Deliberate Self-Harm in an Incarcerated Population of Youth: An Examination of Prevalence Rates, Risk, and Protective Factors

Kelly Penner Hutton, M.A.

A Thesis Submitted to the Faculty of Graduate Studies of

The University of Manitoba

in Partial Fulfilment of the Requirements of the Degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

University of Manitoba

Winnipeg, Manitoba

April 10, 2011

Abstract

Deliberate self-harm (DSH) is a major health concern, especially for high-risk populations such as incarcerated youth. DSH refers to socially unacceptable, deliberate behaviour that causes harm to the body regardless of intent to die. There is limited research concerning prevalence rates as well as risk and protective factors for high-risk, adolescent groups. Participants were recruited from a correctional facility for youth aged 12-18. Male (n = 36) and female (n = 51) incarcerated adolescents (N = 87; mean age = 15.9) completed a survey that measured social-demographic characteristics, current depressed mood, lifetime alcohol and drug use, perceptions of social support (availability and satisfaction), approach-avoidance coping, problem-solving confidence, and DSH. The prevalence rates (81% lifetime, 74% annual, and 51% while incarcerated) for this mainly Aboriginal and Métis population were much higher than previous offender, community, and hospital findings. Youth reported much higher rates of DSH on a checklist than in response to a general question previously used in such research, suggesting that previously reported prevalence rates are likely grossly underestimated. Hypotheses regarding risk and protective factors were only partially supported. Depressed mood and drug use were positively, directly related to annual DSH frequency. Depressed mood proved to be a significant risk factor as well for incarcerated DSH. Overall, protective factors did not predict DSH well for this group of offenders. Only approach coping was inversely related to DSH frequency. Participants in this study reported very low levels of protective factors, which likely affected the outcome of statistical analyses. In general, youth reported high rates of risk factors and low rates of protective factors. Rates of DSH warranting medical attention increased with duration

and frequency of such behaviour, as did actually receiving medical attention. Although 74% of offenders indicated that medical attention had been warranted at least once, only 50% actually received medical attention. Offenders were equally likely to receive medical attention whether they had engaged in DSH once or repetitively. It is likely that offenders prefer to keep their behaviour private, which affects how often they seek medical attention, even if they believe it is warranted. Recommendations are advanced for detecting and responding to DSH in incarcerated youth.

Acknowledgements

This thesis would not have been possible without the support of my husband and children. Even when obstacles made it seem like this thesis would never be completed, you urged me back on path. Without your encouragement I would have given up long ago. This project spanned six years, three children, and two international moves. It is amazing that this thesis was even completed.

I would like to acknowledge Jan B, without whom this thesis would not have been possible. Thank-you for your insight and your dedication to the youth you serve. I would also like to acknowledge the work of Shelley H for making data collection possible and her commitment to education regarding DSH in the prison system.

On the academic side, I would like to thank Bruce Tefft, my Research Supervisor, for his support and sticking with me throughout this long project. I would also like to thank my Ph.D committee members for continuing to stay on and support this thesis. In addition, this research would not have been possible without the financial awards I received from the Social Sciences and Humanities Research Council, as well as the J.G. Fletcher Arts Award.

Table of Contents

List of Tables

Deliberate Self-Harm in an Incarcerated Population of Youth: An Examination of Prevalence Rates, Risk, and Protective Factors

Deliberate self-harm (DSH) is a global health issue that requires increased research and clinical attention. DSH has become increasingly more common in adolescent populations over the past 30 years (Hawton, Fagg, Simkin, Bale, & Bond, 1997; Hawton, Rodham, Evans, & Weatherall, 2002). DSH refers to socially unacceptable, deliberate behaviour that causes harm to the body, regardless of the person's intent to die. Although some socially or culturally acceptable (e.g., decorative piercing) and high-risk (e.g., drunk driving, sky diving) behaviours may result in harm to self, these behaviours differ from DSH in that the harm inflicted is not intentional. Although interest has increased recently, there has been relatively little research examining adolescent DSH, including the determination of prevalence rates. DSH research suggests that prevalence rates may reach as high as 20% in community populations and 60% in patient populations (Goddard, Subotsky, & Fombonne, 1996; Groholt, Ekeberg, Wichstrom, & Haldorsen, 2000; Hawton et al., 2002; Muehlenkamp & Gutierrez, 2004; O'Sullivan & Fitzgerald, 1998; Patton et al., 1997; Suyemoto, 1998; Whitlock, Eckenrode, & Silverman, 2006).

In addition to being a health issue on its own, DSH has also been identified as a major risk factor for both attempted and completed suicides (Bethell & Rhodes, 2009; Cooper et al., 2005; Favazza & Rosenthal, 1993; Hawton, Fagg, Simkin, Bale, & Bond, 1997, 2000; Hawton, Zahl, & Weatherall, 2003; Jacobson & Gould, 2007; Larsson & Sund, 2008). Adolescent suicide is a major health concern for Canada (Peter, Roberts, & Buzdugan, 2008). In 2005, suicide was the second leading cause of death for children aged 10-14 (14% of all deaths, 2/100,000), as well as youth aged 15-19 (22% of all

deaths, 10/100,000), following only deaths due to unintentional injuries (Statistics Canada, 2009a, electronic data file). Males (13.4/100,000) accounted for more suicide deaths than females (6.3/100,000) for ages 15-19 in 2005 (Statistics Canada, 2009b, electronic data file).

Given that suicide is such an important health concern, it seems apparent that research should focus on risk factors such as DSH. Previous adult studies estimated that 50% (Foster, Gillespie, & McClelland, 1997) to 65% (Appleby, Cooper, Amos, & Faragher, 1999) of persons who die by suicide have a history of DSH. The results of a long-term (1997-2001) study in the United Kingdom provided compelling evidence of DSH's link to suicide (Cooper et al., 2005). Cooper and colleagues examined suicide rates for patients (> 10 years; median age = 30) who presented to hospital for DSH (defined as an act of intentional self-poisoning or injury irrespective of the apparent purpose of the act). Seventy-eight percent of patients who completed suicide during the study period reported previous DSH at their first presentation to hospital. The suicide rate was highest during the first six months of follow-up, with males who self-harmed more likely to commit suicide than females. Overall, DSH patients had more than 30 times the number of suicides than would have been expected in the general population of England and Wales. The results of this study strongly indicated that DSH is a major risk factor for suicide. Thus, research is required to determine risk and protective factors for DSH so that treatment and prevention programs may be developed to reduce DSH and, in turn, help to reduce youth suicides.

Although DSH is a major risk factor for suicide, it is important to note that only a relatively small proportion of self-harming individuals commit suicide. A review of

follow-up data from 90 studies indicated that 2% of self-harming individuals died by suicide in the 12 months following an incident of DSH (Owens, Horrocks, & House, 2002). Nonetheless, it has been estimated that the risk of suicide increases by 50 (Owens et al.) to 100 (Hawton & Fagg, 1988) times in the 12 months following DSH, compared to the general population (Cooper et al., 2005). It is, therefore, imperative that individuals who engage in DSH receive treatment and follow-up within the 12 months following the first identified DSH incident. Unfortunately, very few individuals who harm themselves present for medical attention (Groholt, Ekeberg, Wichstrom, et al., 2000; House, Owens, Patchett, 1998; Martin, Rozanes, Pearce, & Allison, 1995; Rodham, Hawton, & Evans, 2004) and, of those who do, the incident is often not considered or recorded as self-harm by medical staff (Bethell & Rhodes, 2009).

The United Kingdom has a monitoring system for collecting and coding data on DSH presentations to hospitals. In other countries this is not the case. In a Canadian review of one province's (Ontario) hospital emergency department data (2001-2002), Bethell and Rhodes (2009) found that DSH incidents (defined as intentional self-injury or self-poisoning) were likely grossly underestimated (up to 63%) due to misclassification or coding self-harm (e.g., self-cutting and self-poisoning) as 'undetermined' rather than DSH. In this study, DSH was most prevalent for the 15-19 age group. Bethell and Rhodes suggested that misclassification was likely due to three factors: (a) the lack of a standardized, clear definition of DSH; (b) individuals withholding information about DSH (e.g., not indicating that harm was self-inflicted); and (c) clinicians overlooking the self-harm and coding the incident as undetermined or unintentional. This study highlights

the need for a standardized definition and classification system of DSH in Canadian institutions (e.g., health care, forensic).

Young offenders are thought to be a particularly vulnerable and at-risk population for DSH, especially those who have mental health concerns (Callaghan, Pace, Young, & Vostanis, 2003). Liebling (1993) reported that rates of self-harm behaviours (including DSH, attempted suicide, and completed suicides) were disproportionately higher among forensic populations than the general population, indicating that forensic populations are at increased risk for self-harming behaviours. Aboriginal youth, in particular, are at a higher risk of coming into contact with the youth justice system in Canada than non-Aboriginal youth (Boe, 2002). In addition, suicide rates among Aboriginal persons in Canada are three to four times higher than those seen in the general population (Population and Public Health Branch, 1999). Among youth Status Aboriginals (15-24 years) in Manitoba, suicide rates are five times the national average for males and seven times for females (Population and Public Health Branch, 1999). Despite their high-risk for DSH and suicide, there is limited research on DSH in offender populations and no available DSH research on Canadian Aboriginal adolescents. Overall, Aboriginal and offender groups are very high-risk populations for DSH and suicide.

Conceptualizing DSH

There is a lack of clear terminology and agreed-upon definitions for DSH. DSH has been referred to by various names in the literature, including but not limited to: self-mutilation, self-injurious behaviour (SIB), self-poisoning, parasuicidal behaviour, self-inflicted violence, self-abuse, self-destructive behaviour, self-attack, non-suicidal self-injurious behaviour (NSSI), suicidal gestures, suicidal behaviours, partial suicide,

attempted suicide, and self-damaging behaviour (Connors, 1996a; Favazza, 1998; Jacobson & Gould, 2007; Kahan & Pattison, 1984; Muehlenkamp, 2005; Patton et al., 1997; Pattison & Kahan, 1983; Santa-Mina & Gallop, 1998; Suyemoto, 1998). Over 33 terms have been used in the literature to describe self-harm behaviours (Favazza, 1998; Muehlenkamp, 2005). Some of the terms appear to be all inclusive (e.g., self-inflicted violence, self-abuse), whereas others have narrow definitions (e.g., cutting, self-poisoning, suicide attempts).

Many researchers who use the above terms (e.g., non-suicidal self-injury) specify a lack of suicidal intent in their definitions. Unfortunately, it is often difficult to determine suicidal intent. The term parasuicide is often used incorrectly in the research literature to imply an intent to die. However, the World Health Organization's definition of parasuicide, as referenced in a study by Santa-Mina and Gallop (1998), does not presume "a failed intent to produce a fatal outcome" (p. 795), but rather defines parasuicide as a non-fatal act that causes self-harm. Adding to the confusion, DSH is often mislabeled as a suicide attempt when it requires medical attention, even though the person may not have intended to kill him or herself. The term parasuicide (i.e., non-fatal self-injurious behaviour with clear intent to cause bodily harm regardless of suicidal intent) has not been used consistently in Europe and the United States, thereby making it difficult to compare studies (Welch, 2001). A World Health Organization study conducted by Platt et al. (as cited by Rodham et al., 2004) identified four possible criteria for parasuicide: (a) initiating behaviour which is intended to cause self-harm, (b) ingesting a substance in excess of the prescribed amount or recognized therapeutic dose, (c) ingesting a recreational or illicit drug to cause self-harm, and (d) ingesting a non-ingestible substance

or object. The last three criteria focus on self-poisoning. The first criterion refers to any initiated behaviour intended to cause self-harm but does not identify specific methods that may be included in the definition (e.g., self-cutting or self-hitting). When the definition for parasuicide presented by the World Health Organization is used, parasuicide and DSH are essentially the same in definition. However, the term parasuicide can be misleading and has been misused in the literature. Therefore, the current paper uses the term DSH, rather than parasuicide, to describe a broad range of self-inflicted and intentional harm, regardless of intent to die.

Lack of a common terminology or conceptualization of DSH, makes it difficult to compile accurate information about DSH (etiology, prevalence, treatment) and complicates research. Variations in DSH definitions lead to very serious conceptual problems. Most researchers agree that DSH involves an intentional act to cause harm to the body but differ in whether they include subjective concepts of social acceptability, intent, and lethality. These issues are discussed next.

Subjective Criteria

Social acceptability.

The social acceptability of any harming behaviour is important. DSH occurs on a continuum that is partly determined by social and/or cultural norms, as well as the context in which the behaviour occurs (Connors, 1996a). Societies around the world are very heterogeneous concerning social beliefs. Social acceptability is relative to the social or cultural group making the judgment. What is acceptable to one group may be unacceptable to another. There are numerous examples of potentially harmful behaviours that are arguably socially acceptable, depending on the culture or sub-cultural group (e.g.,

ear piercing, drinking alcohol, overeating, cosmetic surgery, tattoos). Chosen and direct body alterations such as ear-piercing, eye-brow plucking, tattoos, and ceremonial scarring are generally not considered DSH behaviours (Claes & Vandereycken, 2007; Connors, 1996a).

Claes and Vandereycken (2007) proposed a flowchart for distinguishing self-harm behaviours that starts with the question of social acceptability. In their conceptualization, if the body changes are socially acceptable, the behaviour cannot be classified as self-harm (Claes & Vandereycken). Although a few researchers have included body alterations and high-risk behaviours as sub-clinical forms of DSH, most researchers exclude these behaviours because of the lack of intentional harm. Researchers studying DSH need to be aware of acceptable social and cultural practices in the groups they study, and exclude socially acceptable behaviours from DSH definitions.

Intent and lethality.

As discussed above, researchers seem to disagree about whether the intent and lethality of DSH should be crucial elements of the DSH definition. Although most researchers agree that the DSH includes an intentional act to harm oneself, they differ in their inclusion of death as an intended outcome.

DSH is sometimes differentiated from attempted suicide. Some researchers do not include harmful behaviours in their definition of DSH when there is an expressed, conscious intent to die. Instead, they label behaviour that includes a conscious intent to die as attempted suicide (Chapman, Gratz, & Brown, 2006; Favazza, 1998; Gratz, 2001, 2003; Herpertz, 1995; Mangnall & Yurkovich, 2008; Muehlenkamp, 2005; Santa-Mina & Gallop, 1998; Simpson & Porter, 1981; Suyemoto, 1998; Suyemoto & MacDonald, 1995;

Taiminen, Kallio-Soukainen, Nokso-Koivisto, Kalijonen, & Helenius, 1998). Mangnall and Yurkovich (2008) believe that "those who self-harm with the intent to kill themselves do so from far different antecedent causes and with far different outcome expectations than those who self-harm without the intent to kill themselves" (p. 176). Other researchers include harmful acts regardless of evidence that the act was intended to cause death (Cooper et al., 2005; Hawton et al., 1997; Hurry, 2000). For example, Hawton et al. (1997) regarded DSH as any injury that had been deliberately self-inflicted. Still other researchers attempt to side-step the issue of intent by focusing on the severity of the injury, stating that the behaviour must be non life-threatening. In this case, the person may have *intended* to commit suicide although the *lethality* of the act was not high enough to result in death. Walsh (2006) uses 'low-lethality' as a criterion in his definition of DSH to distinguish self-harm from suicide attempts. Focusing on injury severity, although observable and somewhat measurable, does not provide clear criterion for differentiating DSH from suicide attempts (Herpertz, 1995).

Although many studies have focused on suicide attempts, in most cases adolescents do not intend to kill themselves when they engage in DSH (Groholt, Ekeberg, & Haldorsen, 2000; Hawton, O'Grady, Osborn, & Cole, 1982; Hurry, 2000; Mangnall & Yurkovich, 2008). Many researchers have asserted that DSH is a coping mechanism for expressing suicidal thoughts without risking death (Claes & Vandereycken, 2007; Klonsky, 2007; Suyemoto, 1998). Unfortunately, individuals often lack insight into their behaviour and may not have or express conscious intent (Walsh, 2006). Self-harming acts often occur at the height of interpersonal or emotional crisis, which makes it extremely difficult to ascertain intentions of the act (Hurry, 2000). As well, it is often difficult for

clients, clinicians, and researchers to differentiate between serious suicidal attempts and DSH that inflicts more serious injury than was intended. Even for adolescents who report suicidal ideation and intent to die, the lethality of DSH behaviour is generally low (Patton et al., 1997; Rotheram-Borus & Trautman, 1988). Twenty-eight to 41% of persons who self-harm report suicidal ideation at some point (Favazza, 1998; Simeon & Favazza, 2001). Within adolescent populations, suicidal ideation is quite common, even for youth who do not self-harm, which further suggests that suicidal ideation may not be a reliable criterion for differentiating DSH from suicide attempts (Muehlenkamp & Gutierrez, 2004).

There appears to be moderate agreement in the literature that DSH and suicide are conceptually very different (Claes & Vandereycken; 2007; Chapman et al., 2006; Favazza, 1998; Herpertz, 1995; Hurry, 2000; Jacobson & Gould, 2007; Mangnall & Yurkovich, 2008; Muehlenkamp, 2005; Nock & Prinstein, 2005; Pattison & Kahan, 1983; Santa-Mina & Gallop, 1998; Simpson & Porter, 1981; Suyemoto, 1998; Suyemoto & MacDonald, 1995; Taiminen et al., 1998; Walsh, 2006). However, a study comparing self-harming high school students with students who reported suicide attempts found no difference between the groups on suicidal ideation or depressed mood (Muehlenkamp & Gutierrez, 2004). Walsh (2006), who uses the term self-injurious behaviour, distinguishes self-harm behaviour from suicide in terms of both intent and lethality. He suggests that the intent of DSH is often to modify consciousness in order to obtain relief from unpleasant affect and to live another day. As discussed later in this paper, many researchers have discovered that a common function of DSH is to obtain relief from emotions (Mangnall & Yurkovich, 2008; Messer & Fremouw, 2008; Nock & Prinstein,

2005; Suyemoto, 1998). In contrast to self-harm, Walsh indicates that the intent of suicide attempts is to terminate consciousness and escape emotional pain permanently. Walsh concedes that ascertaining intent from clients can be quite difficult, which leaves focusing on lethality or severity of physical damage. He asserts that the DSH method used can convey suicidal intent. Walsh argues that people who intend to die and have completed suicides tend to use highly lethal methods (firearm, hanging, overdose, jumping from a height) compared to people who have self-injurious motivation (cutting, carving, self-hitting, self-burning). Of course, the difficulty with conceptualizing DSH by the chosen method is that severity of harm occurs on a continuum and it is difficult to determine cut-off points for severity that distinguish a self-harming individual from a suicide attempter.

Pattison and Kahan (1983) attempted to distinguish DSH from suicidal behaviour by using a continuum of lethality: (a) low lethal acts over multiple episodes were classified as DSH; (b) medium lethal acts were classified as either atypical DSH if it was only a single episode or suicide attempts if there were multiple episodes; and (c) high lethal acts, even in a single episode, were classified as suicide attempts. This classification system does not clarify a 'grey' area in which high lethality was an unintended consequence for people who did not wish to end their life or low-level lethality was unintended for a person attempting to end their life. For researchers who wish to distinguish lethality of DSH, this classification system may be useful. However, Pattison and Kahan's classification system is somewhat subjective in nature. It also assumes that wound severity is directly related to intent to die, which is problematic.

It is very difficult to accurately determine an individual's conscious intent through observations or self-report (Herpertz, 1995). Similarly, it is difficult to base intent on lethality or wound severity, as people often cannot accurately predict the physical consequences of their actions or external factors that are outside their control. Having said that, it is important to note that suicide is a very different phenomenon from DSH. Still, the two concepts are inherently linked and may occur at different ends of the same continuum, with repeated DSH possibly leading to suicide attempts and eventual suicide (Cooper et al., 2005; Jacobson & Gould, 2007). However, the relationship between DSH and suicide attempts is complex and difficult to fully separate (Jacobson & Gould; Muehlenkamp & Gutierrez, 2004).

It is important for clinicians and researchers to acknowledge difficulty with ascertaining and classifying intent. Even when intent is included in the criteria for DSH, many episodes may fall into the 'grey' area in which intent cannot be classified with certainty. Overall, inclusion of intent and lethality in any conceptualization of DSH is problematic and leads to measurement issues unless a clear operational distinction between suicide attempts and DSH can be formulated. It may be best to identify intent in descriptive information for participants in a study, but not use intent as a definitional criterion for DSH. Future definitions of DSH should include socially unacceptable forms of DSH that directly cause harm to the body, regardless of intent to die.

Approaches to Conceptualizing DSH

Theoretical conceptualizations of DSH can be divided into two approaches: functional and structural. Functional approaches to conceptualizing DSH describe the functions that self-harm serves for individuals. Structural approaches attempt to classify

DSH as a clinical disorder based on observable criteria and typical patterns of behaviour (i.e., a recognized mental disorder included in classification systems such as the Diagnostic and Statistical Manual of Mental Disorders). The structural approach often takes into account the functions served by DSH. These two approaches are discussed next.

Functional approach.

From the functionalist perspective, DSH is considered an expression of distress or way of coping with distress (Claes & Vandereycken, 2007). The main task of the functional approach is to determine "why this particular behavior, at this particular time, is serving this particular function, for this particular person" (Claes & Vandereycken, p. 142; Suyemoto, 1998). When viewed in this way, people may use a variety of DSH methods to meet differing psychological needs, possibly leading to multiple functional explanations for DSH, even within the same person (Claes & Vandereycken; Klonsky, 2007).

Based on a review of the existing literature, Suyemoto (1998) proposed six functional models of self-harm (listed below). She uses the term pathological self-mutilation for self-harm. Pathological self-mutilation was defined as direct, socially unacceptable, repetitive self-mutilation that results in minor to moderate self-harm and lacks suicidal intent or a need for self-stimulation (Suyemoto). Pathological self-mutilation is not related to cognitive ability and does not include stereotypical, self-stimulating behaviour such as that seen in developmental disorders. Suyemoto focused on intrapsychic and interpersonal functions of self-harm, derived mostly from research on self-cutting. She excluded biological bases, impulsivity, and psychotic hallucinations or

delusions from her discussion, indicating that these areas were beyond the scope of her literature review. Based on the articles reviewed, Suyemoto proposed four main functional categories encompassing six specific functions, including: (1) environmental (environmental); (2) drive (antisuicide and sexual models); (3) affect regulation (affect regulation and dissociation models); and (4) interpersonal (boundaries) models. It is difficult to differentiate between categories and functional models in Suyemoto's scheme because many category names are also used for functional models. Overall, the organization and terminology is confusing. Suyemoto, herself, indicated that self-mutilation is contextually complex, making it difficult to differentiate one function from another.

In a different literature review, Klonsky (2007) identified seven functions of DSH that were repeatedly examined in the research literature and are similar to those identified by Suyemoto (1998). These functions included: interpersonal-influence; anti-suicide; affect-regulation; anti-dissociation; interpersonal boundaries; self-punishment; and sensation-seeking. Although he separated these functions, Klonsky indicated that they are not mutually exclusive, as several functions may co-occur and overlap conceptually. Nonetheless, each function is the core of a separate model of interpersonal or intra-psychic dynamics.

The affect-regulation model suggests that DSH functions to alleviate negative affect or psychological distress through psychological and/or biological mechanisms (Klonsky, 2007). In other words, self-mutilation functions as a way to express, externalize, or control anger, anxiety, or pain that cannot be expressed by other means. Moreover, the act of DSH may validate the internal experience of emotional pain, as well as express the

depth of their pain to others (Suyemoto, 1998). According to Klonsky, during the early years of life, individuals may encounter invalidating environments as well as people who model dysfunctional coping strategies. Individuals from these environments, or individuals prone to emotional instability (stemming from biological disposition), have difficulty managing their emotions/affect and use DSH to manage their emotions in stressful situations.

The interpersonal-influence model suggests that DSH is used to influence or manipulate people within the environment (Klonsky, 2007). In this model, DSH is conceptualized as a cry for help, a means of avoiding abandonment, or an attempt to be taken more seriously. According to Klonsky, manipulation should not be considered a conscious act because the self-harmer may not be aware of the reinforcement received from others in their reaction to the self-harm.

The anti-suicide model views DSH as suicide replacement or a coping mechanism for resisting urges to attempt suicide (Klonsky, 2007). In this perspective, DSH is a means of expressing suicidal thoughts without risking death. DSH may also reduce or eliminate suicidal ideation for a short period of time.

The anti-dissociation model indicates that DSH is a response to periods of dissociation or depersonalization (Klonsky, 2007). Dissociation (the ability of the mind to hide a memory, feeling, or body sensation) serves as a way for people's minds to deal with difficult situations. People may feel numb, unreal, or see themselves from a distance during a dissociative state (Suyemoto, 1998). Episodes of dissociation may be triggered when individuals are removed from loved ones for extended periods of time or may occur in response to intense emotions. The sight of blood or the physical sensations associated

with DSH may shock the system, serving to end the dissociative period and regain a sense of self.

The interpersonal boundaries model (Klonsky, 2007), based on object-relations theory, asserts that DSH is a way to affirm the boundaries of the self (i.e., distinguish between self and others). Self-harmers are thought to lack a normal sense of self due to insecure maternal attachments. Perceived abandonment from others results in a fear of loss of identity. Self-mutilation results from the building of emotional pain and anger associated with the perceived loss and serves to create an identity and confirm boundaries (Suyemoto, 1998). The act of self-harm (e.g., marking the skin) allows the creation of one's identity by distinguishing the self from others and the environment (Klonsky, 2007). Adolescents may come to be viewed by others in reference to their choice of self-harm (e.g., a cutter), thus creating a distinct sense of self.

The self-punishment model suggests that the self-harm is an expression of anger towards oneself (Klonsky, 2007). Self-harmers may use DSH as a way to punish or invalidate themselves. According to this model, DSH may become a way of self-soothing when faced with emotional distress.

The sensation-seeking model holds that DSH is a way to generate excitement, similar to that in sky-diving (Klonsky, 2007). Klonsky indicated that the sensation-seeking model has not received much attention in the theoretical literature.

Most of the information gathered about functions of DSH comes from self-report studies in which participants are asked their motivations or reasons for initiating DSH. Self-report data regarding motivations is subject to serious problems, similar to issues associated with reporting intent (Klonsky, 2007). The data are retrospective in nature,

requiring individuals to think about the last time they engaged in DSH and to determine their motivations for DSH at that time. Time may degrade the individual's ability to accurately describe motivations due to experiences that follow the self-harming incident. As well, self-harmers may not be conscious of why they harm themselves. Another potential problem is that individuals may be embarrassed to report their reasons for self-harm and may fabricate explanations for their behaviour.

Klonsky (2007) argued that the seven functional models remained consistent across various types of samples (e.g., clinical, forensic, non-clinical, adult, adolescent, women, and men). Studies of the functions or reasons for self-harm provide mostly anecdotal accounts of why people think they harmed themselves or how they think they felt before, during, and after engaging in DSH. Unfortunately, the 11 studies reviewed by Klonsky do not provide any causal links or solid, empirical support for any of the models. Percentages of participants that endorsed certain reasons were provided however, more robust statistical analyses were not used. The information gleaned from these studies indicates that negative affect often precedes or accompanies an act of DSH and that negative affect is reduced following a DSH act. Self-regulation reasons for DSH were highly endorsed by participants (by 53% to 80% of participants in the various studies). Thus, the affect-regulation model received the most empirical support.

Messer and Fremouw (2008) critically reviewed seven functional models of adolescent self-mutilation (overlapping considerably with Klonsky, 2007) that have been described in the literature. Messer and Fremouw found two studies of adolescent inpatients, conducted by the same authors (Nock & Prinstein, 2004, 2005), that provided direct, systematic evaluation rather than using merely descriptive methods. The two

studies provided empirical support for the affect-regulation model. There was also some support for the self-punishment model. Six studies indicated that participants endorsed self-punishment type items 63% to 80% of the time. However, five studies found much less frequent endorsement of these items (10% to 32% of participants). There was mixed support for the anti-dissociation and interpersonal-influence models. According to Messer and Fremouw, the anti-suicide, interpersonal boundaries, and sensation seeking models have received less research attention.

Messer and Fremouw (2008) stated that integrating multiple models, and using a variety of research techniques and methodologies, are essential for studying DSH. At present, there are very few studies that have researched functions of self-harm in adolescent groups. Based on their literature review, Messer and Fremouw concluded that adolescents who self-harm have trouble regulating affect, which may stem from chaotic or abusive childhoods, or from biological factors. As well, social contingencies (modeling, reinforcement) may play a role in starting and maintaining self-harm behaviours.

All of the above studies have broadly investigated reasons/motivations for DSH as a starting point for understanding why people self-harm. Three reviews (Klonsky, 2007; Messer & Fremouw, 2008; Suyemoto, 1998) examined studies that investigated reasons/motivations for DSH and then, based on the endorsed items in these surveys or interviews, attempted to categorize reasons into theoretical models. The result is a confusing mix of possible explanations for DSH. However, one consistent finding was that self-harmers have a need to manage and regulate emotions.

Based on previously identified functions for DSH, Chapman et al. (2006) proposed a behavioural model of DSH, the experiential avoidance model (EAM). The EAM integrates aspects of affect regulation, dissociation, and boundaries models. Chapman et al. maintain that DSH (defined as a form of parasuicidal behaviour without any intent to die) is primarily a behaviour of emotional avoidance which may also "function to help individuals avoid thoughts, memories, somatic sensations, or other aversive internal experiences" (p. 374). Chapman et al. assert that experiential avoidance represents a set of behaviours (e.g., substance use, avoidant coping, thought suppression, etc.) that serve the function to avoid or escape from unwanted emotions and internal experiences linked to emotions (e.g., thoughts, feelings, somatic sensations).

Chapman and colleagues' (2006) model identifies factors leading to DSH. First, a stimulus relevant to the person triggers an emotional response (e.g., anger, shame, sadness, frustration). Following the start of the emotional response, four factors interact to produce avoidance behaviour. The four factors are: (a) lower tolerance for intense emotions; (b) difficulty implementing alternative coping strategies; (c) emotion regulation skill deficits; and/or (d) poor distress tolerance. Ironically, the use of avoidant strategies (e.g., thought suppression, emotional avoidance, substance use) may increase rather than decrease distress. The failure of avoidant strategies, coupled with the need to avoid the intense emotion, leads to engagement in DSH. Following DSH, the individual experiences a reduction in, or escape from, intense emotions, thereby negatively reinforcing DSH behaviour. Temporary relief from emotions reinforces the self-harming behaviour, making repetition likely. Rule-governed behaviour, a verbal rule that specifies a relationship between a given behaviour and a consequence (e.g., "if I cut, I will feel

better"), further serves to strengthen self-harming behaviour. Thus, over time DSH becomes an automatic and conditioned response to emotional arousal, which perpetuates the cycle of DSH.

Chapman et al. (2006) have provided a model of DSH that can be empirically tested, which is a great improvement over previous attempts to identify models of DSH. Hopefully, the EAM will spur needed research into its major tenant. In particular, the following require empirical examination: (a) the presence of avoidance behaviours (e.g., avoidance coping strategies, substance use) in adolescents who self-harm; (b) the presence of emotional relief or decline in emotional intensity immediately following DSH; (c) the presence of symptoms from associated avoidance-type clinical disorders (e.g., depressed mood, substance abuse); and (d) comparison between individuals who consistently use avoidant coping strategies but do not engage in DSH with individuals who repeatedly engage in DSH.

Support for the EAM stems from research findings that avoidance behaviours (e.g., substance use, avoidant coping styles, thought suppression) and disorders related to avoidance (e.g., depressive, borderline personality, post traumatic stress, and dissociative disorders) are directly related to DSH. There has been preliminary support that avoidance behaviours such as substance use (Hawton, Hall, et al., 2003; Hjelmeland, 1996; Zlotnick, Mattia, & Zimmerman, 1999) and avoidance coping, (Hasking, Momeni, Swannell, & Chia, 2008; McAuliffe et al., 2006) are also directly related to DSH. More research on the relationship between DSH and avoidance behaviours is required to determine the degree of support for this model.

Some studies have documented higher rates of mental disorders associated with avoidance behaviours in DSH patients, with: (a) reported rates ranging from 48-80% for Borderline Personality Disorder (Chapman et al., 2006; Dulit, Ryer, Leon, Brodsky, & Frances, 1994; Zlotnick et al., 1999); (b) rates greater than 50% for Post Traumatic Stress Disorder (as cited in Chapman et al. 2006, Cloitre, Koenen, Cohen, & Han, 2002); and (c) rates ranging from 44-80% in adolescent depressive disorders (Groholt, Ekeberg, Wichstrom et al., 2000; Haliburn, 2000; Haw, Hawton, Houston, & Townsend, 2001; Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999). However, DSH occurs in community samples as well as patient samples and, therefore, clinical diagnosis should not be the only determinant for DSH. Rather, specific symptoms associated with avoidant-type clinical disorders should be examined to determine if they are directly related to DSH. For example, research using community samples should investigate whether depressed mood is directly related to self-harming behaviour, rather than focusing on diagnosis of depressive disorders. Although there is some correlational research providing support for the relationship of avoidance behaviours to DSH, the EAM itself has not been fully researched or tested.

In summary, there are currently no empirically-supported or commonly-accepted models of DSH. Few empirical studies have used statistical methods to examine causal or functional models of DSH. Thus, none of the models presented above can be considered as more than exploratory. Furthermore, no one functional category can explain why people engage in DSH. Individuals report varied reasons for DSH over time, indicating that their reasons or motivations for DSH may change based on the circumstances. Chapman et al.'s experiential avoidance model integrates several of the theoretical

models postulated by other author's (Claes & Vandereycken, 2007; Suyemoto, 1998) into a relatively clear model that can be empirically investigated.

Structural approach: DSH as a clinical disorder.

Many researchers have argued for DSH to be recognized as a clinical disorder in their attempts to clarify terminology, conceptualization, operational definition, and treatment issues. Those who support this structuralist approach propose that people who self-harm constitute a unique group with a specific syndrome, whose core feature is self-harm behaviour (Claes & Vandereycken, 2007). DSH has long been discussed as a clinical syndrome and is currently under review for the *Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition* (DSM-5; American Psychiatric Association, 2010).

Menninger was the first to formally describe self-harming behaviour (as cited in Favazza, 1998; as cited in Muehlenkamp, 2005). He proposed that self-harm was an "action to avert suicide and promote self-healing" (Muehlenkamp, p. 324). Since then, other clinicians have described self-harm as a clinical syndrome (Claes & Vandereycken, 2007; Muehlenkamp; Pattison & Kahan, 1983). Morgan (as cited in Claes & Vandereycken, 2007; as cited in Pattison & Kahan, 1983) proposed the concept of a non-fatal, deliberate self-harm syndrome in 1979, focusing on psychological symptoms that included:

> (1) sudden and recurrent intrusive impulses to harm oneself without the perceived ability to resist; (2) a sense of existing in an intolerable situation which one can neither cope with nor control; (3) increasing anxiety, agitation, and anger; (4) constriction of cognitive-perceptual processes resulting in a narrowed perspective on one's situation and personal alternatives for action;

> (5) a sense of psychic relief after the act of self-harm; and (6) a depressive mood, although suicidal ideation is not typically present. Drug and alcohol abuse are reported to be common concomitants of deliberate self-harm, and lack of social support appears temporally related. The syndrome typically begins in late adolescence, has a low level of lethality, and continues over many years, with repetitive episodes. Morgan suggested that persons with the syndrome have a higher probability of committing suicide after many years of deliberate self-harm behavior (Claes & Vandereycken, 2007, p. 141; Pattison & Kahan, 1983, p. 867).

Based on Morgan's work (as cited in Claes & Vandereycken, 2007; as cited in Pattison & Kahan, 1983) and a review of the available clinical literature, Pattison and Kahan (1983; Kahan & Pattison, 1984) proposed that DSH as a clinical disorder warranted consideration for inclusion in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV). Pattison and Kahan classified DSH by level of lethality, directness of inflicted harm, and single versus multiple episodes. They constructed a chart for classifying all self-damaging behaviours including: (a) DSH; (b) suicide attempts; (c) indirect methods of self-harm such as chronic alcoholism, acute drunkenness, high-risk stunts; and (d) termination of vital health treatment. In this chart, DSH was separated into two types, namely (a) atypical DSH that was of medium lethality, occurring once (single episode) and (b) DSH syndrome that was of low lethality over multiple episodes. Favazza (1998) and Muehlenkamp (2005) indicated that this classification method was quite valuable for clearing up some of the terminology and conceptual confusion associated with DSH.

Pattison and Kahan's (1983; Kahan & Pattison, 1984) proposal was not approved for inclusion in the DSM-IV, based on three main objections. First, it was suggested that DSH is just a variant of a suicidal event. In response to this objection, Pattison and Kahan (1983) asserted that, based on the literature at that time, DSH and suicidality were clinically distinct classes of behaviour. For example, most cases of DSH do not lead to suicide attempts or completed suicide (Owens et al., 2002). A second objection was that DSH was a symptom of an underlying personality disorder, such as Borderline Personality Disorder, and did not represent a separate clinical disorder. For instance, self-mutilation is one of the criteria for Borderline Personality Disorder (American Psychiatric Association, 2000). However, Ross and McKay's (1979; as cited in Pattison & Kahan, 1983) review of all personality diagnoses associated with DSH indicated no clear association between DSH and a specific personality disorder. Later, Favazza (1998) suggested that self-mutilation may be a marker of severity in Borderline Personality Disorder but, when the behaviour becomes repetitive, it develops into an impulse disorder warranting a separate diagnostic syndrome. A third objection was that DSH was a symptom of an axis I mental disorder. At that time, no studies had explicitly studied the connection between DSH and axis I disorders. Recently, Mangnall and Yurkovich's (2008) review of the literature revealed that DSH behaviours are associated with a variety of DSM-IV disorders. In fact, depression, anxiety disorders, substance abuse, eating disorders, posttraumatic stress disorder, schizophrenia, and several personality disorders have been associated with DSH (Klonsky, 2007). In response to both the second and third objections, Pattison and Kahan (1983) pointed to high prevalence rates for DSH in

community samples. Thus, DSH is not simply related to existing DSM disorders and may occur in the absence of any identified mental disorder.

