RESEARCH ARTICLE

Non-Suicidal Self-Injury and Suicidal Behaviour in Children and Adolescents Accessing Residential or Intensive Home-Based Mental Health Services

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Abstract

Objective: There is a dearth of Canadian research with clinical samples of youth who self-harm, and no studies could be located on self-harm in children and youth accessing residential or intensive home-based treatment. The purposes of this report were to explore the proportion and characteristics of children and youth identified as self-harming at admission by clinicians compared to youth not identified as self-harming, compare self-harming children to adolescents, and to compare caregiver ratings of self-harm at intake to clinician ratings at admission. **Method:** This report was developed from a larger longitudinal, observational study involving 210 children and youth accessing residential and home-based treatment and their caregivers in partnership with five mental health treatment centres in southwestern Ontario. Agency data were gleaned from files, and caregivers reported on symptom severity at 12 to 18 months and 36 to 40 months post-discharge. **Results:** Fifty-seven (34%) children and youth were identified as self-harming at admission. The mean age was 11.57 (SD 2.75). There were statistically significant differences on symptom severity at intake between those identified as self-harming and those not so identified; most of these differences were no longer present at follow up. Children were reported to have higher severity of conduct disorder symptoms than adolescents at intake, and there was some consistency between caregiver-rated and clinician-rated self-harm. Children were reported to engage in a wide range of self-harming behaviours. **Conclusion:** These findings suggest that youth who were identified as self-harming at admission have elevated scores of symptom severity, self-harm can occur in young children and while many improve, there remains a concern for several children and youth who did not improve by the end of service. Children engage in some of the same types of self-harm behaviours as adolescents, and they also engage in behaviours unique to children.

Key words: *self-harm, child, adolescent, intensive mental health service, residential treatment*

Résumé

Contexte: Il existe peu d'études cliniques sur les adolescents qui s'automutilent, et aucune sur l'automutilation d'enfants et d'adolescents qui suivent un traitement en établissement ou un traitement intensif à la maison. **Objectif:** Étudier la proportion et les caractéristiques des enfants et adolescents dont les blessures volontaires ont été constatées par les cliniciens à l'admission, et les comparer à celles d'adolescents qui ne s'automutilent pas; comparer l'automutilation des enfants à celle des adolescents; et comparer les scores d'automutilation des soignants au premier contact à celles du clinicien à l'admission. **Méthodologie:** Cette étude est dérivée d'une plus vaste étude longitudinale d'observation de 210 enfants et adolescents qui suivaient un traitement en établissement ou à domicile, et de leurs soignants, en partenariat avec cinq centres de traitement en santé mentale du sud-ouest de l'Ontario. Les données utilisées par l'agence provenaient des dossiers médicaux; les soignants consignaient la gravité des symptômes entre 12 et 18 mois et entre 36 et 40 mois après le congé. **Résultats:** Cinquante-sept enfants et adolescents (34%) ont été diagnostiqués comme

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s'infligeant des blessures volontaires à l'admission. L'âge moyen des sujets était 11,57 ans (DS: 2,75). On constate des différences statistiques significatives dans la gravité des symptômes à l'admission entre les sujets qui s'automutilent et les autres. La plupart de ces différences ne sont plus présentes au moment du suivi. Les symptômes du trouble des conduites étaient plus prononcés chez les enfants que chez les adolescents à l'admission; les données des fournisseurs de soins et des cliniciens sur l'automutilation présentaient une certaine. Les enfants adoptaient une vaste gamme de comportements autodestructeurs. **Conclusion:** Les adolescents qui avaient reçu un diagnostic d'automutilation à l'admission présentaient des symptômes plus graves; l'automutilation existe chez les jeunes enfants, mais malgré l'amélioration constatée chez de nombreux sujets, la situation de plusieurs enfants et adolescents dont le comportement ne s'était pas amélioré à la fin du traitement restait préoccupante. Les enfants empruntent certaines techniques d'automutilation aux adolescents, mais ils ont aussi leurs propres comportements.

Mots clés: *automutilation, enfant, adolescent, soins intensifs de santé mentale, traitement en établissement*

Self-harm is emerging as a critical issue in community and clinic populations. Self-harm refers to a wide range of behaviours resulting in injury to one's person, and encompasses several terms: self-injury (or self-injurious behaviour); non-suicidal self-injury (NSSI); self-mutilation; deliberate self-harm (DSH); parasuicide, as well as suicide ideation; and, gestures and attempts (Favazza, 1989, 1996; Nock, 2010). NSSI is becoming increasingly prevalent and refers to an act involving the deliberate destruction of one's body tissue using methods that are not socially or culturally sanctioned and without the intent to kill oneself (Favassa, 1998; Nock & Favassa, 2009). NSSI and suicidal behaviours frequently co-occur (Nock & Kessler, 2006; Whitlock & Knox, 2007) though it is not known if these behaviours can be considered as a continuum or distinct concepts (Muehlenkamp & Gutierrez, 2004; Walsh, 2006). Precisely how NSSI differs from suicidal behaviours is uncertain, and has been the focus of recent research. One distinction centres on the intention to die or terminate consciousness for permanent relief (i.e., suicidal behaviour) where in non-suicidal self-injury the intent is to modify consciousness for temporary relief (Walsh, 2006), though it is uncertain whether youth are completely cognizant of their intentions when engaging in self-harming behaviours. The history of suicide attempts is common for adolescents who self-harm, where over 70 percent have made at least one past attempt, with an average of 2.8 suicide attempts over the course of their life (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). For ease of readability the term self-harm in this report will be used to encompass both NSSI and suicidal behaviours.

