

## Characteristics of Self-harm Behaviour among Identified Self-harming Youth in Care

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**Abstract** The objective of this study was to describe deliberate self-harming (DSH) characteristics in a child-welfare population identified as having threatened or completed self-harm. Secondary data from 621 serious occurrence reports (SOR) that documented 2004–2007 DSH incidents and DSH threats with 252 Canadian youth in care (Y-INC) of the Children’s Aid Society of Toronto (CAS-T) was analyzed. In addition to descriptive analysis, a clustered design binary logistic regression was employed to determine factors associated with DSH characteristics such as repetition, reported behaviour, and severity. Y-INC males ( $n=140$ ) made up a slight majority in both DSH categories: single incident of self-harm (sDSH) vs. repeat incidents (rDSH) (55.4% and 56.0% respectively); the female Y-INC sample ( $n=112$ ) was responsible for the majority of rDSH incidents (69.1%). Most DSH incidents took place between 6 pm to 12 am, Monday to Friday. Factors found to be associated with DSH in an in-care population of DSH youth were: *non-permanent status* (non-Crown wards were more likely to self-harm vs. threaten self-harm compared to permanent/Crown wards (OR 2.46, CI 1.26–4.80); *older Y-INC* (age 14–21) were more likely to receive medical attention due to a DSH incident vs. 6–13 year olds (OR 4.26, CI 2.51–7.21); and *female Y-INC* were found more likely to have repeat DSH incidents (OR 2.55, CI 1.08–6.02). In addition to heightened supervision and resources for Y-INC that are at-risk for or engage in DSH, greater research attention to this issue is warranted.

**Keywords** Deliberate self-harm · Repetition · Child welfare · Crown Ward · Time of day · Severity

### Abbreviations

DSH                    Deliberate self-harm  
Y-INC                 Youth in care  
Y-INC-SH-1        Youth in care who self-harm on one occasion

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Y-INC-rSH	Youth in care who repeat self-harm
SOR	Serious Occurrence Report
CAS	Children's Aid Society
AOR	Adjusted Odds Ratio
ACI	Adjusted Confidence Interval
sDSH	Single incident of self-harm
rDSH	Repeated incidents of self-harm

Deliberate self-harm (DSH) is commonly acknowledged to be the intentional injuring of oneself without suicidal intent (Isacsson and Rich 2001). Studies around the world have established DSH as a highly prevalent phenomenon in non-clinical youth populations (Anteghini et al. 2001; De Leo and Heller 2004; Hawton et al. 2002; Matsumoto et al. 2008; Morey et al. 2008; Nixon et al. 2008; Whitlock et al. 2006).

For example, Whitlock and colleagues (2006) found in a sample of American college students a lifetime prevalence rate of 17.0% of at least one bout of self-injurious behaviour. Hawton and colleagues' (2002) cross-sectional, self-report survey to English youth at 41 schools found 13.2% reported a lifetime history of self-harm and 8.6% reported a self-harming event within one year of the study (Hawton et al. 2002). De Leo and Heller's (2004) school-based survey of Australian youth found 12.4% had deliberately injured themselves. Morey and associates (2008) found a lifetime history of DSH in 9.1% of Irish adolescents. A Japan study reported a 9.9% lifetime history of self-cutting and 40.4% history of suicide ideation among junior and senior high-school students (Matsumoto et al. 2008). And a Canadian population-based, longitudinal survey of youth 14–21 years found 16.9% had reported previously harming themselves (Nixon et al. 2008). In short, DSH is not an uncommon behaviour among youth.

Much of the extant literature on DSH has focused on population based studies and not on the more clinical cohort of child welfare involved youth, more specifically, youth in care (Y-INC). It is posited that DSH has not been a well-studied area in child welfare for a number of reasons. One, it is not a consistently captured data point in the child welfare record, and two, DSH is neither well defined nor understood in child welfare (Goodman 2005). However, in the last decade, the 53 mandated children's aid societies (CAS) in Ontario have been required to submit reports on DSH incidents and threats via a Ministry document called the Serious Occurrence Report (SOR). Goodman's (2005) preliminary analysis on 2003/2004 SOR data from five Ontario child welfare agencies representing 7,815 children in care found that 6–10% of youth in care (Y-INC) had documented incidents of self-harm or threatened self-harm. While this suggests that DSH may also be a prevalent behaviour among child welfare youth little can be concluded given the limited examination thus far of DSH in a Y-INC population (Cyr et al. 2005; Goodman 2005). The result is DSH remains a poorly understood issue for child-welfare involved youth. Given the paucity of examination to date, this study attempts to begin to address that gap by improving our understanding of the characteristics of DSH in a population of Y-INC of the Children's Aid Society of Toronto (CAS-T) between 2004–2007 where each youth had at least one documented DSH incident or DSH threat.