Soon after the proposal of DSH as a mental disorder, Favazza and Rosenthal (1990) proposed the adoption of the repetitive self-mutilation syndrome (RSMS). They described RSMS as an impulse control disorder. The essential feature of RSMS is the recurrent, deliberate, and direct destruction or alteration of body tissue in the absence of conscious suicidal intent, with the exclusion of socially acceptable body modification. Due to Favazza's focus on self-mutilation, other forms of DSH such as self-poisoning (e.g., overdose) and self-battery were excluded from the definition (Favazza, 1998). Favazza and colleagues later refined the RSMS description, dividing pathological self-mutilation into three categories: major, stereotypic, and superficial/moderate (Favazza; Messer & Fremouw, 2007). Major self-mutilation is associated with a serious mental disorder (e.g., psychosis) or neurological illness, and includes acts such as eye enucleation, limb amputation, or castration. According to Favazza et al., stereotypic self-mutilation is repetitive and commonly associated with neurological illness or developmental disabilities, including acts such as head banging, hitting, and other forms of self-stimulation. Superficial/moderate self-mutilation is divided into three categories: (a) compulsive type refers to repetitive and ritualistic behaviour engaged in to release tension (e.g., nail biting, skin picking and scratching, trichotillomania); (b) episodic type refers to less frequent behaviour that provides tension relief; and (c) repetitive type refers to intense preoccupation with self-mutilation. Episodic and repetitive types include acts such as cutting, carving, burning, bone breaking, and interference with wound healing. Favazza et al. conceptualize repetitive self-mutilation (i.e., RSMS) as an Axis I type

disorder of impulse control. Favazza indicated that most self-mutilators have problems with impulsivity. Self-mutilation may lead to suicide attempts as repetitive acts escalate in frequency and intensity. Criticism of the RSMS was the same as those raised for the DSH syndrome proposed by Pattison and Kahan (1983). In addition, some clinicians suggested that the term self-mutilation has negative connotations that imply a more severe degree of harm than most DSH involves (Gratz, 2001; Mangnall & Yurkovich, 2008). Favazza (1998) recognized that self-mutilation carries negative implications. However, he asserted that his definition was neutral in regard to pathology. He indicated that besides self-mutilation, the most common terms to describe self-mutilative behaviour were DSH, followed by self-injurious behaviour.

Muehlenkamp (2005) combined the two most common terms cited above by using the term deliberate self-injury syndrome. She proposed that deliberate self-injury syndrome should be reviewed for inclusion in the DSM-5, currently under review. Meuhlenkamp based her proposed diagnostic criteria for deliberate self-injury syndrome on previous conceptualizations by Kahan and Pattison (1984), Favazza and Rosenthal (1990), and Simeon and Favazza (as cited in Muehlenkamp, 2005). Criteria proposed for the deliberate self-injury syndrome were:

(1) a preoccupation with physically hurting oneself that is devoid of conscious suicidal intent or ideation;

(2) one has an inability to resist the impulse to hurt oneself;

(3) preceding the act of self-injury, there is a psychological experience of increasing tension, anger, anxiety, dysphoria, or general distress, which the person feels he or she cannot escape from or control;

(4) there is a sense of relief, gratification, and/or release from depersonalization immediately following the act of self-injury;

(5) there is a repetitive pattern of self-injury in which five or more acts of self-injury have occurred (the method of self-injury may vary across injury episodes);

(6) the self-injury is not better accounted for as a response to psychosis, transexualism, mental retardation, developmental disorders, or a general medical condition; and

(7) the self-injury causes clinically significant distress or impairment in social, occupational, or other important areas of functioning (Muehlenkamp, p. 333).

An essential feature of Muehlenkamp's (2005) conceptualization is preoccupation with harming oneself in the absence of conscious suicidal intent. She also focused on the functions that self-harm serves in relation to increasing tension. Muehlenkamp argued that most acts of DSH are preceded by precipitating events that may be regarded by others as trivial in nature. The event triggers increasing tension, whereas the act of DSH immediately serves the function of releasing the tension, leading to a sense of relief, gratification, and/or release from depersonalization. Muehlenkamp's proposed criteria for the deliberate self-injury syndrome are based on research findings, but she does not adequately address issues regarding social acceptability or intent/lethality. In addition, the proposed criteria are not clear enough to resolve definitional issues in the literature. For example, what types of behaviours are considered self-injury? As well, Muehlenkamp

includes impulse control as a criterion, but there is no evidence to substantiate its inclusion. There is also difficulty associated with determining intent of the self-injury.

Most recently, Shaffer & Jacobson (2010) proposed the inclusion of non-suicidal self-injury (NSSI) disorder for the DSM-5. They submitted their proposal as a response to the absence of self-harm behaviour in the DSM-IV (except as a criterion for Borderline Personality Disorder), as well as in response to misperceptions and problems of a public health and clinical nature that arise due to the lack of a clear understanding and definition of DSH. They asserted that "the absence of an appropriate and narrowly defined category for describing NSSI has, we believe, a negative impact on public health efforts to monitor prevalence, on research, and - most importantly - on clinical practice" (Shaffer & Jacobson, p. 2).

Shaffer and Jacobson (2010) suggested that NSSI be defined as intentional self-inflicted damage to the surface of the body (inducing bleeding, bruising, or pain), with the expectation that the injury will lead to minor or moderate physical injury. They address intent by stating that an absence of suicidal intent can be either self-reported or inferred by frequent use of methods that the patient knows, by experience, not to be lethal. The intentional injury must be associated with at least two of the following: (a) negative feelings or thoughts immediately prior to self-harm (e.g., depression, anxiety, tension, anger, generalized distress, self-criticism); (b) preoccupation with self-harm prior to engaging in the intentional act; (c) frequent urges to engage in self-harm, even if not acted upon; or (d) self-harm is engaged in with a purpose (e.g., relief from negative feelings/thoughts, relief from interpersonal difficulty, induction of a positive feeling). They exclude socially sanctioned behaviours (e.g., body piercings, tattoos), common or

trivial behaviours (e.g., wound picking, nail biting), repetitive stereotypes found in developmental disorders, self-injury only occurring during states of psychosis or intoxication, and self-injury better accounted for by another mental or medical disorder. As well, Shaffer and Jacobson excluded self-poisoning from their definition of NSSI due to the association between overdoses and suicide attempts. The problem with excluding self-poisoning is that people may attempt to harm themselves by ingesting harmful substances, but may not be trying to kill themselves even if the ingestion is considered an overdose by medical professionals.

Shaffer and Jacobson's (2010) definition addresses social acceptability, intent, and lethality. However, as discussed previously, a problem with the inclusion of intent is that it cannot always be inferred from the method of DSH. Furthermore, the definition includes subjective assumptions regarding people's "expectation that the injury will lead to only minor or moderate physical harm" (Shaffer & Jacobson, p. 4). Including this as a criterion would necessitate measurement of the perceived expected outcome (e.g., mild injury) by individuals, a very difficult task. Furthermore, the definition of 'mild to moderate' harm is not stated. Mild to moderate injury would need to be operationalized and measurement tools developed. As discussed previously, developing a standard measurement for lethality would be difficult.

Two *Not Otherwise Specified* sub-types of NSSI were proposed: Type 1, Subthreshold and Type 2, Intent Uncertain (Shaffer & Jacobson, 2010). Subthreshold would be indicated if the patient met all criteria for NSSI disorder, but injury had occurred less than five times in the past twelve months. Intent Uncertain would be indicated if the patient meets criteria for NSSI, but insists that the intention was to

commit suicide. It is interesting that the authors are adamant that NSSI is quite different from a suicide attempt, but include a sub-type that allows for self-harm with suicidal intent. Shaffer and Jacobson had rejected deliberate self-harm as a potential name for the disorder because DSH is widely used and is applied to both non-suicidal harm and suicide attempts.

Evidence suggests that DSH warrants a separate clinical diagnosis designation that is not associated with Borderline Personality Disorder. The DSM-5 task force has placed the proposed Non-Suicidal Self Injury (NSSI) disorder under the category of Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence, despite calls to include NSSI under mood or behaviour disorders. This decision may be appropriate, considering that most self-harming individuals start harming when they are in early adolescence. However, including intent as a main criterion is questionable. It is widely known that most persons who engage in DSH are not attempting to commit suicide (Groholt, Ekeberg, & Holdersen, 2000; Hawton et al., 1982; Mangnall & Yurkovich, 2008). However, even when individuals do not intend to end their lives, there may be occasions when suicidal intent is reasonably inferred, either by the method, lethality, or an individual's declaration. One problem with categorizing people into a self-harm disorder that does not allow for suicide attempts is that people who regularly harm themselves and fit the diagnostic criteria, but who express suicidal intent or experience severe wounds on a few occasions, would not qualify for it. Instead, they would be classified as a suicide attempter, even though they meet other criteria for a self-harm disorder. However, it may make sense for individual acts of DSH to be categorized into suicidal or non-suicidal intent. A case could also be made for including self-poisoning as a self-harm method.

Although, self-poisoners are more likely to present for medical care (e.g., due to overdoses) than individuals who use other methods of DSH, it is quite likely that many self-poisoning acts do not include suicidal intent.

Conclusions Regarding Conceptualization of DSH

Two approaches for conceptualizing DSH have been discussed in the previous sections, namely functional and structural. Both approaches have merit in the conceptualization of DSH. However, there is an immediate need for an agreed-upon definition of DSH, which may be best obtained within the structural approach through creation of a clinical disorder. Classifying DSH as a clinical disorder would serve to clarify definition and terminology issues, while providing stimulation for research. Recognition as a clinical disorder (e.g., in the DSM) would also allow for specification of criteria for DSH and ensure that the same criteria and terminology are used for investigating DSH. Using the clinical disorder as a basis for research, functional analyses would still be able to provide descriptive information regarding DSH. A combination of the two approaches may lead to a better understanding of DSH and, in turn, guide prevention and treatment strategies.

Many researchers have adopted a conceptualization of DSH that identifies social unacceptability, directness of the behaviour, level of injury, absence of suicidal intent, and exclusion of psychotic and developmental diagnoses in their definitions. Most agree that DSH should include only socially unacceptable forms of self-harm, as well as the use of direct methods (as opposed to indirect methods) for inflicting harm.

A majority of clinicians and researchers appear to support the inclusion of intent in the definition of DSH, despite the difficulties associated with ascertaining and classifying

intent. Some researchers have included intent in their definition by stating that there needs to be a lack of 'conscious' suicidal intent. Thus, if individuals indicate intent to die, the behaviour is not classified as DSH, but rather as a suicide attempt. However, if individuals do not clearly indicate suicidal intent or fully understand their intent, even though suicidal intent may have been present, the behaviour would be classified as DSH.

Some researchers refer to DSH as a main term for any self-harm act, with sub-types of self-harm behaviour under DSH's broader definition. Hasking and colleagues (Hasking, Momeni, Swannell, & Chia, 2008) indicated that non-suicidal self-injury (NSSI) referred to self-destructive behaviour without suicidal intent. They further indicated that DSH (self-destructive behaviour irrespective of intent) included incidents of NSSI. In a recent study, Muehlenkamp and colleagues (Cloutier, Martin, Kennedy, Nixon, & Muehlenkamp, 2009) conceptualized DSH as an umbrella term that can be separated into NSSI (purposeful and repetitive destruction of body tissue without conscious lethal intent, using methods not socially sanctioned), suicide attempts, and completed suicide. Although most of the self-harming adolescents presenting to hospital were classified as NSSI only (91%), NSSI and suicide attempts were found to co-occur for a minority (4%) of self-harming adolescents. Had the researchers not specifically asked about suicidal intent, it is likely that these adolescents would have been classified as NSSI, despite that fact that they had also, at some point, attempted suicide.

If clarity is the objective, deliberate self-harm appears to be the most suitable term for conceptualizing and describing self-harm behaviors. The current study defines DSH as socially unacceptable, deliberate, and direct destruction or alteration of body tissue (external or internal), regardless of intent to die, that does not end in death.

Operational Definition of DSH

Predictably, conceptual disagreement among researchers has led to a lack of consensus in operational definitions of DSH in the research literature. Clinicians and researchers have included a variety of self-harm methods in their operational definitions. Three main types of self-harm have been consistently referred to in the literature: self-laceration (also called self-mutilation), self-poisoning, and self-battery. Self-laceration refers to skin cutting, carving, piercing (e.g., with pins or needles), and burning, excluding that for the purpose of self-decoration (Gratz, 2001; Muehlenkamp & Gutierrez, 2004). Self-laceration includes self-mutilative behaviours such as cutting the skin with knives, pins, or other sharp objects. Self-poisoning refers to ingesting medication, illicit drugs, and substances considered toxic to the body (i.e., non-ingestible substances) for the purpose of self-harm (Hawton et al., 2002; Rodham et al., 2004). Definitions of self-poisoning often include overdoses of medications or drugs (Hawton et al., 2002; Rodham et al., 2004). Self-battery refers to hitting or slapping self, pulling hair to cause pain, breaking bones, and hitting/kicking walls or other objects (Muehlenkamp & Gutierrez, 2004).

In the research literature it is very difficult to find a study that investigates a broad range of DSH behaviours. Self-laceration and self-poisoning have been researched more often than self-battery, probably because self-battery is the most difficult to observe. As well, of the three DSH methods, individuals who engage in self-battery are probably least likely to require or present for medical attention due to less severe or non-life-threatening injury. Persons who present for medical attention have most often engaged in self-poisoning (Hurry, 2000; Rodham et al., 2004). Webb (2002), following a review of the

DSH literature, stated that "no study fully attempts to separate and compare poisoning with other self-destructive behaviour" (p. 242). Self-poisoning is often excluded from definitions of DSH because the resulting harm is generally unpredictable and does not result in visible tissue modification or destruction (Favazza, 1998). As well, some researchers consider self-poisoning to infer an intent to die (Shaffer & Jacobson, 2010). Thus, due to the inclusion of non-suicidal intent in some definitions of DSH, self-poisoning is often not classified as DSH. Although research examining one type of DSH can provide valuable information about the behaviour, research is needed that examines a variety of methods of DSH.

Measurement Approaches

Some researchers have operationally defined DSH based on participants' responses to 1-2 broad or open-ended questions about DSH in general (Boudewyn & Liem, 1995 cited in Gratz, 2001; Gutierrez, Osman, Barrios, & Kopper, 2001; Martin & Waite, 1994), whereas others have investigated specific methods of DSH based on their research interests (Gratz, 2001; Sansone, Wiederman, & Sansone, 1998). The following general questions have been used to measure self-harm: (a) "have you ever had the desire to hurt or harm yourself in some way?" (from Boudewyn & Liem's Mental Health History Form, as cited in Gratz, 2001, p. 256); (b) "have you deliberately hurt yourself without trying to kill yourself anytime in the last two years?" (from Zweig-Frank, Paris, & Guzder, 1994, as cited in Gratz, p. 256); (c) "in the past six months, have you intentionally harmed yourself in a way which at the time was NOT considered by you or anyone else a suicide attempt?" (from the Suicide Behaviors Questionnaire, as cited in Gratz, p. 256); (d) "have you ever hurt yourself on purpose? (e.g., scratched yourself with finger nails or sharp

object)" (Gutierrez et al., 2001, p. 477); and (e) "have you ever deliberately taken an overdose (e.g., of pills or other medication) or tried to harm yourself in some other way (e.g., such as cut yourself)?" (Rodham et al., 2004, p. 81). Most of these general questions do not explain to the reader what constitutes 'harm' and do not tap into specific methods of DSH. Therefore, general questions may be interpreted in various ways and participants may not think to include behaviours that could be considered DSH.

Operational definitions of DSH often specify whether or not the inclusion of suicidal intent is necessary. None-the-less, measurement approaches often do not reflect the definition. For example, non-suicidal self-injury (NSSI) questions may ask 'have you ever harmed yourself on purpose without trying to kill yourself?' or 'have you ever engaged in any of the following behaviours for the purpose of self-harm but not to attempt suicide.' However, they may not go beyond this to ask if the person has ever actually tried to attempt suicide in general or for specific methods. As demonstrated in the Cloutier et al. (2010) study, a small portion of adolescents engaged in NSSI and attempted suicide. There may have been occasions when these adolescents had engaged in NSSI in the absence of a suicide attempt, however, they had at other times attempted suicide. Thus, these individuals would have answered affirmatively to the above questions and been included in an NSSI group for research purposes despite also engaging in suicide attempts. As a result, despite their best attempts to eliminate suicide attempters from NSSI groups, researchers may inadvertently be investigating DSH in general.

Several researchers have developed questionnaires to measure DSH (Gutierrez et al., 2001; Gratz, 2001; Klonsky & Glenn, 2008; Sansone et al., 1998). Gutierrez and

colleagues (Gutierrez, King, & Ghaziuddin, 1996) initially developed the Self-Harm Behavior Questionnaire (SHBQ) as a semi-structured interview, based on information gathered from open-ended clinical interviews and an extensive review of the suicide risk assessment literature. To increase efficiency, the questionnaire was later changed into a self-report format, including both closed and open responses (Hagstrom & Gutierrez, 1998). The SHBQ includes four sections investigating: (a) intentional self-harm not identified by the participant as suicidal in nature; (b) suicide attempts; (c) suicide threats; and (d) suicidal ideation (Gutierrez et al., 2001). NSSI was defined as an act of intentional self-harm without the intent to die and suicidal behaviour was defined as an act of self-harm with intent to die (Muehlenkamp & Gutierrez, 2007). The SHBQ's first section starts with the question "have you ever hurt yourself on purpose (e.g., scratched yourself with finger nails or sharp object)." Participants who answer 'yes' then indicate how many times they have engaged in the behaviour, ages at first and most recent incident, methods used, whether anyone else was aware of the behaviour, and if the behaviour resulted in injury that required medical attention (Gutierrez et al., 2001). The data in each section is then coded into numerical categories. A strength of the SHBQ is that it identifies two conceptual types of DSH (with and without suicidal intent). A limitation of the SHBQ is that it does not identify specific methods of DSH, except for the two examples in brackets after the initial general question. It relies on participants' subjective identification of DSH behaviours, which is then coded into methods based on Favazza (1996) and Ross and McKay's (1979) descriptions (cited in Muehlenkamp & Gutierrez, 2004). There may also be overlap between the self-harm and suicide attempt sections. The question used to measure NSSI does not specify that participants should not

include harm in which there was suicidal intent. A qualifier such as ‘but was not a suicide attempt’ is needed to ensure that suicide attempts are not included in the self-harm section. As a result, the SHBQ may over-estimate NSSI.

Sansone et al. (1998) developed the Self-Harm Inventory (SHI), a 22-item self-report measure, to identify intentional self-harm behaviour and screen for Borderline Personality Disorder (BPD). BPD is a mental disorder characterized by instability in moods, interpersonal relationships, self-image, and behaviour (including suicidal and impulsive behaviours: American Psychiatric Association, 2000). Suicidal behaviour, including self-harm, is one of the diagnostic criteria for BPD. The SHI was developed to measure DSH methods that are commonly present in BPD patients. Originally, a list of 41 items was identified, but was reduced to 22 items following a study investigating the correlation of SHI items to scores on the Diagnostic Interview for Borderlines (Sansone et al.). The list of methods on the SHI was preceded with “have you ever on purpose, or intentionally . . .” Participants respond ‘yes’ or no’ to items including overdosed, banged your head on purpose, driven recklessly on purpose, had accidents on purpose, burned yourself, abused alcohol, and engaged in physically abusive relationships. A score on the SHI is the sum of endorsed “yes” responses, which essentially indicates the number of methods utilized. The authors suggest that a cut-off score of five be used for predicting BPD. A score of 5 on the SHI accurately classified 84% of patients in their study diagnosed with BPD. Although DSH is a symptom of BPD, DSH is not specific to that disorder and often occurs in non-clinical samples. The SHI utilizes specific items for investigating self-harm, which is an improvement over previous measures. However, the

items on the scale are correlated to self-harm methods observed in BPD and, therefore, is likely not valuable as a DSH measurement tool for community and non-BPD samples.

Gratz (2001) attempted to improve measurement of DSH by inquiring about specific self-harm behaviours (Deliberate Self-Harm Inventory or DSHI). Gratz based the 16 specific methods included on clinical observations, testimonies of individuals who self-harm, and common self-harm behaviours reported in the literature. Items included: cutting; burning with cigarette; burning with lighter or match; carving words into skin; carving pictures into skin; severe scratching; biting; rubbing sandpaper on skin; dripping acid on skin; using bleach or oven cleaner to scrub skin; sticking pins, needles, staples into skin; rubbing glass into skin; breaking bones; banging head; punching self; and, interference with wound healing. She added a 17th item in which the participants could report a form of self-harm not already listed. Each act was embedded in the question, "have you ever intentionally (i.e., on purpose) . . . (without intending to kill yourself)" (Gratz, p. 262). In addition to specific methods of self-harm, the DSHI also requests information about frequency ("how many times have you done this?"), duration (i.e., age when the behaviour first began and ended), and severity (i.e., resulted in hospitalization or required medical attention) for each behaviour. Thus, the DSHI measures specific methods of DSH, without suicidal intent, as well as their frequency, duration, and severity. These areas had been largely ignored in the research literature.

Unfortunately, there are several limitations associated with the DSHI. Interestingly, Gratz (2001) chose to focus mainly on self-laceration, with the inclusion of a few self-battery items. She did not include any self-poisoning items, likely due to her definition of DSH – the deliberate, direct destruction or alteration of body tissue without conscious

suicidal intent, but resulting in injury severe enough for tissue damage to occur. Definitions that incorporate lack of suicidal intent and tissue damage often do not include self-poisoning because of the assumption that these behaviours are suicide attempts and/or do not result in observable tissue damage. Another limitation of the DSHI is that of seemingly redundant items (e.g., carving words into skin and carving pictures into skin) which could be collapsed into one item (e.g., "have you ever carved words or pictures into your skin?") with minimal loss of information. A third limitation is the length of the DSHI. For each type of self-harm, several questions are asked, making the questionnaire quite lengthy. Despite these limitations, the DSHI is an improvement over previous measures of DSH and can be adapted for measuring a wider range of self-harm methods. It provides concrete, behavioural DSH methods for investigation, instead of leaving the definition of DSH up to respondents. Thus, the construct being measured is unambiguous and the DSH involved does not require interpretation. A scale such as this can more readily allow for comparisons between studies.

The epidemiology of DSH among adolescents is discussed in the next section, due to the focus on adolescents in the current study. It is important to consider how DSH is measured in these studies (e.g., by general questions, open-ended questions, or by a checklist of self-harm behaviours) because the measurement method may significantly influence reported prevalence rates of DSH. For example, people may be less likely to respond 'yes' to a general inquiry about self-harm but may respond affirmatively when asked about specific methods of DSH.

Epidemiology

Studies investigating adolescent prevalence rates of DSH can be separated into hospital or patient sample studies and community sample studies. Relatively high rates of DSH have been found in both settings.

Hospital and Patient Studies

Hospital epidemiology studies tend to focus on incidence rates (i.e., number of new cases) or on annual prevalence rates, rather than lifetime prevalence rates. Many studies investigating DSH, in adults, have focused on hospital or patient samples. In adult hospital populations, DSH is most often associated with borderline personality disorder, eating disorders, and childhood sexual abuse (Andover, Zlotnick, & Miller, 2007; Conners, 1996a; Connors, 1996b; Santa-Mina & Gallop, 1998; Taiminen et al., 1998). Adolescent patient studies are less prevalent in the research literature than adult studies. However, a DSH lifetime prevalence rate of 24% has been documented for psychiatric inpatients aged 12-18 (Taiminen et al., 1998). Most people who present to hospital following an act of DSH have self-poisoned (Bland, Newman, & Dyck, 1994). Hurry (2000) reported that 90% of adolescents presenting to hospital following DSH had taken an overdose and the majority of the remaining 10% had cut themselves, usually without serious risk of life. Hurry surmised that the lack of appropriate classification of DSH (i.e., classification often relies on observable injuries and intent), combined with frequent lack of presentation for medical attention, leads to a gross underestimation of the true prevalence of DSH in adolescent populations.

As indicated above, adolescents who present for hospital care are most likely to have self-poisoned. Therefore, hospital DSH incidence rates usually include

predominantly self-poisoners. Hawton and his colleagues have focused almost exclusively on self-poisoning (Goldacre & Hawton, 1985; Hawton & Fagg, 1992; Hawton & Harriss, 2008a; Hawton et al., 1997; Hawton et al., 2000; Hawton, Hall, et al., 2003). Hawton et al. (1997) followed referrals to general hospitals in the United Kingdom from 1985 to 1995. During this time, they noticed a dramatic increase in rates of self-poisoning for both males and females. The increase in males aged 15-24 was the most dramatic, with an increase of 194% from 1985 to 1995. For adolescents aged 10-19 years, there was a noticeable increase in self-poisoning from 1985-86 to 1994-95 (28% increases for both males and females). Twelve percent of youth who had poisoned themselves repeated the self-poisoning within a one-year period following the first act. Although Hawton and colleagues focused on self-poisoning referrals, they noted that approximately 8% of adolescents in their sample engaged in other forms of DSH.

A second study examined DSH trends in Oxford, United Kingdom, from 1990-2000 (Hawton, Hall, et al., 2003). Most of the adolescents in the study had self-poisoned (86%), with 92% of females and 85% of males engaging in self-poisoning (Hawton, Hall, et al., 2003). Other methods of DSH were more frequent in males (15%) than females (8%). Following self-poisoning, the most common method of DSH was self-laceration (e.g., cutting of wrists and arms). Although prevalence rates were not reported, the authors stated that, at younger ages, females were more likely to engage in DSH than males. However, the female to male ratio tended to decrease with each year of age (Hawton & Harriss, 2008a, 2008b).

An Australian study of self-poisoners (N = 441) presenting to hospital between 1991 and 1995 investigated new cases (Reith, Whyte, Carter, & McPherson, 2003).

Incidence rates were reported for 10-14 year-olds (53 per 100,000 per year) and 15-19 year-olds (266 per 100,000 per year). The incidence rates indicated that more females (71 per 100,000 for 10-14 year-olds; 375 per 100,000 for 15-19 year-olds) than males (36 per 100,000 for 10-14 year-olds; 159 per 100,000 for 15-19 year-olds) presented to hospital following self-poisoning. There were 14 deaths (9 male, 5 female) during the four-year time period, eight of which were likely suicides. Death rates were much higher for self-poisoners than for the general population (a 6-fold increase for females and a 12-fold increase for males). There was no significant difference in the death rates between patients who deliberately harmed themselves and patients who accidentally misused drugs (e.g., recreational drug misuse). Reith et al.'s study also identified a high suicide rate for self-poisoners compared to the general population. Overall, Reith et al. concluded that self-poisoning was a significant risk factor for suicide.

Even though incidence rates of self-poisoning presentations to hospital have been increasing over time (Hawton et al., 1997), many self-harmers do not report to the hospital for medical care (Groholt, Ekeberg, Wichstrom et al., 2000). Self-poisoners are most likely to report for medical care (Hurry, 2000), with females being more likely to present to hospital for self-poisoning than males (Hawton et al., 1997; Hawton et al., 2003; Reith et al., 2003). As a result, self-laceration and self-battery cannot be adequately studied in hospital samples. In addition, incidence and prevalence rates of DSH obtained in hospitals likely grossly underestimate prevalence rates of DSH in the community.

Community Populations

Studies investigating DSH in community populations have found alarming rates of DSH (Hawton et al., 2002; Laukkanen et al., 2009; Rodham et al., 2004; Sourander et al.,

2006), indicating that DSH should be investigated further in non-patient samples. Refer to Table 1 for a summary of prevalence rates found in community-based studies. Some have documented lower rates, although still concerning, of DSH in the community studies (Garnefski, Diekstra, & de Heus, 1992; Groholt, Ekeberg, Wichstrom et al., 2000; Larsson & Sund, 2008; Madge et al., 2008; Muehlenkamp & Gutierrez, 2004; Patton et al., 1997; Plener, Keller, Fegert, & Muehlenkamp, 2009). Despite the lower rates, results from these studies indicate that DSH is present in communities across the globe and a world-wide health concern.

In a longitudinal, school-based study, Larsson and Sund (2008) reported an overall lifetime prevalence rate of 6%, as well as a high rate of repetition. Approximately half of the self-harmers also reported suicidal intent. Females (2% with suicidal intent and 4% without suicidal intent) were more likely to report an incidence of DSH during the past year (annual) than males (1% and 3%, respectively).

In a multi-country, school-based study by Madge and colleagues (2008), prevalence rates varied significantly by country and gender. Lifetime prevalence rates ranged from 2% (The Netherlands) to 7% (Belgium) for males and 6% (The Netherlands) to 17% (Australia & England) for females. High rates (14% or more) of lifetime prevalence for females were reported in several countries (Australia, Belgium, England, Ireland and Norway). When all six countries were taken into consideration, the lifetime prevalence rate was 4% for males and 14% for females. Annual prevalence rates ranged from 2% to 4% for males and 4% to 12% for females. When all six countries were taken into consideration, the annual prevalence rate was 3% for males and 9% for females. Overall, females were four times as likely to report DSH in their lifetime and three times more

Table 1

Adolescent Prevalence Rates by Study

Authors	Year of Publication	Country	Type of sample	Age	Suicidal Intent	Gender	Annual prevalence	Lifetime prevalence
Groholt, Ekeberg, Wichstrom et al.	2000	Norway	Community	13-19	Both	Both		8%
Hawton et al./Rodham et al.	2002/2004	England	School	15-16	Both	Both	9%	13%
Larsson & Sund	2008	Norway	School	12-15	No intent	Male	3%	2%
						Female	4%	4%
					Intent	Male	1%	2%
						Female	2%	4%
					Both	Both		6%
Laukkanen et al.	2009	Finland	School	13-18		Both		Cutting 12% Other 10%
Madge et al	2008	7 countries	School	12-17	Both	Males	3%	4%
						Females	9%	14%
Muehlenkamp & Gutierrez	2004	USA	School	*M* = 16.3	No Intent	Both	16%	
					Both		22%	
Muehlenkamp & Gutierrez	2007	USA	School	*M* = 15	No Intent	Both	16%	
					Both		23%	
Patton et al.	1997	Australia	School	*M* = 15.9	Both	Both	5%	
						Males	4%	
						Females	6%	
Plener et al.	2009	Germany	School	*M* = 15	No Intent	Both	20%	26%
					Intent			5%
Sourander et al.	2006	Finland	Community	Age 15	Both	Males		5%
						Females		13%

likely over the past year. Cutting (56%) and overdose (23%) were the most commonly reported methods. Over 50% of self-harming youth reported repeated DSH and use of multiple DSH methods.

Patton et al. (1997) focused primarily on DSH in a teenaged high school sample as part of a larger survey. They reported a 5% annual DSH prevalence rate, with self-laceration (2% annual prevalence) and self-poisoning (2% annual prevalence) being the most commonly reported methods of DSH. Self-battery and risk-taking were also assessed. Self-battery was the only self-harm type not associated with suicidal intent. In this study, females (6%) reported significantly higher rates of DSH than males (4%). Suicide attempts were very rare in this sample with less than one percent (0.2%) reporting a suicide attempt within the past year.

Groholt, Ekeberg, Wichstrom et al. (2000) surveyed an epidemiological sample of youth in Norway. They reported that 8% of a representative adolescent community sample responded ‘yes’ to the question ‘have you ever on purpose taken an overdose of medication or tried to harm yourself in other ways?’ (p. 870). The most common method of DSH in the hospitalized group was medication ingestion (88%), whereas the community group reported self-laceration (49%), followed by medication ingestion (31%). Only 2% of community participants reported that they had been hospitalized following DSH behaviour.

Other studies have found higher rates of DSH in school and community samples. One study documented an increase in prevalence rates as children grew older. In a Scandinavian, longitudinal study of DSH as part of a larger research project (the Finnish Family Competence Study), self-harm data were collected when children were aged 12

and 15 (Sourander et al., 2006). Surveys were mailed out to both parents and children to determine whether parents were aware of their children's self-harm behaviour. At age 12, the return rates were high, with 80% of parents (n = 907) and children (n = 900) returning the surveys. At age 15, the return rate declined to 66% of parents (n = 738) and 75% of children (n = 839). DSH was assessed with one likert-scale question ('I deliberately try to hurt or kill myself'). Self-reported DSH prevalence rates increased significantly from age 12 (3%) to 15 (13%) for females but not for males (3% to 5%, respectively). However, parent reports of their children's DSH did not statistically differ from age 12 (2% for females, 3% for males) to age 15 (3% for females, 3% for males). Differences in prevalence rates for females from age 12 to 15 make sense given that many youths indicate starting self-harm behaviour between ages 13-15 (Muehlenkamp & Gutierrez, 2004, 2007; Plener et al., 2009). It is possible that male DSH may start later or that they did not interpret the vague self-harm question to include self-battery methods of harm, which tend to be more common in males, explaining their lower prevalence rates. In keeping with previous suggestions that DSH is a private behaviour, parent and child agreement on both ideations and acts of DSH was very low, indicating that most parents were not aware of their children's DSH.

Differences reported between males and females in this study (Sourander et al., 2006) identify the need to investigate a broad range of DSH methods. Females may be more likely to engage in certain methods of DSH (e.g., self-cutting and self-poisoning) than males. However, this study also documented similar prevalence rates for males and females on other methods of DSH. In support of this notion, a Finnish study found that females reported higher rates of self-laceration and self-poisoning than males (Laukkanen

et al., 2009). Self-cutting ('have you ever cut yourself?') was assessed separately from other forms of self-harm ("have you ever engaged in any kind of self-harming behaviour other than self-cutting"). Lifetime prevalence rates for 13-18 years were 12% for cutting and 10% for other methods of DSH. Females were more likely than males to report a history of self-cutting, however males and females were just as likely to report a history of engaging in other methods of DSH.

In a study of 15 and 16 year-old students in England, with analyses of separate hypotheses reported in two articles (Hawton et al., 2002; Rodham et al., 2004), 13% of students reported a lifetime prevalence of DSH and 9% reported DSH within the past year. More females (11%) than males (3%) reported engaging in DSH during the previous year. Self-laceration (65%) was most commonly reported, followed by self-poisoning (31%), self-battery (4%), consumption of a recreational drug (4%), jumping (3%), burning (2%), hanging or strangulation (1%), ingestion of a non-ingestible substance (0.5%), and electrocution (0.4%) (Rodham et al., 2004). In this survey, 13% of participants reported that they had gone to the hospital as a result of DSH (Hawton et al., 2002; Rodham et al., 2004). Rodham et al. reported that adolescents who engaged in self-poisoning (23%) presented to hospital more often than those who engaged in self-laceration (6%). The researchers suggested that previous rates found in schools may be underestimated due to a high rate of absenteeism, as regular truants are thought to have a relatively high rate of DSH (Rodham et al.). Higher prevalence rates may also have been due to the inclusion of a broad range of DSH methods.

One study examined DSH with and without suicidal intent. In a survey of 390 high school students, 16% of participants self-reported DSH in response to a question asking

whether they had ever purposefully harmed themselves (Muehlenkamp & Gutierrez, 2004). An additional 6% of participants reported a suicide attempt in their lifetime, as well as DSH. Although there were slightly more males (55%) than females (45%) in the self-harm group, the suicide attempt group consisted mainly of females (73%). Similar DSH rates for males and females in the self-harm group may have been a result of including a broad range of DSH methods. Of the participants who self-harmed (with no reported suicide attempt), 23% reported using multiple methods. Methods were categorized into the following behaviours: cutting; scratching (injuring skin with no cut); burning; self-hitting; punch/kicking solid objects; banging body against an object; and other (e.g., hanging, overdose, jumping from a height). The most common methods for both the self-harm only and suicide attempt groups were cutting and scratching. Most participants had begun harming between the ages of 13 and 15 years. Overall, including both self-harm with no suicidal intent and suicidal intent, the lifetime prevalence rate was approximately 22% (16% plus 6%). Participants who reported a suicide attempt were more likely to be female but did not differ from the self-harm group in terms of commonly used self-harm methods, depressed mood, or suicidal ideation. However, the self-harm group reported significantly higher rates of depressed mood and suicide ideation than controls (the suicide attempt and control groups were not compared). These findings indicate that self-harming individuals who do and do not report suicidal intent both experience high levels of emotional distress. As well, rates of suicidal ideation may not differ between self-harming adolescents who attempt suicide and those who do not. Thus, the inclusion of suicidal intent as a criterion for DSH is questionable.

Plener et al. (2009) surveyed 665 ninth-grade students in Germany (57% female, mean age = 15 years). The Self-Harm Behavior Questionnaire was used to assess lifetime prevalence of self-harm (i.e., 'have you ever hurt yourself on purpose?') and suicide attempts (e.g., 'have you ever attempted suicide?'). Lifetime self-harm in the absence of suicide attempts (NSSI group) was reported by 26% of students. The annual prevalence rates were 82% for the NSSI group and 20% for the whole sample. In addition, most of the self-harming participants (61%) reported starting self-harm behaviour within the year previous to the survey. Repetition was high, with 10% of adolescents reporting four or more acts, 3% reporting three acts, and 6% reporting two acts. The most commonly reported methods of DSH were severe scratching (27%), cutting (25%), and hitting oneself (12%). Five percent of the participants reported both NSSI and suicide attempts, whereas less then 2% reported suicide attempts with no NSSI. These findings indicate that relatively few adolescents who engage in DSH also report suicide attempts.

A similar study to the German study cited above, surveyed 540 high school students (62% female, mean age = 15 years) in the USA (Muehlenkamp & Gutierrez, 2007). The Self-Harm Behavior Questionnaire was used to obtain information regarding DSH. Males were significantly less likely than females to complete the self-harm section of the survey. NSSI was reported by 23% of the participants with 16% reporting only NSSI, 7% reporting both NSSI and suicide attempts, and 2% reporting only suicide attempts (Meuhlenkamp & Gutierrez). These rates were comparable to the German sample of adolescents (Plener et al., 2009). Females were more likely than males to report both NSSI and suicide attempts, otherwise females and males were just as likely to report self-harm. Self-harming behaviour most often began between ages 13 and 14. Repetition of

NSSI was high, with 22% of adolescents reporting four or more incidents and 34% reporting 2-3 incidents. The annual prevalence rate for NSSI was 59% among self-harming adolescents. The NSSI-only group and the combined NSSI/suicide attempt group reported similar amounts of self-harming incidents within the past year. Adolescents who reported suicide attempts, in addition to NSSI, reported significantly more suicidal ideation than the NSSI-only group. The most common methods of self-harm were cutting (48%), severe scratching (27%), and hitting oneself (11%). When the methods used by the German and USA samples were compared, US adolescents were more likely to use cutting than German adolescents, but were just as likely to engage in severe scratching and hitting oneself (Plener et al).