Due to conflicting operational definitions for measuring self-harm (e.g., within the past month, or within the life of the individual), it is difficult to ascertain a precise prevalence rate for self-harm among clinic and community samples of adolescents. Self-harm, though, is quite prevalent in clinical samples and has been estimated to be between 20 to 68 percent (Boxer, 2010; Cloutier, Martin, Kennedy, Nixon, & Muehlenkamp, 2010; Csorba, Dinya, Plener, Nagy, & Pali, 2009; Darche, 1990; Guerry & Prinstein, 2010; Tuisku et al., 2009). Estimates for community samples range from 13 to 56 percent (Hilt, Cha, & Nolen–Hoeksema, 2008; Ross & Heath, 2002). The age of onset for self-harming behaviours has been estimated to be between 10 to 14 years (Csorba et al., 2009; Hilt et al., 2008; Kumar, Pepe, & Steer, 2004; Laye-Gindhu & Schonert-Reichl, 2005; Muehlenkamp & Gutierrez, 2004, 2007). It has been reported that younger adolescents engage more frequently in NSSI, whereas older adolescents report more suicide ideation and attempts (Cloutier et al., 2010; Tuisku et al., 2006). Gender differences are complex. While some investigators have found that more adolescent females engage in self-harm and suicidal behaviours and report higher levels of depressive symptoms and interpersonal stressors (Cloutier et al., 2010; Csorba et al., 2009; Guerry & Prinstein, 2010; Prinstein et al., 2010), others have reported no significant gender differences (Nock et al., 2006; Tuisku et al., 2006; Tuisku et al., 2009). It seems that females who self-harm tend to visit emergency departments (Cloutier et al., 2009; Hawton & Harriss, 2008) more often than males. Overall, the most common method of self-harm has been reported as cutting or carving into the skin, with over two-thirds of those who self-harm using this method (Csorba et al., 2009; Dougherty et al., 2009; Laye-Gindhu & Schonert-Reichl, 2005; Nixon, Cloutier, & Jansson, 2008; Ross & Heath, 2002).

There is an abundance of research suggesting that self-harm co-occurs frequently with other psychiatric disorders (Cloutier et al., 2010). The most commonly reported co-morbid disorder is a depressive disorder, with higher depressive symptoms in patients with NSSI than those without (Csorba et al., 2009; Dougherty et al., 2009; Guerry & Prinstein, 2010; Prinstein et al., 2010; Tuisku et al., 2009). Anxiety disorders have also been found in a significant proportion of samples of youth who self-harm (Boxer, 2010; Tuisku et al., 2006). Tuisku and colleagues (2006) have found that reports of self-harm were even higher when one measured the symptoms of anxiety and not just the formal diagnosis of an anxiety disorder. Other disorders associated with self-harm include oppositional defiant disorder, conduct disorder, attention-deficit hyperactivity disorder, adjustment disorders, post-traumatic stress disorder, thought disorders (including schizophrenia and schizoaffective disorder) and borderline personality disorder (Boxer, 2010; Csorba et al., 2009; Guerry & Prinstein, 2010). The use and abuse of alcohol and other substances has also been commonly reported and poses further difficulties for these adolescents (Tuisku et al., 2009). It is concerning that, despite

the problems these youth face, they also report low levels of positive social support from family members and peers (Tuisku et al., 2009). Adolescent girls in particular report being highly influenced by their perceptions of their peers' self-harming behaviours, which significantly predicted their own NSSI behaviours nine months after treatment and beyond (Prinstein et al., 2010). Preadmission risk and clinical correlates have been described but little is known about outcomes after mental health services.

There appears to be a dearth of clinically-based research in Canada. Two studies could be located in which clinical samples were used. Nixon, Cloutier and Aggarwal (2002) explored the characteristics and functions of repetitive self-harm in adolescents admitted or participating in inpatient and acute youth partial hospitalization programs. Youth reported almost daily urges to self-harm, mainly to cope with feelings of depression and to release intolerable tension. Of note were the addictive features of repetitive self-harm. In one other study the incidence rates of NSSI and suicidal behaviours, the overlap between NSSI and suicide attempt (SA), and the characteristics of different types of self-harm were examined among Canadian adolescents admitted to emergency crisis services (Cloutier et al., 2010) during a one-year period. These investigators found that 50 percent (234/468) had deliberately self-harmed within the previous 24 hours. Of these youth 91% engaged in NSSI, 5% attempted suicide only, and 4% engaged in both. There were statistically significant differences in depressive symptoms, impulsivity and suicide ideation with youth engaging in self-harming behaviours having higher scores than youth with no self-harming behaviours. These investigators have made remarkable contributions about youth accessing hospital-based mental health or psychiatric services; however, further research reports on various clinical samples may enhance understanding of self-harming from a Canadian clinical perspective. In particular, the next least restrictive type of care available may be residential treatment, and no studies could be located in which the identification of self-harm at the start of residential or the home-based alternative treatment was explored.

The overall intention for this report is to describe children and youth identified as using self-harming behaviours who have accessed residential treatment (RT) or intensive home-based treatment (IHT) services from five agencies in southern Ontario, Canada: Craigwood Youth Services; kidsLINK; Lutherwood (Mental Health Services Division); Lynwood Charlton Centre; and, Vanier Children's Services. This report is purely exploratory, and there were no hypotheses. The purposes were to report the number of children and youth identified as self-harming by clinicians at admission, and to compare characteristics with youth who were not identified as self-harming. Secondary purposes were to explore differences between children and adolescents who were identified as self-harming at admission, and compare caregiver ratings at intake to clinician ratings at admission. This report stems from a larger study on the psychosocial outcomes of children and youth who have accessed these intensive mental health services. These centres operate with funding from and are regulated by the Ministry of Children and Youth Services, and they are accredited provincially through Children's Mental Health Ontario.