### DSH Characteristics

In addition to confirming DSH as a highly prevalent phenomenon in the general youth population, research also suggests DSH is more common among female youth (De Leo and

Heller 2004; Goodman 2005; Hawton et al. 2002; Madge et al. 2008; Matsumoto et al. 2008; Morey et al. 2008; Nixon et al. 2008). DSH is associated with depression, anxiety, low self-esteem, impulsivity, drug-misuse, self-punishment, as well as other factors such as socio-demographic, familial, sexual orientation, situational and sensation seeking (Crouch et al. 2004; De Leo and Heller 2004; Skegg 2005). DSH manifests itself predominantly in the forms of cutting, scratching, choking, burning, head-banging, ingesting items/poisons and medication overdose (Klonsky 2007; Skegg 2005). In collecting the self-reported DSH histories of over 30,000 European youth, ages 15 and 16 years, of the 13.5% of females and 4.3% of males who reported previous DSH, the most common response to why they engaged in DSH: to get relief from their mental state (Madge et al. 2008).

Clearly our understanding needs to be furthered about any youth thinking about or doing self-harm. And significant knowledge advancement is needed regarding youth who repeat DSH. Given the limited study to date with DSH in child welfare youth, much remains unknown whether Y-INC DSH characteristics are similar or not to the DSH characteristics found in the general youth population. Specific to the issue of advancing the understanding of repeat DSH in young people, examination has been limited (Brunner et al. 2007; Chitsabesan et al. 2003). Research on DSH repetition among Y-INC has received even less attention (Cyr et al. 2005; Goodman 2005). Therefore, in addition to describing key characteristics of Y-INC with DSH incidents, this study aims to identify factors associated with repeated DSH.

### **Serious Occurrence Report (SOR)**

The provincial Ministry of Child & Youth Services (MCYS) is responsible for child welfare in Ontario, a Canadian province with over 12 million residents. Between 2000–2010, the 53 Ontario CAS agencies that provide the legislated child welfare services were required by MCYS to formally document and report back within 24 h on specific, high risk occurrences (e.g. death, AWOL, DSH) involving child welfare youth in their care through a serious occurrence report (SOR). The SOR tool, completed by the youth's worker, collects both quantitative (e.g. child name, age, previous DSH SOR incidents, placement, time of incident) and qualitative data (e.g. narrative description of the DSH incident, recommendations, and outcome (e.g. medical attention required vs. no medical attention)).

### **Methods**

#### **Study Design and Population**

The data set included for this analysis was all the secondary data from 621 CAS-T—Serious Occurrence Reports (SOR) related to DSH collected on 252 Y-INC between 2004 and 2007. Funding to input the secondary, longitudinal data was received through Christine Wekerle's CIHR-NET Grant (2003–2009), ethics approval was obtained from CAS-T-REB, and between 2004–2007 CAS-T research staff inputted the standardized data elements from each SOR report into a SPSS database.

Variables were selected because they were consistent with those tracked in other DSH studies (e.g. age, gender, type of DSH), or because they were unique to the child welfare

population (e.g. legal status), or because there has been little attention to date in the extant DSH literature (e.g. single (sDSH) vs. repeat (rDSH), time/date of DSH incident, subsequent medical action).

For data reported in a narrative or qualitative format four steps were taken to ensure consistent data collection: 1) a code book was developed in advance of data collection on all selected quantitative and qualitative variables (e.g. method of self-harm described) to address consistent inputting, 2) where data were missing, the CAS-T researchers contacted the CAS-T worker to provide the missing data, and 3) across the four-year collection period one person was responsible for inputting all SOR into the SPSS database.