These two studies (Meuhlenkamp & Gutierrez, 2007; Plener et al., 2009) highlight the similarities in DSH between countries. Consistent with previous studies, suicide attempts combined with DSH were reported for a subset of mostly female youth. In the US study, suicidal ideation was more prevalent in the suicide attempt group than in the NSSI group (Meuhlenkamp & Gutierrez). Given that the suicide attempts group consisted mostly of females, a comparison between females in the NSSI group and females in the suicide attempt group was likely warranted to determine if suicidal ideation differentiated the two groups. It may be that females are more likely to report suicidal ideation than males. If that is the case, the difference between the NSSI and suicide attempts groups may be better accounted for by gender (male vs. female) than suicide ideation. Further research is required to fully examine potential differences between self-harming adolescents with and without suicidal intent.

In sum, alarming rates of DSH have been found in both hospital and community samples. Prevalence rates in adolescent community samples are variable, ranging from 2% to 26% (Groholt, Ekeberg, Wichstrom, et al., 2000; Hawton et al., 2002; Hurry, 2000; Martin et al., 1995; Martin & Waite, 1994; Muehlenkamp & Gutierrez, 2004, 2007; Plener et al., 2009; Rodham et al., 2004). Differences in reported rates are likely influenced by differences in conceptualization, operational definition, and measurement, which highlights the need for clarity in the definition and measurement of DSH.

Given the arguably high rates of DSH in the community, it is very important to examine DSH in high-risk groups such as young offenders.

Young Offenders

Most adolescents who commit criminal offences remain in the community. Even so, many require secure custody (i.e., within institutions), even if just briefly. A minority of adolescents require ongoing secure care. Aboriginal youth in Canada are at much higher risk of coming into contact with the youth justice system than non-Aboriginal youth (Boe, 2002). In 1997/98, approximately 70% of all admissions to Canadian youth correctional facilities were Aboriginal youth (Government of Canada & Government of Manitoba, 2000, 2006). Aboriginal male youth were 12 times more likely and Aboriginal female youth 22 times more likely to be admitted to a correctional facility than males and females in the general population, respectively. In September 2000, 77% of youth held at the Manitoba Youth Centre were Aboriginal (Aboriginal Justice Implementation Commission, 2001). In addition to incarceration, Aboriginal youth suicide is a major health concern in Canada (Health Canada, 2002). Aboriginal suicide rates are considerably higher than non-Aboriginal rates (Aboriginal and Northern Affairs, 2000,

2008; Sigurdson, Staler, Matas, Hildahl, & Squair, 1994; Health Canada, 2002). Specifically, Aboriginal suicide rates are approximately five times the national rate for males and seven times the national rate for females (Government of Canada & Government of Manitoba, 2006). In 1999, suicide and self-inflicted injuries accounted for 38% of all deaths for youth aged 10-19. DSH is a major risk factor for suicide that needs to be investigated in Aboriginal adolescents and, in particular, those who are in contact with the youth justice system. Unfortunately, in the studies that investigated DSH in young offender populations, Aboriginal and other minority groups were largely under-represented due to the countries in which these studies were conducted (e.g., United Kingdom, United States). Due to the large numbers of Aboriginal youth in the Canadian youth justice system, it is imperative to understand suicidal behaviours and DSH in this population.

Two studies investigated DSH in youth offender populations through staff reports and records of DSH. Four studies investigated youth offender self-reports of DSH. Other studies have focused on suicide attempts. Most of the studies have focused on male youth offenders (Chowanec, Josephson, Coleman, & Davis, 1991; Ireland, 2000; Morgan & Hawton, 2004), with a few including female offenders (Matsumoto et al., 2005; Matsumoto et al., 2009; Penn, Esposito, Schaeffer, Fritz, & Spirit, 2003). These studies are reviewed next.

Studies Investigating Staff Reports of Youth Offender DSH Behaviour

Two studies have investigated staff reports of DSH. One study was conducted in a long-term stay facility for delinquent male youth in the State of Georgia, USA (Chowanec et al., 1991). Chowanec and his colleagues examined a large sample (*n* =

424) of incarcerated males (aged 13-17 years) that included all admissions within a one-year time period. Approximately 10% of offenders engaged in DSH while incarcerated (the length for incarceration was not provided). Data were also collected from available records: background data; evaluations made by court service workers before incarceration; psychological evaluation data collected during the first week of detention; and behavioural reports throughout the detention period. Deliberate acts that inflicted damage to the body or threatened the body's integrity (the facility's definition of DSH) found in behavioural records were used to place offenders into the self-harm group. Suicidal ideation and depressive symptoms at time of admission to the youth centre did not differentiate between inmates who later engaged in DSH and inmates referred for psychiatric evaluation, indicating that both groups experienced high rates of emotional distress. When compared to youth referred for psychiatric evaluation who did not engage in DSH, the DSH group exhibited more behavioural difficulties (e.g., rule violations during incarceration, escape attempts, and assaults during incarceration) than the psychiatric group. The self-harm group also had poorer nonverbal problem-solving skills (i.e., scores on the Wechsler Intelligence Scale for Children - Performance Scale) than the referred group. Furthermore, the authors suggested that when incarcerated youth experience mental health difficulties, poor problem-solving skills differentiated inmates who engaged in DSH from inmates who did not. In addition, adolescents in the self-harm group appeared to experience increasing tension and distress before the act of DSH. The authors suggested that non-compliant youth who feel trapped in an environment they cannot control and who experience a limit-setting circumstance (e.g., rule), may experience an intense, affective experience (e.g., rage) that leads to DSH. The authors

stress that further study is required of incarcerated youth to determine reactions to stressors experienced while in custody.

One drawback of the above study is that data were based on facility staff reports of DSH (Chowanec et al., 1991). It was unclear whether staff members were educated about DSH and had information regarding DSH methods (i.e., objective criteria). As a result, recording of DSH acts may not have been reliable or valid. Furthermore, DSH is often a private behaviour that may not always be apparent to others. Youth self-report data on past and present self-harming behaviour would have added to the data pool and allowed a comparison between staff and youth reports of DSH. Without corroboration from inmates, it is difficult to determine the actual number of inmates who self-harmed. It is likely that the rates of DSH were under-estimated due to the reliance on staff reports of DSH. Another drawback is that Chowenac et al. did not report comparisons between the DSH group and the general group on key variables. With the large number of participants, a matched sample (e.g., on demographics such as age, type of offense) may have been possible and, if so, would have contributed significantly to the research literature. Nonetheless, this study revealed that DSH is quite prevalent, even while adolescents are incarcerated.

A second study of staff reports on DSH in young offenders focused on male youth and young adult offenders (aged 16-21) in the United Kingdom (Ireland, 2000). The study investigated 89 incidents of DSH over a period of 10 months, as recorded by the prison staff on self-harm forms. DSH was defined as incidents in which prisoners deliberately harmed themselves, regardless of the methods used or intent to die. The self-harm forms were completed for inmates who “had shown evidence of actual self-injury

or had displayed behaviours associated with an increased risk of self-injury" (Ireland, p. 607). The definition of DSH used by prison staff in this study was subjective and depended on staff members' perceptions of self-harm. An examination of the self-harm forms indicated that staff members were more likely to complete a self-harm form to indicate a perceived risk of DSH (n = 47) rather than actual DSH incidents (n = 27). Behaviours recorded on forms indicating an increased risk for DSH included: verbal threats to staff or other inmates indicating an intention to self-harm (46% of forms); new inmates who had a previous history of DSH (19% of forms); other indicators that were not described (17% of forms); non-verbal threats such as written statements or potential self-harm tools found in their possession (9% of forms); and information received by others (9% of forms). The majority of self-harm forms were filed by medical staff (49%), followed by prison officers (32%), and other staff such as teachers and psychologists (13%).

Overall, this study (Ireland, 2000) demonstrates the limitations of using existing records to collect data on DSH. A further limitation of Ireland's study was the reliance on staff-initiated self-harm forms. Medical staff were most likely to complete self-harm forms. It may be that other prison staff, such as prison officers/guards who have daily contact with inmates, may not have completed self-harm forms due to perceived 'minor' incidents; that is, other prison staff may not have perceived that harm was severe enough to warrant a form being completed. It is also possible that some offenders were able to keep their DSH secret. Inmates may have engaged in incidents of DSH while in custody that staff did not account for due to a lack of knowledge or awareness of DSH behaviour. Another limitation of the study was that many of the self-harm forms were incomplete,

which is a common difficulty with using record-based data. Another drawback of the study was the combining of both adolescents and young adults. The results were not presented by age and, thus, the extent to which they would generalize to youth-only inmate populations is unknown.

Studies Investigating Youth Offender Self-Reports of DSH

Other studies have investigated self-reports of DSH in young offenders. Morgan and Hawton (2004) had hoped to survey 150 male detainees (aged 16-18 years) consecutively entering a juvenile detention centre. However, the study was prematurely terminated by the Prison Governor, despite previous approval, due to staff shortages. The Prison Governor was also concerned about the ability of the institution to cope with potential emotional distress inmates may have experienced as a result of completing the questionnaire. As a result, only 45 youth entering the centre during the study's active period completed the anonymous, self-report questionnaire, developed for the Child and Adolescent Self-Harm in Europe (CASE) Study (Hawton et al., 2002). Of the 45 offenders, 16% reported a lifetime prevalence of DSH and 9% reported harm within the past year (annual prevalence). None of the youth reporting DSH were diagnosed with a mental disorder nor were any taking psychotropic medication. Interestingly, there was a discrepancy between detainee self-reports and medical records. Only three medical records, of the six that could be accessed, indicated a previous history of DSH. This may be partly due to youth not disclosing DSH in the admittance interview. Morgan and Hawton stressed the importance of future research investigating risk factors in order to adequately screen offenders for DSH and suicidal behaviours.

Although the above study had good potential, the small numbers (e.g., seven youths who reported DSH) make it difficult to draw conclusions that could be generalized to other inmate populations. The study design, however, was an improvement over previous DSH offender research. DSH was defined, according to the parasuicide criteria, as an act with a nonfatal outcome in which the individual deliberately engaged in one or more of the following: (a) initiated behaviour intended to cause harm to self (e.g., cutting, jumping from a height); (b) ingested a substance in excess of the prescribed or therapeutic dose; (c) ingested a recreational or illicit drug regarded as self-harm by the individual; and, (d) ingested a non-digestible substance or object. If participants reported DSH, they were asked to provide details about their most recent episode. Another improvement was that criteria for DSH in the current study were more objective than the definitions used in the two studies described above. Morgan and Hawton (2004) collected data on demographics, lifestyle and problems, previous DSH, and suicidal ideation. They also measured current mood, anger, impulsivity, coping strategies, and self-esteem. A larger number of participants would have allowed for comparisons between offenders who self-harmed and those who did not, as well as those with and without suicidal intent, on the risk factors measured.

In another self-report study, Penn and colleagues (Penn et al., 2003) investigated DSH in a psychiatric group of male and female youth offenders, as well as suicide attempts in the general youth offender population of a US correctional facility. Despite the large, randomly-selected sample (234 male and 55 female inmates; mean age = 15.8 years), self-harm data were only collected on offenders who were referred for psychiatric evaluation (n = 78). Although lifetime prevalence for suicide attempts was reported (12%

of the general sample and 32% for those referred for psychiatric care), no prevalence rates could be reported for DSH in the general sample (*n* = 211) because only the psychiatric sample completed a measure of self-harm. Thirty percent of the psychiatric group reported engaging in DSH while incarcerated (*n* = 78). Approximately 18% of offenders referred for psychiatric evaluation reported both DSH and suicidal behaviour (e.g., suicidal ideation, suicide attempts) during their incarceration. Self-harm behaviours were defined as purposeful, non-lethal injuries, including self-laceration and self-battery. Of those who reported DSH, 45% engaged in one method, 32% in two or three methods, 14% in four or five methods, and 9% in six or more methods. Youth reported that they engaged in DSH in order to stop bad feelings (65%), feel something (60%), and punish self (60%). These motivations are similar to those in the affect regulation, dissociation, and self-punishment functional models discussed previously.

Penn et al. (2003) discovered that, within the psychiatric sample, offenders with suicidal ideation/behaviour during incarceration were more likely than offenders with no suicidal ideation/behaviour to report a lifetime history of suicide attempts and DSH. In terms of affective symptoms, offenders with suicidal ideation/behaviour reported higher levels of depression, anger, and anxiety than did inmates with no suicidal ideation/behaviour. Penn et al. also compared psychiatrically referred offenders who engaged in DSH and those who did not. The groups did not differ in terms of social-demographics, but self-harmers were more likely than non-harmers to report a history of suicide attempts and DSH, suicidal ideation/behaviour while incarcerated, and a history of illicit drug use.

There were some other noteworthy findings in the Penn et al. (2003) study. First, the prevalence rates for suicidal behaviour were somewhat lower than what would be expected for an incarcerated group of youth, although the rate is still higher than community rates. Second, results from this study confirmed previous research findings that current suicidal ideation is strongly associated with past suicidal behaviour and closely linked to self-harm behaviour during incarceration. Third, approximately a third of the inmates referred for psychiatric assessment reported current engagement in DSH. Unfortunately, due to the nature of the data collection (i.e., not collecting DSH data for the general sample), an institution-wide rate of current DSH was not available. Fourth, for the psychiatric group, self-harm was positively associated with risk factors such as more illicit drug use and higher levels of anger and anxiety. However, illicit drug use did not differentiate suicidal youth from non-suicidal youth. Fifth, depressed mood did not differentiate between youth who self-harmed and youth who did not, as would have been expected from previous research on depression and DSH (Groholt, Ekeberg, Wichstrom, et al., 2000; Haw et al., 2001; Hawton et al., 1999). Depression did, however, differentiate between suicidal and non-suicidal youth. It is unfortunate that DSH data were not collected for the larger offender population. Due to the collection of DSH data in only the psychiatric sample, the findings cannot be generalized to youth offenders overall. The findings in this study would have been strengthened had comparisons between self-harming and non-harming adolescents within the general offender population been conducted.

In a different study, Matsumoto et al. (2009) investigated DSH and suicidal behaviour in youth offenders aged 15-17 (113 male; 22 female) and high school students

(116 male; 200 female). High lifetime DSH prevalence rates were reported for females (37% of female offenders; 11% of students). Lifetime prevalence rates for males were lower than females (13% of male offenders; 7% of students). Youth offenders were more likely to report previous suicide attempts and sexual abuse than high school students. In addition, female offenders were more likely than female high school students to report DSH, suicidal ideation, suicide attempts, and illicit drug use. This study highlights the importance of evaluating DSH in offender populations. Lifetime prevalence rates, especially for females, were quite high indicating the need for more DSH research, prevention and treatment programs in youth offender populations.

Studies Investigating Suicide Attempts in Youth Offenders

Other studies have focused on suicide attempts rather than a broad range of self-harm behaviours. An Australian study obtained self-report screening assessment data for 900 young offenders (Putnins, 2005). Most of the offenders were male (90%), with ages ranging from 11-20 years (82% of participants fell within the 14-17 age range). Twenty-seven percent of participants identified themselves as Aboriginal. Of the overall sample, 27% reported an attempted suicide in their lifetime, specifically: 25% of males; 46% of females; 29% of Aboriginals; and 27% of non-Aboriginals. Two hundred and six of these participants (92% male; 31% Aboriginal) were re-assessed upon re-admittance to secure care (usually within 12 months of original admittance). Of the 45 offenders who had reported suicide attempts during the first assessment, 38% did not report previous attempts at the second assessment. Putnins argued that this was not surprising, as offenders are likely to forget, especially if the suicide attempt was of low lethality, or to reinterpret the event over time. For offenders who did not report previous suicide

attempts at the first assessment but did report them at the second assessment, scores on depression, suicidal ideation, and number of prior offenses at the first assessment did not significantly predict suicidal attempts at the second assessment.

Another Australian study investigated the relationship between substance use and suicidal behaviour (Howard et al., 2003). Howard et al. collected interview survey data for 300 Australian offenders, aged 12-22 (mean age = 16.5), on remand or serving sentences at juvenile justice centers. Most of the sample was male (90%). Twenty-four percent of the sample reported a previous suicide attempt. Aboriginal status was not associated with or predictive of suicide attempts.

Summary

Overall, relatively few studies have specifically investigated DSH in adolescent offender populations. Moreover, youth offenders are defined differently in terms of age in each study, with two studies including young adults as well as adolescents in their participant pool (Ireland, 2000; Howard et al., 2003). Three studies included at least a four year age range of adolescents (Chowanec et al., 1991; Masumoto et al., 2005; Penn et al., 2003). Morgan and Hawton (2004) were more restrictive in the age range of participants (16-18 year olds), as were Matsumoto et al. (2009; 15-17 year olds). Thus, it is difficult to compare rates of DSH and other results due to the various age ranges.

DSH has been defined and measured differently in studies to date, also making comparisons between them extremely difficult. Prevalence of DSH is likely under-estimated in many of these studies. It is likely that DSH occurs more often than prison staff report. Although high DSH prevalence rates were reported (Matsumotoet al., 2005; Matsumoto et al., 2009; Penn et al., 2003), it is likely that rates would have been higher

had a broad range of DSH methods been assessed. Morgan and Hawton (2004) used more objective criterion for defining and measuring DSH. However, their sample size was small making it difficult to obtain prevalence rates and conduct analyses. As well, participants only reported on their last act of DSH and not all of the methods they may have used in the past. Utilization of a checklist including self-laceration, self-battery, and self-poisoning items would strengthen future research.

Despite the fact that prevalence rates are likely under-estimated, high rates of DSH have been found in youth offender populations. Sixteen to 39% of offenders reported DSH within their lifetime (Matsumoto et al., 2005; Matsumoto et al., 2009; Morgan & Hawton, 2004). In addition, 10-30% of offenders harmed while incarcerated (Chowanec et al., 1991; Penn et al., 2003). As well, a high percentage of offenders reported suicide attempts in their lifetime, with females and offenders referred for psychiatric evaluation being the most likely to attempt suicide (Penn et al., 2003; Putnins, 2005). The above studies indicate that youth offenders are indeed a very vulnerable and at-risk population in which DSH is very prevalent. Research is required to determine risk-factors for DSH so that youth can be better assessed upon entrance to youth detention facilities. As well, the high DSH rates for offenders while incarcerated indicate the need for staff education and treatment programs in correctional facilities.

Risk and Protective Factors

Risk Factors

Studies addressing causes of DSH have focused on the risk factors associated with completed and attempted suicide. Only a handful of studies have researched possible correlates or risk factors of DSH in adolescent populations (Groholt, Ekeberg, Wichstrom

et al., 2000; McLaughlin, Miller, & Warwick, 1996; Patton et al., 1997; Suyemoto & MacDonald, 1995; Webb, 2002).

The most common risk factor associated with DSH is psychological morbidity. For both adolescent males and females, the presence of a mental disorder is a major risk factor for DSH, especially depression (Patton et al., 1997). There is also a strong co-morbidity between DSH, psychiatric disorders, and substance use. McLaughlin et al. (1996) found that 25% of 12-17 year-olds presenting to hospital had a previous psychiatric history. Similarly, Hawton et al. (1982) reported that 20% of adolescents presenting to emergency wards following self-poisoning had psychiatric problems, mostly in the form of mild depression. Hawton et al. (2003) found that 21% of adolescents presenting to hospital (from 1990-2000) following DSH had received previous psychiatric treatment.

In a study of 150 hospital patients (15 years of age and older) presenting after an act of DSH, 92% were diagnosed with at least one psychiatric disorder (Haw et al., 2001). Forty-six percent of the sample was diagnosed with two or more disorders. Depressive disorders (71%) were most common, followed by alcohol abuse disorders (27%), anxiety disorders (18%), eating disorders (11%), and non-alcohol, drug abuse disorders (9%). At follow-up, a large portion of the sample was assessed for personality disorders (n = 111). It was discovered that 46% met criteria for personality disorders, most notably anxious, anakatic, and paranoid personality disorders.

In a study of 1220 patients (15 years and older) admitted to hospital following parasuicide, Hjelmeland (1996) found that 55% of persons who repeatedly engaged in DSH and 24% of non-repeaters reported psychiatric problems (no gender or age

differences were found). A significant portion of the sample reported that psychiatric problems were their main concern prior to the parasuicide episode. For persons engaging in parasuicide for the first time, reported main concerns were a history of sexual abuse, alcohol abuse, and self-reports of psychiatric problems. These studies all focused on persons who had presented to hospital following attempted suicide or DSH.

Herpertz (1995) assessed psychiatric diagnoses in 54 inpatients (16-57 years of age) who had histories of repeated DSH, irrespective of the reason for hospitalization. Over 80% were diagnosed with a psychiatric disorder. The most common diagnoses were eating disorders (54%; bulimia most common), followed by alcohol use disorder (27%), affective disorders (20%; dysthymia most common), and schizophrenic disorders (18%). Overall, DSH appears to be strongly related to mental disorder in general.

Depression and hopelessness.

Depression is the most commonly cited risk factor for DSH (Beautrais et al., 1996; Chitsabesan, Harrington, Harrington, & Tomenson, 2003; Ennis, Barnes, Kennedy, & Trachtenberg, 1989; Haliburn, 2000; Haw et al., 2001; Hawton et al., 1999; Groholt, Ekeberg, & Haldorsen, 2000; Groholt, Ekeberg, Wichstrom et al., 2000; Milnes, Owens, & Blenkiron, 2002; Suominen, Isometsa, Henriksson, Ostamo, & Lonnqvist, 1998). The studies cited above were conducted in Australia, Norway, Finland, and the United Kingdom, demonstrating the generalizability of the predominant finding. In adolescent patient studies, diagnoses of depression ranged from 44% to over 80% (Groholt, Ekeberg, Wichstrom et al., 2000; Haliburn, 2000; Haw et al., 2001; Hawton et al., 1999). Thus, depressed mood is strongly related to DSH.

Hopelessness, which is often associated with depression, has been directly related to DSH (Goldston et al., 2001; Rotheram-Borus, & Trautman, 1988). Hopelessness has also been found to be a strong predictor of suicidal behaviour (Carris, Sheeber, & Howe, 1998; Rudd, Rajab, & Dahm, 1994). McLaughlin et al. (1996) found that 51% of adolescents who engaged in DSH reported feeling hopeless, compared to 10% and 29% of school and clinical control groups, respectively. Even after depression was taken into account, high levels of hopelessness were strongly associated with DSH (McLaughlin et al.). Adolescents who had engaged in DSH felt hopeless about problems concerning family, friends, and romantic partners (McLaughlin et al.). Milnes et al. (2002) found that hospital attendees who experienced more problems or perceived their problems to be unsolvable were more likely to feel hopeless than those who experienced fewer problems or perceived their problems to be solvable.

Substance use.

Increased use of drugs and alcohol has also been associated with DSH (Bolognini, Plancherel, Laget, Stéphan, & Halfon, 2003; Evans, Hawton, & Rodham, 2004; Hawton et al., 1982; Hawton, Hall, et al., 2003), as well as with suicide following parasuicide in adolescents (Goddard et al., 1996). Unfortunately, casual use of alcohol is quite prevalent among adolescents. In a general population survey of youth in grades 8-12, prevalence of alcohol use ranged from 26% for eighth graders to 51% for twelfth graders (Weinberg, Rahdert, Colliver, & Glantz, 1998).

Although alcohol use has been identified as a risk factor for DSH, it is difficult to predict which adolescents will engage in DSH based on alcohol use alone. Some studies have found no relationship between alcohol use and DSH (Groholt, Ekeberg, Wichstrom

et al., 2000; Hawton, Fagg, & Simkin, 1996; Howard, Lennings, & Copeland, 2003), whereas other studies have reported positive relationships (Hawton et al., 1982; Hawton, Hall, et al., 2003; Rossow et al., 2007). In a mixed hospital and community sample, alcohol use did not differentiate adolescents who had engaged in DSH from those who had not (Groholt, Ekeberg, Wichstrom, et al., 2000). Similarly, in a study of children under 16 years of age presenting to hospital in Oxford, United Kingdom, from 1976-1993, problems with alcohol or drugs were reported to be uncommon (Hawton, Fagg, & Simkin, 1996). In a study of suicide attempts (lifetime and within the past month) of offenders aged 12-22 (N = 300), both lifetime and recent (within the past month) drug use did not predict attempted suicide in the past (Howard, Lennings, & Copeland, 2003). Patton et al. (1997) only found a significant relationship between alcohol use and DSH in adolescent females.

In contrast, other studies have shown alcohol use to be directly associated with DSH. Rossow et al. (2007) examined alcohol use and DSH data from the Child and Adolescent Self-Harm in Europe (CASE) study. Alcohol use varied considerably between countries, with heavy drinking (four or more episodes of drunkenness in the past year) more frequently reported in Norway (42%) than the other countries included in the analyses: England (33%), Australia (30%), Ireland (30%), Hungary (20%), Belgium (19%), and The Netherlands (12%). Overall, frequent alcohol intoxication was positively associated with DSH in all seven countries. In two studies of self-poisoning hospital patients in the United Kingdom (Hawton et al., 1982; Hawton, Hall, et al., 2003), approximately 14% of adolescents were reported to misuse alcohol. Furthermore, higher

frequency of alcohol and drug use was associated with higher frequencies of DSH during the past year (Hawton et al., 2002).

Approximately 10% of DSH and parasuicide patient populations have been diagnosed with substance abuse disorders (Groholt, Ekeberg, & Haldorsen, 2000; Hjelmeland, 1996; Milnes et al., 2002; Osuch, Noll, & Putnam, 1999; Wylie, House, & Storer, 1996). Hjelmeland distinguished between repeat and first-time parasuicide patients, finding that more DSH repeaters (33%) abused alcohol than first-time harmers (11%). Parenthetically, alcohol abuse disorders may be even more common in adult DSH populations than in adolescent populations. Zlotnick et al. (1999) reported that 52% of an adult general psychiatric patient population diagnosed with substance abuse or dependency engaged in self-laceration. Consistent alcohol and drug misuse may reflect generally poor ability to cope with daily life stressors, as well as general health problems. Lack of coping skills or confidence in problem-solving may lead to use of dysfunctional coping strategies such as DSH.

Drug use may also be positively related to DSH. In a study of all 12-18 year-olds presenting to Oxford hospitals following an episode of DSH from 1990 to 2000 (n = 1583), Hawton, Hall and colleagues (2003) found that 14% of adolescents had used drugs prior to their first presentation to hospital for DSH. Similar to alcohol use findings from the same study, drug use was more common in males (35%) than females (9%). Hawton et al. also discovered that the proportion of males who used drugs increased substantially from 1993 (13%) to 2000 (39%). Marijuana use was most common (57%), followed by amphetamines (20%). Due to the near tripling of the proportion of males using drugs during the study period, the authors suggested that drug use may be becoming more

problematic than alcohol use, even though alcohol and drug use were equally prevalent in the sample (Hawton, Hall, et al., 2003).

It also appears that substance abuse at the time of harm appears to be common. Adolescents often explain their DSH behaviours as an attempt to escape from a painful situation (e.g., an interpersonal crisis), which is often complicated by the influence of alcohol and drugs (Hurry, 2000; Madge et al., 2008). Alcohol and drug use may impair judgment and impulse control, thereby contributing to the initiation of DSH behaviour. Many studies have reported substance use around the same time as DSH. Patton et al. (1997) reported that 6-18% of adolescents had either used marijuana or alcohol in the week previous to engaging in DSH. According to Hurry (2000), approximately 66% of males and 50% of females drink alcohol within a few hours before poisoning themselves. Blenkiron, House, and Milnes (2000) reported that 57% of DSH patients referred for psychiatric interview had used alcohol around the time of DSH. When time of day was considered, alcohol use was found to be more common for DSH episodes occurring later in the day (Blenkiron et al.). Madge and colleagues (2008) found that approximately 20% of youth were under the influence of alcohol or drugs at the time of DSH. In a study of youth offender suicide attempts, 26% of offenders who reported suicide attempts (n = 71) indicated that they had used substances (alcohol or drugs) just prior to the suicide attempt (Howard et al., 2003). A study of 1583 adolescents aged 12-18 presenting to general hospital in Oxford, United Kingdom following DSH (self-poisoning and self-injury) found that 14% of adolescents had used alcohol at the time of self-harm (Hawton, Hall, et al., 2003). In this study, significantly more males (23%) than females (11%) used alcohol. Given these findings, it appears that alcohol and drug use often accompany DSH.

In summary, although some studies have found no relationship between alcohol and DSH (Groholt, Ekeberg, Wichstrom, et al., 2000; Hawton et al., 1996; Patton et al., 1997), many other studies indicate rates over 10% (Groholt, Ekeberg, & Haldorsen, 2000; Hawton et al., 1982; Hawton, Hall, et al., 2003; Hjelmeland, 1996; Milnes et al., 2002; Osuch et al., 1999; Wylie et al., 1996), with individuals who abuse alcohol more likely to repeatedly engage in DSH (Hjelmeland, 1996). Alcohol use close to the time of harm also appears to be quite common (Blenkiron et al., 2000; Hawton et al., 2002; Hawton, Hall, et al., 2003; Hurry, 2000; Madge et al., 2008). According to Hawton and colleagues (Hawton, Hall, et al., 2003), drug use is becoming more commonly reported in self-harming youth. Thus, drug use requires examination as a risk factor for DSH in addition to alcohol use. Overall, previous research indicates that both alcohol and drug use are frequently associated with DSH. Further research is required in three separate areas of substance use: (a) the relationship of chronic or lifestyle alcohol and drug use to DSH; (b) acute alcohol/drug use shortly before or at the time of DSH; and (c) the relationship of chronic and acute substance use with repeated DSH.

Personality disorders.

The presence of a personality disorder also appears to be a risk factor for DSH. Milnes et al. (2002) indicated that up to 13% of DSH hospital attendees may be diagnosed with one or more personality disorders. However, the relationship of specific personality disorders to DSH is somewhat unclear. Borderline personality disorder (BPD) has most often been associated with DSH and, in particular, with self-laceration (Suyemoto & MacDonald, 1995). In fact, DSH is included in the diagnostic criteria for

BPD. The prevalence of DSH (also called self-mutilation) in BPD is reported to be as high as 80% (Dulit et al., 1994; Zlotnick et al., 1999).

Dulit et al. (1994) found that, of 124 consecutively admitted adult inpatients with BPD, 50% engaged in self-laceration (19% infrequently and 31% frequently). Of those patients who engaged in self-laceration, 47% suffered from co-morbid major depression, with 82% of the frequent self-laceration group and 53% of the non-self-laceration group suffering from major depression. Dulit and colleagues concluded that borderline patients who frequently engaged in DSH were at very high risk for suicidal behaviour, as well as for co-morbid depression and eating disorders. A variety of other personality disorders were present in all groups of the sample (mutilators and non-mutilators). These results indicate the necessity of assessing a range of personality disorders, not just BPD.

Haw et al. (2001) assessed 150 patients (aged 15 and older) presenting to hospital following an episode of DSH for a full range of personality disorders. Forty-six percent of the sample met criteria for a personality disorder. Avoidant (21%), obsessive-compulsive (20%), paranoid (15%), histrionic (13%), dependent (13%), borderline personality (11%), schizoid (5%), and anti-social (5%) disorders were all present in the sample. Although DSH has most often been associated with BPD, this study found five other personality disorders that were more prevalent than BPD in a group of self-harming patients.

A study of young adult prisoners (aged 18-25) in Spain found that inmates who had DSH episodes while in prison had a greater prevalence of personality disorders than did prisoners who did not engage in DSH (Mohino Justes et al., 2004). When each personality pattern was assessed individually, the DSH group was significantly more

likely to report the following personality patterns than were non-DSH inmates: schizoid; avoidant; dependent; passive-aggressive; self-defeating; schizotypal; anti-social, and borderline personality disorders. Although the group means (DSH vs. no DSH groups) for anti-social personality disorder were not significantly different, results from a forward, step-wise regression analysis indicated that anti-social, in combination with borderline and passive-aggressive personality disorders, best predicted vulnerability for DSH episodes during imprisonment. Results from the studies listed above clearly indicate that DSH behaviour is not limited to BPD but that personality disorders in general are related to DSH.

Eating disorders.

Similarities between DSH and eating disorders have been pointed out in the literature (Bolognini et al., 2003; Favaro & Santonastaso, 1999; Wincheld & Stanley, 1991). Some authors suggest that DSH is an impulse control disturbance, similar to bulimia nervosa and obsessive-compulsive disorder (Favaro & Santonastaso, 1999). DSH, bulimia, and obsessive-compulsive disorder are all characterized by an urge to carry out an act, mounting tension or anxiety upon resistance, and relief following completion of the act (Winchel & Stanley, 1991).

Favaro and Santonastaso (1998) found that DSH was quite common in bulimia outpatients. These authors investigated various types of self-harm behaviour and discovered two distinct groups of patients. One group engaged in more impulsive acts of DSH (e.g., skin cutting and burning), whereas the other group engaged in more compulsive (repetitious) acts of DSH (e.g., hair pulling, skin picking, severe nail biting). The impulsive group of patients reported a history of suicide attempts, use of illicit drugs

and alcohol, depression, and a history of childhood sexual abuse (Favaro & Santonastao, 1998, 1999).

In a relatively recent review of the eating disorders and DSH literature (1989-2005), Svirko and Hawton (2007) found that prevalence rates of DSH in eating disorder patients ranged from 14-68%. The large range seems to be accounted for by the type of eating disorder in question. Higher prevalence rates of DSH were found in bulimia nervosa patients and lower rates of DSH in anorexia nervosa patients. In two studies investigating the presence of eating disorders in DSH patients (Svirko & Hawton; Herpertz, 1995), prevalence rates of eating disorders were high (54-61%). Results from the nine studies reviewed indicate direct association between bulimia, as well as anorexia nervosa binge eating/purging subtype, and DSH. Based on their literature review, Svirko and Hawton (2007) presented a hypothetical model to explain the relationship between bulimia and DSH. They argue that self-harm and eating disorder behaviours are pathological coping mechanisms. Based on the limited literature available, Svirko and Hawton suggested potential factors that may underlie the association between bulimia and DSH, including: impulsivity; affect dysregulation; dissociation; self-criticizing cognitive style; need for control; and obsessive-compulsive tendencies. They indicated that, at the time of publication, only impulsivity and obsessive-compulsive characteristics had been adequately researched. Although there appears to be an association between eating disorders, in particular bulimia nervosa, and DSH, more research needs to be conducted to determine prevalence rates of bulimia in individuals who engage in DSH. As well, factors that are common to, or distinguish between, bulimia and DSH need to be determined.

Relationship factors.

Lack of satisfaction in both peer and family relationships can strongly influence suicidal ideation (Shagle & Barber, 1995). In fact, adolescents who have deliberately harmed themselves report significantly increased levels of relationship problems with family and friends (Groholt, Ekeberg, Wichstrom, et al., 2000; Hawton & Harriss, 2008a). Family problems are most common, followed by interpersonal problems associated with friends and romantic partners (Hawton & Harriss, 2008a; Hawton et al., 1997; Hawton et al., 2000; McLaughlin et al., 1996). These findings are consistent with general adolescent studies. Seiffge-Krenke, Aunola, & Nurmi (2009) found that the highest levels of stress in a school sample of adolescents were related to situations involving parents.

In patient populations, a variety of interpersonal problems have been cited as precipitants to DSH. DSH patients (16 years and older) referred for psychiatric care listed family problems (82%), lack of close friends (44%), and losing a loved one to death (29%) as precipitants for DSH (Blenkiron et al., 2000). Similarly, 51% percent of DSH patients (15 years and older) reported an interpersonal conflict prior to the DSH act (Morgan, Burns-Cox, Pocock, & Pottle, 1975).

As indicated above, the most frequent problems associated with adolescent DSH were problems with family members or family dysfunction (Fillmore, Dell, & The Elizabeth Fry Society, 2000; Hawton et al., 1982; Hawton et al., 2000; Martin et al., 1995; McLaughlin et al., 1996). Parent-child discord has also been identified as the most common precipitant for suicidal behaviour (Brent et al., 1994; Martin et al.). In an ethnic sample of DSH adolescents, Caucasian and African-American adolescents reported

similar levels of family problems. Twenty-five percent reported family stressors and 75% reported problems with family relationships as precipitants to DSH (Goddard et al., 1996). Adolescent self-poisoners reported significantly more problems communicating with parents compared to children in the general population (Hawton et al., 1982). For example, an inpatient group of adolescents perceived parents as significantly less understanding of them compared to a school control group (McLaughlin et al., 1996). In another study, children under the age of 16 cited arguments with parents as a precipitating factor in 50-75% of cases (Hurry, 2000). Adolescents and young adults (15-24 years) were most likely to cite fights with romantic partners. Thus, while family problems are most common at younger ages (e.g., age 14), broader relationship problems are more common for older adolescents (e.g., ages 16-18; Hawton et al., 2003). This very likely reflects the change in attachment figures during adolescence (Neufeld & Mate, 2004).

Family rigidity and low parental care have been associated with adolescent suicidal behaviours. Carris et al. (1998) found that adolescent-perceived family rigidity differentiated suicidal from non-suicidal adolescents in both community and patient samples. In another study, lower maternal and paternal care was significantly associated with DSH (Martin & Waite, 1994). One-third of the sample perceived their fathers and another third perceived their mothers as being affection-less and controlling. Maternal care seemed to be most important to females.

Although highly stressed adolescents in all family types are more likely to be suicidal, those that come from so-called non-intact families tend to experience higher levels of stress (Rubenstein, Halton, Kasten, Rubin, & Stechler, 1998). Rubenstein et al.

suggested that, given the links of family conflict and parental divorce to suicidal behaviour, strong family cohesion may be regarded as a protective factor. In a small (N = 40) Canadian study investigating risk factors of attempted suicide in adolescents residing in residential treatment centres, the most powerful discriminator between no attempt and attempted suicide groups was the lack of an emotional significant other in their lives (Grossi & Violato, 1992). As well, greater disruption of living arrangements (e.g., not living with parents, number of residential moves) was significantly predictive of attempted suicide. The authors suggested that the "life experiences of suicidal adolescents were more chaotic and disruptive than those of the non-suicidal adolescents" (p. 412).