Methods

Participants

Participants were recruited from five mental health agencies in southwestern Ontario, Canada, three of which served children aged approximately 5 to 12 years and the remaining serving those aged 12 to 18 years. Two recruitment strategies were used. All youth and their families or guardians previously discharged from RT or IHT between January 2004 and July 2005 (yielding a sample size of 112) and all youth either discharged or entering RT or IHT between August 2005 and December 2006 (n=98) were invited to participate. Consistent with privacy laws, potential participants were contacted by agency staff, and asked if they would consent to be contacted by a research assistant. Research assistants then contacted potential participants, obtained informed consent, administered a questionnaire and accessed agency files. In the original study, approximately 75% of all the families who consented to be contacted by research assistants participated in the study, about 10% declined participation, and research assistants were unable to contact the remainder mainly due to disconnected telephone lines. The exact representativeness of the sample is unknown. Intake data (Brief Child and Family Phone Interview; BCFPI) and admission and discharge clinical data (Child and Adolescent Functional Assessment Scale; CAFAS) were gleaned from agency files. The measure of symptom severity (BCFPI) was re-administered by trained research assistants at 12 to 18 months, and 36 to 40 months after program discharge. The participants received a $25 gift certificate for their participation. Research ethics approval was granted by Wilfred Laurier University and from each of the participating agencies.

Treatment Modalities

All treatment options are routinely discussed with the caregivers and youth, including the residential and intensive home-based options. RT is a structured treatment program incorporating individual, family and group interventions including cognitive-behavioural, psycho-educational, brief and solution-focussed models to create an individualized treatment plan for each child. The children live on-site during the week, where they attend a community or on-site school and, if possible, they go home for the weekend (about half to two thirds remain in residential care on weekends). The average expected length of stay can range from three to nine months, while the mean is closer to nine months. Anecdotal evidence suggests that RT is reserved

for the most severe cases, including those with highly disruptive behaviours.

IHT was initially created to reduce the long waiting lists for access to RT or to prevent out-of-home placement. IHT can include the same range of mental health treatments available in RT which are also individualized for each child but designed to be implemented in the home. The family receives a variety of intensive services that are designed to improve family functioning, including provision of links with community resources and collaborative work with community partners. Parent training models of intervention, for example Family Coaching and Capacity Building, may also be part of the treatment plan. In order to receive IHT, one needs to have a supportive and dedicated family willing to participate in such a treatment. For this reason, children in the care of Children's Aid Society (CAS) are often excluded from IHT. Youth typically receive IHT for three to nine months with up to five booster sessions within six months of closing the file; for example, a mental health specialist could attend a school meeting with a parent.

Measures

Research assistants manually gleaned data regarding the study participants who provided informed consent from agency files which consisted of two measures used in Ontario upon intake, and admission and discharge to children's mental health services: the BCFPI (Cunningham, Pettingill, & Boyle, 2002) and the CAFAS (Hodges, 2000). Files were incomplete, and no attempt was made to impute missing data. The BCFPI is administered at intake by an intake worker in consultation with a caregiver or parent. It is an interview tool which is used to measure the symptom severity of both internalizing problems (separation anxiety from parents; managing anxiety; and managing mood) and externalizing problems (regulation of attention, impulsivity and activity; cooperation with others; and conduct disorder) and yields a Total Mental Health score (TMHP). This measure has been standardized (normed), and a resultant score of 70 or higher (above 98 percent of the population) indicates significant dysfunction in that area. The BCFPI has been shown to have internal consistency and content validity (Cunningham et al., 2002) and is considered a well-validated clinical tool (Boyle et al., 2009). Because the BCFPI is administered well in advance of clinical services, if self-harm is identified at intake, safety plans for the youth and family are enacted by agency mental health professionals, and in severe cases the youth would likely be admitted to a hospital crisis clinic. For the BCFPI, the self-harm items are only administered if the person has an elevated score on the Managing Mood Subscale. On the BCFPI, there are three items on the self-harm subscale: concerns regarding weight loss; suicidal talk; or suicidal attempts. Research assistants re-administered the short version of the BCFPI at discharge, 12-18 months post-discharge and 36-40 months post-discharge which does not include self-harm items; that is, these discharge and follow-up data were not collected by the agencies.