### Statistical Analysis

Data were analyzed using SPSS Version 15.0 statistical software for Windows XP. Cluster analysis was performed with SAS Version 9.1. Descriptive statistics (frequencies and percentages) of demographic variables (*age* and *gender*), *legal status*, and other variables (*time of day*, *time of week*, *type of reported behaviour*, and *medical attention required*) are reported in Table 2 on a per subject and per incident basis. There were missing data ( $n=71$ ) for the *time of day* variable, which was coded as *unknown* in order to include this variable for analysis.

Since the outcome variables in this study were dichotomized for the Y-INC binary logistic regression was used to: (a) Determine the association between age, gender, and type of behaviour (self-harm incident vs. threat of self-harm [exposure variables]) with DSH frequency (rDSH vs. sDSH; [outcome variable]), (b) Determine the association between DSH frequency (rDSH vs. sDSH) with behaviour type (self-harm vs. threat of self-harm [outcome variable]) controlling for age, gender, and legal status, (c) Determine the association between DSH frequency (rDSH vs. sDSH) with severity of self-harm (medical attention required vs. not required [outcome variable]) controlling for age, gender, and legal status.

To rule out multi-collinearity, we compared crude and adjusted odds ratios and observed no significant differences between exposure variables. We therefore present adjusted odds ratios (AOR) with their corresponding adjusted 95% confidence intervals (ACI). These analyses used a cluster design within the logistic regression in order to adjust for the individual youth vs. the number of incidents.

## Results

### Descriptive Analysis

The age range for these 252 Y-INC with 621 DSH reports (that spanned a four year period) was between six years and 21 years of age (child welfare care ends at age 21). Overall gender distribution across the 252 youth was 44.4% female ( $n=112$ ) and 54.8% male ( $n=140$ ). Across all 621 SOR reports, the 112 female Y-INC had 386 DSH incidents ( $n=62.1\%$ ) while the 140 male Y-INC accounted for 235 ( $n=37.8\%$ ) SOR reports. As noted in Table 2, most Y-INC with a DSH incident or threat of DSH are older than 14 years of age.

There was a high variation in the number of DSH incidents per individual. Across the four year period it ranged from youth with only one incident (sDSH) to youth with over one hundred SOR reports of self harm (rDSH). Frequency of DSH for the 252 youth was

defined into two groups: single (sDSH) and repeat (rDSH), where 70.2% ( $n=177$ ) of Y-INC had only one incident and 29.8% ( $n=75$ ) Y-INC had repeat DSH incidents.

This Y-INC sample is weighted towards male Y-INC in both the single DSH category ( $n=177$ ) (male sDSH=55.4%,  $n=98$  vs. female sDSH=44.6%,  $n=79$ ), and with repeat DSH incidents ( $n=75$ ) (male rDSH=56.0%,  $n=42$  vs. female rDSH=44%,  $n=33$ ). That said, female Y-INC were responsible for the majority of the ( $n=444$ ) repeat DSH incidents, (female rDSH=69.1%,  $n=307$  vs. males rDSH=30.9%,  $n=137$ ). Descriptive statistics on sDSH vs. rDSH are described in Table 2.

Legal status was also dichotomized such that youth were either coded Crown Ward (permanent in-care status with CAS as the child's legal parent) or non-Crown Ward (temporary in-care status such as society ward, non-ward, temporary care agreement, temporary care and custody or extended care and maintenance and could include child welfare involved youth in the community—see Table 1 for definitions). It is important to differentiate between legal status with youth in care because Crown Ward youth represent a more complex population (e.g. more prescribed medications, higher mental health diagnoses, greater learning disabilities, more CAS supervision) when compared to non-Crown Ward youth (CAS-T Crown Ward Review 2007).

Regarding when the DSH incidents took place there were four possible time periods: 1) 12:00 am to 5:59 am; 2) 6:00 am–11:59 am; 3) 12:00 pm to 5:59 pm; and 4) 6:00 pm to 11:59 pm. The majority of DSH incidents took place between 6 pm and 12 am for both sDSH (35.6%,  $n=63$  of 177) and rDSH (48.2%,  $n=214$  of 444). Also Y-INC are more likely to self-harm between Monday to Friday with both DSH types: sDSH (80.8%,  $n=144$  of 177) and rDSH (76.8%,  $n=341$  of 444) vs. the weekend. These time periods correspond with when Y-INC is typically engaged in family visits, family and/or individual counselling and school activities (Table 2).