In Manitoba, Aboriginal children and youth are at greatly increased risk for family disruption compared to the general population. The number of Status and non-Status Aboriginal children in the care of Child and Family Services (CFS) is highly disproportionate to their population. Although Aboriginals make up approximately 11% of the population in Manitoba, "in 1997, over 70% of Manitoba children in care were Aboriginal. From 1988 to 1998, the Aboriginal case-load of Winnipeg CFS tripled, while the non-Aboriginal case load declined" (Government of Canada & Government of Manitoba, 2000, p. 3). It is also important to note that, in Manitoba, a large proportion of Aboriginal families are led by single parents. Specifically, 61% of First Nations families and 41% of Métis families in Winnipeg are led by single parents (Government of Canada & Government of Manitoba, 2000, 2006).

It is unclear whether living in a "non-intact" family (e.g., not living with parents, living with a single parent) is associated with DSH. Some studies have linked living in a single parent family to DSH and suicide attempts (Hawton et al., 1982; Hawton et al.,

2002; Martin et al., 1995). Hawton et al. (1982) discovered that one-third of adolescents who had overdosed lived in a single-parent family and one-seventh were in the care of social services. Another study found that just as many adolescents who self-harmed lived in a single parent home as those who did not DSH (Groholt, Ekeberg, Wichstrom, et al., 2000).

Summary.

It appears that DSH is highly co-morbid with mental disorders, most notably depression and personality disorders. Psychiatric morbidity is most evident for persons who repeatedly engage in DSH. In addition, alcohol and drug use have been directly related to DSH, especially if alcohol use occurs at the time of DSH. Relatively few studies have investigated risk factors in adolescent and ethnic populations. Limited research is available regarding Canadian youth, Aboriginal populations, and incarcerated youth. Interpersonal problems may interact with other risk factors. For example, family and peer problems may contribute to feelings of depression, which in turn contributes to DSH (Martin et al., 1995). As well, interpersonal problems are likely strongly related to social support, coping approaches, and self-esteem.

Protective Factors

Very little attention has been given to protective factors in the DSH literature. However, risk factors do not account for all cases of DSH (e.g., not all persons diagnosed with depression engage in DSH). Thus, there must be factors that protect or guard against DSH. Protective factors are resources that people perceive to be available to them. Potential protective factors for DSH include social support, approach coping strategies, and problem-solving confidence. Unquestionably, the way in which a person copes with

stressors in their daily life influences the outcome (e.g., psychological wellness or distress). Coping resources include the perceived availability of, and support received from, a social network, as well as individual problem-solving skills (Compas, 1987). It has been suggested that an abundance of social support (Pattison & Kahan, 1983; Rubenstein et al., 1998) and problem-solving skills (Portzk, Wilde, & van Heeringen, 2008; Sadowski & Kelley, 1993; Webb 2002) may protect against DSH.

Social support.

Social support is used as a broad term to describe specific characteristics of individuals' social world (Haber, Cohen, Lucas, & Baltes, 2007). Social support is described by Haber et al. as a meta-construct consisting of a variety of sub-constructs. In general, social support refers to individuals' evaluations and perceptions of others that influence the degree to which they feel loved, wanted, valued, and able to count on others should the need arise (Sarason, Pierce, & Sarason, 1994). Received social support and perceived social support are two separate sub-constructs of social support (Haber et al., 2007). Social support refers to both the support that individuals currently receive, as well as to the support that individuals perceive to be available. Received social support refers to specific supportive behaviours that are provided to recipients by members of their support network. Perceived social support refers to recipients' perceptions of the availability of support and/or the general satisfaction with the support received. Positive perceptions of both actual support received and availability of support have generally been associated with psychological well-being (Compas, 1987; Sarason, et al., 1994).

Social support buffers the stressful aspects of a situation by helping people deal with the emotional distress brought on by stressors (Sarason et al., 1994). The most

important aspects of social support are the degree to which the recipient perceives it to be available and adequate (e.g., satisfaction), not the number of people within an individual's network (Compas, 1987; Sarason et al., 1994). Of course, a minimum amount of embeddedness (i.e., extensiveness or structure of the support network) is necessary so that there are people within the social network from whom support can be received (Finch, Okun, Pool, & Ruehlman, 1999). Perceived support includes individuals' perceptions concerning both the availability of support and satisfaction with support received (Finch et al.). As indicated above, perceived support is also a function of: (a) the extent to which people believe that others care for and value them and (b) the extent to which people feel that members of their social network are available when they need them (Sarason et al.). When people have close and caring relationships, they believe that other people can be counted on for support or assistance when required. People who rate themselves high on perceived availability of support believe that they are accepted and liked by others and are satisfied with the support they receive.

Another important aspect of social support is actually receiving support from others (Finch et al., 1999). Support may include emotional support, material or monetary aid, behavioural assistance, guidance through information or advice, intimate interaction (i.e., caring or sharing), social feedback (i.e., reality checking), humour, or positive social interaction. Although individuals may receive support from numerous persons in their social network, the support they receive may not match the need brought on by a stressful event. In this case, the benefit of social supports' direct and indirect buffering affects are limited by dissatisfaction with the support they receive. Thus, it is important to investigate people's satisfaction with the support they receive. Lakey and Cohen (2000)

suggest that social support's health-enhancing effects stem from the quality of support received, as determined by the objective match between the type of support received and the needs of the support recipient.

Although it would seem that perceived and received social supports are inherently related, they appear to be different sub-constructs of social support. Lakey and Cohen (2000) suggested that the relationship between perceived and received social support should be high, especially when the support received matches the needs of the support recipient. However, perceived and received social support has been found to be only mildly correlated, typically below 0.30 (Lakey et al., 2002). A meta-analysis of studies that measured both perceived and received social support, found that correlations ranged from .01 to .64 (Haber et al., 2007). Received support measures have been found to be relatively objective and accurate in nature, whereas perceived support measures are more subjective in nature. Although received support measures may more accurately describe an individual's social environment, some researchers have postulated that received support may improve outcomes for recipients only if it modifies perceived support in a positive direction (Haber et al.; Sarason, Sarason, & Pierce, 1990). That is, outcomes may only be improved if an individual perceives support to be available and is satisfied with the support they receive, regardless of the amount of actual support they receive. Finch et al., (1999) found that perceived support satisfaction was more strongly related to outcomes (e.g., distress) than were ratings of received support. It is important to note that the same objectively-identifiable support behaviours may be interpreted/perceived differently by different individuals (Haber et al.). Thus, not everyone will interpret received support in the same way.

Social support has been shown to be inversely related to mental disorders (Compas, 1987). The presence of perceived social support has been found to both moderate the appraisal of stress and the consequences of stress, such as distress (Sarason et al., 1994). Social support has been associated with mental and physical health, speedier recovery from illness, and the likelihood of remaining healthy when faced with stressors (Holahan & Moos, 1994). Positive outcomes linked to social support are feelings of acceptance from others, low feelings of anxiety, and high self-esteem (Sarason et al., Holahan & Moos). In a study of youth admitted to juvenile justice centres, Chagnon (2007) found that social support may moderate the impact of stressful events on well-being. In this study, non-suicidal youth were more likely to talk about their problems and what they were feeling with others than suicidal youth with or without current suicidal ideation. Chagnon postulated that lack of help-seeking and disclosure of feelings to others may be important in the suicidal process, thus highlighting the importance of social support.

Youth may receive social support from a variety of sources. In a study of high school students in Atlanta, Georgia, researchers discovered that students valued most the support they received from parents, followed by friends, peers, and authority figures (Markward, McMillan, & Markward, 2003). Youth considered parents to be a major source of social support. The authors also found that ethnicity of students did not differentiate between the perceived importance of individuals who gave them support, the amount of support received, and the amount of support wanted. However, compared to males, females were found to want more support that made them feel loved, specifically from family and friend sources. This study highlights the importance of asking youth from whom they receive support and how satisfied they are with the support.

Lack of social support from parents or peers has been correlated with greater engagement in DSH (Pattison & Kahan, 1983). Conversely, Rubenstein et al. (1998) discovered that positive emotional involvement of the family, spending time together, and familial common interests were more typically associated with adolescents who did not harm themselves, compared to adolescents who did harm themselves. It was suggested that family cohesiveness and social support led to a larger repertoire of problem-solving and coping behaviours. Thus, an abundance of social support is considered a possible protective factor for guarding against DSH.

Problem solving and coping.

Adolescents who come into contact with the youth justice system are a very vulnerable group. They have often experienced traumatic events or stressful situations before contact with the justice system. The accumulation of stress associated with placement in a youth centre increases the risk of suicide (Chagnon, 2007). In their transactional model of stress and coping, Lazarus and Folkman (1984) proposed that the way in which people adapt to stressful events impacts their psychological well-being. It is the transaction between the environment and personal characteristics that determines the outcome. Coping includes behavioural, emotional, and cognitive attempts to mange the demands of a stressful event (Seiffge-Krenke et al., 2009). The use of these coping strategies becomes more diverse and flexible during adolescence. The impact of a stressful event on people's psychological well-being is related to their perception of the events, as well as the coping behaviours they use to adapt or solve the problem (Compas, 1987; Compas, Conner-Smith, Saltzman, Harding Tomsen, & Wadsworth, 2001). During early and mid-adolescence, youth report more family and romantic stress than other

sources of stress. On the other hand, during late adolescence, youth tend to report more achievement and school-related stressors. Seiffge-Krenke et al., found that, in general, youth experience high levels of stress during early adolescence to age 15, after which stress levels begin to decrease. Stress over time and repetitive maladaptive coping increase adolescents' vulnerability (Chagnon, 2007) and likelihood to engage in DSH.

According to the transactional model, coping behaviours may, and should, change depending on the situation (Lazarus & Folkman, 1984). Coping behaviours that are effective in one situation may not be effective in a different situation (Lazarus & Folkman). There are two main ways to tackle a problem, namely avoidance and approach coping. Both types of coping have been identified as important in the successful adaptation to stress (Compas, 1987). No single type of coping will be effective for the variety of stressors that may be encountered. Coping responses are dependent upon the specific problem and the individual's perception of the problem, as well as coping strategies that have been learned over time (Seiffge-Krenke et al., 2009). Compas (1987) suggested that effective coping is characterized by flexibility, change, and the ability to accurately determine which type of coping is best suited for different contexts or stressors.

People may avoid a problem in an effort to manage the emotional distress associated with it. This type of coping is often called avoidance coping or emotion-focused coping (Compas, 1987; Lazarus & Folkman, 1984). People may avoid thinking about the problem and, thereby, avoid feelings associated with it. They may also accept the problem for what it is and not try to find a solution, which often reduces distress. Sometimes people become resigned to the belief that the problem is not within their

control under the present circumstances (which may or may not be true). Avoidance strategies can help people to sooth themselves emotionally when they feel that they have very little control over the situation or problem. This strategy can also be helpful when waiting for barriers to action to decrease, and can enable people to regain cognitive and emotional equilibrium. Adolescents tend to use avoidance strategies when the problem is perceived as a threat, loss, or uncontrollable (Seiffge-Krenke et al., 2009).

In contrast to avoidance coping, people may actively approach and attempt to solve the problem. This type of coping is often called approach coping or problem-focused coping (Compas, 1987; Lazarus & Folkman, 1984). Approach coping is most often used for problems that are perceived to be controllable. When using approach coping strategies, people may analyze the situation from an intellectual point of view, define or re-define the problem in a more hopeful manner, seek information regarding the problem, discuss the problem with others, or take direct action to alter the problem. Generally, approach coping strategies are associated with less psychological distress (Seiffge-Krenke et al., 2009). Problem-focused strategies usually follow a certain pattern of actions: (a) defining and/or re-defining the problem, (b) generating alternative solutions, (c) weighing the costs and benefits of the alternatives, (d) choosing an alternative, and (e) acting on the problem (Thorlakson, 1998). Research findings indicate that approach coping strategies are most often used by adolescents for problems related to school and peers, as opposed to problems related to self, parents, romantic relationships, and leisure contexts (Seiffge-Krenke et al., 2009). This may be due to the perception of controllability and/or balance of individual power levels. For example, authority figures (e.g., parents) may be perceived to have more power leading to adolescents being less

likely to use active coping strategies. As well, adolescent females generally use approach coping and support seeking more than males when dealing with stress associated with relationships (Seiffge-Krenke et al., 2009). In addition, suicidal youth, in general, tend to use approach coping strategies less frequently than non-suicidal youth (Chagnon, 2007).

In a four-year, longitudinal study (starting in grades 7 and 8) that did not investigate DSH or suicidal behaviour, Seiffge-Krenke and colleagues (2009) found that adolescent students tended to use approach coping strategies, rather than withdrawal/avoidance, in highly stressful situations. They also found that early use of approach coping strategies predicted a decrease in the level of perceived stress for the same situation in later adolescence. Conversely, early use of withdrawal coping strategies predicted an increase in future stress in similar situations. Seiffge-Krenke et al. suggested that use of approach coping strategies is highly efficient for solving the problem at hand, whereas high levels of withdrawal coping leads to maladaptive outcomes in cases of high perceived stress. Youth who consistently use avoidant coping strategies may experience more stress, over a longer period of time, with poorer outcomes than youth who consistently utilize approach coping strategies for stressful problems.

In an interview-based study of suicidal behaviour among youth admitted to justice detention centres (in Quebec), Chagnon (2007) found evidence for less flexible coping, as well as increased use of avoidant strategies, in suicidal youth. Suicidal youth with current suicidal ideation used fewer coping strategies than non-suicidal youth for a stressful problem experienced within the past month. In their reaction to the problem, suicidal youth also reported more negative cognitive reframing, aggression, or blaming others than non-suicidal youth or youth with no current suicidal ideation but who had a previous

suicide attempt. Non-suicidal youth in this study were more likely to use positive cognitive re-framing and to speak about their problems with a third party than youth with current suicidal ideation and youth without current suicidal ideation but who had past suicidal behaviour. Based on these findings, Chagnon suggested that suicidal youth have poorer cognitive coping mechanisms than non-suicidal youth when they encounter events that generate a high level of stress.

Suicidal adolescents have been found to use maladaptive problem-solving and coping strategies (de Anda et al., 2000; Sadowski & Kelley, 1993). In a study investigating family rigidity, problem solving, and suicidal thoughts in college students, poor problem-solving abilities accounted for most of the variance in suicidal ideation (Carris et al., 1998). Suicidal adolescents have been found to generate predominantly avoidant coping alternatives (Sandin, Chorot, Santed, Valiente, & Joiner, 1998; Sadowski & Kelley). For example, Spirito, Overholser, and Stark (1989) found that suicidal adolescents used social withdrawal more often than other distressed and non-distressed youth. Adolescents who abuse substances also have been found to use avoidant coping strategies (e.g., denial, behavioural excess, withdrawal) more often than adaptive coping strategies such as relaxation (de Anda et al., 2000). Substance abuse itself has been cited as a maladaptive coping strategy employed by adolescents (de Anda et al.).

Hasking and colleagues (2008) found confirmation for the increased use of avoidant coping strategies by adults (aged 18-30) who engaged in non-suicidal self-injury (NSSI). Participants were self-recruited through posters on university notice boards, doctors' offices, counseling services, and businesses. Participants completed an anonymous questionnaire and returned it by mail to the researchers. Forty-four percent (n = 92) of the

sample reported NSSI (the most common methods were deliberate scratching followed by cutting). The participants were classified into one of three groups: no NSSI (*n* = 119); mild NSSI (*n* = 70) as indicated by low severity and infrequent NSSI; and moderate/severe NSSI (*n* = 22) as indicated by weekly frequency, high severity (required medical attention or life threatening), and recency (within the last month). Participants in the moderate/severe NSSI group reported more avoidant coping and less active coping (taking action to solve the problem, even if not effective or thought out) than the no-NSSI and mild NSSI groups. As well, the mild NSSI group reported more substance use and less active coping and emotional social support than did the no-NSSI group. The moderate/severe group reported more substance use, depression, anxiety, and hostility, as well as less emotional and instrumental social support, than did the no-NSSI group. Overall, participants reporting NSSI (mild or moderate/severe) experienced more psychological distress than did the individuals who did not self-harm. Furthermore, the results indicated that the use of avoidant coping strategies increased in frequency with increased severity of NSSI.

A World Health Organization/Europe Multicentre Study (McAuliffe et al., 2006) investigated problem-solving in 836 medically-treated patients for DSH from 12 European regions. Participants were interviewed at the initial presentation for medical treatment, as well as at a one-year follow-up. Thirty percent (*n* = 232) of the sample were found to repeatedly DSH. Patients who reported repeated DSH (more than one act) were compared with patients whose only known DSH act was at the time of the initial presentation for medical care (non-repeaters). When repeaters and non-repeaters were compared, repeaters scored higher on passive-avoidance coping (i.e., avoiding or

resigning oneself to the problem; feeling helpless, pessimistic, and overwhelmed by the problem). For males only, repeaters were also more likely than non-repeaters to engage in negative emotional expression (i.e., showing anger and annoyance with others). Conversely, repeaters scored significantly lower on active handling (i.e., an active approach to problem-solving, tackling problems positively and proactively) than did non-repeaters. High scores on active handling were significantly associated with reduced risk of repetition. Overall, the study found that repeaters engaged in a habitual coping style of passive avoidance strategies. The authors cited Williams' (1997) finding that "suicidal people stop trying to solve problems because they tend to over-generalize from a problem that cannot be solved to situations in which things can be done" (McAuliffe et al., 2006, p. 54). They suggested that avoidance coping strategies are likely to be maintained if repeaters feel hopeless when problems occur. There is also, however, the possibility that avoidance coping can have positive results in the short term by reducing distress, even if the problem is not resolved. The reduction in distress could be highly reinforcing, leading to repetition of avoidance strategies. This is not limited to suicidal youth, but applies to avoidance coping in general. McAuliffe and colleagues recommended that patients be trained to approach problems and engage in active problem-solving strategies in order to reduce repetition.

If some individuals are prone to use DSH as an avoidance strategy to cope with problems (Rodham et al., 2004; Webb, 2002), it is important to understand why. This may be due to a failure to learn and/or failure to use approach coping strategies. It is possible that youth who engage in DSH may not have learned (e.g., through modeling of problem-solving by family or friends; through specific instruction) to solve problems

with approach-type strategies. Also, if youth have learned approach coping strategies, approach coping may not be possible in particular situations or youth may not chose to use approach strategies, even when possible (e.g., tendency to use avoidance strategies for most situations). Moreover, it is possible that certain approach strategies are not appropriate for the types of problems that youth encounter. Youth require adequate resources and authority/power for approach coping to be possible. Despite the option of using approach coping methods, youth may chose predominantly to use avoidance strategies. Unfortunately, avoidant strategies may reduce distress in the short term but do not tend to solve problems. Therefore, problems tend to return and may become more distressing. When avoidance coping is not possible and emotional distress reaches a boiling point, emotional discharge may result. At such times, feelings are let out in a cathartic manner (e.g., yelling or punching a wall). This does not directly deal with the problem and may create new problems or exacerbate existing problems, but does serve to release tension. Similarly, DSH serves to release tension and relieve emotional distress (Gratz, 2003; Klonsky, 2007; Walsh, 2006). In a study investigating motivations for DSH, getting relief from emotional distress was the most frequently cited reason for engaging in DSH (Rodham et al., 2004). DSH may be used as an avoidant coping strategy and avoidance strategies generally may be used more often by youth who engage in DSH than those who do not engage in DSH.

There are many possible ways to learn to use DSH as a strategy to cope with problems. DSH may have been learned vicariously through the mass media, websites, chat rooms on the internet, or modeling by others (e.g., friends or family). As discussed previously, the most cited motivation for engaging in DSH is to relieve intense emotions

(Klonsky, 2007; Suyemoto, 1998). Thus, individuals are likely to start DSH when they are experiencing emotional distress. DSH may be used initially as a last resort when youth perceive that non-harming strategies are not feasible or would not be effective. Youth who harm may not have learned non-harming strategies, such as approach coping strategies, thereby making other strategies not available to them in times of emotional distress. It is also possible that at the time of DSH, some people are too impaired psychiatrically, or feel too overwhelmed emotionally, to utilize non-DSH strategies. Following DSH, youth may learn that DSH can be an effective strategy for relieving emotional distress, making them more likely to repeatedly use this strategy when faced with emotional distress or problems that are perceived to be outside their control. There is also the possibility that some youth experience secondary gain from the attention they receive following harming themselves, thereby reinforcing DSH. Although it is almost always maladaptive, DSH is an easy, readily available, and immediately implemented coping strategy youth may use to alleviate emotional distress or avoid problems.

Given that DSH is often engaged in without intent to die, it is likely that DSH is associated with a lack of problem-solving skills or problem-solving confidence. Sadowski and Kelley (1993) found that adolescents who had engaged in DSH had poorer problem-solving skills than psychiatric patients and a control group. McLaughlin et al. (1996) found that a substantial proportion of an adolescent DSH group "felt unable to generate solutions to their problems" (p. 531). In a review of the DSH literature, Webb (2002) found that, when depression was controlled for, poor problem-solving distinguished self-poisoners from controls.

Similarly, many studies have cited a link between suicidal behaviour and a lack of problem-solving ability or limited coping strategies (Hasking et al., 2008; Seiffge-Krenke et al. 2009; Webb, 2002). In fact, adolescent suicide, depression, and substance abuse "have been identified as responses to an increase in stressors in the lives of adolescents and their lack of sufficient coping skills to deal with the stress they generate" (de Anda et al., 2000, p. 442). There are numerous sources of stress for adolescents. Environmental stressors including economic hardship, family discord, and discord in peer relationships may be cumulative (de Anda et al.).

Beside the type of problem-solving utilized by adolescents, researchers also emphasize the importance of investigating individuals' perceptions of their own problem-solving abilities (Heppner & Baker, 1997; Heppner & Lee, 2002; Lazarus & Folkman, 1984). When individuals are self-assured and trust in their own ability to solve problems and cope effectively with situations, it is likely that they will reach an acceptable solution. Although few studies have investigated the protective role of problem-solving skills in DSH, prevention and treatment programs for DSH stress the importance of effective problem-solving (Harrington et al., 1998; Hawton et al., 2003; Rodham et al., 2004; Townsend et al., 2001; Wood, Trainor, Rothwell, Moore, & Harrington, 2001).

Current Research

Although DSH research has been conducted in several countries, there appears to be little research in Canada or research investigating high-risk youth. Moreover, despite the fact that DSH is not a new area of research, relatively few studies have investigated it in adolescent offender populations. There is a complete lack of studies investigating DSH in Canadian Aboriginal youth populations. Being aware of suicidal and self-harm

behaviour in Aboriginal youth is especially important when investigating incarcerated populations in Manitoba, as Aboriginal youth are at much higher risk than non-Aboriginal youth of coming into contact with the justice system and being incarcerated. Given that suicide is a major health concern for adolescents, especially Aboriginal youth, and DSH (especially repeated DSH) is a risk factor for suicide, it is important to examine DSH in this high-risk youth offender population. The current research aims to fill this gap. In addition, examining risk and protective factors for DSH may increase our understanding of suicidal behaviours and help to target prevention approaches.

DSH is defined here as socially unacceptable, deliberate behaviour that causes harm to the body, regardless of the person's intent to die. Types of DSH investigated in previous research can be separated into three main methods: (a) self-laceration (e.g., skin cutting, piercing, and burning excluding that for the purpose of self-decoration), (b) self-poisoning (e.g., overdose on medication or illicit drugs and ingesting other toxic substances), and (c) self-battery (e.g., hitting self, pulling hair to cause pain, hitting walls or other objects). The current research investigated all three types of DSH, even though previous research has focused mainly on self-laceration and self-poisoning. Self-battery is often not investigated by researchers because persons who engage in self-battery are least likely to present for medical attention and self-battery often leaves no apparent marks on the body.

Research has tended to focus on patient populations or youth referred for medical attention. However, relatively few people seek medical attention following engagement in DSH (Groholt, Ekeberg, Wichstrom, et al., 2000; Hawton, Rodham, Evans, & Weatherall, 2002; Madge et al., 2008; Martin et al., 1995; Rodham et al., 2004; Safer,

1997). Thus, reliance on patient samples greatly under-estimates the prevalence of DSH in general samples and does not allow for generalization of study results. Studies of DSH in offender samples most often focus on medical/psychiatric samples (Penn et al., 2003) or rely on staff-completed self-harm forms (Chowanec et al., 1991; Ireland, 2000). To obtain a fuller understanding of DSH in youth offenders, the current research surveyed youth in the general population of offenders and did not rely on patient samples.

The current research also improved on past research by including both male and female offenders. Male and female offenders were held in secure care at the same facility. Previous research had been skewed towards gathering data for males, even if females were included in the study.

This research project established prevalence rates for an incarcerated sample of youth. There has been a clear lack of reported prevalence rates in adolescent populations, especially for high-risk populations such as incarcerated and Aboriginal youth. A variety of prevalence rates were investigated, including lifetime prevalence (anytime within their lifetime), annual prevalence (anytime within the past 12 months), and incarcerated prevalence (anytime within the current incarceration period). In keeping with the definition of DSH presented above and to reduce ambiguity, a self-report measure was used that assessed the presence of specific DSH methods. Some prior research studies have assessed the presence of DSH with general questions (e.g., "have you ever harmed yourself on purpose") that do not specify for participants the meaning of "harm." Rates of DSH are likely under-estimated in the research literature partly due to the use of general questions. Participants in the current study answered a general question about DSH before completing the checklist of specific DSH methods. By assessing both means of

measuring DSH, the effect of general versus specific questioning about DSH can be assessed. It was expected that significantly more participants would respond that they had engaged in harm during their lifetime when presented with specific DSH methods, rather than just a general question about DSH.

Existing DSH research has focused simplistically on the presence or absence of DSH (i.e., a dichotomous variable). Thus, one instance of DSH has been considered to be distinctly different than no instances. Also, one instance of DSH has not been distinguished from repetitive engagement in DSH. However, differences likely exist between youth who repeatedly or chronically engage in DSH and those who engage in DSH once in their lifetime. Ireland (2000) found that there were significant differences between offenders who engaged in DSH once and repeaters. Thus, the present research took DSH frequency (i.e., number of reported incidents) into consideration, rather than presence or absence of the behaviour.

The current study also investigated risk and protective factors of DSH. Based on previous research findings, it focused on depressed mood, alcohol use, and drug use as risk factors for DSH (Bolognini et al., 2003; Evans et al., 2004; Groholt, Ekeberg, & Haldorson, 2000; Groholt, Ekeberg, Wichstrom, et al., 2000; Haw, Houston, Townsend, & Hawton, 2002; Hawton et al., 1982; Hawton, Hall, et al., 2003; Martin & Waite, 1994; Muehlenkamp & Gutierrez, 2004; Portzky et al., 2008; Rossow et al., 2007; Suyemoto & MacDonald, 1995; Webb, 2002). It was expected that each of these risk factors would be directly related to DSH frequency (for example, greater depressed mood would be directly related to more frequent annual and incarcerated DSH). It was beyond the scope of this research to investigate eating disorders, child abuse, and personality disorders,

although these factors have been related to DSH in the literature. Chapman and colleagues' (2006) experiential avoidance model (EAM) postulates that avoidance behaviours (e.g., substance use, avoidant coping style) are present in individuals who engage in DSH. The current study investigated the presence of avoidance behaviours in individuals who engage in DSH. Based on the EAM, it was expected that offenders who reported DSH would report higher levels of avoidant coping style than offenders who did not report DSH.

Unlike many previous DSH studies that focused only on risk factors, this research also investigated protective factors. DSH is often thought of as a maladaptive coping strategy. Therefore, it is likely that adolescents engage in DSH when they do not perceive that they can turn to others for help, are not satisfied with the support they receive, and don't have the skill or confidence to use other, more adaptive methods of coping (Rodham et al., 2004; Webb, 2002). The current study focused on perceived, rather than received, social support due to the current situational factors faced by inmates (e.g., being removed from their social networks while in custody which greatly restricted the ability to receive material and emotional support). Thus, this study investigated the number of supportive people that offenders perceived to be available to them in times of need, as well as their satisfaction in general with received support. In terms of coping, offenders reported their confidence in being able to solve problems, as well as the strategies they use when faced with problems. Based on previous findings for suicidal behaviour and DSH, it was expected that higher levels of available social support (number), social support satisfaction, approach coping strategies, and confidence in problem-solving would all be associated with less frequent DSH behaviour (Chagnon, 2007; de Anda et

al., 2000; Hasking et al., 2008; Hawton et al., 2003; McAuliffe et al., 2006; McLaughlin et al., 1996; Pattison & Kahan, 1983; Rubenstein et al., 1998; Sadowski & Kelley, 1993; Spirito et al., 1989; Webb, 2002).

Even though the harm inflicted by DSH can sometimes be life-threatening or be serious enough to require medical attention, relatively few people who engage in DSH actually seek medical attention. Often the behaviour is done in private. Some authors have suggested that 33% (House et al., 1998) to 60% (Martin et al., 1995) of people engaging in DSH and suicide attempts, respectively, do not present for medical care. Other researchers have found the rates of received medical attention to be much lower, with 12-15% of people who attempt suicide or engage in serious forms of DSH presenting to hospital emergency (Hawton et al., 2002; Madge et al., 2008; Safer, 1997). Thus, patient surveys and staff reports of DSH likely under-estimate the prevalence of DSH. This study investigated self-reported DSH that warranted medical attention, even if medical attention was not sought, as well as DSH for which medical attention was received. Although DSH may often warrant medical attention (based on the opinion of self-harming individuals), it is likely that adolescents actually seek such attention much less frequently. It is also likely that very few first-time harmers inflict enough damage to warrant medical attention. However, over time, multiple stressful events, especially justice-related stressors for young offenders, may increase the level of stress experienced or lessen the threshold for distress. Thus, adolescents who engage in DSH may inflict more damage on themselves as the frequency (i.e., repetition of DSH) and/or duration of DSH increases. To investigate this possibility, warranted and received medical attention were measured separately.

The current research planned to collect data about DSH from both inmates and prison staff in order to compare reported rates of DSH. It was expected that staff rates would be significantly lower than youth self-report. Unfortunately, staff reports were not collected due to circumstances outside of the researcher's control and this hypothesis could not be examined.

Hypotheses

Hypothesis 1. It was expected that incarcerated youth would be significantly more likely to report DSH in their lifetime on a behavioural measure of DSH than in response to a general question measuring DSH.

Hypothesis 2. It was expected that higher depressed mood, lifetime alcohol use, and lifetime drug use would each be directly related to higher *annual* DSH frequency and the effect of all three risk factors combined would be greater than that of any single risk factor.

Hypothesis 3. It was expected that higher depressed mood, lifetime alcohol use, and lifetime drug use would each be directly related to higher *incarcerated* DSH frequency and the effect of all three risk factors combined would be greater than that of any single risk factor.

Hypothesis 4. It was expected that higher amounts of perceived available social support (number), social support satisfaction, approach-coping, and problem-solving confidence would each be directly related to lower *annual* DSH frequency and the effect of all four protective factors combined would be greater than that of any single protective factor.

Hypothesis 5. It was expected that higher amounts of perceived available social support (number), social support satisfaction, approach-coping, and problem-solving confidence would each be directly related to lower *incarcerated DSH* frequency and the effect of all four protective factors combined would be greater than that of any single protective factor.

Hypothesis 6. It was expected that offenders who reported DSH within the past year would report more avoidance coping than youth who did not report DSH.

Hypothesis 7. It was expected that offenders who reported DSH that warranted medical attention would report longer durations of engaging in DSH than those whose DSH did not warrant medical attention. In addition, it was expected that offenders who reported receiving medical attention for DSH would have engaged in DSH longer than those who did not receive medical attention.

Hypothesis 8. It was expected that higher rates of annual DSH frequency would be directly related to warranting medical attention. That is, as annual DSH frequency increases it is more likely that DSH warrants medical attention.

Similarly, it was expected that higher rates of annual DSH frequency would be directly related to receiving medical attention. That is, as annual DSH frequency increases it is more likely that offenders receive medical attention.

Method

Participants

Participants were recruited from the Manitoba Youth Centre (MYC) in Winnipeg, Manitoba. The MYC is the main correctional facility for youth in Manitoba. The sample consisted of 51 females (59%) and 36 males (41%), for a total of 87 participants. Participants ranged from 13-19 years old (M = 15.9, SD = 1.2; females M = 15.7, SD = 1.1; males M = 16.2, SD = 1.3). Participants indicated their ethnic affiliation on the questionnaire. The sample was largely Aboriginal (n = 55, 63%) and Métis (n = 18, 21%) in origin, with these two ethnic groups making up 84% of the sample. The remainder of the sample indicated their ethnicity as White (n = 11, 13%), Hispanic (n = 2, 2%), or African-American (n = 1, 1%). Academic grade levels ranged from 7 to 12, with grade 9 (55% of participants) being the average and modal grade level.

Most participants were on remand (n = 75, 86%), whereas 12 (14%) had been sentenced and were carrying out their terms in custody. Participants reported being in custody from 1 day to over 6 months, with approximately 70% of offenders being in custody for two months or less at the time of the study: ten offenders (12%) were in custody for 1-6 days; 13 (15%) for 1-2 weeks; 16 (18%) for 3-4 weeks; 21 (24%) for 1-2 months; 10 (12%) for 3-4 months; 7 (8%) for 5-6 months; and 10 (12%) for over 6 months.

Most of the participants had lived with one (n = 16, 18%) or two (n = 40, 46%) parents before coming into custody. Of the 31 (36%) participants who did not live with parents before custody, most reported living in a variety of situations, including living

with: other family members (*n* = 5); on the street (*n* = 6); in foster care (*n* = 8); at a friend's house (*n* = 12); and in a group home (*n* = 14).

Procedure

The study received ethics approval from the University of Manitoba Psychology/ Sociology Research Ethics Board. Permission to recruit participants was granted by the MYC Superintendent (Appendix A). The researcher was not granted permission to access MYC records for offenders. As well, parental consent needed to be obtained by MYC staff members before the researcher could recruit or meet with offenders.

An attempt was made to recruit as many offenders as possible between March and July of 2006. MYC staff members contacted parents/guardians of male and female offenders either in person or by phone to advise them of the study. Staff members read from a script provided by the researcher (Appendix B) and documented whether consent was granted. It was made clear to guardians that the research was not being conducted by the facility and that participation was not required. Rather, participation was completely voluntary and would not influence the adolescent's status or care at the institution. All of the guardians contacted provided consent for their youth to participate in the research. However, it was difficult to reach guardians of all the inmates in custody. For example, a few social workers and parents were on holidays or not otherwise reachable. The number of guardians not contacted was not available to the researcher. As well, guardians of youth offenders who were in the centre for short periods of time (e.g., less than one day) were not contacted because staff knew that the adolescents would not be in the centre when the researcher came to collect data. Permission from guardians was not required for youth who were 18 years of age at the time of the study.

Once parental/guardian consent had been obtained, assent from youth was obtained (Appendix C). Eligible offenders (i.e., those whose guardians had granted permission) were advised of their rights as participants and told that opting not to participate would not influence their care at the centre. All of the participants for whom guardian permission had been granted chose to participant in the study. Each participant was given $10 as an honorarium for their participation.

Youth worked independently to complete the questionnaire and asked questions if they needed clarification or a word defined. They handed the survey directly to the researcher, who checked it for completeness and missing items. If missing items were discovered, the participant was asked if they had missed the item or had difficulty answering it. On most of the occasions that data were missing, the participants indicated that they had accidently skipped the item, which they then completed. Participants with reading difficulties were assisted by the researcher individually to ensure confidentiality. The questionnaire took participants between 15 and 45 minutes to complete, with most participants finishing within 20 minutes. Several participants spontaneously expressed support for the research because they felt that their self-harming behaviour was not understood by others. Overall, the participants were extremely co-operative and worked diligently to complete to survey. A debriefing script was read to participants following completion of the survey (Appendix D).

Following youth data collection, the researcher labeled envelopes with the participants' names on the outside and a form for staff to complete on the inside. Any staff member on duty in the days following the participation of the offender could complete the survey, but there was only one survey per offender. On a paper taped to the

envelope, staff was asked to complete the questionnaire (Appendix E) with reference to the offender whose name was on the envelope. Unfortunately, the researcher had great difficulty in obtaining completed staff forms despite support from the Superintendent. Only one staff form was completed. Staff members were resistant to completing the forms, citing lack of time and limited knowledge of offenders self-harming behaviours. The staff supervisor attempted to explain what was required; however, staff members continued to complain that they were inundated by a large population of offenders (more than usual) that left them little time to complete additional paperwork. An alternative to collecting data from a staff perspective could have been to obtain information regarding DSH through running records of offender behaviour. A major limitation was that DSH was not defined at the centre and, therefore, not recorded as self-harm in MYC records. Thus, staff data could not be reliably collected through other means.

Assessment Instruments

The participants completed a self-report questionnaire made up of six sections: (a) social-demographics, (b) Children's Depression Inventory, (c) Youth Risk Behavior Survey substance use questions, (d) Social Support Questionnaire, (e) Problem-Solving Inventory, and (f) a Deliberate Self-Harm Checklist.

Social-demographics

Participants first completed a section that obtained personal information. Participants indicated their: (a) age; (b) gender; (c) current grade level; (d) ethnic origin; and (e) living arrangements prior to incarceration. Participants also indicated if they were on remand or sentenced and the length of time they had been in custody.

Children's depression inventory.

The Children's Depression Inventory (CDI) is a 27-item self-report rating scale patterned after the Beck Depression Inventory (Sitarenios & Kovacs, 1999). It was designed specifically for use with school-aged children and adolescents aged 7-17. The CDI has been widely used to assess childhood depression and depressed mood (Cloutier et al., 2009).

The 27 items that make up the CDI are written at a grade-one reading level, ensuring readability. The questionnaire takes approximately 5-10 minutes to complete. Each item includes three responses in the form of sentences describing feelings and/or ideas. The responses are assigned a numerical value ranging from zero (absence of a symptom) to two (definite symptom). Higher numbers indicate more clinically severe behaviour. Participants are asked to pick out the sentence in each group that best describes their feelings and ideas during the past two weeks. For half of the items, the first response represents the most pathology, with the order reversed for the other half of the items.

The CDI yields a total score as well as five subscale scores (Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia, and Negative Self-esteem). The total score is calculated by summing the separate item scores. The total score may range from 0-54. Scores of 11 or greater indicate mild symptoms of depression, whereas scores of 19 or greater indicate clinical depression (Figueras Masip, Amador-Campos, Gomez-Benito, & Del Barrio Gandara, 2010). Previous research suggests that the total score is the most robust and informative (Sitarenios & Kovacs, 1999). The subscale scores have not been

as widely reported in the literature as the total score. Thus, for the purpose of this research, only the total score on the CDI was utilized.