The CAFAS is administered by a clinician at admission or the start of services which could be several months after intake, and at discharge. It is designed to assess impairments along eight domains of psychosocial functioning: role performance at school or work, at home, and in the community (including acts of delinquency); behaviour toward others; moods and emotions (mainly depression and anxiety); self-harm behaviour; substance use; and, problems in thinking. Each subscale is rated as 0 (no or minimal impairment), 10 (mild impairment), 20 (moderate impairment) or 30 (severe impairment). On the Self-harm Behaviour subscale, a score of 30 represents potentially life-threatening self-harm (potentially the person has the intent to die), whereas a score of 20 is serious self-harm but is not life-threatening and a score of 10 represents self-harm that is unlikely to cause serious injury. In all three classifications, the self-injury is non-accidental. A Total CAFAS score is calculated by the summation of all subscales and reflects overall youth functioning. Scores can range from 0 to 240 with higher scores indicative of greater functional impairment. This scale demonstrates good reliability and validity, is sensitive to change and is widely used (Hodges, Doucette-Gates, & Kim, 2000; Hodges & Kim, 2000; Hodges & Wong, 1996; Hodges, Xue, & Wotring, 2004). Two variables have been identified as important to understanding self-harm: role performance in the home (Wilkinson, Kelvin, Robers, Dubicka, & Goodyer, 2011) and disruptions in thinking (Csorba et al., 2009). The Home subscale of the CAFAS (Hodges, 2000) was used to explore differences in the functioning of the youth in the home environment rated as severe, moderate, mild or little to no impairment. For example, clinicians base the assessment on the degree of management and supervision needed in order for the child to be maintained in the home, and how disruptive the child's behaviour is. The Thinking subscale of the CAFAS (Hodges, 2000) was used to explore disruptions in thinking. Clinicians rate the thinking as severe, moderate, mild, or minimal to no impairment based on assessment of communication (e.g., ease of understanding communication), speech or nonverbal behaviour (e.g., odd or incommunicative), strange behaviour (e.g., due to delusions etc.), or patterns of memory problems or disorientation.

In routine clinical practice, the identification of self-harm with the BCFPI or CAFAS, or if clinicians or staff suspect self-harm, is followed by further assessment and risk management protocols, and procedures are in place including on-going monitoring. The identification of self-harm would lead to the use of intervention specific to self-harm, such as Dialectic Behaviour Therapy, and consultation with a nurse practitioner, psychologist or psychiatrist depending on severity. Youth entering residential treatment are also routinely screened regarding risk for suicidality.

Table 1. Characteristics of children and adolescents engaging in self-harm

	Score on the CAFAS Self-Harm Subscale (Admission)				
	Minimal/none (*n* = 112)	Mild (*n* = 27)	Moderate (*n* = 23)	Severe (*n* = 7)	Total (*n* = 169)
Mean age at admission, years (SD)	11.73 (2.69)	11.11 (2.62)	11.91 (3.13)	9.57 (2.51)	11.57 (2.75)
95% CI	11.22-12.24	10.07-12.15	10.56-13.27	7.25-11.89	11.15-11.98
Sex, *n* (%)					
Female	28 (25)	6 (22)	5 (22)	3 (43)	42 (25)
Male	83 (75)	21 (78)	18 (78)	4 (57)	126 (75)
Age, *n* (%)*					
6-12 years	39 (23.5)	10 (6.0)	7 (4.2)	5 (3.0)	61 (36.7)
13-18 years	70 (42.2)	17 (10.2)	16 (9.6)	2 (1.2)	105 (63.3)
Attending school, *n* (%)					
Yes	90 (81)	21 (81)	17 (74)	7 (100)	135 (81)
No	21 (19)	5 (19)	6 (26)	0	32 (19)
Guardian, *n* (%)					
Parent	86 (77)	19 (70)	17 (74)	5 (71)	127 (76)
Guardian	25 (23)	8 (30)	6 (26)	2 (29)	41 (24)
Parental income, *n* (%)**					
$0-29,999	27 (23.1)	10 (8.5)	7 (6.0)	3 (2.6)	47 (40.2)
$30,000-59,999	39 (33.3)	3 (2.6)	7 (6.0)	2 (1.7)	51 (43.6)
$60,000 and above	12 (10.3)	5 (4.3)	2 (1.7)	0	19 (16.2)
Agency, *n* (%)					
KidsLINK[a]	20 (18)	6 (22)	8 (35)	1 (14)	35 (21)
Lynwood Hall Child & Family Centre[a]	17 (15)	2 (7)	1 (4)	0	20 (12)
Madame Vanier Children's Services[a]	18 (16)	6 (22)	4 (17)	5 (71)	33 (20)
Craigwood Youth Services[b]	29 (26)	8 (30)	5 (22)	0	42 (25)
Lutherwood[b]	27 (24)	5 (19)	5 (22)	1 (14)	38 (23)
Self harm at discharge, *n*	132	11	5	4	152

[a] Approximately aged 6-12 years; [b] Ages 12-18 years
* χ^2 (3) = 4.06, $p < .255$; ** χ^2 (6) = 8.40, $p < .210$

Since the original study did not include a focus on the types of self-harm behaviour of children, anonymized information was gleaned from agency files of current cases for children less than 12 years of age. A clinical collaborator (i.e., agency staff) at each of the three agencies serving children located files of children with a CAFAS Self Harm score of 10, 20 or 30 and viewed at least eight files each to glean the types of self-harm behaviour. This exploration of the types of behaviours was not systematic at each site, and therefore provides only some indication of their self-harming behaviour.

Data Analysis

Characteristics are presented with descriptive statistics, and these youth were compared to youth who were not identified as self-harming on admission and discharge variables using Student's t-test, chi-square or Wilxocon depending on the type of data (Altman, 1991). Since the BCFPI is often administered at a time of heightened distress and caregivers may not know about the self-harm (Thompson et al., 2005) and since agency files were less complete for BCFPI than CAFAS Self-harm behaviour subscale, the CAFAS was used to identify youth who engage in self-harm behaviours at admission for this report. However, a comparison of BCFPI Self-harm at intake and CAFAS Self-harm at admission was explored with Spearman's rho and Analysis of Variance (ANOVA). A repeated measures ANOVA was conducted to assess change over time from intake to 12 to 18 months post-discharge and 36 to 40 months post-discharge on symptom severity (BCFPI). Comparison between younger children (less than 12 years) to older children was made with Student's t-test. Statistical significance was considered to be $p<0.05$, and a trend toward significance at $p<0.10$. Agency files were incomplete and the statistical analyses were conducted with the available data.