No differences in the types of DSH behaviours exhibited by Y-INC were found between sDSH and rDSH. In other words, the range of DSH behaviours was evident across both frequency types. A more detailed analysis finds the DSH behaviours of cutting, scratching, and stabbing as the most frequent type of behaviour of Y-INC, followed by head banging and punching objects. Consistent across both DSH frequency types most were *actual* self-harm incidents (sDSH=78.0%,  $n=138$  of 177 and rDSH=83.1%,  $n=369$  of 444) vs.

**Table 1** Definitions for different types of care provided by Children's Aid Society

Crown Ward	A child who has been made the legal responsibility of the government, as decided by a family court judge. The CAS exercises the rights and responsibilities of the parent until the child is 18 years of age.
Society Ward	A child is placed in CAS care for a specified period of time (maximum of 24 months) when a family court judge believes protection is required for children less than 16 years of age.
Temporary care agreement	A child less than 16 years of age who is in care of CAS resulting from a temporary and voluntary agreement made by the parents.
Temporary care and custody	When a child is ordered into CAS care and custody during an adjournment of a child protection hearing.
Extended care & maintenance	For children who remain Crown Ward until 18 years of age, they are eligible for extended care and maintenance until 21 years of age, in which a written contract is signed between the child and social worker. The CAS remains the legal guardian, providing monetary support, medical and dental coverage, and ensures the child is either in school, working, volunteering, or working toward specific goals through counselling programs.

**Table 2** Serious occurrence report descriptive characteristics of youth in care who self-harm on one occasion (Y-INC-SH-1) and youth in care who repeat self-harm (Y-INC-rSH)

	Types of SOR youth; presented as n (%)	
	Y-INC-SH-1	Y-INC-rSH
PER SUBJECT		
Gender		
Male	98 (55.4)	42 (56.0)
Female	79 (44.6)	33 (44.0%)
Total # of Subjects	177 (100.0)	75 (100.0)
PER INCIDENT		
Age		
6–13 years	53 (29.9)	89 (20.0)
14–21 years	124 (70.1)	355 (80.0)
Child's legal status (Crown Ward)	109 (61.6)	211 (47.5)
Gender		
Male	98 (55.4)	107 (30.9)
Female	79 (44.6)	307 (69.1)
Time of Day		
12 am–6 am	8 (4.5)	21 (4.7)
6 am–12 pm	21 (11.9)	57 (12.8)
12 pm–6 pm	57 (32.2)	109 (24.5)
6 pm–12 am	63 (35.6)	214 (48.2)
Unknown	28 (15.8)	48.2 (9.7)
Time of week (week day)	143 (80.8)	341 (76.8)
Method of self-harm		
Self-harm	138 (78.0)	369 (83.1)
Threaten to self harm	39 (22.0)	74 (16.7)
Hospitalization required (Yes)	61 (34.5)	200 (45.0)
Total # of reported incidents	177 (100.0)	444 (100.0)

*threats* of self-harm (sDSH=22.0%,  $n=39$  and rDSH=16.7%,  $n=74$ ). Finally, regarding the analysis on the outcome of the DSH incident with the Y-INC, for the sDSH event one-third required medical attention (sDSH=34.5%,  $n=61$ ) vs. nearly half that had repeat events (rDSH=45.0%,  $n=200$ ). This finding may be influenced by CAS policy that requires precautionary medical attention for any Y-INC with a moderate to serious DSH incident.

#### Logistic Regression: Gender, Type of Behaviour, & Age with rDSH

Table 3 presents the results of a logistic regression analysis of the association between gender, type of behaviour, and age with repeat DSH incidents (rDSH  $n=75$ ) vs. single DSH incidents (sDSH  $n=177$ ). Female Y-INC with more than one DSH incident were significantly more likely to have rDSH incidents compared to males (AOR 2.55, ACI 1.08–6.02). Youth in care who self-harmed rather than threaten self-harm were associated with a somewhat greater likelihood (AOR 1.31, ACI 0.74–2.33) of having rDSH incidents.