Studies using the CDI report alpha coefficients ranging from good (0.70 to 0.79) to excellent (0.80 to 0.95). In a review of all studies reporting use of the CDI, Sitarenios and Kovacs (1999) found that most studies reported internal consistencies over 0.80 and all were over 0.70. The CDI has been used on a variety of child and adolescent samples and was normed with two samples (Kovacs, 1992). The CDI has been determined to have acceptable two-week test-retest reliability (0.87: Kovacs, 1992).

Youth risk behavior survey: Substance use.

The Youth Risk Behavior Survey (YRBS), developed in 1988 by the Centers for Disease Control and Prevention (CDC), has been used extensively to measure and assess the leading causes of mortality, morbidity, and social problems among youth around the world (Brener, Collins, Kann, Warren, & Williams, 1995; Brener et al., 2002; Kann, 2001). In designing the YRBS, the CDC obtained input from experts in each categorical area as well as state, local, and educational representation (Kann). The survey, written at a grade 7 level, underwent extensive focus group and field test trials before the final version was used in a 1991 national survey (Kann).

The two key variables from the YRBS of interest in this research were lifetime alcohol use and lifetime drug use. Lifetime alcohol use was measured by the single question, "During your life, on how many days have you had at least one drink of alcohol (beer, wine, liquor, wine coolers)?" Answer choices for lifetime alcohol use are: (a) 0 days; (b) 1 or 2 days; (c) 3 to 9 days; (d) 10 to 19 days; (e) 20 to 39 days; (f) 40 to 99 days; or (g) 100 or more days. Five questions relating to lifetime drug use were used in

the current research. The five lifetime drug use questions are: (a) During your life, how many times have you used marijuana?; (b) During your life, how many times have you used any form of cocaine?; (c) During your life, how many times have you used heroin?; (d) During your life, how many times have you used methamphetamines; and (e) During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high? (online source: http://www.cdc.gov/nccdphp/dash/yrbs/2001survey.htm, accessed February 28, 2002). Answer choices for the drug use questions are: (a) 0 times; (b) 1 or 2 times; (c) 3 to 9 times; (d) 10 to 19 times; (e) 20 to 39 times; (f) 40 to 99 times; or (g) 100 or more times. The responses were coded from 0-6, corresponding to the response categories, for the purpose of this research. Lifetime drug use was derived by summing the coded responses to the five drug questions for a total drug use score (potential range 0-30). To determine commencement of drinking behaviour, the YRBS question "how old were you when you had your first drink of alcohol other than a few sips?" was also utilized for this research.

Although the YRBS has been used in city, state/province, and national research in the United States and Canada, it is difficult to find psychometric data regarding reliability and validity of individual questions and subtests. Brener and colleagues (2002) reported test-retest reliability for 1,776 students (1995) and for 4619 students (2002) who completed the survey twice, two weeks apart. Items with Kappas greater than or equal to 61% are considered to have substantial reliability and Kappas greater than or equal to 41% to have moderate reliability (Brener et al., 2002). Kappa statistics for the alcohol and marijuana questions ranged from 66% to 90% indicating adequate reliability for the items (Brener et al., 1995). Individual Kappas for the questions were: (a) 71% (Brener et

al., 1995) and 66% (Brener et al., 2002) for age first drank alcohol; (b) 86% (Brener et al., 1995) and 82% (Brener et al., 2002) for lifetime alcohol use, (c) 88% (Brener et al., 1995) and 90% (Brener et al., 2002) for lifetime marijuana use; (d) 73% (Brener et al., 1995, 2002) for lifetime cocaine use; (e) 57% (Brener et al., 2002) for lifetime heroin use; (f) 71% (Brener et al., 2002) for lifetime methamphetamine use; and (g) 42% (Brener et al., 2002) for ever inhaled substances to get high. The researchers did not report reliability Kappas for questions measuring heroin use, methamphetamine use, or inhaling substances in the 1995 article. Drug scores were not summed for a total lifetime drug use score, so Kappas are not available total lifetime drug use. Prevalence rates arising from the two administrations did not significantly differ for the alcohol variable and all but one of the drug variables (Brener et al., 1995, 2002). The authors reported a significant increase in self-reported heroin use (from 1.9% to 3.0%) from time 1 to time 2 (Brener et al., 2002). Brener et al. (1995) stated that these reliability rates are comparable to other substance use self-report measures for alcohol and drug use. Overall, most of the questions used in Brener's research demonstrated good reliability over two administrations.

Social support questionnaire.

The six-item Social Support Questionnaire (SSQ6), developed by Sarason, Sarason, Shearin, and Pierce (1987), assesses two important parts of social support for every item: (a) perceived availability of support and (b) satisfaction with support. Items on the SSQ6 include: (a) whom can you really count on to distract you from your worries when you feel under stress?; (b) whom can you really count on to help you feel more relaxed when you are under pressure or tense?; (c) who accepts you totally, including both your worst

and your best points?; (d) whom can you really count on to care about you, regardless of what is happening to you?; (e) whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?; and, (f) whom can you count on to console you when you are very upset? (Sarason et al., 1987). For each of the above items, participants respond to two parts. In the first part, participants are asked to identify persons that they believe are available and that they can turn to when they are in need of a particular type of support (social support availability). Participants are instructed to list all of the people they know they can count on for help or support for each item, up to a maximum of nine people. If participants believe that no one is available to support them, they place a check beside 'no one.' A score for social support availability is calculated simply by adding up the number of persons listed (range 0-54). The second part of each item measures social support satisfaction or the "individuals' degree of satisfaction with the perceived support available in that particular situation" (Sarason et al., 1987, p. 499). Participants indicate their degree of satisfaction on a 6-point, likert-scale ranging from Very dissatisfied (1) to Very satisfied (6). Total scores for satisfaction are derived by summing responses on the six satisfaction questions likert-scales. Higher scores indicate greater satisfaction (range of 6-36).

The SSQ6 was empirically derived from items on the original 27-item SSQ (Sarason et al., 1987). The 27-item SSQ has been proven to be a reliable and valid measure of social support. On the 27-item SSQ, the test-retest correlations were high, with correlations of 0.90 for availability and 0.83 for satisfaction (Sarason, Levine, Basham, & Sarason, 1983). The alpha coefficients of internal reliability were 0.97 and 0.94 for availability and satisfaction, respectively (Sarason et al., 1983). The two factors

only correlated mildly with each other (r = 0.34), indicating that they are measuring two separate dimensions of social support (Sarason et al., 1983). The availability and satisfaction scores on the SSQ6 have been found to correlate strongly with the original SSQ. Internal reliabilities for the SSQ6 are 0.90 for availability and 0.93 for satisfaction (Sarason et al., 1987). The SSQ has been widely used in research (Bal, Crombez, Van Oost, & Debourdeaudhuij, 2003; Esposito & Clum, 2002; Sarason et al., 1987). Esposito and Clum used the SSQ6 in their research of social support's relationship to suicidal behaviours and reported internal consistencies of 0.91 for availability and 0.86 for satisfaction.

Problem solving inventory.

Heppner and Petersen (1982) developed the Problem Solving Inventory (PSI) to assess individuals' perception of their problem-solving ability, not their actual problem-solving ability. The PSI is considered a global measure of problem-solving appraisal and has been widely used. This self-report measure consists of 35 six-point items (rated 0 = strongly agree to 5 = strongly disagree), three of which are filler items, that takes approximately 15 minutes to complete. The adult version is written at a ninth-grade reading level and the adolescent version at a fourth-grade reading level (Heppner, Manley, Perez, & Dixon, 1993). The adult and adolescent versions are positively correlated (0.87), indicating that both measures are likely tapping the same construct (Heppner & Petersen, 1982). The present study used the adolescent version.

The PSI yields a total score as well as three subscale scores (i.e., problem-solving confidence, approach-avoidance style, and personal control). In the current study, the first two subscale scores were considered key and utilized. Typically, higher scores on these

subscales indicate a lack of problem-solving confidence and avoidant problem-solving style (Heppner & Lee, 2002). For the purpose of this research, scores were reversed so that higher scores indicated more problem-solving confidence and use of approach coping strategies.

Approach-avoidance style is defined as "a general tendency to approach or avoid different problem-solving activities" (Heppner & Lee, p. 260). This subscale is comprised of 16 items, such as: "sometimes, I solve a problem one way. Then I compare what really happened to what I thought should have happened" and "when I have a problem, I stop and think about it before deciding on a next step." Scores on approach-avoidance style items are summed to provide a total score ranging from 0-80.

Problem-solving confidence is defined as "an individual's self-assurance in a wide range of problem-solving activities, a belief and trust in one's problem-solving abilities" (Heppner & Lee, 2002, p. 290). Problem-solving confidence refers to one's general problem-solving self-efficacy. This subscale is comprised of 11 items, such as: "usually, I can think up new and useful ways to solve a problem" and "I'm almost sure that my plans to solve a problem will work." Scores on problem-solving confidence are summed to provide a total score ranging from 0-55.

In six samples examining the adolescent version of the PSI in adolescent and college samples, internal consistencies have been reported to range from 0.74 to 0.91 for problem-solving confidence and from 0.83 to 0.88 for approach-avoidance style (Heppner et al., 1994). In a study investigating problem-solving and suicidal behaviour in delinquent adolescents, the internal consistencies were 0.76 for approach-avoidance style and 0.72 for problem-solving confidence (Esposito & Clum, 2002). Parker (1988)

administered the PSI to 212 adult, male inmates and found that the same three subscale factors emerged (i.e., problem-solving confidence, approach-avoidance style, and personal control). Based on his research, Parker concluded that the PSI is a valid and reliable problem-solving measure for use with an incarcerated population.

Deliberate self-harm checklist.

A self-report behavioural measure of DSH was developed by the researcher for the present study (Appendix F). Participants were first asked a general question about DSH, followed by a series of behaviour specific questions. The general question, drawn from the literature, was "have you ever harmed yourself on purpose?" (Fliege et al., 2006; Gratz, 2001; Gutierrez et al., 2001; Rodham et al., 2004; Sourander et al., 2006) and offered two response choices ('yes' or 'no'). Often when general questions are used in research no definition of harm is provided and participants interpret the question as they wish. Continuing this pattern, in the current research the general question was at the top of the page before any other information, to allow participants to reach their own conclusions about what 'harm' inferred and to respond based on their perceptions. This question was included to investigate the hypothesis regarding whether general questions yield the same results as responses to specific DSH methods.

Following the general question was another section that began: "This part asks about different things that people sometimes do to hurt themselves. Read each item carefully and respond honestly. Often, people who do these kinds of things keep it a secret. Only the researcher will see your answers. The staff at the Manitoba Youth Centre will never see your answers. Please answer yes to a question only if you did the behaviour **on purpose**, **to hurt yourself**."

DSH methods were presented to participants as a table consisting of 17 items, including: six items assessing self-laceration behaviours; five items assessing self-battery behaviours; four items assessing self-poisoning behaviours; one item assessing interference with wound healing (e.g., scab picking); and one item inquiring about 'other' methods of DSH. Self-laceration items were based on items from the DSHI (Gratz, 2001), as well as the research literature (Muehlenkamp & Gutierrez, 2004), including, "have you on purpose": (a) cut your skin on your wrists, arms or other areas of your body?; (b) pricked holes in your skin (e.g., with a pin, needle, or staples)?; (c) burned your skin; (d) carved words, pictures or other marks into your skin; (e) scratched yourself so bad that it was bleeding or left a scar?; and (f) bit yourself, to the extent that you broke the skin?. A few items on the DSHI were considered redundant by the researcher and were collapsed into one item on the current scale as has been done in previous studies (Muehlenkamp & Gutierrez, 2004). For example, 'carving words into skin' and 'carving pictures into skin' on the DSHI were collapsed into 'carved words or pictures into your skin' on the current scale. As well, 'burning with a lighter or match' and 'burning with a cigarette' from the DSHI were combined into 'burned your skin (e.g., with a match or cigarette).' The current scale added information to two items to ensure participants would not include culturally excepted practices. The item 'pricked holes in your skin' was followed by 'do not include ear piercing, tattoos, or when using needles for drug use' to clarify what was not included in the item. As well, 'carved words, pictures or other marks into your skin' was followed by 'this does not include decorative tattoos.'

Self-battery items were based on items on the DSHI (Gratz, 2001) and SHI (Sansone et al., 1998), as well as research findings in the literature (Muehlenkamp &

Gutierrez, 2004). Self-battery items included on the current scale were: (a) slapped or punched myself (Gratz; Muehlenkamp & Gutierrez, 2004); (b) pulled my hair hard enough to cause pain; (c) hit objects to hurt myself (Muehlenkamp & Gutierrez); (d) broken own bones (Gratz); and banged your head against something (Muehlenkamp & Gutierrez; Sansone et al.), to the extent that you caused a bruise to appear (Gratz, 2001).

Self-poisoning followed the WHO criteria for parasuicide. The items used were drawn from Hawton et al. (2002) and Rodham et al. (2004), and included: (a) ate or drank something that is not meant to be eaten; (b) swallowed medication in order to harm myself (e.g., swallowed a lot of pain medication or laxatives); (c) used drugs to harm myself; and (d) ate toxic substances.

A general question was piloted regarding frequency. The question read 'if you answered yes to any of the types of self-harm, overall how often have you harmed yourself?.' Response categories included: (a) only once and I never did it again, (b) once every 6 to 12 months, (c) once every 2 to 3 months, (d) once a month, (e) once every 2 to 3 weeks, (f) once a week, and (g) more than once a week. Feedback from 10 youth acting as a pilot sample indicated that this question was too difficult to answer because their self-harm was too variable in frequency. They would sometimes go months or years without harming and then engage in DSH frequently, within a short period of time. It was difficult for youth to estimate an average rate that fell into one of the above categories. Therefore, this item was eliminated from the questionnaire, leaving the item-specific annual and incarcerated DSH frequencies.

Participants indicated whether or not they had engaged in each of the 15 DSH items/methods for three separate time periods, namely: (a) have you ever done this?; (b)

have you done this in the past 12 months?; and (c) have you done this while you have been in MYC? A response of 'yes' was coded as present for DSH during the time period specified. If participants responded 'yes' to the 12-month and MYC prevalence questions, they were asked to provide a number indicating how many times they had engaged in that particular behaviour. The number of times participants had engaged in each DSH behaviour (i.e., across the 15 items) were summed to determine a total frequency for both annual and incarcerated time frames. Then, frequency data were coded categorically, rather than kept continuous, to determine an annual frequency and an incarcerated frequency of DSH, respectively, using the following categories: '0' indicating no harm; '1' indicating engaging in DSH one time; '2' indicating DSH 2-10 times; and '3' indicating DSH more than 10 times. Harming one time was kept a separate category because harming once is likely clinically different from repeated harm.
It was considered unlikely that participants would be able to remember all incidences of harming behaviour in their lifetime, so frequencies were not collected for lifetime DSH.

For each of the 15 DSH methods listed, participants indicated whether it had warranted medical attention or if they received medical attention. Warranted medical attention was measured with two questions for each DSH item, namely, 'have you ever hurt yourself so bad that you **probably should have sought medical attention** even if you didn't?' and 'if so, how many times.' The number of times that medical attention was warranted was summed across the 15 DSH methods to reflect the total number of times medical attention was warranted. Received medical attention was measured by two analogous questions for each DSH item, namely 'have you ever gone to **see a doctor or nurse** (actually received medical attention) after doing this (for example, to get

stitches)?' and 'if so, how many times.' The number of times that medical attention was received was added across the 15 DSH methods for a total number of times they received medical attention.

Participants also indicated lifetime duration for each DSH method. They were asked the age at which they first engaged in each DSH method, as well as their age at which they last did it. Lifetime duration was calculated by subtracting the youngest age from the oldest age reported.

Results

Preliminary Analyses

Prior to statistical analyses, the data were examined for missing data and outliers. There were relatively few cases of missing data (21 items altogether). Three missing data points on the Problem Solving Inventory were replaced by the sample means for the items. Two participants did not answer the general DSH item ("have you ever harmed yourself on purpose"); however, both participants reported numerous methods of self-harm. Thus, the missing data points were replaced with a code of 'yes' for the general DSH item. In addition, sixteen participants had difficulty completing frequency counts for annual DSH. When the researcher queried the participants regarding how many times they had harmed themselves, they could not quantify it. The researcher coded replacement data for annual DSH frequency based on individual respondents' responses to several items: number of methods reported in the past year, age first, and age last harmed. For example, if a participant had reported two or more methods of DSH in the past year or reported one type of harm but at two different ages, the response was coded

for 2-10 times harmed in the past year. After these calculations, there were no missing data points.

The data were checked for outliers, defined as scale scores more than three standard deviations from the sample mean. There were three outlying scores for social support satisfaction and one outlying score for depressed mood. These four outlying scores were assigned a raw score that was one unit larger than the next most extreme score in the distribution. This allowed outlying cases to remain in the analysis but reduced their impact (Tabachnick & Fidell, 1996).

The data were also examined regarding assumptions of multi-collinearity, normality, and linearity. There was no problem with multi-collinearity between any of the variables. That is, there were no correlations over 0.70 (see Table 2 for the correlation matrix of independent variables). Avoidance coping is not presented in Table 2, as it is simply the inverse of approach coping (i.e., the correlations for approach coping are exactly the same as avoidance coping but in the opposite direction). Normality was examined by assessing the distribution of residuals, skewness, kurtosis, and Kolmogorov-Smirnov statistics for all variables. All but two variables were satisfactory. First, social support satisfaction scores were skewed toward the negative end of the scale, with no scores reported on the positive end of the scale. Thus, statistical tests that do not assume normality of distributions were used in statistical analyses that included social support satisfaction. Second, the distribution of lifetime alcohol use scores showed that, of the seven original categories, by far the most frequently endorsed category was drinking '100 or more days' in their lifetime (n = 39, 45% of participants), which contributed to a skewed distribution and limited variability. Twenty-seven participants reported low levels

Table 2

Correlation Matrix of Independent Variables

Variables	Alcohol Use	Drug Use	SS Number	SS Satisfaction	Problem Solving	Approach Coping	Duration
Depressed Mood	0.20	***0.37	-0.20	*0.23	***-0.37	***-0.43	**-0.31
Lifetime Alcohol Use		0.20	0.03	-.05	-0.01	-0.19	-0.12
Lifetime Drug Use			0.10	0.03	-0.21	*-0.23	**-0.30
Social Support Number				***-0.34	0.05	0.70	-0.16
Social Support Satisfaction					0.11	-0.08	0.05
Problem Solving Confidence						***0.61	0.13

Note: SS Number = Social Support Number; SS Satisfaction = Social Support Satisfaction; Problem Solving = Problem Solving Confidence
* = $p \leq .05$
** = $p \leq .01$
*** = $p \leq .001$

of alcohol use within the past year (4 reported drinking 1-2 days, 7 reported drinking 3-9 days, 5 reported drinking 10-19 days, and 11 reported drinking 20-39 days). In order to correct the distribution problem, the four least-endorsed alcohol use categories (1-2 times, 3-9 times, 10-19 times, and 20-39 times), besides 'no alcohol use,' were collapsed into one category ('1 to 39 days'), reducing the number of categories from seven to four. The revised categories were: no alcohol use (n = 3); mild alcohol use of 1-39 days (n = 27); moderate alcohol use of 40-99 days (n = 18); and heavy alcohol use of over 100 days (n = 39). This corrected the distribution issue as much as possible and no log transformations of the data were necessary. In addition, statistical tests that do not assume normality of distributions were utilized for analyses that included variables of a categorical nature, including analyses in which alcohol use was a variable.

Independent Variables

Table 3 presents descriptive statistics for risk and protective factors.

Risk factors.

The first risk factor, depressed mood, was measured using the Children's Depression Inventory (CDI). In the current study, a Chronbach's alpha of .81 indicated excellent internal consistency for the total CDI scale. The average CDI score (M = 13.5, SD = 7.88) indicates a mildly depressed sample, with 56% of offenders scoring 11 or higher (the cut-off score for mild depression). Forty-four percent of offenders reported no depressed mood, 30% reported mild symptoms of depressed mood, and 26% reported moderate to severe symptoms of depressed mood. Of the participants who scored 11 or higher (indicating at least mild depressive symptoms), 88% (n = 43) reported DSH within

Table 3

Means and Standard Deviations for the Independent Variables by Total Sample and Gender

	Total Sample (N = 87)		Males (*n* = 36)		Females (*n* = 51)	
	M	SD	M	SD	M	SD
Risk Factors						
Depressed mood	13.5	7.88	10.3	7.71	15.7	7.31
Lifetime Alcohol Use	2.1	0.95	1.9	0.94	2.2	0.95
Lifetime Drug Use	13.6	4.32	11.5	1.92	15.1	4.9
Protective Factors						
Social Support Number	20.4	11.83	18.2	11.27	21.9	12.08
Social Support Satisfaction	11.2	4.63	11.4	4.89	11.1	4.47
Approach Coping	38.0	8.44	40.6	7.49	36.2	8.65
Problem-solving Confidence	28.9	9.60	32.4	7.97	26.4	9.96
Avoidance Coping	42.0	8.44	39.4	7.49	43.8	8.65
Duration (*n* = 70; 23 males; 47 females)	3.5	2.66	3.2	3.17	3.6	2.39

the past year, whereas only 12% (n = 6) reported no harm. Depression scores for offenders who reported DSH within the past year ranged from 2-37, with 66% of offenders scoring greater than 10.

The second risk factor, lifetime alcohol use, was derived from a question on the Youth Risk Behaviour Survey. Forty-six percent of offenders reported having their first drink between ages 11 and 12, with another 31% reporting a first drink between ages 13 and 14. Only three participants (3%) reported never drinking alcohol. Thirty-one percent of offenders reported mild alcohol use (1-39 days) and 21% reported moderate alcohol use (40-99 days). A large proportion of participants (45%) reported heavy alcohol use (over 100 days). Overall, there was limited variability in lifetime alcohol use (M = 2.9, SD = 1.27) due to its high prevalence, which affected analyses of the hypotheses involving this variable. It was difficult to determine if alcohol use had the hypothesized effect on the dependent variables due to the low number of offenders who did not report alcohol use.

The third risk factor, lifetime drug use, was derived from five questions on the Youth Risk Behaviour Survey. All of the participants in the sample reported using drugs during their lifetime. Marijuana was the most commonly used drug (95% of offenders), with 74% of the sample reporting using marijuana on 100 days or more during their lifetime. Cocaine was used by 63% of offenders. Methamphetamine use was reported by 37% of participants. Heroin and inhaling substances were the least common types of drug use, with 9% of participants reporting heroin use and 3% of participants reporting inhaling glue, aerosol spray can contents, or paints. For analyses, responses to the five drug questions were added together to create an overall lifetime drug use score (M = 13.6,

SD = 4.32). In the current study, a Chronbach's alpha of .448 indicated poor internal consistency over the five drug questions likely due to the limited use of heroin and inhalants in the current sample.

Protective factors.

The first two protective factors, social support availability (number) and social support satisfaction, were derived from the Social Support Questionnaire (SSQ). Social support availability reflects the number of people perceived to be available for support over six situations. In the current study, a Chronbach's alpha of .90 indicated excellent internal consistency. The mean score of 20.4 (SD = 11.83) indicated that, on average, participants perceived approximately three people who could be available to provide support in each situation. However, examination of frequency counts revealed that 74% of offenders had scores in the lower half of the range (scores of 0-27) reflecting low levels of embeddedness and numbers of available supportive people. Thus, the mean score does not adequately reflect the low level of social support availability experienced, in general, by this group of offenders. Offenders listed parents (77%, *n* = 67), other relatives (69%, *n* = 60), friends (69%, *n* = 60), romantic partners (36%, *n* = 30), Manitoba Youth Centre staff/guards (24%, *n* = 21), and social workers/counselors (20%, *n* = 17) as people they could count on for support.

Social support satisfaction reflects the level of satisfaction with support received in the same six situations. A Chronbach's alpha of .83 indicated excellent internal consistency. Overall, 66% of offenders were very dissatisfied, 26% were dissatisfied, and 8% were neutral (between dissatisfied and satisfied) with the support they received from others. There were no scores on the positive end of the scale, leading to a skewed

distribution that affected analyses. In recognition of this problem, statistical tests that do not assume normality of distributions were used. The sample's average score of 11.2 (*SD* = 4.64) over the six situations translates into a score of 2 on the 1 (very dissatisfied) to 6 (very satisfied) scale, indicating overall dissatisfaction with the social support they received.

The next two protective factors were measured using the Problem-Solving Inventory – Adolescent version (PSI). The approach-avoidance and problem-solving confidence sub-scale scores were used in analyses. Scores were reversed from the original scoring method, so that higher scores indicated more approach coping and more problem-solving confidence. There was acceptable internal consistency for the Approach/Avoidance scale, with a Cronbach's alpha of .55. When the mean score (*M* = 38, *SD* = 8.44) for approach coping is interpreted using the 0 ('really disagree') to 5 ('really agree') scale, participants, on average, reported disagreeing 'a little' with using approach coping strategies. Approximately half of the approach coping scores (52%) fell in the middle of the scale (agree or disagree 'a little'), with approximately an equal number of scores falling on the positive and negative ends of the scale. Overall, approach coping scores indicated that participants used a combination of approach and avoidance coping strategies with a slight tendency to utilize more avoidance strategies.

Problem-solving confidence scores (*M* = 28.9, *SD* = 9.60), on average, also fell in the middle of the 0-5 scale. Forty-six percent of problem-solving confidence scores fell in the middle of the scale (agree or disagree a little), with similar numbers of participants falling on positive and negative ends of the scale. According to the distribution of problem-solving scores, 29% of the sample reported being at least 'a little' confident in

solving problems. Overall, it appears that this group of offenders was not confident in their ability to solve problems. There was excellent internal consistency for the problem-solving confidence scale with a Cronbach's alpha of .82.

Avoidance coping strategies.

Avoidance coping was measured using the PSI. For the purpose of analyses, the approach-avoidance sub-scale was used to measure avoidance coping, the same sub-scale used to measure approach coping. However, to be consistent with the scoring of other avoidance behaviours (that is, lifetime alcohol use and lifetime drug use) the original scoring method was utilized (that is, scores were not reversed as they were for the approach coping variable) so that higher scores indicated more avoidance coping (M = 42, SD = 8.44). As with approach coping, the mean score is indicative of a sample that utilizes a mixture of avoidance and approach coping strategies, with a tendency to utilize more avoidance coping strategies.

Duration.

Duration of DSH was derived from two questions on the Deliberate Self-Harm Checklist. Duration was calculated by taking the age of the participant at the last time they harmed, minus the age of first harm. Responses were then coded as '0' if the participant reported DSH on only one occasion or using multiple DSH methods for less than one year. The remaining responses were coded according to the interval between first and last DSH ('1' for one year, '2' for two years, etc.). The youngest reported starting age was 5-years-old, whereas the oldest starting age was 16 years. Age of last harm ranged from 11-18 years of age. Duration ranged from harming less than one year to 11 years, with: 13% (n = 9) of participants reporting DSH for less than one year; 7% (n

= 5) for 1 year; 20% (*n* = 14) for 2 years; 23% (*n* = 16) for 3 years; 13% (*n* = 9) for 4 years; 3% (*n* = 2) for 5 years; 8% (*n* = 6) for 6 years; 1% (*n* = 1) for 7 years; 6% (*n* = 4) for 8 years; 3% (*n* = 2) for 9 years, and 3% (*n* = 2) for 11 years. The average duration of DSH for offenders reporting lifetime harm (*n* = 70) was three and a half years (*M* = 3.5, *SD* = 2.66). Sixty-seven percent (*n* = 47) of participants continued to engage in DSH at the date of the survey. Twenty-six percent (*n* = 18) of participants had not harmed for one year. Of the remainder, 3% (*n* = 2) had not harmed for two years, 3% (*n* = 2) had not harmed for three years, and 1% (*n* = 1) had not harmed for four years. Although 13% (*n* = 9) of lifetime self-harmers engaged in DSH over a short period of time (less than one year) and then stopped, most participants repetitively engaged in DSH over many years.

Deliberate Self-Harm

Prevalence rates.

Lifetime, annual, and incarceration (i.e., while incarcerated) prevalence rates of DSH are presented in Table 4. Lifetime prevalence was examined using two measurement methods. The first method was through the use of a general question. In response to the general question, "have you ever harmed yourself on purpose?," 53% (*n* = 46) of the sample indicated 'yes' (33% of males; 67% of females). This is a high rate of DSH compared to previous self-reported lifetime rates for offenders (Matsumoto et al., 2005; Matsumoto et al., 2009; Morgan & Hawton, 2004; Penn et al., 2003). Previous lifetime prevalence rates ranged from 13% in a male sample (Matsumoto et al., 2009) to 39% in a mixed male and female sample (Matsumoto et al., 2005).

Table 4

Lifetime, Annual, and Incarcerated DSH Prevalence Rates Based on the General Question and the Checklist by Total Sample and Gender

	Total (N = 87)	**Males (*n* = 36)**	**Females (*n* = 51)**
General question			
Ever Harmed Self on Purpose?	53%	33%	67%
Specific Methods on DSH Checklist			
Lifetime DSH	81%	64%	92%
Annual DSH	74%	53%	88%
Incarcerated DSH	51%	42%	57%

The second measurement method used the Deliberate Self-Harm Checklist, developed for this research project, to determine whether participants had ever engaged in DSH. The lifetime DSH scale displayed excellent internal consistency with a Cronbach's alpha of .83. When assessed by specific methods, the lifetime prevalence rate increased to 81% (*n* = 70) of participants (64% of males; 92% of females). Participants who reported lifetime harm on the general question also reported harm for specific DSH methods on the checklist. However, 28% (*n* = 24) of the sample reported lifetime prevalence on the checklist but not on the general question. Of the harmers who reported DSH on the checklist but not on the general question, 66% (*n* = 16) used two or more DSH methods in their lifetime and reported one or more years duration of harm. Thus, 28% of the sample, many of whom were repeat harmers, would have been incorrectly classified as non-harmers had only the general question been used to measure DSH.

Annual and incarceration prevalence rates were also measured using the Deliberate Self-Harm Checklist (see Table 4). The annual and incarceration DSH scales yielded good to excellent internal consistencies (Cronbach's alphas of .83 and .75 for annual and incarceration respectively). Overall, 74% of participants (53% of males; 88% of females) reported DSH within the past 12 months (i.e., annual DSH). Rates of annual DSH were much higher than the 9% annual rate reported by Morgan and Hawton (2004). Participants also reported whether they had engaged in DSH while incarcerated at the institution. Approximately half (51%) of the total sample (42% of males; 57% of females) reported deliberately harming themselves while in custody. Incarceration rates of DSH were much higher in this study than the 30% who reported DSH in Penn et al.'s (2003) study of male offenders.

Main methods of DSH.

Table 5 presents prevalence rates of DSH types/methods by time period. Participants reported using approximately four and a half DSH methods in their lifetime. The most common methods were carving words or pictures into the skin (54%) and hitting objects (52%). When methods were aggregated into general DSH types, self-laceration was the most common DSH type (71% of the whole sample) followed by self-battery (63%) and self-poisoning (47%).

Participants who reported DSH during their lifetime (n = 70) indicated using six DSH methods on average (M = 6.1, SD = 3.40). Of the 70 offenders who reported DSH in their lifetime, the most common method reported was carving words or pictures into the skin (67% of lifetime harmers), followed by hitting objects to hurt self (64%), and cutting the skin (60%). When methods were aggregated into general DSH types, self-laceration (87%) was the most common type, followed by self-battery (79%), and self-poisoning (59%).

The 64 offenders who engaged in DSH within the past year (annual DSH), reported an average of five methods (M = 4.9, SD = 3.06). The most commonly reported method of DSH used in the past year was hitting objects (63%), a self-battery method, followed by two self-laceration methods, namely cutting skin (56%) and carving skin (52%). When methods were aggregated into DSH types, self-laceration (81%) and self-battery (80%) were most common, followed more distantly by self-poisoning (47%).

Of the 44 offenders who reported DSH during their incarceration (incarcerated DSH) the average number of DSH methods used was three (M = 3.2, SD = 2.25). Seventy

Table 5

DSH Type/Method Prevalence Rates by Time Period

DSH Type/Method	Whole sample Lifetime DSH (N = 87)	Lifetime DSH (*n* = 70)	Annual DSH (*n* = 64)	Incarcerated DSH (*n* = 44)
Self-Laceration	71%	87%	81%	61%
Cut skin	48%	60%	56%	46%
Pricked skin	23%	29%	17%	14%
Burned skin	39%	49%	38%	2%
Carved words/pictures	54%	67%	52%	39%
Scratched skin	44%	54%	45%	25%
Bit skin	5%	6%	3%	5%
Self-Battery	63%	79%	80%	75%
Slapped or punched self	37%	46%	39%	30%
Pulled hair	23%	29%	27%	18%
Hit objects	52%	64%	63%	64%
Broke own bones	13%	16%	16%	11%
Banged head	22%	27%	22%	14%
Self-Poisoning	47%	59%	47%	9%
Not meant to be eaten	13%	16%	13%	5%
Swallowed medications	37%	46%	31%	5%
Used drugs to harm self	33%	41%	33%	2%
Toxic substances	5%	6%	5%	0%
# of Methods Reported				
Mean	4.5	6.1	4.9	3.2
Standard Deviation	3.5	3.4	3.1	2.3

percent of the youth reporting DSH while in custody used more than one DSH method. Similar to annual DSH, the most commonly reported method of DSH was hitting object (64%) followed by cutting (46%), and carving skin (39%). When methods were aggregated into DSH types, self-battery methods (75%) were most common, followed by self-laceration (61%). Self-poisoning methods (9%) were rarely used during incarceration likely due to their unavailability. Self-battery was likely used more than self-laceration due to limited availability in detention of tools used for self-laceration (e.g., cutting tools, matches and lighters).

Dependent Variables

Annual DSH frequency.

Annual DSH frequency was determined using the Deliberate Self-Harm Checklist. Responses were coded into one of four categories: none, harmed once, harmed 2-10 times, and harmed more than 10 times. See Table 6 for annual and incarcerated frequencies. Twenty-six percent (n = 23) of the sample reported no harm in the past year whereas, 6% (n = 5) reported harming once, 30% (n = 26) reported harming 2-10 times, and 38% (n = 33) reporting harming more than 10 times. The mean score for annual DSH frequency (M = 1.8, SD = 1.21) is indicative of a group of youth who harmed themselves frequently during the past year. Repetitive harm was very prevalent. Ninety-two percent of offenders reporting DSH in the past year had deliberately self-harmed more than once. Fifty-two percent of self-harming offenders engaged in extremely frequent DSH (i.e., more than 10 times).

Incarcerated DSH frequency.

Incarcerated (i.e., during period of incarceration) DSH frequency was derived from

Table 6

Annual and Incarcerated DSH Frequency

	Total Sample (N = 87)				**Self-Harmers** (Annual n = 64; Incarcerated n = 44)		
	None	Once	2-10 times	> 10 times	Once	2-10 times	> 10 times
Annual DSH Frequency	26%	6%	30%	38%	8%	40%	52%
Incarcerated DSH Frequency	49%	10%	18%	22%	21%	36%	43%

the Deliberate Self-Harm Checklist. Responses were coded into four categories: none, harmed once, 2-10 times, and more than 10 times. Approximately half of the participants reported none (49%, *n* = 43), whereas 10% (*n* = 9) reported harming once, 18% (*n* = 16) reported harming 2-10 times, and 22% (*n* = 19) reported harming more than 10 times (see Table 6). The mean score for incarcerated DSH frequency (*M* = 1.1, *SD* = 1.25) is indicative of a group of youth who harmed themselves repetitively (i.e., minimum 2-10 times) while incarcerated. Of the offenders who reported DSH while incarcerated (non-harmers excluded), 79% reported repetitive DSH (i.e., more than once), with 43% reporting extremely frequent DSH (i.e., over 10 times). These are alarming numbers given that offenders are under observation while incarcerated.

Medical Attention and Duration Variables

The following variables were derived from the sub-sample of participants who reported at least one incident of DSH in their lifetime (n = 70, males = 23, females = 47).

Warranted medical attention.

Warranted medical attention was derived from the Deliberate Self-Harm Checklist. One question asked whether or not they thought medical attention was ever warranted, even if they did not seek medical attention for DSH. Participants answered this question regarding each of the specific DSH methods they reported having used. Of the 70 offenders who reported DSH in their lifetime, 26% (*n* = 18) reported that they had never been hurt badly enough to warrant medical attention, whereas 74% (*n* = 52) indicated that they should have sought medical attention at least once (*M* = 0.7, *SD* = 0.44). Thus, three quarters of the youth who engaged in DSH during their lifetime reported harm that, in their opinion, was severe enough to warrant medical care. In addition, 63% of offenders

who engaged in DSH during their lifetime reported that medical attention was warranted on more than one occasion.

Received medical attention.

Received medical attention was derived from the Deliberate Self-Harm Checklist. One question asked whether or not they received medical attention for DSH (i.e., ever gone to see a doctor or nurse). Participants answered this question regarding each of the specific DSH methods they reported having used. Of the 70 offenders who reported DSH during their lifetime, 50% reported receiving medical attention at least once (M = 0.5, SD = 0.50). Specifically, 50% (n = 35) reported never receiving medical attention, 17% (n = 12) reported receiving medical attention once, and 33% (n = 23) reported receiving medical attention repetitively.

Hypothesis 1: General Question Versus Specific Methods

It was expected that incarcerated youth would be significantly more likely to report DSH in their lifetime on a behavioural measure of DSH (i.e., checklist of specific methods) rather than in response to a general DSH question. Table 7 presents response frequencies on the general and checklist DSH questions. Nineteen percent (n = 17) of offenders reported no DSH on both the general question and the checklist of specific DSH methods. Fifty-three percent (n = 46) of offenders reported DSH on both the general question and the checklist. All offenders who reported DSH on the general question also reported DSH on the checklist. Thus, 72% of offenders were consistent with their responses over two DSH measures. However, 28% (n = 24) of offenders were not consistent and reported DSH on the checklist but not on the general question. Of these 24

Table 7

Frequency of Offenders Reporting or Not Reporting Lifetime DSH on General and Specific (Checklist) DSH Measures

		DSH Checklist		
		No	Yes	Total
General DSH Question	No	17 (19.5%)	24 (27.5%)	41 (47.0%)
	Yes	0 (0.0%)	46 (53.0%)	46 (53.0%)
	Total	17 (19.5%)	70 (80.5%)	87 (100.0%)

offenders, 67% reported repetitive DSH (i.e., using two or more methods in their lifetime), 82% reported DSH within the past year, and 50% reported DSH while incarcerated. Thus, many of the offenders who reported 'no' on the general question, but 'yes' on the checklist, had engaged in DSH recently and repetitively.