Table 2. Scores on the BCFPI Subscales by self-harm group at intake and discharge

	Intake				Discharge			
	n	M (SD)	95% CI	*p*	*n*	M (SD)	95% CI	*p*
Regulation of Attention, Impulsivity and Activity Level (RAIAp)								
No self-harm	95	70.91 (10.21)	68.84-72.99	.011*	47	64.95 (11.00)	61.72-68.18	.131
Self-harm	48	75.25 (7.75)	73.00-77.50		22	69.05 (8.97)	65.08-73.03	
Managing Anxiety (MAp)								
No self-harm	94	58.79 (15.33)	55.65-61.93	.056	47	59.27 (14.86)	54.90-63.63	.460
Self-harm	47	64.27 (17.11)	59.25-69.29		22	62.20 (16.10)	55.06-69.33	
Managing Mood (MMp)								
No self-harm	95	71.36 (19.12)	67.47-75.26	.016*	47	59.61 (15.70)	55.00-64.22	.074
Self-harm	47	79.75 (19.86)	73.92-85.58		22	67.17 (16.94)	59.66-74.68	
Internalizing Behaviour (INp)								
No self-harm	94	66.38 (18.05)	62.68-70.08	.038*	47	61.17 (13.21)	57.30-65.05	.072
Self-harm	45	73.13 (17.24)	67.95-78.31		22	67.37 (12.93)	61.64-73.10	
Total Mental Health Score (TMHp)								
No self-harm	94	77.43 (11.43)	75.09-79.77	.015*	47	67.02 (11.91)	63.52-70.52	.030
Self-harm	45	82.50 (11.14)	79.15-85.85		22	73.35 (8.76)	69.46-77.23	

* Statistically significant difference at $p < 0.05$

Results

Sample Characteristics

Of the 210 youth who participated in this study, CAFAS Self-harm data were available for 169. Of these 57 (34%) were identified as engaging in self-harm by clinicians at the start of service (Table 1). Of these, 27 (47%) were rated as engaging in mild self-harming behaviours (e.g., repeatedly pinching self), 23 (40%) in severe self-harming behaviours (e.g., superficial razor cuts), and 7 (12%) as engaging in life-threatening self-harming behaviour (e.g., running into path of oncoming car). Of concern is the finding that children in the most severe functioning category of self-harm appear to be the youngest though this difference was not statistically significant. While there were more males than females identified as self-harming, the differential was not statistically different than the overall sample (i.e., 75% of the overall sample and 75% of this subgroup of youth who self-harm were male). Excluding guardians who were caseworkers, caregiver reported income (Table 1) suggests that many families were living near Statistics Canada Low Income Cutoff (after taxes, $29,996 for a community of 100,000 to 499,000, for a family of four; Statistics Canada, 2010). Significantly more youth (60%) who self-harm were accessing residential service than IHT ($\chi^2 = 5.753$, p = 0.013).

Symptom Severity (BCFPI) at Intake, Discharge, and Post-Discharge

There were statistically significant differences in BCFPI subscales taken at intake (Table 2); youth who engaged in self-harm had higher symptom severity on Attention and Impulsivity regulation, Managing Mood, Internalizing Behaviour and Total Mental Health. At discharge, the only statistically significant difference between the two groups was on the Total Mental Health subscale, and no differences were evident at 12 to 18 months post-discharge or 36 to 40 months post-discharge. At and after discharge, most mean scores were also below the clinical cut-off of 70, with the exception of the Total Mental Health subscale for both groups of youth at 12 to 18 months post-discharge, and only youth identified as self harming had scores above 70 at 36 to 40 months post-discharge in regulation of Attention and Impulsivity and the Total Mental Health subscale (Table 3).

Repeated measures analyses of BCFPI at intake, 12 to 18 months post-discharge and 36 to 40 months post-discharge

Table 3. Scores on the BCFPI subscales by self-harm group at time 1 and 2 follow up

	12-18 months post-discharge				36-40 months post-discharge			
	n	M (SD)	95% CI	*p*	*n*	M (SD)	95% CI	*p*
Regulation of Attention, Impulsivity and Activity Level (RAIAp)								
No self-harm	110	69.26 (10.48)	67.28-71.24	.936	75	69.89 (10.98)	67.36-72.41	.901
Self-harm	56	69.41 (12.48)	66.07-72.75		49	70.15 (11.67)	66.80-73.50	
Managing Anxiety (MAp)								
No self-harm	110	58.25 (13.76)	55.65-60.85	.350	74	57.83 (14.56)	54.45-61.20	.685
Self-harm	57	60.42 (14.98)	56.44-64.39		49	58.86 (12.67)	55.22-62.50	
Managing Mood (MMp)								
No self-harm	109	64.30 (17.43)	60.99-67.61	.102	74	59.82 (15.34)	56.27-63.37	.084
Self-harm	57	69.00 (17.68)	64.31-73.70		49	64.90 (16.56)	60.15-69.66	
Internalizing Behaviour (INp)								
No self-harm	111	63.90 (15.36)	61.01-66.79	.293	74	60.42 (13.91)	57.20-63.64	.187
Self-harm	57	66.52 (15.08)	62.52-70.52		49	63.86 (14.28)	59.75-67.96	
Total Mental Health Score (TMHp)								
No self-harm	111	71.04 (12.15)	68.75-73.32	.209	75	68.91 (12.01)	66.15-71.67	.239
Self-harm	57	73.64 (13.61)	70.03-77.25		49	71.53 (12.17)	68.04-75.03	

* Statistically significant difference at $p < 0.05$

revealed that there were statistically significant within subject improvements for Attention and Impulsivity ($F (2, 208) = 11.25$, $p<.001$), Managing Mood ($F (2, 206) = 27.11$, $p<.001$), Internalizing behaviours ($F (2, 204) = 11.48$, $p<.001$) and Total Mental Health ($F (2, 204) = 36.76$, $p<.001$). Over time, there was one statistically significant between groups difference on Managing Mood ($F (1, 103) = 5.48$, $p < .021$) with greater symptomatology in youth identified as self-harming (mean 70.38; SD 15.14) versus youth not identified as self-harming (mean 64.15; SD 12.03), which could be a trend toward significance ($p=0.084$) with the T-test at 36 to 40 months post-discharge.