**Table 3** Logistic regression analysis to explain the association between gender, type of behaviour, and age reported in adolescents who are Y-INC-SH-1 ( $n=177$ ) vs. Y-INC-rSH ( $n=75$ )

Adjusted Odds Ratio (95% Adjusted Confidence Interval)	
Gender <sup>a</sup>	2.55 (1.08–6.02)
Type of Behaviour <sup>b</sup>	1.31 (0.74–2.33)
Age <sup>c</sup>	1.20 (0.38–1.83)

<sup>a</sup> 1 = male, 2 = female

<sup>b</sup> 1 = threatens to self-harm, 2 = self-harm

<sup>c</sup> 1 = 6–13 year olds, 2 = 14–21

1 = reference group for each exposure variable listed.

Y-INC-SH-1 is reference group for outcome variable

Similarly, the older Y-INC cohort of 14–21 year olds had a slightly increased likelihood (AOR 1.20, ACI 0.38–1.83) of having rDSH incidents compared to the younger age group of 6–13 year olds.

#### Logistic Regression: Type of Behaviour & Frequency of rDSH

Table 4 summarizes results from a logistic regression analysis of the association between the type of behaviour and frequency of repetition, adjusting for age, gender, and legal status. It appears that females were somewhat more likely to self-harm than threaten self-harm (AOR 1.34, ACI 0.79–2.27) when compared to males. However, with those rDSH youth the older age group of 14–21 year olds were no more likely to self-harm vs. threaten self-harm when compared to 6–13 year olds. Non-Crown Wards were more likely than Crown-ward youth to self-harm vs. threaten self-harm (AOR 2.46, ACI 1.26–4.80). Youth with rDSH incidents were slightly more likely to self-harm vs. threaten self-harm when compared to sDSH youth (AOR 1.20, ACI 0.72–2.01).

**Table 4** Logistic regression analysis to explain the type of behaviour (self-harm vs. threaten to self-harm) reported in the SOR between Y-INC-SH-1 ( $n=177$ ) and Y-INC-rSH ( $n=75$ )

Adjusted Odds Ratio (95% Adjusted Confidence Interval)	
Gender <sup>a</sup>	1.34 (0.79–2.27)
Legal Status <sup>b</sup>	2.46 (1.26–4.80)
Age <sup>c</sup>	1.06 (0.62–1.82)
Repeat <sup>d</sup>	1.20 (0.72–2.01)

<sup>a</sup> 1 = male, 2 = female

<sup>b</sup> 1 = crown-ward, 2 = not crown ward

<sup>c</sup> 1 = 6–13 year olds, 2 = 14–21

<sup>d</sup> 1 = Y-INC-SH-1, 2 = Y-INC-rSH

1 = reference group for each exposure variable listed.

Threaten to self-harm is reference group for outcome variable

## Logistic Regression: rDSH &amp; Severity of DSH

Table 5 summarizes results from a logistic regression of the association between repetition of self-harm and severity of self-harm, adjusting for age, gender, and legal status. Female Y-INC were somewhat more likely than male Y-INC to require medical attention (AOR 1.26, ACI 0.79–2.02) following a DSH incident. There was no observed association between a child's legal status and severity of self-harm. As found in previous analysis, those Y-INC ages 14–21, were more likely (AOR 4.26, ACI 2.51–7.21) to require medical attention following self-injury compared to 6–13 year olds. And those Y-INC with rDSH incidents were somewhat more likely to require medical attention following an incident (AOR 1.32, ACI 0.85–2.05) when compared to sDSH Y-INC.

## Discussion

Prior studies confirmed that DSH is a prevalent phenomenon within the general community-based youth population. This study suggests that DSH is also evident within the Ontario child-welfare population. While a large, urban Canadian CAS documented 621 DSH incidents by 252 youth in care over a four-year period, the reality is that a small number of Y-INC account for the majority of DSH incidents as documented by the SOR report.