A McNemar's test, a special chi square test for nominal data, was performed to determine whether participants were equally likely to report DSH on the general question as they were on a checklist of specific DSH methods. The McNemar's test is utilized in cases where multiple observations are from the same source (e.g., each participant answered both the general question and the DSH checklist). Prior to statistical analyses being conducted, a significance level of .05 was chosen for all analyses of hypotheses.

Reports of DSH were not equally distributed between the two measurement methods, χ^2 (1, N = 87) = 24.00, $p < .001$, providing support for Hypothesis 1. Offenders were significantly more likely to report DSH in their lifetime when specific methods were measured rather than on a general question. This finding illustrates the importance of defining DSH for participants rather than using general, ambiguous questions for assessing the presence of DSH. As a result, previous studies that relied on general questions for calculating prevalence rates have likely greatly underestimated rates of adolescent DSH.

Hypothesis 2: Risk Factors Relationship to Annual DSH Frequency

It was hypothesized that the three risk factors would, independently and in combination, differentiate between levels of annual frequency of DSH (i.e., none, once, 2-10 times, and more than 10 times).

To examine the relationship of each risk factor to annual DSH frequency, chi square univariate analyses were performed, using either the Kruskal-Wallis test or the Cochran-Mantel-Haenszel test depending on the type of data (e.g., continuous or categorical). The Kruskal-Wallis test does not assume that the sample scores are normally distributed and was used for continuous variables. The Cochran-Mantel-Haenszel test is a special chi square test used for ordinal data (e.g., discrete categories).

Depressed mood was examined first. Descriptive statistics are presented in Table 8. Mean scores for depressed mood were calculated for participants within each of the annual DSH frequency categories (i.e., none, once, 2-10 times, more than 10 times). Mean scores for depressed mood were lower for 'none' (M = 7.7) and 'once' (M = 7.8) annual frequency categories than for '2-10 times' (M = 14.5) and 'more than 10 times' (M = 17.4). Mean scores indicated that offenders who never harmed or harmed only once were, in general, not depressed. However, mean scores revealed that offenders who repetitively harmed (i.e., 2-10 times and more than 10 times) reported mild to moderately severe symptoms of depression. Results from the Kruskal-Wallis test indicated that depressed mood was able to differentiate between the different levels of annual DSH frequency, χ^2 (3, N = 87) = 26.61, $p < .001$. Increasing levels of depressed mood were associated with increasing levels of annual DSH frequency. Thus, as hypothesized, depressed mood differentiated between offenders with different annual DSH frequencies.

Lifetime alcohol use was examined next. Descriptive statistics are presented in Table 9. The Cochran-Mantel-Haenszel test result indicated that increasing levels of alcohol use (no alcohol, 1-39 days, 40-99 days, over 100 days) tended to be associated with increasing levels of DSH frequency, however results did not reach statistical

Table 8

Depressed Mood Descriptive Statistics by Annual DSH Frequency

	Depressed Mood				
Annual DSH Frequency	N	Mean	SD	Maximum	Minimum
None	23	7.7	6.12	26	0
Once	5	7.8	3.35	10	2
2-10 times	26	14.5	6.99	32	3
More than 10 times	33	17.4	7.48	37	2

Table 9

Lifetime Alcohol Use Descriptive Statistics for Annual DSH Frequency

		Lifetime Alcohol Use				
Annual DSH Frequency		No alcohol use	Mild (1 - 39 days)	Moderate (40 - 99 days)	Heavy (> 100 days)	Total
None	Frequency	1	9	4	9	23
	Percent	1%	11%	5%	10%	27%
Once	Frequency	1	2	2	0	5
	Percent	1%	2%	2%	0%	5%
2-10 times	Frequency	1	8	5	12	26
	Percent	1%	9%	6%	14%	30%
More than 10 times	Frequency	0	8	7	18	33
	Percent	0%	9%	8%	21%	38%
Total	Frequency	3	27	18	39	87
	Percent	3%	31%	21%	45%	100%

significance, χ^2 (3, N = 87) = 6.81, p = .08. The hypothesis that lifetime alcohol use would be positively related to annual DSH frequency was not confirmed. The analysis was likely affected by the restricted variability of lifetime alcohol use scores, with only 3% of participants reporting no alcohol use and 45% reporting heavy alcohol use. Lifetime drug use was examined last. Descriptive statistics are presented in Table 10. Mean scores for lifetime drug use were lower for 'none' (M = 11.7) and 'once' (M = 11.2) annual frequency categories than they were for the '2-10 times' (M = 13.7) and 'more than 10 times' (M = 15.4) categories. Results of the Kruskal-Wallis test indicated that lifetime drug use was able to differentiate between increasing levels of annual DSH frequency, χ^2 (3, N = 87) = 11.47, p < .01. As hypothesized, increasing scores for lifetime drug use were associated with increasing levels of annual DSH frequency.

To examine whether the three risk factors would in combination be able to differentiate between levels of annual DSH frequency, a multivariate logistic regression was performed. Logistic regression is a special type of regression analysis used when the dependent variable (i.e., DSH frequency) has discrete categories. In order to assess the risk factors' simultaneous associations with annual DSH frequency, all three risk factors were entered into the equation at the same time. Table 11 presents Wald Chi Square statistics from the regression analysis. Results indicated that depressed mood was the only predictor of annual DSH frequency. Lifetime alcohol and drug use were not significant contributors in the regression model. The hypothesis that the three risk factors would in combination differentiate between levels of annual DSH frequency was not supported.

Table 10

Lifetime Drug Use Descriptive Statistics for Annual DSH Frequency

	Lifetime Drug Use			
Annual DSH Frequency	Mean	SD	Maximum	Minimum
None	11.7	3.39	5.0	22.0
Once	11.2	1.48	9.0	13.0
2-10 times	13.7	4.09	7.0	23.0
More than 10 times	15.4	4.69	8.0	23.0

Table 11

Odds Ratio Estimates and Analysis of Effects for the Logistical Regression Model of Risk Factors and Annual DSH Frequency

	Odds Ratio Estimates			**Analysis of Effects**		
Effect	Point Estimates	95% Wald Confidence Limits Minimum	Maximum	Degrees of Freedom	Wald Chi Square	Significance
Depressed Mood	0.88	0.83	0.94	1	14.64	$p < .001$
Lifetime Alcohol Use				2	0.35	ns
Heavy vs. Mild	0.75	0.29	1.93			
Moderate vs. Mild	0.89	0.29	2.76			
Lifetime Drug Use	0.91	0.82	1.01	1	3.09	ns

Overall, Hypothesis 2 was only partially supported. Two of the three risk factors, depressed mood and lifetime drug use, were positively related to annual DSH frequency. As the level of the risk factor (i.e., depressed mood and lifetime drug use) increased in severity, so did the frequency of annual DSH. Results from the regression model indicated that the best predictor of annual DSH frequency was depressed mood, even when the other risk factors were considered. In this group of offenders, alcohol and drug use was very prevalent (e.g., only three participants did not report alcohol use). The high prevalence, and restricted variability, of alcohol and drug use likely affected the results. The hypothesis that the risk factors would, in combination, differentiate between different levels of annual DSH frequency was not supported.

The relationship of gender to annual DSH frequency was examined post hoc due to gender's association with DSH in previous research; that is, females have been found to have higher rates of DSH than males (Laukkanen et al., 2009; Madge et al., 2008; Sourander et al., 2006). However, these results should be interpreted cautiously, due to the imbalance in numbers of males and females in the current study. Table 12 provides gender frequencies for the categories of annual DSH frequency. Similar to previous findings, the Cochran-Mantel-Haenszel statistic indicated that gender was significantly related to annual DSH frequency, χ^2 (1, N = 87) = 14.99, $p < .001$. Males were more likely than females to report no annual harm, whereas females were more likely to report higher levels of DSH. As a result of this finding, gender was entered into the logistic regression analysis, simultaneously with all three risk factors, to determine the relationship of risk factors to annual DSH frequency with gender considered. Table 13

Table 12

Annual DSH Frequency by Gender

		Annual DSH Frequency				
Gender		None	Once	2-10 Times	>10 Times	Total
Male	Frequency	17	3	8	8	36
	Percent	20%	3%	9%	9%	41%
Female	Frequency	6	2	18	25	51
	Percent	7%	2%	21%	29%	59%
Total	Frequency	23	5	26	33	87
	Percent	27%	5%	30%	38%	100%

Table 13

Odds Ratio Estimates and Analysis of Effects for the Logistical Regression Model of Risk Factors, Gender, and Annual DSH Frequency

	Odds Ratio Estimates			**Analysis of Effects**		
Effect	Point Estimates	95% Wald Confidence Limits Minimum	Maximum	Degrees of Freedom	Wald Chi Square	Significance
Depressed Mood	0.89	0.84	0.95	1	12.17	$p < .001$
Gender	0.39	0.15	0.99	1	3.93	$p = .04$
Lifetime Alcohol Use				2	0.26	Ns
Heavy vs. Mild	0.94	0.31	2.84			
Moderate vs. Mild	1.20	0.38	3.76			
Lifetime Drug Use	0.94	0.84	1.05	1	1.28	Ns

presents statistics from the regression analysis. Results indicated that depressed mood and gender, together, were the best predictors of annual DSH frequency.

Hypothesis 3: Risk Factors Relationship to Incarcerated DSH

It was hypothesized that the three risk factors would, independently and in combination, differentiate between levels of incarcerated DSH (i.e., frequency of DSH while in custody). Approximately half (51%) of the offenders in this study reported DSH while in custody, compared to 74% who reported annual DSH. Changing the focus from annual to incarcerated DSH resulted in different youth comprising the target group, which required separate analyses for incarcerated and annual DSH frequencies. To examine the relationship of each risk factor to incarcerated DSH frequency, chi square univariate analyses were performed, using either the Kruskal-Wallis test or the Cochran-Mantel-Haenszel test depending on the type of data (e.g., continuous or categorical).

Depressed mood was examined first. Descriptive statistics for depressed mood are presented in Table 14. Mean scores for depressed mood were calculated for participants within each of the incarcerated DSH frequency categories (i.e., none, once, 2-10 times, more than 10 times). Mean scores for depressed mood increased from lower mean scores for the 'none' frequency category to higher mean scores for the 'more than 10 times' frequency category. Mean scores indicated that offenders in the 'none' and 'once' categories were mildly depressed, whereas offenders who repetitively harmed were moderately depressed. The Kruskal-Wallis test indicated that depressed mood was able to differentiate between the different levels of incarcerated DSH frequency, χ^2 (3, N = 87) = 11.35, p = .01. Results indicated that increasing levels of depressed mood were associated with increasing frequency of DSH while incarcerated. Similar to the findings for annual

Table 14

Depressed Mood Descriptive Statistics for Incarcerated DSH Frequency

	Depressed Mood				
Incarcerated DSH Frequency	N	Mean	Standard Deviation	Maximum	Minimum
None	43	11.0	7.74	0	32
Once	9	13.7	6.10	6	23
2-10 times	16	15.1	7.35	3	29
More than 10 times	19	17.6	7.76	2	37

DSH frequency, higher levels of depressed mood were directly related to more frequent DSH while incarcerated. These results provide support for Hypothesis 3.

Lifetime alcohol use as a predictor of incarcerated DSH was examined next. Descriptive statistics are presented in Table 15. The distribution of frequencies indicates that alcohol use was just as, if not more, frequent for non-harmers than it was for repetitive harmers. Although the three offenders who reported no alcohol use also reported no DSH, alcohol use frequencies for non-harmers were fairly equally distributed across the mild, moderate, and heavy use categories. It was expected that non-harmers would be more highly represented in the no alcohol use and mild use categories whereas, repetitive harmers would be highly represented in the moderate and heavy use categories. However, this was not the case. The Cochran-Mantel-Haenszel test indicated that increasing levels of alcohol use (no alcohol, 1-39 days, 40-99 days, over 100 days) were not associated with increasing levels of incarcerated DSH frequency, χ^2 (3, N = 87) = 4.98, *ns*. The analysis was likely affected by the restricted variability of lifetime alcohol use scores. The hypothesis that lifetime alcohol use would be positively related to incarcerated DSH frequency was not supported.

Lifetime drug use as a predictor of incarcerated DSH was examined last. Descriptive statistics are presented in Table 16. Mean scores for lifetime drug use were similar for all levels of incarcerated DSH frequency. Results of the Kruskal-Wallis test indicated that lifetime drug use was not able to differentiate between increasing levels of incarcerated DSH frequency, χ^2 (3, N = 87) = 2.89, *ns*. These results do not provide support for Hypothesis 3.

Table 15

Lifetime Alcohol Use Descriptive Statistics for Incarcerated DSH Frequency

		Lifetime Alcohol Use				
Incarcerated DSH Frequency		**No alcohol use**	**Mild (1 - 39 days)**	**Moderate (40 - 99 days)**	**Heavy (> 100 days)**	**Total**
None	Frequency	3	14	10	16	43
	Percent	3%	16%	12%	19%	50%
Once	Frequency	0	1	1	7	9
	Percent	0%	1%	1%	8%	10%
2-10 times	Frequency	0	7	1	8	16
	Percent	0%	8%	1%	9%	18%
More than 10 times	Frequency	0	5	6	8	19
	Percent	0%	6%	7%	9%	22%
Total	Frequency	3	27	18	39	87
	Percent	3%	31%	21%	45%	100%

Table 16

Lifetime Drug Use Descriptive Statistics for Incarcerated DSH Frequency

	Lifetime Drug Use				
Incarcerated DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	43	13.2	4.63	5	23
Once	9	14.6	4.03	10	22
2-10 times	16	13.2	3.76	8	20
More than 10 times	19	14.6	4.25	10	23

To examine whether the three risk factors would in combination be able to differentiate between levels of incarcerated DSH frequency, a multivariate logistic regression was performed. In order to assess the risk factors' simultaneous associations with incarcerated DSH frequency, all three risk factors were entered into the equation at the same time. Table 17 presents statistics from the regression analysis. Results indicated that depressed mood was the only significant predictor of incarcerated DSH frequency. Lifetime alcohol and drug use were not significant contributors in the regression model.

The relationship of gender to incarcerated DSH frequency was also examined post hoc due to gender's association with DSH in previous research (Laukkanen et al., 2009; Madge et al., 2008; Sourander et al., 2006). Table 18 provides gender frequencies for the categories of incarcerated DSH frequency. The Cochran-Mantel-Haenszel statistic indicates that gender was not significantly related to incarcerated DSH frequency, χ^2 (1, N = 87) = 0.63, *ns*. Unlike the findings for annual DSH frequency, males and females were found to report similar amounts of DSH while incarcerated.

Overall, Hypothesis 3 was largely unsupported. It was hypothesized that the three risk factors would, independently and in combination, differentiate between offenders with different frequencies of DSH while incarcerated. Only one of the three risk factors, depressed mood, was found to be independently positively related to incarcerated DSH frequency. As the level of depressed mood increased in severity, so did the frequency of incarcerated DSH. Results from the multiple regression model indicated that depressed mood remained a significant predictor of incarcerated DSH frequency, even when the other risk factors were considered. Again, however, alcohol and drug use were very prevalent, which likely affected their ability to predict incarcerated DSH frequency.

Table 17

Odds Ratio Estimates and Analysis of Effects for the Logistical Regression Model of Risk Factors and Incarcerated DSH Frequency

	Odds Ratio Estimates			**Analysis of Effects**		
Effect	Point Estimates	95% Wald Confidence Limits Minimum	Maximum	Degrees of Freedom	Wald Chi Square	Significance
Depressed Mood	0.91	0.86	0.97	1	9.46	p = .002
Lifetime Alcohol Use				2	0.12	ns
Heavy vs. Mild	0.88	0.34	2.27			
Moderate vs. Mild	0.83	0.26	2.58			
Lifetime Drug Use	1.01	0.92	1.12	1	0.06	ns

Table 18

Cell Frequencies/Percents for Incarcerated DSH Frequency by Gender

		Incarcerated DSH Frequency				
Gender		None	Once	2-10 Times	>10 Times	Total
Male	Frequency	21	2	5	8	36
	Percent	24%	2%	6%	9%	41%
Female	Frequency	22	7	11	11	51
	Percent	25%	8%	13%	13%	59%
Total	Frequency	43	9	16	19	87
	Percent	49%	10%	19%	22%	100%

Hypothesis 4: Protective Factors Relationship to Annual DSH Frequency

It was hypothesized that the four protective factors (i.e., social support availability, social support satisfaction, approach coping, and problem-solving confidence) would, independently and in combination, distinguish between different frequencies of annual DSH. It was expected that higher levels of social support availability, social support satisfaction, approach-coping, and problem-solving confidence would each be inversely related to annual DSH frequency; that is, as scores on the protective factors increased, scores on annual DSH frequency would decrease. To examine the relationship of each protective factor to annual DSH frequency, chi square univariate analyses were performed, using the Kruskal-Wallis test.

Social support availability was examined first. Descriptive statistics for social support availability and satisfaction are presented in Table 19. Results of the Kruskal-Wallis test indicated that social support availability was not able to differentiate between different levels of annual DSH frequency, χ^2 (3, N = 87) = 3.21, *ns*. Although there was a full range of scores (0-54), most fell in the lower half of the range, which likely affected the results. The means for social support availability were essentially equal across annual DSH categories. However, there was a slight increase in scores as DSH frequency increased. This indicates a possible trend in the opposite direction from what was expected. Thus, social support availability did not serve as a protective factor against annual DSH frequency.

Social support satisfaction was examined next. Results of the Kruskal-Wallis test indicate that social support satisfaction was not able to differentiate between different levels of annual DSH frequency, χ^2 (3, N = 87) = 0.27, *ns*. Mean scores for social support

Table 19

Descriptive Statistics for Social Support Availability and Satisfaction by Annual DSH Frequency

			Social Support Availability		
Annual DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	23	17.7	18.0	0	54
Once	5	19.8	18.0	8	38
2-10 Times	26	19.7	17.5	6	49
More than 10 times	33	22.9	24.0	0	52
			Social Support Satisfaction		
Annual DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	23	11.3	12.0	6	22
Once	5	9.8	9.0	7	16
2-10 Times	26	11.0	9.5	6	22
More than 10 times	33	11.5	11.0	6	22

satisfaction on the different levels of annual DSH frequency were essentially equal. Social support satisfaction scores were skewed toward the negative end of the scale, with no scores reported on the positive end of the scale. Thus, there was a truncated distribution that likely made it difficult to detect a relationship between social support satisfaction and annual DSH frequency. A striking finding for this group of offenders was their overall dissatisfaction with social support.

Approach coping was examined next. Descriptive statistics for approach coping and problem-solving confidence are presented in Table 20. Cell means revealed that greater use of approach coping strategies was associated with never harming or harming only once, whereas less approach coping was associated with repeated DSH. Results of the Kruskal-Wallis test indicate that approach coping was able to differentiate between different levels of annual DSH frequency, χ^2 (3, N = 87) = 16.00, p = .001. Visual examination of the means indicate that, as approach coping increased, annual DSH frequency decreased. Thus, the hypothesis that approach coping is inversely related to annual DSH frequency was supported.

Lastly, problem-solving confidence was examined. Cell means indicate that the most confident problem-solvers had never engaged in DSH. On the other hand, offenders who engaged in DSH, whether once or repeatedly, were less confident in their ability to solve problems. Results of the Kruskal-Wallis test indicate that problem-solving confidence was not able to differentiate between the different levels of annual DSH frequency, χ^2 (3, N = 87) = 6.67, $p < .10$. Problem-solving confidence was not significantly different between the four categories of annual DSH frequency.

Table 20

Descriptive Statistics for Approach Coping and Problem Solving Confidence by Annual DSH Frequency

			Approach Coping		
Annual DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	23	41.8	7.45	24	55
Once	5	45.6	5.27	39	53
2-10 Times	26	35.1	9.01	13	56
More than 10 times	33	36.5	7.59	21	59
			Problem-Solving Confidence		
Annual DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	23	32.8	8.02	20	52
Once	5	26.4	2.61	24	30
2-10 Times	26	27.9	10.20	3	55
More than 10 times	33	27.3	10.29	10	50

To examine whether the four protective factors would, in combination, be able to differentiate between levels of annual DSH frequency, a multivariate logistic regression was performed. All four protective factors were entered into the equation at the same time to assess their simultaneous associations with annual DSH frequency. Table 21 presents statistics from the regression analysis. Results indicate that the only significant predictor of annual DSH frequency was social support availability. Overall, of the four protective factors, only approach coping was found to be inversely related to annual DSH frequency. However, when all four protective factors were entered into regression analysis, approach coping style did not contribute to annual DSH frequency. Rather, only social support availability was a significant predictor of annual DSH frequency. Although social support availability was not independently related to annual DSH frequency, when it was combined with the protective factors in regression analysis it became a significant predictor. This may be partially influenced by social support availability's direct relationship with annual DSH frequency, in contrast to the inverse trend for the other protective factors.

Post hoc correlations were conducted for the protective variables and annual DSH frequency (Table 22). Social support availability was not significantly correlated with annual DSH frequency. However, the correlation was in a positive direction and not inverse as was hypothesized. The coping-related protective factors (i.e., approach coping and problem-solving confidence) both had statistically significant, inverse relationships with annual DSH frequency. The direction of the relationships between the protective factors and annual DSH frequency may have affected regression results, with the most direct relationship, even though not independently significant, becoming a predictor in

Table 21

Odds Ratio Estimates and Analysis of Effects for the Logistical Regression Model of Protective Factors and Annual DSH Frequency

	Odds Ratio Estimates			**Analysis of Effects**		
Effect	Point Estimates	95% Wald Confidence Limits		Degrees of Freedom	Wald Chi Square	Significance
		Minimum	Maximum			
Social Support Availability	0.96	0.83	1.00	1	4.42	p = .03
Social Support Satisfaction	0.97	0.88	1.06	1	0.52	ns
Approach Coping Style	1.06	0.99	1.12	1	3.38	ns
Problem Solving Confidence	1.01	0.96	1.07	1	0.20	ns

Table 22

Protective Factors Correlations with Annual DSH Frequency

	Annual DSH Frequency	
Protective Factor	Pearson Correlation	Significance (two-tailed)
Social Support Availability	0.17	0.114
Social Support Satisfaction	0.24	0.823
Approach Coping	-0.30	0.005**
Problem-Solving Confidence	-0.22	0.041*

Note:
* = $p \leq .05$
** = $p \leq .01$
*** = $p \leq .001$

the regression model. In general, participants in this study reported very low levels of protective factors, which likely affected the outcome of statistical analyses. Overall, Hypothesis 4 was only minimally supported.

The relationship of gender, in combination with protective factors, for predicting annual DSH frequency was examined post hoc due to gender's association with annual DSH in the current research, as well as in previous research (Laukkanen et al., 2009; Madge et al., 2008; Sourander et al., 2006). Gender was entered into the regression equation simultaneously with the four protective factors. Regression statistics are presented in Table 23. Results indicated that, when gender was entered into the regression, it was the only predictor of annual DSH frequency. As reported in the risk factors section (Table 13), being female is directly related to higher frequencies of annual DSH. When gender is considered, none of the protective factors were found to be significant contributors in the regression model. Again, this is likely affected by the very low levels of the protective factors reported by participants in the current study. Thus, the hypothesis that the four protective factors would in combination be significantly related to annual DSH frequency was also not supported when gender was considered.

Hypothesis 5: Protective Factors Relationship to Incarcerated DSH Frequency

It was hypothesized that the four protective factors would, independently and in combination, distinguish between different frequencies of incarcerated DSH. It was expected that higher levels of social support availability, social support satisfaction, approach-coping, and problem-solving confidence would each be inversely related to incarcerated DSH; that is, as scores on the protective factors increased, scores on incarcerated DSH frequency would decrease. Approximately half (51%) of offenders in

Table 23

Odds Ratio Estimates and Analysis of Effects for the Logistical Regression Model of Protective Factors, Gender, and Annual DSH Frequency

	Odds Ratio Estimates			**Analysis of Effects**		
Effect	Point Estimates	95% Wald Confidence Limits		Degrees of Freedom	Wald Chi Square	Significance
		Minimum	Maximum			
Gender	0.26	0.11	0.64	1	8.79	$p < .01$
Social Support Availability	0.97	0.93	1.01	1	2.80	Ns
Social Support Satisfaction	0.97	0.88	1.06	1	0.58	Ns
Approach Coping Style	1.05	0.99	1.11	1	2.27	Ns
Problem Solving Confidence	1.00	0.95	1.06	1	0.01	Ns

this study reported DSH while in custody, compared to 74% who reported annual DSH. Changing the focus from annual to incarcerated DSH resulted in different youth comprising the target group, which required separate analyses for incarcerated and annual DSH frequencies. To examine the relationship of each protective factor to incarcerated DSH frequency, chi square univariate analyses were performed, using the Kruskal-Wallis test.

Social support availability was examined first. Descriptive statistics for social support availability and satisfaction are presented in Table 24. Similar to the results for annual DSH frequency, there was a trend in the opposite direction as hypothesized. Lower social support availability scores were observed for non-harming offenders whereas, the highest mean scores were observed for the groups who harmed only once and those who harmed more than 10 times. Results of the Kruskal-Wallis test indicted that social support availability was not able to differentiate between the different levels of incarcerated DSH frequency, χ^2 (3, N = 87) = 4.09, *ns*. Although there was a full range of scores (0-54) for social support availability, most of the scores fell within the lower half of the range. Overall, this group of offenders did not perceive a lot of available supportive people. As a result, social support availability was not inversely related to incarcerated DSH frequency.

Social support satisfaction was examined next. Consistent with the results for annual DSH frequency, mean scores were similar across incarcerated DSH frequency categories. Results of the Kruskal-Wallis test indicate that social support satisfaction was not able to differentiate between different levels of incarcerated DSH frequency, χ^2 (3, N = 87) = 1.57, *ns*. Social support satisfaction scores were skewed toward the negative end

Table 24

Descriptive Statistics for Social Support Availability and Satisfaction by Incarcerated DSH Frequency

			Social Support Availability		
Incarcerated DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	43	18.0	11.52	0	54
Once	9	23.7	13.13	9	49
2-10 Times	16	20.3	7.53	6	37
More than 10 times	19	24.3	14.14	3	52
			Social Support Satisfaction		
Incarcerated DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	43	11.6	5.02	6	22
Once	9	9.7	3.87	6	16
2-10 Times	16	11.5	3.74	6	19
More than 10 times	19	10.8	4.84	6	22

of the scale, with no scores reported on the positive end of the scale. Thus, there was a truncated distribution that likely made it difficult to detect a relationship between social support satisfaction and incarcerated DSH frequency. Social support satisfaction was not inversely related to incarcerated DSH frequency.

Approach coping was examined next. Descriptive statistics for approach coping and problem-solving confidence are presented in Table 25. Cell means across incarcerated DSH frequency categories indicated that non-harmers reported more use of approach coping than harmers. However, the approach coping mean score for extremely repetitive harmers (more than 10 times) was the highest of the DSH frequency categories (i.e., once, 2-10 times, and more than 10 times). Thus, although there was a trend for non-harmers to report more approach coping than harmers, approach coping mean scores did not exponentially decrease with greater levels of DSH frequency. Results of the Kruskal-Wallis test indicated that approach coping was able to differentiate between the different levels of incarcerated DSH frequency, χ^2 (3, N = 87) = 12.17, $p < .05$. Overall, the hypothesis that approach coping was inversely related to incarcerated DSH frequency was supported.

Lastly, problem-solving confidence was examined. Inspection of cell means for problem-solving confidence by category of incarcerated DSH frequency indicated that levels of problem-solving confidence were similar across the frequency categories, with the exception of harming 2-10 times, which had a slightly lower mean score than the rest of the categories. Results of the Kruskal-Wallis test indicated that problem-solving confidence was not able to differentiate between different levels of incarcerated DSH

Table 25

Descriptive Statistics for Approach Coping and Problem Solving Confidence by Incarcerated DSH Frequency

			Approach Coping		
Incarcerated DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	43	40.5	9.22	20	59
Once	9	34.2	6.61	22	43
2-10 Times	16	33.6	7.69	13	51
More than 10 times	19	37.9	5.84	26	46
			Problem-Solving Confidence		
Incarcerated DSH Frequency	N	Mean	Standard Deviation	Minimum	Maximum
None	43	30.1	8.67	16	52
Once	9	29.6	13.70	10	55
2-10 Times	16	25.9	9.50	3	38
More than 10 times	19	28.4	9.71	14	50

frequency, χ^2 (3, N = 87) = 1.32, *ns*. Problem-solving confidence was not inversely related to incarcerated DSH frequency.

To examine whether the four protective factors would, in combination, be able to differentiate between levels of incarcerated DSH frequency, a multivariate logistic regression was performed. All four protective factors were entered into the equation at the same time to assess their simultaneous associations with incarcerated DSH frequency. Table 26 presents statistics from the regression analysis. Similar to the results for annual DSH frequency, the only significant predictor of incarcerated DSH frequency was social support availability. Post hoc correlations were conducted for the protective variables and incarcerated DSH frequency (Table 27). Social support availability was not significantly correlated with incarcerated DSH frequency. However, the correlation was in a positive direction and not inverse as was hypothesized. When correlated with incarcerated DSH frequency, the three other protective factors all had relationships in the inverse direction, although the only statistically significant relationship was between approach coping and incarcerated DSH frequency. The direction of the relationships between the protective factors and incarcerated DSH frequency may have affected the regression results, with the only direct relationship becoming a predictor in the regression model. Overall, the hypothesis that the protective factors would, in combination, be able to differentiate between levels of incarcerated DSH frequency was not supported.

Similar to annual DSH frequency, of the four protective factors, only approach coping was found to be inversely related to incarcerated DSH frequency. However, when all four protective factors were entered into regression analysis, only social support

Table 26

Odds Ratio Estimates and Analysis of Effects for the Logistical Regression Model of Protective Factors and Incarcerated DSH Frequency

	Odds Ratio Estimates			**Analysis of Effects**		
Effect	Point Estimates	95% Wald Confidence Limits		Degrees of Freedom	Wald Chi Square	Significance
		Minimum	Maximum			
Social Support Availability	0.96	0.93	1.00	1	4.25	p = .03
Social Support Satisfaction	1.01	0.92	1.12	1	0.03	Ns
Approach Coping Style	1.06	1.00	1.13	1	3.29	Ns
Problem Solving Confidence	1.00	1.00	1.05	1	0.02	ns

Table 27

Protective Factors Correlations with Incarcerated DSH Frequency

	Incarcerated DSH Frequency	
Protective Factor	Pearson Correlation	Significance (two-tailed)
Social Support Availability	0.19	0.070
Social Support Satisfaction	-0.51	0.639
Approach Coping	-0.20	0.066
Problem-Solving Confidence	-0.12	0.291

Note:
* = $p \leq .05$
** = $p \leq .01$
*** = $p \leq .001$

availability was a significant predictor of incarcerated DSH frequency. In general, it appears that participants in this study had very low levels of all the protective factors, which likely affected the outcome of statistical analyses. Thus, Hypothesis 5 was only minimally supported.

Hypothesis 6: Avoidance Coping and Annual DSH

It was expected that offenders who reported annual DSH would report more avoidance coping than youth who did not report annual DSH. In order to examine this hypothesis, the Wilcoxon Two-Sample t-test, a non-parametric test that does not require the assumption of normality, was utilized. Descriptive statistics are presented in Table 28. For this analysis, participants were separated into youth who reported no harm in the past year (n =23) and youth who reported DSH (n = 64). Avoidance coping mean scores for the no harm and DSH groups indicated that youth who harmed had higher levels of avoidance coping than youth who did not harm. In fact, results indicated that avoidance coping was significantly related to annual DSH, with higher levels of avoidance coping associated with offenders who self-harmed, Wilcoxon $W = 714.0$, $p < .001$. Hypothesis 6 was supported.

Hypothesis 7: Duration and Medical Attention

It was expected that offenders who reported DSH that warranted medical attention would have engaged in DSH longer than those whose DSH did not warrant medical attention. Similarly, it was expected that offenders who reported receiving medical treatment for DSH would have engaged in DSH longer than those who did not receive medical attention.

These hypotheses were assessed using the Wilcoxon Two-Sample t-test in two

Table 28

Descriptive Statistics for Avoidance Coping by Annual DSH

	Avoidance Coping				
Annual DSH	N	Mean	SD	Minimum	Maximum
No	23	38.2	7.45	25	56
Yes	64	43.5	8.40	21	67

separate analyses, one for warranted medical attention and a second for received medical attention. The sample was restricted to offenders who had reported lifetime harm on the DSH checklist (n = 70; 23 males; 47 females). Results of the first analysis indicated that offenders who reported harm that warranted medical attention (n = 52, M = 3.7, SD = 2.11) were significantly more likely to have self-harmed for longer durations than offenders whose DSH did not warrant medical attention (n = 18, M = 2.6, SD = 2.48), Wilcoxon W *(two-sided)* = 460.5, $p < .05$.

Similar to the previous result, results of the second Wilcoxon two-sample t-test indicated that offenders who reported receiving medical treatment (n = 35, M = 3.9, SD = 2.24) were significantly more likely to have self-harmed than offenders who did not report receiving medical attention (n = 35, M = 3.0, SD = 2.18), Wilcoxon W = 1069.5, $p < .05$. Hypothesis 7 was supported. It is possible that severity of harm increases with duration, leading to more occasions that warrant medical attention, as well as actually receiving medical attention.

Hypothesis 8: Annual DSH and Medical Attention

It was expected that higher annual DSH frequency would be directly related to medical attention being warranted, as well as to receiving medical attention. The sample was restricted to offenders who had reported annual harm on the DSH checklist (n = 64; 19 males; 45 females). The Cochran-Mantel-Haenszel chi square statistic was used to assess this hypothesis in two separate analyses. The relationship of warranted medical attention and annual DSH frequency was assessed first. Cell and row/column frequencies are presented in Table 29. Cell frequencies reveal that warranting medical attention was highest for offenders who harmed more than 10 times (n = 31). In comparison, only two

Table 29

Cell and Total Frequencies/Percents for Annual DSH Frequency by Warranted Medical Attention

		Annual DSH Frequency			
Warranted Medical Attention		Once	2-10 Times	>10 Times	Total
No	Frequency	4	9	2	15
	Percent	6%	14%	3%	23%
Yes	Frequency	1	17	31	49
	Percent	2%	27%	48%	77%
Total	Frequency	5	26	33	87
	Percent	8%	41%	51%	100%

youth whose DSH did not warrant medical attention reported harming over 10 times. In addition, all but one offender who reported that DSH warranted medical attention also reported repetitive harm. Chi square results indicate a significant difference between groups, χ^2 (1, N = 64) = 15.62, $p < .001$. Warranting and not warranting medical attention differentiated between different levels of annual DSH frequency. Visual inspection of cell frequencies indicated that warranting medical attention was directly related to increasing frequency of annual DSH. In particular, 31 of 33 offenders reporting DSH 10 or more times stated that medical attention was warranted on at least one occasion.

The relationship of received medical attention and annual DSH frequency was assessed second. Cell and row/column frequencies are presented in Table 30. Receiving and not receiving medical attention groups had similar cell frequencies for harming once and harming 2-10 times. The only visible difference between groups (did not receive and received medical attention) was that, for youth who harmed more than 10 times, more had received medical attention (n = 20) than not received medical attention (n = 13). Results show that, overall, there was no significant difference between groups, χ^2 (1, N = 64) = 1.11, *ns*, indicating that receiving and not receiving medical attention were approximately the same for each category of annual DSH frequency.

Hypothesis 8 was partially supported. Warranting medical attention was directly related to increased frequency of annual DSH. However, received medical attention was not directly related to annual DSH frequency. Youth who engaged in DSH more frequently acknowledged that at least one incident warranted medical attention but they were no more likely to have received medical attention.

Table 30

Cell and Total Frequencies/Percents for Annual DSH Frequency by Received Medical Attention

		Annual DSH Frequency			
Received Medical Attention		Once	2-10 Times	>10 Times	Total
No	Frequency	3	13	13	29
	Percent	5%	20%	20%	45%
Yes	Frequency	2	13	20	35
	Percent	3%	20%	31%	55%
Total	Frequency	5	26	33	87
	Percent	8%	40%	52%	100%

Discussion

This study served several important purposes. There is limited DSH research pertaining to high-risk youth, especially in Canadian settings. The current study ascertained prevalence rates for an incarcerated sample of youth not restricted to medical or mental health samples. All available male and female offenders were approached to participate in the study. As well, this was the first study to investigate risk and protective factors of DSH in a largely Aboriginal sample of adolescents.

Prevalence

In order to assess the usefulness of a single, general question previously used in the literature to determine rates of DSH, participants responded to both a general question ("have you ever harmed yourself on purpose?"), as well as to specific DSH methods on a checklist. As hypothesized, results indicated that youth offenders were more likely to report DSH on checklist of specific DSH methods than in response to a general question. In response to the general question, 53% of offenders (33% of males and 67% of females) indicated engaging in DSH during their lifetime. These rates are much higher than previous self-reported prevalence rates of offenders obtained from general questions used in Europe (16% in a male sample; Morgan & Hawton, 2004) and Japan (13% of males and 37% of females; Matsumoto et al., 2009).

When a checklist was used in the current study, the lifetime prevalence rate increased to 81% of offenders. It is very difficult to compare this rate to published rates, as previous studies have typically not used checklists. However, in comparison to cutting (16%) and burning (28%) lifetime prevalence rates for male and female offenders reported by Matsumoto et al., (2005), the rates for cutting (48%) and burning (39%) skin

in the current study are much higher. The difference in rates may reflect cultural differences in DSH between Japanese and Canadian, mostly Aboriginal, offenders. Lifetime prevalence rates in this study are also much higher than rates reported in previous hospital and community adolescent samples (Hawton et al., 2002; Larsson & Sund, 2008; Laukkanen et al., 2009; Madge et al., 2008; Taiminen et al., 1998). Overall, lifetime prevalence rates were very high in the current study compared to previously reported rates.