Psychosocial Functioning: Home and Thinking Subscales (CAFAS) at Admission and Discharge

There were statistically significant differences in the Home subscale of the CAFAS from admission to discharge for both youth identified as self-harming and those not self-harming (Table 4). There was a statistically significant improvement in the Thinking subscale for youth identified as self-harming from admission to discharge. Exploration between youth identified as self-harming and those not identified revealed statistically significant differences at admission in the Home and Thinking subscales, and a statistically significant difference in the Thinking subscale at discharge (Table 4.1) with youth identified as self-harming having higher scores (i.e., poorer functioning) than youth not so identified.

While there were 57 youth identified as self-harming at admission, there were only 20 at discharge (Table 1) though, we did not have discharge data for five of these participants. The majority (70%) of those identified as self-harming improved on this measure of self-harm from admission to discharge (Table 5). Likely due to the small sample size, there were no statistically significant differences evident on demographic or baseline measures between those who did improve and those who did not; however, those who did not improve had higher (not statistically significant) severity of BCFPI scores on activity (mean 79.6 versus 74.4) and Managing Mood (88.6 versus 70.5), and a much lower Conduct Disorder score (94.9 versus 104.3).

Comparison of Children to Adolescents

In comparing younger to older children, there were no statistically significant differences on BCFPI intake measures, though there was a trend toward significance on Conduct Disorder Subscale, with younger children (n=22) reported to display greater symptom severity (mean 100.86, SD 35.88 vs mean 85.79, SD 26.34) compared to (n=26) adolescents (t=2.05, p=0.061). At discharge, there was only one statistically significant difference on the Total CAFAS score with younger children (n=19, mean 51.05, SD 29.89) rated by clinicians as having overall better functioning than youth (n=33, mean 84.85, SD 47.05; t=-2.81, p=0.007). There were no reported differences between younger and older children on any of the BCFPI scores at discharge. Finally, younger children engaged in a wide range of self-harming behaviours, including attempted hanging, strangulation, choking, wandering into traffic, burning, and cutting. Some dangerous behaviours such as perching unsafely on furniture and wandering into traffic are common in children and uncommon in adolescents. While some children may attempt overdose with medication, attempted overdose with medication or alcohol and/or drugs is common for adolescents. Moreover, the means of self-harming tend to become more efficient and sophisticated (e.g., a cord or belt rather than clothing for hanging self) as the child becomes an adolescent.

There was consistency between the BCFPI Self-harm caregiver rating at intake and CAFAS Self-harm clinician rating at admission (rho=.286, p=0.001). There was also some consistency evident when comparing the degrees of CAFAS self-harm by BCFPI severity of symptoms (F=4.278, p=0.007) with youth not identified as self-harming and youth in the moderate category as significantly different (Tukey post hoc test, p=0.011; Table 6).

Discussion

The proportion of youth identified as self-harming at admission using routine clinical assessment in this study was 34%. This estimate is considerably lower than research conducted with other clinical (out-patient) adolescent populations, such as the 50% of youth accessing emergency crisis services who self-harmed in the Canadian clinical study by Cloutier and colleagues (2010), and the 48% identified in out-patient services (Jacobson, Muehlenkamp, Miller, & Turner, 2008) in the United States. One reason may be that our study represents a naturalistic view of identification of self-harm at admission using a provincially mandated tool; that is, participants were not asked about their self-harm behaviour as part of a research study. Our reported prevalence likely under-estimates the true figure at admission. Many youth attempt to conceal their self-harming behaviours, especially if the behaviour may result in a longer length of stay. Moreover, the clinical partners on this research project indicate that the presence of self-harm is often made known to clinicians through or after the development of a therapeutic relationship with youth which occurs after admission. These noteworthy differences in proportions suggest that future research is needed on children and youth accessing intensive mental health treatment, particularly if early identification of self-harm is desired.

In this sample, 39% (n=22) of those identified as self-harming at admission were children (less than 12 years of age). There is scant information on self-harm in children accessing these intensive mental health interventions. The findings reported here are similar to those reported by Sarkar and colleagues (2010). These investigators reported differences in suicidal phenomena between children and adolescents presenting to an acute paediatric hospital's accident and emergency department. Children under 12 years of age were more likely to present with suicide ideation, higher levels of attempted hanging/strangulation, walking into traffic and throwing self down stairs. Adolescents were more likely to present with acts of self-harm, overdose with medicine, and drug and alcohol overdose. The children in the present study differ from adolescents in the types of self-harming behaviours. For example, children used less complex methods such as wandering into traffic, placing themselves in dangerous positions (e.g., hanging out a window) while adolescents have been reported to use more sophisticated methods such as self-poisoning, overdosing, and cutting or carving (Briere & Gil, 1998; Lowenstein, 2005; Nijman et al., 1999). Adolescence is a period of transition from childhood to adulthood, and there may be a mix of child-like and adult-like behaviours. Some dangerous behaviours (e.g., climbing on furniture) may be very common in children, somewhat common in young adolescents and uncommon in adolescents and adults. Furthermore, the method of self-harm may become increasingly co-ordinated and efficient as the child becomes an adolescent. Children and adolescents differ in their cognitive, physical, social and sexual development (Shaffer, Wood, Willoughby, 2002), and in the types of mental health disorders (Meltzer, Gatward, Goodman, & Ford, 2000). In terms of cognitive development, consideration should be given to children's understanding of the concept of death which may facilitate understanding of intent (i.e., NSSI versus suicidal intent).