Although male Y-INC with a DSH incident made up a slight majority in both categories (sDSH and rDSH), the slightly greater proportion of males in care at CAS-T accounts for this finding. The extant literature also finds female youth tend to account for the majority of DSH events (O'Connor et al. 2009; Whitlock et al. 2006). That general finding was supported by this study, where female Y-INC were responsible for the majority of rDSH incidents (33 female Y-INC accounted for  $n=307$  rDSH incidents; mean=9.3 vs. 42 male Y-INC which had  $n=137$  rDSH reports; mean=3.3).

While DSH in a Y-INC sample was more prevalent among 14–21 year olds than 6–13 year olds, the fact that very young children in care have been identified with self-harming behaviours is important to note. This finding underscores the need to not view self-harm as solely an adolescent mental health issue. While Latzman and colleagues (2010)

**Table 5** Logistic regression analysis to explain the severity of self-injury (hospitalization required vs. not required) reported in the SOR between Y-INC-SH-1 ( $n=177$ ) and Y-INC-rSH ( $n=75$ )

Adjusted Odds Ratio (95% Adjusted Confidence Interval)	
Gender <sup>a</sup>	1.26 (0.79–2.02)
Legal Status <sup>b</sup>	1.07 (0.65–1.77)
Age <sup>c</sup>	4.26 (2.51–7.21)
Repeat <sup>d</sup>	1.32 (0.85–2.05)

<sup>a</sup> 1 = male, 2 = female

<sup>b</sup> 1 = crown-ward, 2 = not crown ward

<sup>c</sup> 1 = 6–13 year olds, 2 = 14–21

<sup>d</sup> 1 = Y-INC-SH-1, 2 = Y-INC-rSH

1 = reference group for each exposure variable listed.

Hospitalization not required is reference group for outcome variable



found comparable levels of self-harm thoughts between middle (age 10–13) and high-school (age 14–18) students, Muehlenkamp and colleagues (2009) found rates of DSH increased among female and declined among male students over a three year period. Sourander and colleagues (2006) found a significant increase in thoughts or acts of self-harm between 12 and 15 years of age, especially among females (Sourander et al. 2006). It is flagged as an area for future research as other studies have failed to identify differences in rates of self-harm across age or grade among middle-school (Hilt et al. 2008) and high-school (Lloyd-Richardson et al. 2007) students.

Y-INC experience significant emotional, intellectual, educational and developmental challenges that youth living with their parents may not face, such as living in a foster home or in group care. While the transition from elementary to high school presents a different social environment and increased academic demands for youth in general, outcome data underscore this as a very difficult, challenging period for Y-INC. For example, less than half (45%) of Ontario Y-INC are believed to graduate before the age of 20 vs. 79% of youth who live with their parents (Rowden 2010). Future research should explore whether school-related experiences such as academic failure, peer-interactions, and disobedience impact DSH rates. Child welfare agencies need to work with the schools and foster homes to ensure Y-INC with DSH incidents have needed support and resources. A study by Robinson and colleagues (2008) illustrate this point as they found that training teachers on how to support youth who self-harm led to the youth having increased confidence, perceived skills, and knowledge regarding DSH.

In addition to advancing descriptive details of Y-INC with DSH behaviours this study identified a finding that has to date, not been well detailed in the literature. This is related to when DSH incidents tend to occur for Y-INC. Specifically, most are between 6 pm and 12 am during the week. Notwithstanding future research will need to explore educational associations between school-related variables (i.e. school type and poor academic achievement) and DSH (Brunner et al. 2007), and links between birth family and/or counselling visits and DSH (Loxterkamp 2009). The finding of when DSH is most likely to occur for Y-INC flags the need to have heightened foster parent/staff awareness, supervision and resources available between 6pm-midnight for those youth at risk for possible DSH behaviours.

Our finding that youth who were Crown Wards were less likely to self-harm than youth who were not Crown Ward warrants further investigation. Non-Crown Ward youth were most often under temporary care and likely experiencing emotional instability, placement instability, stress, and possibly depressive symptoms. It is possible that following through with self-harm was associated with this difficult time in a child's life. The time it takes for a child to become a Crown Ward may facilitate improvement in emotional stability, as many of these children are removed from situations of parental abuse and neglect. In order to be placed under Crown Ward protection, parents and guardians must be deemed unable to care for the child. It is possible that being removed from the critical situation is a protective factor for self-harm. This finding may also suggest that Children's Aid Society (CAS) is protective against self-harm (e.g. workers and/or caregivers are trained to identify signs of self-harm and are more likely to intervene).

