm primarily to regulate emotion. Contrary to predictions, while results based on Item 9 of HoNOSCA ("Problems with emotional and related symptoms", and the emotion symptoms subscale of the SDQ, were in the expected direction, the self-harming group did not differ significantly from the comparison group on either variable. It may be that children do not primarily engage in self-harm as a way of regulating emotion. However, previous community studies have observed a positive relationship between scores on the emotional symptoms subscale of the SDQ and self-harming behaviours in children and adolescents [20,25]. Levels of emotional problems in non-self-harmers in our inpatient sample were equally high and, again, we should not have expected a result from our study design. Clearly the issue of whether self-injury in children is primarily to moderate high levels of emotion deserves further research, using specific emotion regulation scales [41]. Our inconclusive result regarding the link between emotion regulation and self-harm in child inpatients suggests the need for future research to focus on when and how self-harm develops through childhood into adolescence, and when other cognitive reappraisal strategies come into use [42,43]. We need to better understand how children get the idea to self-harm, how it is sustained, and what might help it stop. A longitudinal design may be needed, as has been done with adolescents [44].

We believe the association between a child's home environment, the higher level of single parenthood, and the higher likelihood of a history of sexual abuse, should alert clinicians to the need to consider family-based intervention strategies [45].

In conclusion, the present study is unique in comparing self-harming to non-self-harming child inpatients. However, there are major limitations in the design. The most serious relates to missing data. Mental Health staff are not good at completion of paperwork. They try to write clinical reports as quickly as possible. At the end of a shift they may leave paperwork to a third party, and there is often resentment about completing questionnaires like HoNOSCA or the SDQ, even though theoretically it is part of a national system in Australia to collect data to better understand outcomes in clinical services. A prospective study, with researchers checking on questionnaire completion and data quality, may overcome this. Curiously, post hoc discussion with relevant clinical staff suggested our self-harming sample may have under-represented the severity of self-harm present in CFTU inpatients. If resources were available, an examination of the whole cohort for the five years could provide a larger sample, and may better clarified differences between self-harmers and non-self-harmers. Finally, once case notes had been chosen, it was not possible for the researcher to be blind to whether participants were in the self-harming or comparison groups when rating the case files; it is possible researcher expectancy bias may have influenced the results. Inclusion of a second researcher to review case-notes may create inter-rater reliability, and improve confidence in the results. We would argue that further research into inpatient children who self-harm is warranted, but clinician recording issues need to be addressed, as do the design issues we have noted.

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