The only statistically significant difference between children and adolescents identified as self-harming in this study was the overall CAFAS score at discharge. The clinical significance of this finding is uncertain since this difference could be an artefact of developmental differences between children and adolescents, or of the CAFAS measure.

There appear to be statistically significant differences in symptom severity at intake, and functioning in the home and impaired thinking at admission with youth identified as self-harming scoring worse than youth not identified as self-harming. All of these differences were no longer evident by discharge except the Total Mental Health subscale

Table 4. Scores on the CAFAS thinking and functioning in the home at admission and discharge by self-harm group

Subscale	*n*	Mean (SD)		Median		Mean rank improvement (n)	Mean rank worsen (n)	Sum of ranks improvement (n)
						No self-harm group		
		Admission	Discharge	Admission	Discharge			
Home	98	20.61 (9.61)	10.92 (9.64)	20.00	10.00	33.47 (59)	21.00 (5)	1975.00 (59)
Thinking	98	3.37 (6.57)	2.35 (5.71)	0.00	0.00	7.05 (11)	9.17 (3)	77.50 (11)
						Self-harm group		
Subscale	*n*	Mean (SD)		Median		Mean rank improvement (n)	Mean rank worsen (n)	Sum of ranks improvement (n)
		Admission	Discharge	Admission	Discharge			
Home	52	25.00 (7.28)	12.50 (10.07)	30.00	10.00	17.00 (33)	0 (0)	561.00 (33)
Thinking	52	8.46 (9.98)	4.81 (8.04)	0.00	0.00	10.89 (18)	14.25 (4)	196.00 (33)

Table 4.1. Scores on the CAFAS thinking and functioning in the home at admission and discharge by self-harm group

Subscale	Mean (SD)		Median		Mean rank		Sum of ranks	
					Admission[a]			
	Self-harm	No self-harm	Self-harm	No self-harm	Self-harm	No self-harm	Self-harm	No self-harm
Home	25.44 (7.09)	20.89 (9.73)	20.00	30.00	99.18	77.78	5653.50	8711.50
Thinking	8.42 (9.96)	3.12 (6.44)	0.00	0.00	101.00	76.86	5757.00	8608.00
					Discharge[b]			
Subscale	Mean (SD)		Median		Mean rank		Sum of ranks	
	Self-harm	No self-harm	Self-harm	No self-harm	Self-harm	No self-harm	Self-harm	No self-harm
Home	12.50 (10.07)	10.92 (9.64)	10.00	10.00	79.62	73.32	4140.00	7185.00
Thinking	4.81 (8.04)	2.35 (5.71)	0.00	0.00	82.80	71.63	4305.50	7019.50

Note: [a]Self-harm *n* = 57, No self-harm *n* = 112; [b]Self-Harm *n* = 52, No self-harm *n* = 98.

of the BCFPI, and Managing Mood at 12 to 18 months and 36 to 40 months post-discharge. In previous reports of the overall sample (Preyde, Cameron, Frensch, & Adams, 2011; Preyde et al., 2010), statistically and clinically significant improvements in psychosocial functioning and symptom severity of youth accessing both RT and IHT were described. However, it is concerning that 21% of the youth identified as self-harming at admission did not improve or their self-harm score worsened while accessing mental health services.

Identification of self-harm during a clinical assessment is a critical and common practice. In Ontario, two assessment measures are mandated for use during the intake, and admission and discharge processes of all children's mental health agencies: the Brief Child and Family Phone Interview, 3rd version (BCFPI; Cunningham et al. 2002), and the Child and Adolescent Functioning Assessment Scale (CAFAS; Hodges 2000). Both of these measures have a subscale for assessing self-harming behaviours. However, the BCFPI is administered to caregivers by an intake worker at intake which is often a time of heightened distress. The CAFAS is administered by a clinician in consultation with the youth at admission which could be several months after intake. From this study the measurement of self-harm during intake and admission processes raised two issues: the use of a clinical screen for research, and the consistency between caregiver-reported and clinician-rated self-harm. The BCFPI is caregiver/parent-report, and these caregivers may underreport due to social desirability reasons or they may not know about the existence or extent of the self-harming behaviours of the children; thus, we used the CAFAS for the present report. The CAFAS permitted the exploration of prevalence and baseline differences between those identified as self-harming at admission and those who were not so identified. Further research is needed to examine other complexities of self-harm in this clinical population. Comprehensive assessment tools used in research may prove beneficial. Moreover, there is uncertainty concerning the consistency and superiority between a self-report or clinician-administered tool (e.g., Federici et al., 2010; Spitzer, Kroenke, & Williams, 1999). Furthermore, most youth self-harm in private and they may attempt to keep the behaviour secret. It is uncertain whether using a self-report completed by youth for identification of self-harm would provide a better assessment than a clinician-rated assessment. Some clinicians believe that as the therapeutic working alliance