Children's Aid Society requires all workers to report incidents of self-harm, as well as threats of self-harm. This latter variable is unique to this study, as youth who threaten self-harm typically go unnoticed within the general population. Do youth who threaten self-harm progress to actual self-harm, and if so, what factors are associated with this transition? Are there specific factors associated with youth who threaten self-harm that can be used to identify at-risk youth? These are just a few questions we hope future research will address.

We found that 14–21 year old Y-INC-SH were more likely to require medical attention compared to 6–13 year olds (AOR 4.26, ACI 2.51–7.21). This suggests that older Y-INC follow through with self-harm more seriously. Moreover, Y-INC-rSH were somewhat more likely to require medical attention following self-injury when compared to Y-INC-SH-1 (AOR 1.32, ACI 0.85–2.05). This suggests that children who repeat self-harm may progress to more harmful behaviours. At CAS-T, it is both a policy and practice for a child's social worker, foster parent, or resident staff to bring a child to a hospital/medical practitioner following actual self-injury (CAS-Toronto Service Policy). The increased likelihood of medical attention could therefore be inflated due to a policy influence specific to CAS youth compared to the general population. It would be of interest to know the age-range at which self-harm is most likely to increase in severity and whether behaviours progress at different ages between males and females. Such findings would provide evidence to inform interventions at the most appropriate time to prevent progression of self-harm, and to provide guidelines for supervision/support for youth who have a past history of self-harm.

Similar to other published studies (Cheung and Goodman 2007; Gratz 2001; Nixon et al. 2008; Skegg 2005), we found that most Y-INC-SH use similar behaviours: cutting, scratching, and stabbing (28.5%) were most prevalent followed by head-banging and punching objects (22.4%) (data not shown). There was no difference in the type of behaviour selected between Y-INC-SH-1 and Y-INC-rSH. As noted previously, females were more likely than males to repeat self-harm when adjusting for age and type of behaviour. This finding is in accordance with research performed on youth within the general population (De Leo and Heller 2004; Hawton et al. 2002; Morey et al. 2008; Nixon et al. 2008; O'Connor et al. 2009), and child-welfare (Cheung and Goodman 2007; Goodman 2005) populations.

### Limitations

Y-INC represent a unique sample of youth, thus conclusions from this study cannot be applied to the general population. And since this Y-INC cohort is a convenience sample, the findings cannot be generalized to all Y-INC. However, the large sample size of 252 and the longitudinal approach to analyzing the data strengthens the findings. It is hoped this study will increase researchers' interest in the child-in-care population and the topic of DSH.

Although we believe that the DSH incidents have been appropriately documented for this child welfare cohort it is unlikely that all have been captured, thus DSH may be underreported in this study as it relied on secondary data from SOR reports. Some of underreporting issues may have to do with vague definitions and poor understanding of what is DSH (e.g. is head-banging DSH behaviour? Is a seven-year old girl's behaviour of pulling out all her eyelashes/brows/hair DSH?). Also if staff/foster parent believe DSH is only an adolescent issue, this may influence underreporting of DSH in this Y-INC sample. The findings presented here most likely represent an underestimate.

This study was also limited by the data made available for analysis on the SOR. For example, we were unable to control for the length of time each child spent in care at the time of an incident, a child's mental health/diagnosis at the time of an incident, whether a child was currently in school, history of physical and/or sexual abuse and history of suicide ideation and/or attempts. Without controlling for such factors as intent of suicide, this study's findings cannot be generalized to specific types of self-harm (e.g. non suicidal self-injury, suicide attempts). Controlling for history of physical and/or sexual abuse is important, as it is associated with repeated suicidal behaviour (Ystgaard et al. 2004). As well, this study did not take into account a child's living situation. A majority of youth

(50–60%) included in this study lived in group homes. Understanding where Y-INC-SH live is important because a child's living environment can impact a child's emotional stability, social support, and peer influence. For example, Prinstein and colleagues (2010) found that females and grade six students (compared to grade seven and eight students) were more likely to be influenced by friends to engage in self-harm. A child living in a group home with others who self-harm may, therefore, be more likely to develop similar behaviours.