The discrepancy between prevalence rates using general and checklist questions suggests that many adolescents lack insight into their behaviour, leading them to indicate no previous DSH in response to the general question when, in fact, they had previously engaged in DSH (approximately 30% of participants in the current study fit this pattern). When provided with specific DSH methods, participants could relate to the item (e.g., "I've done that") and respond accurately. Given the large difference between reported prevalence rates using the general question and the checklist in the current study, previous community, medical, and offender studies that used a general question to measure DSH have likely greatly underestimated its prevalence. As a result, DSH may be a larger health issue, at least among incarcerated and/or Aboriginal youth, than previously thought. Given its association with suicide, DSH should be given high priority for research, prevention, and treatment initiatives. Based on the current results, it is strongly recommended that future research use DSH checklists.

In addition to high lifetime prevalence rates (53% for the general question and 81% for the checklist), there were also high annual (74%) and incarcerated rates (51%). These annual prevalence rates are much higher than those found in previous offender (9% in a

male sample; Morgan & Hawton, 2004) and general population (Hawton et al., 2002; Madge et al., 2008; Muehlenkamp & Gutierrez, 2004, 2007; Patton et al., 1997; Plener et al., 2009) studies. In addition, incarcerated DSH rates in the current study are much higher than previous rates collected from institution records (10% of 13-17 year-old males; Chowanec et al., 1991) and by self-report (Chowenac et al., 1991; Penn et al., 2003). Penn and colleagues reported a 30% incarcerated DSH rate for a psychiatrically referred offender sample, whereas Chowenac et al. reported a 10% incarcerated DSH rate for 13-17 year-old males. Both of these studies reported incarcerated DSH rates that are significantly lower than the 51% rate for the general offender population in the current study. Nonetheless, in the current study, rates of incarcerated DSH were markedly lower than annual and lifetime DSH rates. Several factors may contribute to DSH being less prevalent while incarcerated: (a) short periods of incarceration; (b) restricted access to materials/methods used for DSH (e.g., razors for cutting; matches and cigarettes used for burning); (c) 24-observation by guards; (d) stability and structure of daily activities; (e) access to supports within the institution, including being able to talk to guards; and (f) no access to alcohol and drugs. Despite these factors, rates of incarcerated DSH were still over 50%. High rates of incarcerated DSH indicate the need for screening using DSH checklists upon admission to the facility. Screening may lead to increased staff awareness of offender DSH. Follow-up, such as increased observation in cells or referrals to medical or psychology clinicians, could be initiated based on screening results. Given the high rate of DSH for offenders while incarcerated, it is imperative for staff members to be aware of DSH and minimize the risk of harm.

In addition to high prevalence rates, repetition of DSH was also quite high. Very few participants reported harming only once. Most participants reported engaging in DSH off and on over several years. This highlights three important areas of concern. First, it is imperative to determine risk factors so that youth can be accurately screened for DSH risk behaviours (e.g., depressed mood). When youth are determined to be at high risk for DSH, prevention strategies should be implemented before self-harming behaviour begins and becomes habitual. Second, once DSH has been identified, it is important to start treatment immediately and follow-up to reduce repetition of DSH. Third, once an adolescent has engaged in DSH, it is highly likely that the individual will continue to self-harm. Youth may experience long periods of time between DSH episodes and appear to have stopped harming. However, they remain high-risk for DSH. Thus, even when youth cease engaging in DSH for a period of time, it is important to continue follow-up for a couple of years to ensure they do not fall back into self-harming patterns. Treatment programs should develop a follow-up regimen for discharged youth whenever possible. This is especially important considering that repetitive DSH may lead to suicide attempts and eventually suicide.

When gender was considered, males and females were just as likely to report DSH while incarcerated. However, females were more likely to report annual DSH (i.e., within the past year) than males. These results mirror gender inconsistencies in the literature. Some studies report a gender difference, with females reporting more episodes of DSH than males (Madge et al., 2008; Sourander et al., 2006), while others report similar rates for males and females (Larsson & Sund, 2008; Patton et al., 1997). Hawton et al. (2003) suggested that, at younger ages, females are more likely to self-harm than males, but that

the gender difference decreases with age. In the current study, situational factors may have affected prevalence rates. Offenders, male and female, face similar stressors and circumstances when they are incarcerated. It is likely that, when offenders are under similar circumstances that restrict the use of regular coping strategies (e.g., going out with friends, alcohol, drugs), both genders are equally likely to self-harm. The results of this study indicate a need to screen for DSH regardless of gender.

The current study highlights not only the importance of measuring DSH using a list of specific DSH methods, but also the very high lifetime, annual, and incarceration DSH rates for youth offenders in Canada, especially Aboriginal youth offenders. The checklist measuring method, the high-risk nature of offender populations (e.g., for mental health issues), as well as the largely Aboriginal population, may have all contributed to the elevated rates. In addition, the highly repetitious DSH observed in the present study is troubling, as it can lead to severe DSH or possibly suicide. Suicide rates for Aboriginal persons are significantly higher than for the general population in Canada (Population and Public Health Branch, 1999). The results of the current study indicate a need to study DSH in Aboriginal populations to determine if rates of DSH, in addition to suicide, are significantly higher for Aboriginal youth than for the general population.

Despite the high rates of DSH in this study compared to previous studies, there were also some similarities. First, youth in the current study began harming between ages 12 and 13 (Ayton, Rasool, & Cottrell, 2003; Hawton et al., 2003; Muehlenkamp & Gutierrez, 2004). Given the young age of onset, early identification of risk factors for DSH is very important for prevention of repetitive DSH (Muehlenkamp & Gutierrez). Second, most of the sample used multiple methods of DSH, which is consistent with

previous findings (Favazza, 1996; Walsh & Rosen; 1988; Muehlenkamp & Gutierrez). Interestingly, self-battery was quite common, suggesting the importance of collecting data about self-battery in addition to self-laceration and self-poisoning. Third, consistent with previous estimations (House et al., 1998; Martin et al., 1995), a large proportion of offenders (50%) had never received medical attention. Thus, studies focusing on medical samples are missing approximately half of the self-harming population, which leads to great underestimations of prevalence rates and a large untreated population of adolescents.

Risk Factors

The hypotheses that higher levels of the three risk factors (depressed mood, alcohol use, and drug use) would be directly associated with increases in annual DSH frequency were only partially supported. Similar to previous findings (Groholt, Ekeberg, Wichstrom et al., 2000; Haliburn, 2000; Haw et al., 2001; Hawton et al., 1999), depressed mood was positively related to both annual and incarcerated DSH frequency with higher rates of depressed mood associated with higher rates of DSH. When the three risk factors were entered into a regression equation, depressed mood was the only significant predictor for both annual and incarcerated DSH frequency. Overall, depressed mood proved to be a significant risk factor for past (within the past year) and recent (during incarceration) DSH, as well as being a strong predictor of repeated DSH. Based on these findings, it is important to assess depressed mood in incarcerated youth. Depressed mood, in combination with previous DSH, are likely strong predictors that offenders will harm themselves during incarceration. Such offenders should be monitored closely and

provided adequate resources (e.g., counseling) to prevent harm and potential suicide attempts within institutions.

Offenders in this study reported very high levels of alcohol and drug use, which likely affected the results. In this offender group, over 75% had a drink of alcohol by age 13 and half reported heavy drinking (over 100 days in the past year). As well, almost all of the offenders reported using marijuana and a high number (63%) reported using cocaine. These rates of alcohol and drug use highlight the high-risk nature of this population.

Even though the distribution of alcohol use scores was very high, had restricted variability, and was skewed, when the relationship of alcohol use to annual DSH frequency was examined, chi square results approached significance. This result suggests that alcohol use is a meaningful risk factor. However, results for incarcerated DSH did not indicate a relationship between lifetime alcohol use and recent DSH (i.e., during incarceration). Alcohol use may have been more closely related to both annual and incarcerated DSH frequency had shorter time periods been used to measure alcohol use, instead of lifetime alcohol use. In support of this assumption, lifetime alcohol use was more closely related to annual DSH frequency than for incarcerated DSH frequency. Had annual alcohol use been measured, rather than lifetime use, a closer relationship may have been found between alcohol use and DSH frequency. Despite the negative results in the current study, alcohol use may be an important risk factor for DSH.

Drug use was positively related to annual DSH frequency but not incarcerated DSH frequency. Lifetime drug use was not reliant on one type of drug use, but was measured using reports of five different drugs, thus increasing the range and variability of

the distribution of drug scores. A few factors, in addition to high rates of drug use, likely affected the results. First, although higher levels of drug use were associated with offenders reporting annual DSH (N = 64), 20 of these offenders did not report DSH while incarcerated. Given the high rate of drug use in the study, it is likely that many of these 20 participants reported high rates of drug use. When analyses were conducted for incarcerated DSH frequency, these 20 offenders, who likely had high rates of drug use, were included as non-harming individuals. This probably affected the relationship of drug use to incarcerated DSH because it increased the level of drug use for participants reporting no DSH. Second, many of these participants were in custody for short periods of time. Had their length of custody been longer, the rate of incarcerated DSH may have risen and so may have the significance of drug use. Third, similar to that suggested for alcohol use, had the measurement time period for drug use been shorter (e.g., annual drug use), there may have been a closer relationship of drug use to incarcerated DSH frequency. Overall, lifetime drug use was found to be a significant risk factor for annual DSH frequency and should be evaluated at the time of admittance.

The current findings for alcohol and drug use may not generalize to populations in which there is a range of alcohol and drug use. In other populations, such as high school or community samples, it is possible that higher rates of these risk factors will be associated with higher DSH frequency. In these populations it will also be possible to measure shorter time frames for substance use (e.g., within the past month). The nature of incarceration (i.e., being removed from alcohol and drug sources for potentially long periods of time) did not easily allow for measurement of shorter time periods. It is advisable to measure these variables at time of admission.

When gender was considered, both depressed mood and gender were significant predictors of annual DSH frequency, but not incarcerated DSH. Females were more likely to report depressed mood than males, which probably contributed to the significant gender finding for annual DSH. However, males who self-harmed while incarcerated likely experienced higher levels of depressed mood than those who did not harm themselves. This highlights the significance of depressed mood as a risk factor for DSH. When levels of depressed mood are high, gender may lose its importance for predicting DSH. In addition, despite high levels of alcohol and drug use, depressed mood was the best predictor for DSH. As a result, it is imperative that depressed mood be assessed when youth enter any institution, particularly, correctional facilities. Elevated levels of depressed mood increase the likelihood of DSH and, in turn, the risk of suicide. From a theoretical perspective, depressed mood should be included in any model attempting to explain DSH.

Overall, depressed mood proved to be a significant risk factor for past (with the past year) and recent (during incarceration) DSH, as well as a strong predictor of repeated DSH. Based on these findings, it is important to assess depressed mood in incarcerated youth. Depressed mood, in combination with previous DSH, are likely strong predictors that offenders will harm themselves during incarceration. Such offenders should be monitored closely and provided adequate resources (e.g., counseling) to prevent harm and potential suicide attempts within institutions.

Protective Factors

The hypotheses that higher levels of the four protective factors (social support availability, social support satisfaction, approach coping strategies, and problem-solving

confidence) would be directly associated with lower levels of annual and incarcerated DSH frequency were only partially supported. The most striking finding was the overall low levels of protective factors in this population. Low levels of protective factors, together with high levels of risk factors, corroborate the vulnerability of youth offender populations. This imbalance of risk to protective factors may have contributed to the very high levels of DSH in the current sample.

In independent analyses, only approach coping was inversely related to annual and incarcerated DSH frequency. Higher levels of approach coping were significantly associated with lower annual and incarcerated DSH frequencies. On the other hand, confidence in a person's ability to solve problems was not related to DSH frequency. It is likely that, although a minimal amount of confidence is required, it is the ability to take action (i.e., approach coping) which affects the outcome (e.g., lower DSH frequency). Unfortunately, the youth offenders in this sample did not consistently utilize approach coping strategies. This may be due to the perception that situations are outside of their control and that they don't have the power or resources (e.g., social support, material means) to affect change.

Surprisingly, perceived social support was not significantly related to DSH frequency. In terms of social support availability, participants reported, on average, three persons in their network who could provide support in each situation. However, the availability of support was similar over the four categories of DSH frequency (none, once, 2-10 times, more than 10 times), with a slight trend toward higher numbers of available persons being related to higher rates of DSH. Despite social support availability not being statistically related to DSH frequency, it is important to note that participants

perceived that individuals are available to provide support when they need it. This is an essential component of social support. However, it is the degree to which available persons provide the right kind of support, at the right time, which affects individuals' level of satisfaction. Overall, participants in this study were very dissatisfied with their social support. Thus, offenders likely did not receive the support that they required. It is possible that relatives and friends may not be able to provide adequate or appropriate support based on their own life circumstances. When a protective factor is essentially lacking, it cannot provide buffering effects. The benefit of social support's buffering affects was, therefore, limited by overall dissatisfaction.

When the four protective factors were considered together, social support availability was the only predictor of both annual and incarcerated DSH frequency. It is possible that the overall low levels of protective factors reported by offenders affected the results. Although protective factors were not inter-related in the current study, it is possible that community samples that have more variability in responses may produce different results. Approach coping often involves using available social support to act on and solve problems. Part of approaching the problem may include asking others for assistance, as well as the perception that one can count on people in their social network to support them in desired ways when acting on problems. Thus, social support availability and approach coping are interconnected and dependent upon one another. It becomes a reciprocal process of having good support available and using that social support (i.e., approach coping). It appears that the current group of offenders did not utilize their support network for resolving problems. Feeling loved and supported may encourage one to continue to approach and attempt to resolve problems. When people are

satisfied with the support they receive, they are likely to feel that they can use their social network in the future for approaching and solving problems. Despite the lack of satisfaction with support in the current study, satisfaction may be an important component in this process.

The finding that availability of social support is related to DSH is very important to consider as offenders are released from custody. In the current study it is likely that although people were available to provide emotional support to offenders, the support offenders actually received was not adequate for their needs, leading to an overall dissatisfaction with social support. While they are in custody, it is important to strengthen support networks in preparation for release, especially since many offenders listed guards as a significant part of their networks. This could include the development of social groups in high-risk communities, continued support through justice system programs, or strengthening existing support networks. Youth require adequate resources in order to use approach coping strategies. Overall, youth offenders would benefit from coping skills programs while in custody, in addition to programs aimed at developing and expanding support networks within their communities.

Avoidance Coping

As predicted, use of avoidance coping strategies was significantly related to annual DSH. Offenders who avoid feelings and thinking about problems are more likely to engage in DSH than offenders who use predominantly approach coping strategies. DSH may serve as an avoidance strategy that sooths youth emotionally when they feel they have little control over a situation or they perceive barriers to acting on problems.

This finding, in addition to the finding that depressed mood is strongly related to DSH, provides initial support for the experiential avoidance model. Seiffge-Krenke et al. (2009) suggested that avoidance coping leads to maladaptive outcomes, such as increased stress and DSH. Chagnon (2007) indeed found that suicidal youth used more avoidant coping strategies than non-suicidal youth. Thus, a focus on decreasing use of avoidance strategies and increasing approach coping strategies is imperative for reducing DSH and possibly suicides.

The experiential avoidance model may need to be adjusted slightly, based on the findings of the present study, by including depressed mood. When a triggering event (stimulus) leads to a negative emotional response in an adolescent who has elevated depressed mood, there is a high likelihood of DSH. The likelihood of DSH as an outcome rises further with the use of avoidant strategies such as alcohol and drug use as well as other avoidant coping behaviours. DSH provides temporary relief, which then negatively reinforces the DSH and leads to habituation, perpetuating the cycle. Over time, DSH becomes an automatic conditioned response to emotional arousal, even in the absence of depressed mood.

If there is no history of depressed mood, it is likely that different avoidance coping behaviours have an additive affect. That is, avoidance coping strategies, such as substance use and emotional avoidance, reinforce each other in an unhealthy direction. When these risk factors outweigh protective factors, DSH becomes a likely outcome. Once DSH has been utilized for short-term gain (i.e., relief from distressing emotions), it is likely that it will be used again. Repetitive use then leads to habituation and, over time, DSH becomes a conditioned response to emotional arousal. Youth in whom high levels

of depressed mood and/or avoidance coping are evident, but do not engage in DSH, may engage in other maladaptive behaviours. Such youth may also be at high-risk for DSH or suicide.

Medical Attention

In the current study, 74% of offenders reported that at least some prior DSH warranted medical attention. However, only 50% actually reported receiving medical care. The current study examined the relationship of medical attention, warranted and received, to duration of harm and annual DSH frequency.

The hypothesis that offenders who warranted medical attention would have engaged in DSH for longer durations than those who did not warrant medical attention was supported. As well, offenders who actually received medical attention reported longer durations of DSH than those who did not receive medical attention. This may indicate that the longer an offender engages in DSH, the severity of harm required to achieve a desired effect (e.g., reduction of emotional distress) increases. In addition, pain tolerance may increase over time leading to more severe harm. Thus, severity of DSH may increase over time. As severity increases, so does the risk of undesired outcomes, such as unintentionally severe harm or even unintended suicide.

It is also apparent that, although offenders use DSH repetitively, over time their methods vary. Indeed, offenders in this study reported using a variety of DSH methods. This may also be due to the increasing severity required by a DSH method to produce the desired result (e.g., reduced emotional distress). When harm is repetitive in nature and occurs over an extended period of time, treatment may reduce the severity of DSH and prevent suicidal outcomes. Given the repetitive nature of DSH, early detection and

treatment is important for reducing negative outcomes (e.g., increased severity and suicide).

The hypothesis that higher rates of annual DSH frequency would be directly related to warranting medical attention was supported. In contrast, the hypothesis that higher rates of annual DSH frequency would be directly related to receiving medical attention was not supported. Offenders were equally as likely to receive medical attention whether they harmed only once, 2-10 times, or more than 10 times. Thus, there were some observable differences between warranting and receiving medical attention.

A very concerning outcome in this study was that, even though 74% of the sample indicated that DSH warranted medical attention, only half had received medical attention. For example, of the 31 offenders who reported harming more than 10 times in the past year and also indicated medical attention was warranted, only 20 received medical care. Similarly, for offenders who harmed 2-10 times (n = 26), only half (n = 13) received medical attention. Thus, repeated DSH does not necessarily mean that an offender will receive medical care, even if they perceive it to be warranted. Offenders who self-harm may keep their DSH private and, thus, may not want to alert others to their behaviour. In addition, appropriate medical care may not always be available, especially in rural areas or on First Nations reserves. These factors may partially explain why offenders do not receive medical attention even though it is often warranted. Given the above finding, it is likely that medical practitioners are seeing, at most, 50% of high-risk, self-harming offenders. The rates of received medical attention found in this study may be inflated if the attention was received while in custody. Prison staff may have sent offenders for medical care, perhaps against their will, when cuts or other injuries were observed. These

medical attention findings further highlight the importance for screening of high-risk youth for DSH.

The adolescents in this study reported that self-laceration most often warranted medical attention. They also tended to receive medical care most often for self-laceration. Previous research has cited self-poisoning as being the most likely type of DSH for which patients present for medical treatment (Hawton et al., 2002). The present sample reported rates of receiving medical assistance that were larger than the 12-15% rates found in previous studies (Hawton et al., 2002; Madge et al., 2008; Safer, 1997). The rate of received medical care in the present study supports previous estimates that 60% of self-harmers do not present for medical care (Martin et al., 1995). Higher rates of receiving medical care could be due to inclusion, in the present research, of medical services provided by a variety of medical professionals, rather than being restricted to hospital care. As well, youth in custody may have received medical care for DSH wounds for which they might not have received medical attention on their own had they been in the community.

Limitations of the Current Study

A few limitations of the current study must be considered. The current study included only youth self-report measures. It would have been a stronger study had administrative and personnel issues been resolved in a manner to allow staff reports. Although self-report data are associated with problems such as socially desirable responding, participants in the study were assured confidentiality of responses. Data from previous DSH studies that provided anonymity through survey questionnaires have reported higher prevalence rates than studies using face-to-face interviews (O'Sullivan &

Fitzgerald, 1998; Rodham et al., 2004; Safer, 1997). Participants who respond in a socially desirable manner may be less likely to report self-harm behaviours. Given the high rates of DSH reported in the current, questionnaire-based study, socially desirable responding was likely not a serious issue.

Another limitation was that reports of substance use, lifetime DSH, and, to a lesser extent, annual DSH were retrospective in nature and encompassed a long time period. Lifetime measures for substance use (alcohol and drug use) were originally chosen due to the unpredictability of the length of sentences offenders would be serving. As it turns out, few offenders (11%) had been incarcerated for 6 or more months and almost half (45%) had been incarcerated for less than a month. Overall, 89% of offenders had been in custody for less than 6 months. Therefore, an annual measure of alcohol and drug use could have been utilized. Had substance use measures of shorter duration been utilized, these risk factors may have been more directly related to annual and incarcerated DSH frequency. In terms of DSH frequency, some offenders had difficulty recollecting how many times they had harmed in the past year. It was anticipated that this would be somewhat problematic for lifetime DSH, but difficulties recollecting more recent DSH was not anticipated.

Although the current study collected data from both male and female offenders, the sample was imbalanced, with more female participants than males. This study attempted to collect data from all youth within the institution. Access was gained to all of the female units but not all of the male units. Thus, gender differences should be interpreted with caution. A more balanced gender sample would have been advantageous to determine gender differences.

Lastly, a few variables had a restricted range of scores and/or very high prevalence rates. Notably, alcohol and drug use were very prevalent, making it difficult to detect relationships between substance use and DSH frequency. In addition, alcohol and social support satisfaction scores were truncated on the negative ends of their scales, leading to limited variability. The cross-sectional nature of the current study partly determined the selection of measurement materials and time periods for variables (e.g., lifetime alcohol use). Future studies would benefit from interviewing youth at the time of admission to better determine social support received while in the community as well as recent alcohol and drug use.

Another statistical limitation was the relatively low number of offenders who engaged in DSH on only one occasion. The offenders in this study who self-harmed tended strongly to do so repetitively. As a result, it was difficult to determine if harming only once was significantly different from repetitive harm.

Future Research

Researchers conducting prevalence studies in the future should inquire about specific methods of DSH, as general questions do not adequately measure DSH. It would be advantageous for researchers to work together to develop a checklist for DSH that measures a variety of DSH methods, but that is not too cumbersome or lengthy. The measure developed for the current study, although strongly based on the Deliberate Self-Harm Inventory (Gratz, 2001), has unknown psychometric properties and needs to be validated as an assessment tool. Future measures could also include supplemental sections regarding frequency, severity, and medical attention. They could also obtain descriptive information regarding DSH (e.g., age of onset, description of the last instance

of DSH, feelings or sensations associated with DSH). For those researchers who would like to investigate suicidal intent, supplemental questions regarding suicidal intent and previous suicide attempts may be added. Some researchers have suggested that DSH describes a wide continuum of suicidal behaviour. Due to the difficulties associated with determining suicidal intent, it is recommended that DSH include intentional harm, regardless of the suicidal intent.

The current research was largely preliminary (i.e., Canadian sample and predominantly Aboriginal youth) and reliant on self-report data. This research highlighted significant prevalence rates of DSH for a largely Aboriginal, incarcerated sample of youth. The Aboriginal sample may have contributed to the large imbalance between risk and protective factors. Aboriginal youth tend to come from disadvantaged and stressful life circumstances which may have led to the high rates of risk factors and low rates of protective factors in this sample. In Manitoba, Aboriginal people are significantly poorer, less educated (e.g., high rate of high school drop-out), live in more crowded housing, experience higher unemployment rates, have higher rates of alcohol use, and have higher rates of children living in poverty than non-Aboriginal Manitobans (Allec, 2005). Aboriginal offenders also tend to have more problems with peers and more volatile family relationships than non-Aboriginal offenders (Yessine & Bonta, 2009). Stressful life circumstances prior to and during incarceration as well as generally poor social networks, possibly due to family violence and difficulties that the adults in their life were facing, likely influenced self-reports in this study. Socio-economic factors such as education level of the offender and his or her parents, family income, income assistance, and housing issues (e.g., number and relationship of people in household,

family tension caused by over-crowding, and the community they lived in, for example, reserve, rural, or urban) likely contributed to the high rates of risk factors and low rates of protective factors.

In addition, it is possible that a large number of youth offenders in the current study would have met criteria for mental disorders (e.g., substance use disorders, depressive disorders, Fetal Alcohol Syndrome Disorder/FASD). It is likely that self-harming individuals lack impulse control which should be considered in future research (Favaro & Santonastaso, 1999; Favazza, 1998; Kahan & Pattison, 1984; Meuhlenkamp, 2005). Future research could determine whether incarcerated, Aboriginal youth have high rates of impulsivity in general or high rates of mental disorders associated with impulsivity such as, Attention Deficit Hyperactivity Disorder (ADHD), Aspergers Syndrome, and FASD. Diagnoses of FASD may be difficult to determine in research studies therefore, it would be useful to examine cognitive correlates of FASD, in particular aspects of executive functioning. In general, future research on youth offenders in Canada would benefit from measuring the presence of a variety of mental disorders.

Future research needs to be conducted in community samples that include significant numbers of Aboriginal youth to determine if DSH is also a serious problem within the general Aboriginal community. Should prevalence rates prove to be high in community samples of Aboriginal youth, prevention initiatives would benefit from focusing on decreasing risk factors and strengthening protective factors in early childhood. DSH in the current sample began at a young age (on average between 12 and 13), so it would be important to target prevention strategies to children under 12 years of age. Future research on protective strategies for this high-risk group may be able to shed

light on important prevention factors. Treatment studies should collect longitudinal data to determine whether protective factors are of value for decreasing relapse or future occurrences of DSH.

References

Aboriginal Justice Implementation Commission (2001). *Final Report*. Retrieved from http://www. ajic.mb.ca/reports/final_toc.html.

Allec, R. (2005). First Nations Health and Wellness in Manitoba: Overview of gaps in service and issues associated with jurisdictions, Final Report. *Inter-governmental committee on First Nations Health.*

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, text revision. Washington, DC: American Psychiatric Publishing, Inc.

American Psychiatric Association (2010). Non-suicidal self-injury. *DSM-5 Development.* Retrieved from http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=443#

Andover, M. S., Zlotnick, C., & Miller, I. W. (2007). Childhood physical and sexual abuse in depressed patients with single and multiple suicide attempts. *Suicide and Life-Threatening Behavior, 37*(4), 467-474.

Appleby, L., Cooper, J., Amos, T., & Faragher, B. (1999). Psychological autopsy study of suicides by people aged under 35. *British Journal of Psychiatry, 175,* 168–174.

Ayton, A., Rasool, H., & Cottrell, D. (2003). Deliberate self-harm in children and adolescents: Association with social deprivation. *European Child and Adolescent Psychiatry, 12,* 303-307.

Bal, S., Crombez. G., Van Oost, P., & Debourdeaudhuij, I. (2003). The role of social support in well-being and coping with self-reported stressful events in adolescents. *Child Abuse and Neglect, 27*(12)*,* 1377-1395.

Beautrais, A., Joyce, P., Mulder, R., Fergusson, D. M., Deavoll, B. J., & Nightingale, S. K. (1996). Prevalence and comorbidity of mental disorders in persons making serious suicide attempts: A case-control study. *The American Journal of Psychiatry, 153, 1009-1014.*

Bethell, J., & Rhodes, A. E. (2009). *Identifying deliberate self-harm in emergency department data* (Catalogue no. 82-003-XPE, Health Reports, 2). Ottawa, ON: Statistics Canada. Retrieved from http://www.statcan.gc.ca/pub/82-003x/2009002/article/10836-eng.pdf).

Bland, R. C., Newman, S. C., & Dyck, R. J. (1994). The epidemiology of parasuicide in Edmonton. *Canadian Journal of Psychiatry, 39,* 391-396.

Blenkiron, P., House, A., & Milnes, D. (2000). The timing of acts of deliberate self-harm: Is there any relation with suicidal intent, mental disorder or psychiatric management? *Journal of Psychosomatic Research, 49,* 3-6.

Boe, R. (2002). Future demographic trends may help Canada's Aboriginal youth. *E-Journal of Forum of Correctional Research, 14(3),* 13-16. Retrieved from Correctional Services of Canada http://www.cscscc.gc.ca/text/pblct/forum/e143/e143e-eng.shtml

Bolognini, M., Plancherel. B., Laget. J., Stéphan, P., & Halfon, O. (2003). Adolescents' self-mutilation – Relationship with dependent behaviour. *Swiss Journal of Psychology, 62,* 241-249.

Brener, N. D., Collins, J. L., Kann, L., Warren, C. W., & Williams, B. I. (1995). Reliability of the youth risk behaviour survey questionnaire. *American Journal of Epidemiology, 141,* 575-580.

Brener, N. D., Kann, L., McManus, R., Kinchen, S. A., Sundberg, E. C., & Ross, J. G. (2002). Reliability of the 1999 youth risk behaviour survey questionnaire. *Journal of Adolescent Health, 31,* 336-342.

Brent, D. A., Perper, J. A., Moritz, G., Liotus, L., Schweers, J., Balach, L., & Roth, C. (1994). Familial risk factors for adolescent suicide: A case-control study. *Acta Psychiatrica Scandinavica, 89,* 52-58.

Callaghan, J., Pace, F., Young, B., & Vostanis, P. (2003). Primary mental health workers within youth offending teams: A new service model. *Journal of Adolescence, 26,* 185-199.

Carris, M. J., Sheeber, L., & Howe, S. (1998). Family rigidity, adolescent problem-solving deficits, and suicidal ideation: A mediational model. *Journal of Adolescence, 21,* 459-472.

Chagnon, F. (2007). Coping mechanisms, stressful events and suicidal behavior among youth admitted to Juvenile Justice and Child Welfare Services. *Suicide and Life-Threatening Behavior, 37,* 439-452.

Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour research and therapy, 44,* 371-394.

Chitsabesan, P., Harrington, R. Harrington, V., & Tomenson, B. (2003). Predicting repeat self-harm in children: How accurate can we expect to be? *European Child and Adolescent Psychiatry, 12,* 23-29.

Chowanec, G. D., Josephson, A. M., Coleman, C., Davis, H. (1991). Self harming behavior in incarcerated male delinquent adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 30,* 202-207.

Claes, L., & Vandereycken, W. (2007). Self-injurious behavior: Differential diagnosis and functional differentiation. *Comprehensive Psychiatry, 48*(2)*,* 137-144.

Cloutier, P., Martin, J., Kennedy, A., Nixon, M. K., Muehlenkamp, J. J. (2010). Characteristics and con-occurrence of adolescent non-suicidal self-injury and suicidal behaviours in pediatric emergency crisis services. *Journal of Youth and Adolescence, 39,* 259-269. doi:10.1007/s10964-009-9465-1

Compas, B. E. (1987). Coping with stress during childhood and adolescence. *Psychological Bulletin, 101,* 393-403.

Compas, B. E., Conner-Smith, J. K., Saltzman, H., Harding Tomsen, A., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin, 127,* 87-127.

Connors, R. (1996a). Self-injury in trauma survivors: I. Functions and meanings. *American Journal of Orthopsychiatry, 66,* 197-206.

Connors, R. (1996b). Self-injury in trauma survivors: II. Levels of clinical response. *American Journal of Orthopsychiatry, 66,* 207-216.

Cookson, H. M. (1977). A survey of self-injury in a closed prison for women. *British Journal of Criminology, 17,* 332-347.

Cooper, J., Kapur, N., Webb, R., Lawlor, M., Guthrie, E., Mackway-Jones, K., Appleby, L. (2005). Suicide after deliberate self-harm: A 4-year cohort study. *The American Journal of Psychiatry, 162,* 297-303.

De Anda, D., Baroni, S., Boskin, L., Buchwald, L., Morgan, J., Ow, J., Siegel Gold, J., & Weiss, R. (2000). Stress, stressors and coping among high school students. *Children and Youth Services Review, 22,* 441-463.

Dulit, R. A., Ryer, M. R., Leon, A. C., Brodsky, B. S., & Frances, A. J. (1994). Clinical correlates of self-mutilation in borderline personality disorder. *The American Journal of Psychiatry, 151*(9), 1305-1311.

Ennis, J., Barnes, R., Kennedy, S., & Trachtenberg. D. (1989). Depression in self-harm patients. *British Journal of Psychiatry, 154, 41-47.*

Esposito, C. L., & Clum, G. A. (2002). Social support and problem-solving as moderators of the relationship between childhood abuse and suicidality: Applications to a delinquent population. *Journal of Traumatic Stress, 15,* 137-146.

Evans, E. Hawton, K., & Rodham, K. (2004). Factors associated with suicidal phenomena in adolescents: A systematic review of population-based studies. *Clinical Psychology Review, 24*(8), 957-979.

Favaro, A., & Santonastaso, P. (1998). Impulsive and compulsive self-injurious behavior in bulimia nervosa: Prevalence and psychological correlates. *The Journal of Nervous and Mental Disease, 186,* 157-165.

Favaro, A., & Santonastaso, P. (1999). Different types of self-injurious behavior in bulimia nervosa. *Comprehensive Psychiatry, 40,* 57-60.

Favazza, A. R. (1998). The coming of age of self-mutilation. *Journal of Nervous and Mental Disease, 186*(5)*,* 259-268.

Favazza, A. R., & Rosenthal, R. J. (1990). Varieties of pathological self-mutilation. *Behavioural Neurology, 3,* 77-85.

Favazza, A. R., & Rosenthal, R. J. (1993). Diagnostic issues in self-mutilation. *Hospital and Community Psychiatry, 44,* 134-140.

Figueras Masip, A., Amador-Campos, J. A., Gomez-Benito, J. & del Barrio Gandara, V. (2010). Psychometric properties of the children's depression inventory in community and clinical sample. *The Spanish Journal of Psychology, 13*(2), 990-999.

Fillmore, C., Dell, C. A., & The Elizabeth Fry Society of Manitoba (2001). *Prairie women, violence and self-harm.* Retrieved from http://www.pwhce.ca/pdf/self-harm.pdf

Fliege, H., Kocalevent, F-D., W, O. B., Beck, S., Gratz, K. L., Gutierrez, P. M., & Klapp, B. F. (2006). Three assessments tools for deliberate self-harm and suicide behaviour: Evaluation and psychopathological correlates. *Journal of Psychosomatic Research, 61,* 113-121.

Foster, T., Gillespie, K., & McClelland, R. (1997). Mental disorders and suicide in Northern Ireland. *British Journal of Psychiatry, 170,* 447–452

Garnefski, N., Diekstra, R. F. W., & de Heus, P. (1992). A population-based survey of the characteristics of high school students with and without a history of suicidal behavior. *Acta Psychiatrica Scandinavica, 86,* 189-196.

Goddard, N., Subotsky, F., & Fombonne, E. (1996). Ethnicity and adolescent deliberate self-harm. *Journal of Adolescence, 19,* 513-521.

Goldacre, M., & Hawton, K. (1985). Repetition of self-poisoning and subsequent death in adolescents who take overdoses. *British Journal of Psychiatry, 146,* 395-398.

Goldston, D. B., Daniel, S. S., Reboussin, B. A., Reboussin, D. M., Frazier, P. H., & Harris, A. E. (2001). Cognitive risk factors and suicide attempts among formerly hospitalized adolescents: A prospective naturalistic study. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 91-99.

Government of Canada and Government of Manitoba (2000). *Aboriginal people in Manitoba.* Retrieved from http://www.gov.mb.ca/ana/ apm2000/highlights.html and http://www.gov.mb.ca/ana/apm2000/apm2000.pdf

Government of Canada and Government of Manitoba (2006). *Aboriginal People in Manitoba* (Cat. No. SG5-2/2006E, ISBN 0-662-42923-0). Retrieved from http://www.gov.mb.ca/ana/pdf/apm2006.pdf

Gratz, K. L. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm inventory. *Journal of Psychopathology and Behavioral Assessment, 23,* 253-263.

Gratz, K. L. (2003). Risk factors for and functions of deliberate self-harm: An empirical and conceptual review. *Clinical Psychology: Science and Practice, 10,* 192-205.

Groholt, B., Ekeberg, O., & Haldorsen, T. (2000). Adolescents hospitalised with deliberate self-harm: The significance of an intention to die. *European Child and Adolescent Psychiatry, 9,* 244-254.

Groholt, B., Ekeberg, O., Wichstrom, L., & Haldorsen, T. (2000). Young suicide attempters: A comparison between a clinical and an epidemiological sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 868-875.

Grossi, V., & Violato, C. (1992). Attempted suicide among adolescents: A stepwise discriminant analysis. *Canadian Journal of Behavioural Science, 24,* 410-413.

Gutierrez, P. M., King, C. A., & Ghaziuddin, N. (1996). Adolescent attitudes about death in relation to suicidality. *Suicide and Life-Threatening Behavior, 26,* 8-18.

Gutierrez, P. M., Osman, A., Barrios, F. X., & Kopper, B. A. (2001). Development and initial validation of the self-harm behavior questionnaire. Journal of Personality Assessment, 77, 475-490.

Haber, M. G., Cohen, J. L., Lucas, T., & Baltes, B. B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology, 39,* 133-144.

Hagstrom, A. H., & Gutierrez. P. M. (1998). Confirmatory factor analysis of the multi-attitude suicide tendency scale. *Journal of Psychopathology and Behavioral Assessment, 20,* 173-186.

Haliburn, J. (2000). Reasons for adolescent suicide attempts. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 13-14.

Harrington, R., Kerfoot, M., Dyer, E., McNiven, F., Gill, J., Harrington, V., Woodham, A., & Byford, S. (1998). Randomized trial of a home-based family intervention for children who have deliberately poisoned themselves. *Journal of the American Academy of Child and Adolescent Psychiatry, 37,* 512-518.

Hasking, P., Momeni, R., Swannell, S., & Chia, S. (2008). The nature and extent of non-suicidal self-injury in a non-clinical sample of young adults. *Archives of Suicide Research, 12*(3)*,* 208-218.

Haw, C., Hawton, K., Houston, K., & Townsend, E. (2001). Psychiatric and personality disorders in deliberate self-harm patients. *British Journal of Psychiatry, 178,* 48-54.

Haw, C., Houston, K., Townsend, E., & Hawton, K. (2002). Deliberate self harm patients with depressive disorders: Treatment and outcome. *Journal of Affective Disorders, 70,* 57-65.