	Sum of ranks worsen (n)	*Z*	*p*
	105.00 (5)	-6.38	.001
	27.50 (3)	-1.62	.106
	Sum of ranks worsen (n)	*Z*	*p*
	0 (0)	-5.10	.001
	57.00 (4)	-2.32	.020

	Mann-Whitney U	*Z*	*p*
	2383.50	-2.94	.003
	2280.00	-3.75	.001
	Mann-Whitney U	*Z*	*p*
	2334.00	-.894	.371
	2168.50	-2.10	.036

Table 5. Changes in CAFAS Self-harm impairment from admission to discharge

	n (%)	Valid %
No change	8 (14.04)	15.38
Worsened	4 (7.02)	7.69
Improved	40 (70.18)	76.92
No discharge information	5 (8.77)	-
Total	57	52

Table 6. BCFPI: Caregiver rated self-harm at intake

Clinician rated	Mean (SD)
No self-harm (*n* = 85)	75.16 (21.4)*
Mild self-harm (*n* = 20)	83.55 (20.8)
Moderate self-harm (*n* = 17)	92.96 (21.7)*
Severe self-harm (*n* = 6)	91.05 (19.7)

Note: $F = 4.278$, $p = 0.007$

is built and/or the client feels safe in the setting, behaviourally anchored and clearly defined self-report questions may produce a more accurate picture than parent or clinician rated tools. However, this accuracy may be mediated by the youth's reality testing, cognition and memory. Future investigations of these intake and clinical assessment tools may be warranted.

Parents have been reported to underestimate the presence and frequency of suicidal behaviours in children (Klimes-Doougan, 1998) and particularly in the families where maltreatment was present (Thompson et al., 2005)–many of the children and youth accessing RT are in the care of Child Welfare. Recall that for approximately half of the children and youth accessing RT, the 'caregiver' or guardian was a caseworker from CAS. Nonetheless, in this analysis, there was consistency between the caregiver report at intake and the clinician report at admission. This finding has implications for early detection.

In neither tool is NSSI expressly measured but given the recent research attention maybe these self-harm subscales should be reconsidered. Another issue concerns the time frame for measuring self-harm, for example, did the self-harm have to occur within a certain time frame (e.g., within the last week or month) or did it occur during the person's life time. The BCFPI is administered with a long-term perspective while the CAFAS is limited to the previous 30 days or 90 days, so self-harm prior to this time period would not be identified.

This study makes important contributions to the Canadian clinical literature. It provides basic knowledge about the identification of self-harm in the routine clinical assessment of children and youth who are accessing intensive levels of mental health intervention, intervention which is often reserved for severe expression of mental health problems. Also noteworthy is the consistency between caregiver reports of self-harm at intake and clinician report at admission. These results may guide future screening processes and inform practice. The prevalence estimate presented in this report is likely an underestimation, and could serve as a baseline or point of reference for improvements in screening. In future research, alternate methods of identification of self-harm could be tested in this clinical population. It has been established that adolescents with psychiatric and mental health problems are at increased risk for NSSI (Jacobson & Gould, 2007; Muehlenkamp, 2005), and this study reveals that children with psychiatric and mental health problems are also at risk for self-harm and life-threatening behaviour. Self-harm is a critical concern and warrants special attention.

However, there are limitations. These results were derived from a sample of children and youth accessing residential or home-based treatment who provided informed consent to participate in this study. That is, there may be differences between caregivers and youth who chose to participate and those who chose not to participate. Another limitation concerned the difficulty in recruiting. Consistent with ethical

principles regarding privacy, agency staff initiated contact with potential participants to inquire if their name and contact could be given to the researchers. This process placed burden on staff who were already overburdened, and the contact information in some instances became obsolete by the time the researchers attempted to contact potential participants. Moreover, some participants accessing RT may have been involuntary, (such as through Child Welfare) and may have been reluctant or suspicious of the research or agency. There was also difficulty in gleaning data from the clinical files, in some cases the data did not appear in the file or were not easily accessible. Missing data can interfere with interpretation. We did not use any approach to address missing data (e.g., mean substitution, last value carried forward). These approaches may be inappropriate and they require untestable assumptions (Fleming, 2011) about the possible magnitude or direction of the influence. Fleming (2011) suggests that prevention is considered the preferred and perhaps only satisfactory approach to account for missing data. Limitations related to the clinical measures may also have affected the results. During the admission process, many youth may not divulge their self-harming behaviour or they may try to keep it a secret during their involvement in these intensive treatments because they may worry this it could lengthen their time in treatment. Also, the small number of participants in each category of the CAFAS self-harm subscale prevented the conduct of advanced statistical analyses. Further research on moderating or mediating factors affecting intervention success may prove highly beneficial for resource and program planning.

Conclusions

This study provides important information about the identification of self-harm in routine clinical assessment. Youth accessing residential or home-based intensive service who self-harm appear to have elevated scores at intake on symptom severity and at admission on psychosocial functioning; however, by discharge, most of their scores were not different than youth who were not identified as self-harming. By discharge most of these youth were no longer engaging in self-harm behaviours. However, there were youth discharged from services who were still engaging in self-harming behaviours, which suggests the need for linkages with community mental health and follow-up services. Children engage in some of the same types of self-harm behaviours as adolescents, and they also engage in behaviours that appear to be unique to children. Future research should be focussed on measurement of self-harm including NSSI and suicidal behaviour in this population for screening purposes. Further investigation of mental health symptoms common in these youth who self-harm may enhance identification and early intervention.

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