A majority of youth in foster care have mental health and developmental needs related to a diagnosable difficulty that requires intervention, but few obtain the required services (dosReis et al. 2001; Garland et al. 2000; Osborn 2006; Staudt 2003; Stein et al. 1996; Villagrana 2010). Many Y-INC of CAS are not formally identified as having problems, and of those that are, few receive psychological services (Goodman et al. 2004; Minnis et al. 2006; Pasztor et al. 2006). Further, Ontario Y-INC have higher levels of problematic behaviour and lower levels of prosocial behaviour when compared to youth of the same age within the British and American general population (Marquis and Flynn 2008). Information on whether youth in our study had a mental health assessment and diagnosis was not included in the SOR and represents a limitation in this study. In order for future research to control for mental health/diagnosis at the time of an incident, it is important for all Y-INC to have access to formal mental health assessment and treatment.

Recognizing when and why a child is admitted to Child Protection Services would help to further understand self-harm within the child-welfare population. It would also be of interest to understand whether Y-INC-rSH initiate self-harming behaviours before or following initial care. There is a need for a more detailed history of each youth at the time of each incident and changes to the SOR may help to facilitate this. Such changes may include documentation of the length of time in care, a child's mental health/diagnosis, whether a child was currently in school, history of or current suicide attempt/ideation, history of physical and/or sexual abuse, ethnicity (including First Nations and tribal affiliation), race, sexual orientation (including lesbian, gay, bisexual, transgender), and living situation. Controlling for Aboriginal status is especially important in Canada considering that Aboriginal children are twice as likely to be placed in foster care (Trocmé et al. 2004). Previous work did not show a significant difference in the number of self-harming attempts or threats reported between minority (including black, native, Asian, Hispanic, mixed youth) and non-minority (European-American heritage) Y-INC; however, differences in type of behavior was noted between different cultures (Cheung and Goodman 2007). The SOR form did not allow us to identify youth who were transitioning out of care. The foster care system in Ontario requires youth to leave the child system at age 21 and this shift may be associated with feelings of anxiety, stress, and abandonment (Anonymous 2009; Rowden 2010). It would be interesting for future work to identify if differences in frequency of self-harm exist between older youth who are either making that transition out of care or not, as these youth may require enhanced support in adjusting to their new life.

### Future Directions

Removing children from situations of parental abuse and neglect is essential to protect youth from harm. However, without understanding self-harm within the child-welfare system, Child Protection Services such as CAS are not able to provide all the protection and support these children need. We believe the development and implementation of a screening tool would be beneficial to identify Y-INC that are at high risk to self-harm. If risk can be quantified prior to and throughout the duration of care, we believe that social

workers, foster parents, and professionals will be in a better position to prevent incidents from occurring through directing support and supervision to those who need it most. This study represents a first step toward identifying factors associated with self-harm among Y-INC; however, further research is required within this population of youth as questions remain unanswered. For example, understanding the primary causes of self-harm and differences between Y-INC-SH-1 and Y-INC-rSH is one important consideration. This can lead to the development of evidence-based interventions that can prevent repeat occurrences. The association between children's mental health, the environment of children in care, and effective prevention all warrant ongoing investigation.

## Conclusion

This study confirms that deliberate self-harm (DSH) is present within the Ontario child-welfare population. Among youth in care (Y-INC) who self-harm, females and 14–21 year olds were more likely to repeat. DSH events were most often documented during the week between 6 pm and 12 am. Possible associations between DSH and school events, family visits and professional appointments needs to be explored. Crown Ward youth were more likely to threaten self-harm than complete self-harm, suggesting something about being a Crown Ward may be protective against following through with self-harm. These findings emphasize the need to develop strategies to prevent DSH and to prevent it from re-occurring. Efforts should be made to increase the resources and support available to Y-INC related to DSH. Future research is needed to develop strategies to reduce DSH among Y-INC. This study began to address this gap by analyzing *who* are self-harming and *when* these incidents take place.

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