Hawton, K., & Fagg, J. (1988). Suicide and other causes of death following attempted suicide. *British Journal of Psychiatry, 152,* 359-366.

Hawton, K., & Fagg, J. (1992). Deliberate self-poisoning and self-injury in adolescents: A study of characteristics and trends in Oxford, 1976-89. *British Journal of Psychiatry, 161,* 816-823.

Hawton, K., Fagg, J., & Simkin, S. (1996). Deliberate self-poisoning and self-injury in children and adolescents under 16 years of age in Oxford, 1976-1993. *British Journal of Psychiatry, 169,* 202-208.

Hawton, K., Fagg, J., Simkin, S., Bale, E., & Bond, A. (1997). Trends in deliberate self-harm in Oxford, 1985-1995: Implications for clinical services and the prevention of suicide. *British Journal of Psychiatry, 171,* 556-560.

Hawton, K., Fagg, J., Simkin, S., Bale, E., & Bond, A. (2000). Deliberate self-harm in adolescents in Oxford, 1985-1995. *Journal of Adolescence, 23,* 47-55.

Hawton, K., Hall, S., Simkin, S., Bale, L., Bond, A., Codd, S., & Stewart, A. (2003). Deliberate self-harm in adolescents: A study of characteristics and trends in Oxford, 1990-2000. *Journal of Child Psychology and Psychiatry, 44,* 1191-1198.

Hawton, K., & Harriss, L. (2008a). Deliberate self-harm by under-15-year-olds: Characteristics, trends, and outcome. *Journal of Child Psychology and Psychiatry, 49,* 441-448.

Hawton, K., & Harriss, L. (2008b). The changing gender ratio in occurrence of deliberate self-harm across the lifecycle. *Crisis, 29,* 4-10.

Hawton, K., Kingsbury, S., Steinhardt, K., James, A., & Fagg, J. (1999). Repetition of deliberate self-harm by adolescents: The role of psychological factors. *Journal of Adolescence, 22,* 369-378.

Hawton, K., O'Grady, J., Osborn, M., & Cole, D. (1982). Adolescents who take overdoses: Their characteristics, problems and contacts with helping agencies. *British Journal of Psychiatry, 140,* 118-123.

Hawton, K., Rodham, K., Evans, E., & Weatherall, R. (2002). Deliberate self harm in adolescents: Self report survey in schools in England. *British Medical Journal, 325,* 1207-1211.

Hawton, K., Zahl, D., & Weatherall, R. (2003). Suicide following deliberate self-harm: Long-term follow-up of patients who presented to a general hospital. *The British Journal of Psychiatry, 182,* 537-542.

Health Canada (2000). *Acting on what we know: Preventing youth suicide in first nations. The report of the advisory group on suicide prevention.* Retrieved from http://www.hc-sc.gc.ca/fniah-spnia/alt_formats/fnihb-dgspni/pdf/pubs/suicide/prev_youth-jeunes-eng.pdf

Heppner, P. P. & Baker, C. E. (1997). Applications of the problem-solving inventory. *Measurement & Evaluation in Counseling & Development, 29,* 229-241.

Heppner, P. P., & Lee, D. G. (2002). Problem-solving appraisal and psychological adjustment. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 288-298). London: Oxford University Press.

Heppner, P. P., Manley, C. M., Perez, R. M., & Dixon, W. A. (1993). An adolescent version of the problem solving inventory: Initial reliability and validity estimates. Unpublished manuscript.

Heppner, P. P., & Petersen, C H. (1982). The development and implications of a personal problem solving inventory. *Journal of Counselling Psychology, 29,* 66-75.

Herpertz, S. (1995). Self-injurious behaviour: Psychopathological and nosological characteristics in subtypes of self-injurers. *Acta Psychiatrica Scandinavica, 91,* 57-68.

Hjelmeland, H. (1996). Repetition of parasuicide: A predictive study. *Suicide and Life-Threatening Behavior, 26* (4), 395-404.

Holahan, C. J., & Moos, R. H. (1994). Life stressors and mental health: Advances in conceptualizing stress resistance. In W. R. Avison & I. H. Gotlib (Eds.), *Stress and mental health: Contemporary issues and prospects for the future* (pp. 213-238). New York: Plenum Press.

House, A., Owens, D., & Patchett, L. (1998). Deliberate self-harm. *Effective Health Care, 4,* 1-12.

Howard, J., Lennings, C. J., & Copeland, J. (2003). Suicidal behavior in a young offender population. *Crisis, 24,* 98-104.

Hurry, J. (2000). Deliberate self-harm in children and adolescents. *International Review of Psychiatry, 12,* 31-36.

Ireland, J. L. (2000). A descriptive analysis of self-harm reports among a sample of incarcerated adolescent males. *Journal of Adolescence, 23,* 605-613.

Jacobson, C., & Gould, M. (2007). The epidemiology and phenomenology of non-suicidal self-injurious behaviour among adolescents: A critical review of the literature. *Archives of Suicide Research, 11*(2), 129-147. doi:10.1080/13811110701247602

Kahan, J., & Pattison, E. M. (1984). Proposal for a distinctive diagnosis: the deliberate self-harm syndrome (DSH). *Suicide and Life-Threatening Behavior, 14,* 17-35.

Kann, L. (2001). The Youth risk behaviour surveillance system: Measuring health-risk behaviours. *American Journal of Health Behavior, 25,* 272-277.

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27,* 226-239.

Klonsky, E. D., & Glenn, C. R. (2008). Resisting urges to self-injure. *Behavioural and Cognitive Psychotherapy, 36*(2), 211-220.

Kovacs, M. (1985). The children's depression inventory. *Psychopharmacology Bulletin, 21,* 995-998.

Kovacs, M. (1992). *The children's depression inventory (CDI) Manual*. Toronto, ON: Multi-Health Systems.

Lakey, B. Adams, K., Neely, L., Rhodes, G., Lutz, C. J., & Sielky, K. (2002). Perceived support and low emotional distress: The role of enacted support, dyad similarity, and provider personality. *Personality and Social Psychology Bulletin, 28,* 1546-1555.

Lakey, B., & Cohen, S. (2000). Social support theory and measurement. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 29-52). New York, NY: Oxford University Press.

Larsson, B., & Sund, A. M. (2008). Prevalence, course, incidence, and 1-year prediction of deliberate self-harm and suicide attempts in early Norwegian school adolescents. *Suicide and life-threatening behaviour, 38,* 152-165.

Laukkanen, E., Rissanen, M-L., Honkalampi, K., Kylma, J., Tolmunen, T., & Hintikka, J. (2009). The prevalence of self-cutting and other self-harm among 13- to 18-year-old Finnish adolescents. *Social Psychiatry and Psychiatric Epidemiology, 44,* 23-28. doi:10.1007/s00127-008-0398-x

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York, NY: Springer Publishing.

Madge, N., Hewitt, A., Hawton, K., Wilde, E. J. de, Corcoran, P., Fekete, S., van Heeringen, K., De Leo, D., & Ystgaard, M. (2008). Deliberate self-harm within an international community sample of young people: Comparative findings from the child & adolescent self-harm in Europe (CASE) study. *Journal of Child Psychology and Psychiatry, 49,* 667-677.

Mangnall, J., & Yurkovich, E. (2008). A literature review of deliberate self-harm. *Perspectives in Psychiatric Care, 44,* 175-184.

Markward, M., McMillan, L., & Markward, N. (2003). Social support among youth. *Children and Youth Services Review, 25,* 571-587.

Martin, G., Rozanes, P., Pearce, C., & Allison, S. (1995). Adolescent suicide, depression and family dysfunction. *Acta Psychiatrica Scandinavica, 92,* 336-344.

Martin, G., & Waite, S. (1994). Parental bonding and vulnerability to adolescent suicide. *Acta Psychiatrica Scandinavica, 89,* 246-254.

Matsumoto, T., Yamaguchi, A., Chiba, Y., Asami, T., Iseki, E., & Hirayasu, Y. (2005). Self-burning versus self-cutting: Patterns and implications of self-mutilation; a preliminary study of differences between self-cutting and self-burning in a Japanese juvenile detention center. *Psychiatry and Clinical Neurosciences, 59,* 62-69.

Matsumoto, T., Tsutsumi, A., Izutsu, T., Imamura, F., Chiba, Y., & Takeshima, T. (2009). Comparative study of the prevalence of suicidal behaviour and sexual abuse history in delinquent and non-delinquent adolescents. *Psychiatry and Clinical Neurosciences, 63,* 238-240.

McAuliffe, C., Corcoran, P., Keeley, H. S., Arensman, E., Bille-Brahe, U., DeLeo, D., Fekete, S., Hawton, K., Hjelmeland, H., Kelleher, M., Kerkhof, A. J. F. M., Lonnqvist, J., Michel, K., Salander-Renberg, E., Schmidtke, A., Van Heeringen, K., & Wasserman, D. (2006). Problem-solving ability and repetition of deliberate self-harm: A multicentre study. *Psychological Medicine, 36,* 45-55.

McLaughlin, J., Miller, P., & Warwick, H. (1996). Deliberate self-harm in adolescents: Hopelessness, depression, problems, and problem-solving. *Journal of Adolescence, 19,* 523-532.

Messer, J. M., & Fremouw, W. J. (2008). A critical review of explanatory models for self-mutilating behaviors in adolescents. *Clinical Psychology Review, 28,* 162-178.

Milnes, D., Owens, D., & Blenkiron, P. (2002). Problems reported by self-harm patients: Perception, hopelessness, and suicidal intent. *Journal of Psychosomatic Research, 53,* 819-822.

Mohino Justes, S., Ortega-Monasterio, L., Planchat Teruel, L. M., Cuquerella Fuentes, A., Talon Navarro, T., & Macho Vives, J. L. (2004). Discriminating deliberate self-harm (DSH) in young prison inmates through personality disorder. *Journal of Forensic Science, 49,*

Morgan, G., Burns-Cox, C. J., Pocock, H., & Pottle, S. (1975). Deliberate self-harm: Clinical and socio-economic characteristics of 368 patients. *British Journal of Psychiatry, 127,* 564-574.

Morgan, J., & Hawton, K. (2004). Self-reported suicidal behaviour in juvenile offenders in custody: Prevalence and associated factors. *Crisis, 25,* 8-11.

Muehlenkamp, J. J. (2005). Self-injurious behavior as a separate clinical syndrome. *American Journal of Orthopsychiarty, 75,* 324-333.

Muehlenkamp, J. J., & Gutierrez. P. M. (2004). An investigation of differences between self-injurious behaviour and suicide attempts in a sample of adolescents. *Suicide and Life-Threatening Behavior, 34,* 12-23.

Muehlenkamp, J. J., & Gutierrez. P. M. (2007). Risk for suicide attempts among adolescents who engage in non-suicidal self-injury. *Archives of Suicide Research, 11,* 69-82. doi:10.1080/13811110600992902

Neufeld, G., & Mate, G. (2004). *Hold onto your kids: Why parents need to matter more than peers.* Toronto, Canada: Random House of Canada Limited.

Nock, M. K., & Prinstein, M. J. (2005). Contextual features and behavioural functions of self-mutilation among adolescents. *Journal of Abnormal Psychology, 114,* 140-146.

Osuch, E. A., Noll, J. G., & Putnam (1999). The motivations for self-injury in psychiatric inpatients. *Psychiatry, 62,* 334-346.

O'Sullivan, M., & Fitzgerald, M. (1998). Suicidal ideation and acts of self-harm among Dublin school children. *Journal of Adolescence, 21,* 427-433.

Owens, D., Horrocks, J., & House, A. (2002). Fatal and non-fatal repetition of self-harm: Systemic review. *The British Journal of Psychiatry, 181,* 193-199.

Parker, S. J. (1988). *An analysis of the problem solving inventory on an inmate population* (Unpublished doctoral dissertation). . Dissertation submitted to the Faculty of George Peabody College for Teachers of Vanderbilt University Peabody College, Nashville, US.

Pattison, E. M., & Kahan, J. (1983). The deliberate self-harm syndrome. *The American Journal of Psychiatry, 140*(7)*,* 867-872.

Patton, G. C., Harris, R., Carlin, J. B., Hibbert, M. E., Coffey, C., Schwartz, M., & Bowes, G. (1997). Adolescent suicidal behaviours: A population-based study of risk. *Psychological Medicine, 27,* 715-724.

Penn, J. V., Esposito, C. L., Schaeffer, L. E., Fritz, G. K., & Spirito, A. (2003). Suicide attempts and self-mutilative behavior in a juvenile correctional facility. *Journal of the American Academy of Child and Adolescent Psychiatry, 42,* 762-769.

Peter, T., Roberts, L. W., & Buzdugan, R. (2008). Suicidal ideation among Canadian youth: A multivariate analysis. *Archives of Suicide Research, 12*(3), 263-275. doi:10.1080/13811110802100882

Plener, P. L., Keller, L. F., Fegert, J. M., & Muehlenkamp, J. J. (2009). An international comparison of adolescent non-suicidal self-injury (NSSI) and suicide attempts: Germany and the USA. *Psychological Medicine, 39,* 1549-1558. doi:10.1017/S0033291708005114

Population and Public Health Branch (1999). *Measuring up: A Health Surveillance Update on Canadian Children and Youth Population.* Retrieved from http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/meas-haut/mu_y_e.html.

Portzky, G., Wilde, E. J. de, & van Heeringen, K. (2008). Deliberate self-harm in young people: Differences in prevalence and risk factors between The Netherlands and Belgium. *European Child & Adolescent Psychiatry, 17,* 179-186.

Putnins, A. L. (2005). Correlates and predictors of self-reported suicide attempts among incarcerated youths. *International Journal of Offender Therapy and Comparative Criminology*, *49*(2), 143-157.

Reith, D. M., Whyte, I., Carter, G., & McPherson, M. (2003). Adolescent self-poisoning: A cohort study of subsequent suicide and premature deaths. *Crisis, 24,* 79-84.

Rodham, K., Hawton, K., & Evans, E. (2004). Reasons for deliberate self-harm: Comparison of self-poisoners and self-cutters in a community sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 43,* 80-87.

Rossow, I., Ystgaard, M., Hawton, K., Madge, N., van Heeringen, K., de Wilde, E. J., DeLeo, D., Fekete, S., & Morey, C. (2007). *Suicide and Life-Threatening Behavior, 37*(6), 605-615.

Rotheram-Borus, M. J., & Trautman, P. D. (1988). Hopelessness, depression, and suicidal intent among adolescent suicide attempters. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 700-704.

Rubenstein, J. L., Halton, A., Kasten, L., Rubin, C., & Stechler, G. (1998). Suicidal behavior in adoelscents: Stress and protection in different family contexts. *American Journal of Orthopsychiatry, 68,* 274-284.

Rudd, M. D., Rajab, M. H., & Dahm. P. F. (1994). Problem-solving appraisal in suicide ideators and attempters. *American Journal or Orthopsychiatry, 64,* 136-149.

Sadowski, C., & Kelley, M. L. (1993). Social problem solving in suicidal adolescents. *Journal of Consulting and Clinical Psychology, 61,* 121-127.

Safer, D. J. (1997). Self-reported suicide attempts by adolescents. *Annals of Clinical Psychiatry, 9,* 263-269.

Sandin, B., Chorot, P., Santed, M. A., Valiente, R. M., & Joiner, T. E. (1998). Negative life events and adolescent suicidal behavior: A critical analysis from the stress process perspective. *Journal of Adolescence, 21,* 415-426.

Sansone, R. A., Wiederman, M. W., & Sansone, L. A. (1998). The self-harm inventory (SHI): Development of a scale for identifying self-destructive behaviors and borderline personality disorder. *Journal of Clinical Psychology, 54,* 973-983.

Santa-Mina, E. E., & Gallop, R. M. (1998). Childhood sexual and physical abuse and adult self-harm and suicidal behaviour: A literature review. *Canadian Journal of Psychiatry, 43,* 793-800.

Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The social support questionnaire. *Journal of Personality and Social Psychology, 44,* 127-139.

Sarason, I. G., Pierce, G. R., & Sarason, B. R. (1994). In W. R. Avison & I. H. Gotlib (Eds.), *Stress and mental health: Contemporary issues and prospects for the future* (pp. 151-178). New York: Plenum Press.

Sarason, I. G., Sarason, B. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of social and personal relationships, 4,* 497-510.

Sarason, B. R., Sarason, I. G., & Pierce, G. R. (1990). Traditional views of social support and their impact on assessment. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 9-25). New York: Wiley.

Seiffge-Krenke, I., Aunola, K., & Nurmi, J. (2009). Changes in stress perception and coping during adolescence: The role of situational and personal factors. *Child Development, 80,* 259-279.

Shaffer, D. & Jacobson, C. (2010). Proposal to the DSM-V childhood disorder and mood disorder work groups to include non-suicidal self-injury (NSSI) as a DSM-V disorder. *American Psychiatric Association.* Retrieved from http://www.dsm5.org/Proposed%20Revision%20Attachments/APA%20DSM-5%20NSSI%20Proposal.pdf

Shagle, S. C., & Barber, B. K. (1995). A social-ecological analysis of adolescent suicidal ideation. *American Journal of Orthopsychaitry, 65,* 115-124.

Sigurdson, E., Staley, D., Matas, M., Hildahl, K., & Squair, K. (1994). A five year review of youth suicide in Manitoba. *Canadian Journal of Psychiatry, 39,* 397-403.

Simeon, D. & Favazza, A. R. (2001). Self-injurious behaviors: Phenomenology and assessment. In D. Simeon & E. Hollander (Eds.), *Self-injurious behaviors: Assessment and treatment* (pp. 1-28). Arlington, US: American Psychiatric Publishing, Inc.

Simpson, C. A., & Porter, G. L. (1981). Self-mutilation in children and adolescents. *Bulletin of the Menninger Clinic, 45,* 428-438.

Sitarenios, G., & Kovacs, M. (1999). Use of the children's depression inventory. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment (2nd edition).* Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Sourander, A., Aromaa, M., Pihlakoski, L., Haavisto, A., Rautava, P., Helenius, H., & Sillanpaa, M. (2006). Early predictors of deliberate self-harm among adolescents. A prospective follow-up study from age 3 to age 15. *Journal of Affective Disorders, 93,* 87-96.

Spirito, A., Overholser, J., & Stark, L. J. (1989). Common problems and coping strategies II: Findings with adolescent suicide attempters. *Journal of Abnormal Child Psychology, 17,* 213-221.

Statistics Canada (2009a). Leading causes of death, total population, by age group and sex, Canada, annual. *Leading causes of death in Canada, 2005* (Catalogue No. 84-215-X, CANSIM Table 102-0561). Ottawa, ON: Statistics Canada. Retrieved from http://www5.statcan.gc.ca/cansim/a16?id=1020561&lang=eng&pattern=1020561&

stByVal=3&requestID=20110412125946593 99&MBR%5B%27UNIT%27%5D=1*4&MBR%5B%27GEO%27%5D=1&MBR%5B%27SEX%27%5D=1*3&MBR%5B%27CAUSEOFDEATH%27%5D=46&MBR%5B%27AGEDEATH%27%5D=4.18&retrLang=eng&syear=2005&eyear=2005&exporterId=TABLE_HTML_TIME_AS_COLUMN&__checkbox_accessible=true&action%3Aa23=Retrieve+now

Statistics Canada (2009b). *Suicides and suicide rate, by sex and by age group* (*CANSIM, table 102-0551 and Catalogue no. 84F0209X*). Ottawa: Statistics Canada. Retrieved from http://www5.statcan.gc.ca/cansim/a16?id=1020551&lang=eng&pattern=&stByVal=3&requestID=20110412125456012 41&MBR%5B%27UNIT%27%5D=1*2&MBR%5B%27GEO%27%5D=1&MBR%5B%27SEX%27%5D=2*2&MBR%5B%27CAUSEOFDEATH%27%5D=125&MBR%5B%27AGEDEATH%27%5D=5*2&retrLang=eng&syear=2005&eyear=2005&exporterId=TABLE_HTML_TIME_AS_COLUMN&__checkbox_accessible=true&action%3Aa23=Retrieve+now

Suominen, K., Isometsa, E., Henriksson, M., Ostamo, A., & Lonnqvist, J. (1998). Inadequate treatment for major depression both before and after attempted suicide. *The American Journal of Psychiatry, 155, 1778-1780.*

Suyemoto, K. (1998). The functions of self-mutilation. *Clinical Psychology Review, 18,* 531-554.

Suyemoto, K. L., & MacDonald, M. L. (1995). Self-cutting in female adolescents. *Psychotherapy: Theory, Research, Practice, Training, 32,* 162-171.

Svirko, E., & Hawton, K. (2007). Self-injurious behavior and eating disorders: The extent and nature of the association. *Suicide and Life-Threatening Behavior, 37,* 409-421.

Tabachnick, B. G., & Fidell, L. S. (1989). *Using Multivariate Statistics* (2nd Ed.). New York, NY: HarperCollins Publishers.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using Multivariate Statistics* (3rd Ed.). New York, NY: HarperCollins College Publishers.

Taiminen, T. J., Kallio-Soukainen, K., Nokso-Koivisto, H., Kaljonen, A., & Helenius, H. (1998). Congtagion of deliberate self-harm among adolescent inpatients. *Journal of the American Academy of Child and Adolescent Psychiatry, 37,* 211-217.

Thorlakson, C. L. (1998). *Predictors or coping strategies in adolescence* (Unpublished master's thesis). University of Manitoba, Winnipeg, MB.

Townsend, E., Hawton, K., Altman, D. G., Arensman, E., Gunnell, D., Hazell, P., House, A., & Van Heeringen, K. (2001). The efficacy of problem-solving treatments after deliberate self-harm: Meta-analysis of randomised controlled trials with respect to depression, hopelessness and improvement in problems. *Psychological Medicine, 40,* 1246-1253.

Walsh, B. W. (2006). *Treating self-injury: A practical guide.* New York, NY: The Guilford Press.

Webb, L. (2002). Deliberate self-harm in adolescence: A systematic review of psychological and psychosocial factors. *Journal of Advanced Nursing, 38,* 235-244.

Weinberg, N. Z., Rahdert, E., Colliver, J. D., & Glantz, M. D. (1998). Adolescent substance abuse: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry, 37,* 252-261.

Welch, S. S. (2001). A review of the literature on the epidemiology of parasuicide in the general population. *Psychiatric Services, 52,* 368-375.

Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behaviors in a college population. *Pediatrics, 117,* 1939-1948.

Winchel, R. M., & Stanley, M. (1991). Self-injurious behavior: A review of the behavior and biology of self-mutilation. *The American Journal of Psychiatry, 148,* 306-317.

Wood, A., Trainor, G., Rothwell, J., Moore, A., & Harrington, R. (2001). Randomized trial of group therapy for repeated deliberate self-harm in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 1246-1253.

Wylie, K., House, A., & Storer, D. (1996). Deliberate self-harm and substance dependence: The management of patients seen in the general hospital. *Journal of Mental Health Administration, 23,* 246-252.

Yessine, A. K. & Bonta, J. (2009). The Offending Trajectories of Youthful Aboriginal Offenders. *Canadian Journal of Criminology and Criminal Justice*, 435-472. doi: 10.3138/cjccj.51.4.435

Zlotnick, C., Mattia, J. I., & Zimmerman, M. (1999). Clinical correlates of self-mutilation in a sample of general psychiatric patients. *The Journal of Nervous and Mental Disease, 187*(5)*,* 296-301.

Appendix A

MYC Permission Letter

Manitoba

DEPARTMENT OF JUSTICE

Manitoba Youth Centre
170 Doncaster Street
Winnipeg, Mb. R3N 1X9

Office of Research Services
Human Ethics Secretariat
244 Engineering Building
University of Manitoba
Winnipeg, MB
R3T 2N2

July 19, 2005

Dear Sir or Madam:

This letter is to inform the Psychology/Sociology Research Ethics Board at the University of Manitoba that we at the Manitoba Youth Centre are aware of study procedures for the research entitled Deliberate Self-Harm in an Incarcerated Population of Youths that is to be conducted by Kelly Penner Hutton. I, Superintendent of the Manitoba Youth Centre, grant permission for Kelly Penner Hutton, under the supervision of Dr. Bruce Tefft, to conduct the study at the facility.

Ms. Hutton has provided a research summary including study objectives and procedures, a copy of all consent and assent forms, as well as a form for staff members to read when contacting parents regarding the research.

Sincerely,

[redacted]

Darryl Rumsey
Superintendent

Appendix B

Staff Phone Script for Obtaining Parental/Guardian Consent

Hello, I am _____ (name) from the Manitoba Youth Centre. A researcher from the University of Manitoba, Kelly Hutton, is conducting a research study on self-harming behaviour.

The title of the study is: Deliberate Self-Harm in an Incarcerated Population of Youth: An Examination of prevalence rates, risk, and protective factors

Before your child may participate in the study, we require your consent. Let me tell you about the study and then you can decide whether to allow your child to participate.

Purpose of Study

The purpose of this study is to look into **self-harming behaviour** (for example, cutting wrists, punching things, taking medication in order to harm self).

Study procedures

If you agree to allow your child to participate in this study, your child will be asked to complete several questions about different thoughts, behaviours, and feelings that he/she has.

Confidentiality **is very important in research studies. This study will make sure that the children's responses are only seen by the researcher.** No names will be on the survey that your child completes and nobody will know your child's answers.

It will take about **60 minutes** to answer all the questions on the survey.

Your decision to take part in this study is voluntary. **You may refuse to participate, your child may refuse to participate, and your child may withdraw from the study at any time. If you decide not to let your child fill out the survey,** your child's care at this centre and their relationship with the justice system will not be affected**. Your child will be given this information as well and will be able to decide whether they want to participate even if you agree to let them participate.**

IF your child participates, your child will be given $10.00 as a thank-you for the time it took to complete the survey.

There is a small possibility that your child will feel upset after completing the survey. Your child will have a chance to talk about the experience with the researcher or with a MYC staff member after completing the survey.

This research has been **approved by the Psychology/Sociology Research Ethics Board** at the University of Manitoba. If you have any concerns or complaints about this project you may contact the researcher or the Human Ethics Secretariat.

Do you have any questions? (if there is a question you, the MYC staff member, cannot answer based on the information provided please direct the parent to contact the researcher or ask if he/she will consent to have the researcher contact him/her. If yes, the researcher may contact them, please record the parent's name here)

_____

If the parent has no questions, . . . read,

Do you agree to have your child participate in this research study?

___ no (Your child will not be asked to participate in the research study and his/her care at the centre will not be affected. Thank-you for your time.)

___ yes (Thank-you. Your child will be given the same information that you were given and will be given a choice of whether or not to participate. If he/she decides not to participate, his/her care at the centre will not be affected. If your child chooses to participate he/she will be asked to complete the survey and will receive $10 as a thank-you. We at the Manitoba Youth Centre will not have access to your child's responses).

- □ Would you like to receive a summary of the findings when the research is completed?
  - ___ no
  - ___yes (Can we give the researcher your address so that she can mail a summary to you? Yes / no (circle one))
- MYC may send the summary if they would prefer.

Address _____ (street or postal box)
_____ (city, province)
_____ (postal code)

Summary of Consent:

Did the parent give verbal consent to have his/her child participate in the research?

___ no (if no, keep this form for your records so that the child is not asked to participate)

___ yes

Child's name _____
Parent/Guardian name _____
Date _____

Staff member's initials (for staff member who made the phone contact): _____

Appendix C

Assent Form

Title of Study: "Deliberate Self-Harm in an Incarcerated Population of Youth: An Examinationof prevalence rates, risk, and protective factors".

Principal Investigator: Kelly Penner Hutton, M.A.

Research Supervisor: Bruce Tefft, Ph.D., C. Psych

This form tells you about the study being conducted. It should give you a basic idea of what the research is about and what participation will involve. If you need more detail about something on this form or anything about this research, feel free to ask the researcher. The researcher will read this form with you. Stop me at any time if you have a question.

This study is asking about how teens deal with problems, or coping, and self-harm (things a person does on purpose to harm themselves). After you learn about the study you can decide if you want to fill out the survey. That is, you decide whether you want to participant in this study. Please ask the researcher to explain any words or information that you do not clearly understand.

Purpose of Study

The purpose of this study is to look into **self-harm**. Very little research has looked at self-harm in teens. Self-harm appears to be a coping strategy that teens sometimes use. This study will find out how many teens use self-harm as a way to cope. Because everyone uses different coping strategies, this research will look at other ways of coping with stressful events.

This study will also find out why certain teens self-harm and others do not. Questions will ask about feelings to see how they relate to self-harm. Information will be collected about feelings, alcohol and drug use, emotional support from others, and personal information such as your age, gender, and whether you are sentenced or on remand.

Study procedures

If you agree to take part in this study, you will be asked to complete several question about different thoughts, behaviours, and feelings you have. Nobody will see your answers except the researcher. Parents, guardians, therapists, and Manitoba Youth Centre staff will not see any of the answers you give.

Participation in the study will take approximately 60 minutes.

You can stop participating at any time, even after signing the assent form.

Voluntary Participant/Withdrawal from the Study

Your decision to take part in this study is voluntary. You may refuse to participate or you may withdraw from the study at any time. Your decision not to participate or to withdraw from the study will not affect your care at this centre. IF you decide not to participate or if you decide to withdraw from the study after you have begun, it will not affect your care at this centre or your relationship with the Justice System.

Risks and Discomforts

There is a small possibility that you will feel upset after completing the questionnaires or even feel an urge to engage in self-harming behaviour. After you complete the questionnaire, you will have a chance to talk about the experience, if you like, with the researcher or a unit staff member.

Benefits

There may or may not be direct benefit to you from participating in this study. We hope the information learned from this study will benefit other teenagers who are struggling with self-harming behaviour. After completion of the study, feedback will be given to the staff at the Manitoba Youth Centre. This feedback will contain group data and not specific information about individuals. The feedback given to the centre may provide staff with valuable information about teens that do and do not use self-harm as a coping strategy.

Payment for participation

You will be given $10.00 as a thank-you for the time it took you to complete the study procedures.

Confidentiality

Information gathered in this study may be published or presented in public forums; however, your name will not be used or revealed. Privacy of health records is protected by the Personal Health Information Act of Manitoba. Individual names will not appear in any reports which may be published based on this research. When information is revealed, it will talk about group information and not individual information. Only the researcher and authorized personnel (e.g., research supervisor, research assistants) will have access to the actual questionnaires. No names will appear on or near the questionnaires (the consent forms will be kept in a separate location).

Despite efforts to keep your personal information confidential, absolute confidentiality cannot be guaranteed as the law requires that information about a child being abused or about someone intending to hurt someone else be reported.

Questions

You are free to ask any questions that you may have about your rights as a research participant. If any questions come up during or after the study, contact the study staff: Kelly Hutton or Bruce Tefft.

This research has been approved by the Psychology/Sociology Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at _____. A copy of this consent form has been given to you to keep for your records and reference.

Do not sign this consent form unless you have had a chance to ask questions and have received answers to all of your questions.

Statement of Consent

I have read this consent form. I have had my questions answered in language I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw at any time. I freely agree to participate in this research study.

I understand that information regarding my personal identity will be kept confidential, but that confidentiality is not guaranteed.

By signing this consent form, I have not waived any of the legal rights that I have as a participant in a research study nor does it release the researchers, sponsors, and involved institutions from their legal responsibilities.

Participant's signature _____
Date_____
Participant's printed name _____

Appendix D

Debriefing Script

Thank-you for participating in this research. We hope to obtain valuable information about health behaviour and in particular, self-harm, as it relates to incarcerated youth. The information you have provided us, combined with all the other participants, will help us to understand how we can better help teens who harm themselves even if you have never used self-harm as a coping strategy. We will be giving feedback to staff at the Manitoba Youth Centre upon completion of the study.

We want to make sure that anyone who participates in this research has someone to talk to if they have any uncomfortable feelings. You can talk to the staff here at Manitoba Youth Centre or you can talk to the researcher Kelly Hutton or research supervisor Bruce Tefft.

Appendix E

Staff Report Form

This form asks for information regarding certain inmate's self-harm behaviour. Please fill the information out for the person whose name appeared on the front of the envelope. **Do Not** put that person's name anywhere on this piece of paper. Please destroy the original envelope that put this form in the envelope provided by the researcher. Thank-you.

Please answer both of the questions for each item. The first question asks if you ever witnessed the behaviour. The second question asks whether you have ever heard about the person engaging in this behaviour. If you answer that "yes" to hearing about the behaviour please indicate who you heard the information from (e.g., another staff member, an inmate, psychologist, etc.).

Behaviour:	Have **you** ever **witnessed** this person . . .	Have you ever **heard** (or found out by other means) that this person . . .
1. cut skin on the wrists, arms or other areas of the body?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
2. prick holes in his/her skin (e.g., with a pin, needle, or staples)? Do not include ear piercing, tattoos, or needles for drug use.	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
3. burn his/her skin (e.g., with a match or cigarette)	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
4. carve words, pictures or other marks into his/her skin (this does not include decorative tattoos)?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
5. severely scratch him or herself, to the extent that scarring or bleeding occurred?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times?

		Source of info:
Behaviour:	Have **you** ever **witnessed** this person . . .	Have you ever **heard** that this person . . .
6. bite his or herself, to the extent that it broke the skin?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
7. eat or drink something that was not meant to be eaten?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
11. slap or punch his or herself?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
12. pull his/her own hair hard enough to cause pain?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info: :
13. hit objects to hurt his or herself (e.g., walls)?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:
14. brake his/her own bones?	___ No ___ Yes If yes, how many times?	___ No ___ Yes If yes, how many times? Source of info:

Appendix F

Deliberate Self-Harm Checklist

1. **Have you ever harmed yourself on purpose? ___ no(0) ___ yes (1)**

This part asks about different things that people sometimes do to hurt themselves. Read each item carefully and respond honestly. Often, people who do these kinds of things keep it a secret. Only the researcher will see your answers. The staff at the Manitoba Youth Centre will never see your answers.
Please answer yes to a question only if you did the behaviour **on purpose**, **to hurt yourself**.

			If yes, answer A and B	
Have you on purpose . . .	Have you **ever** done this?		**A.** Have you ever hurt yourself so bad that you **probably should have sought medical attention** even if you didn't?	**B.** Have you ever gone to **see a doctor** or nurse (actually gotten medical attention) after doing this (for example, to get stitches)?
1. cut your skin on your wrists, arms or other areas of your body?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
2. pricked holes in your skin (e.g., with a pin, needle, or staples)? Do not include ear piercing, tattoos, or when using needles for drug use.	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
3. burned your skin (e.g., with a match or cigarette)	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
4. carved words, pictures or other marks into your skin (this does not include decorative tattoos)?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
5. scratched yourself so bad that it was bleeding or left a scar?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
6. bit yourself, to the extent that you broke the skin?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No

			If yes, answer A and B	
Have you on purpose . . .	Have you **ever** done this?		**A.** Have you ever hurt yourself so bad that you **probably should have sought medical attention** even if you didn't?	**B.** Have you ever gone to **see a doctor** or nurse (actually gotten medical attention) after doing this (for example, to get stitches)?
7. ate or drank something that is not meant to be eaten?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
8. swallowed medication in order to harm myself (e.g., swallowed a lot of pain medication or laxatives)?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
9. used drugs to harm myself?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
10. ate toxic substances (e.g., household cleaners)?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
11. slapped or punched myself?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
12. pulled my hair hard enough to cause pain?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
13. hit objects to hurt myself (e.g., walls)?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
14. broken your own bones?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No

			If yes, answer A and B	
Have you on purpose . . .	Have you **ever** done this?		**A.** Have you ever hurt yourself so bad that you **probably should have sought medical attention** even if you didn't?	**B.** Have you ever gone to **see a doctor** or nurse (actually gotten medical attention) after doing this (for example, to get stitches)?
15. banged your head against something, to the extent that you caused a bruise to appear?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
16. prevented wounds from healing?	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No
17. done anything else to harm yourself that was not asked about in this questionnaire? If yes, what did you do to hurt yourself? _____ _____	___ Yes(1) ___ No(0)		___ Yes: how many times? ___ ___ No	___ Yes: how many times?___ ___ No

Harmful Behaviours Part 2: Completed only for methods indicated in Part 1

Have you on purpose . . .	Have you done this in the **past 12 months**?	Have you done this **while you have been in MYC?**	Age I **first did this**	Age I **last did this**	**How long** did you do this for? (number of months or years)
1. cut your skin on your wrists, arms or other areas of your body?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
2. pricked holes in your skin (e.g., with a pin, needle, or staples)? Do not include ear piercing, tattoos, or when using needles for drug use.	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
3. burned your skin (e.g., with a match or cigarette)	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
4. carved words, pictures or other marks into your skin (this does not include decorative tattoos)?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
5. scratched yourself so bad that it was bleeding or left a scar?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			

Have you on purpose . . .	Have you done this in the **past 12 months**?	Have you done this **while you have been in MYC?**	Age I **first did this**	Age I **last did this**	**How long** did you do this for? (number of months or years)
6. bit yourself, to the extent that you broke the skin?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
7. ate or drank something that is not meant to be eaten?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
8. swallowed medication in order to harm myself (e.g., swallowed a lot of pain medication or laxatives)?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
9. used drugs to harm myself?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
10. ate toxic substances (e.g., household cleaners)?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			

Have you on purpose . . .	Have you done this in the **past 12 months**?	Have you done this **while you have been in MYC?**	Age I **first did this**	Age I **last did this**	**How long** did you do this for? (number of months or years)
11. slapped or punched myself?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
12. pulled my hair hard enough to cause pain?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
13. hit objects to hurt myself (e.g., walls)?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
14. broken your own bones?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			
15. banged your head against something, to the extent that you caused a bruise to appear?	___ Yes(1) ___ No(0) If yes, how many times? _____	___ Yes(1) ___ No(0) If yes, how many times? _____			

Have you on purpose . . .	Have you done this in the **past 12 months**?	Have you done this **while you have been in MYC?**	Age I **first did this**	Age I **last did this**	**How long** did you do this for? (number of months or years)
16. prevented wounds from healing?	___ Yes$_{(1)}$ ___ No$_{(0)}$ If yes, how many times? _____	___ Yes$_{(1)}$ ___ No$_{(0)}$ If yes, how many times? _____			
17. done anything else to harm yourself that was not asked about in this questionnaire? If yes, what did you do to hurt yourself? _____ _____	___ Yes$_{(1)}$ ___ No$_{(0)}$ If yes, how many times? _____	___ Yes$_{(1)}$ ___ No$_{(0)}$ If yes, how many times? _____			