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Gender and Age Considerations in the Relationship of Frequency of NSSI and Emotion Regulation in Comparison to SSI

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A thesis submitted in partial fulfillment of the requirements for the degree in Master of Arts

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FREQUENCY OF NSSI AND EMOTION REGULATION IN COMPARISON TO SSI

(Thesis format: Monograph)

by

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Abstract

Non-suicidal self-injury (NSSI) is a pervasive problem within our society and has been increasing since the late 1980s. NSSI is the deliberate destruction of body tissue without the intention of suicide. In comparison, suicidal self-injury involves the intention of suicide. A sample of 8-18 year olds (N=519) were studied to explore how differences in age, gender and emotion regulation impacted their engagement in NSSI and SSI. Participants were grouped into NSSI, SSI and control groups. Findings indicated that emotion regulation abilities did not significantly differ between groups, the SSI group were significantly older than both NSSI and control groups, the frequency of self-harm was significantly higher for the NSSI group, and gender did not significantly differentiate any of the groups. Finally, emotion regulation ability was the only factor found to impact all groups in terms of frequency of self-harm. Overall, the findings point to the importance of emotion regulation skills in reducing self-harm.

Keywords: NSSI, Non-suicidal self-injury, SSI, suicidal self-injury, emotion regulation, age, gender.

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Regulation in Comparison to SSI

Non-suicidal self-injury (NSSI) is the deliberate destruction of body tissue
without the intention of suicide (Gratz, 2003). It is a pervasive problem within our society
and has been garnering additional attention in recent years. In 1999, Ontario spent $886
million on direct and indirect costs of suicide and self-harm with 73,066 individuals
being hospitalized for care (Smart Risk, 2006). However, these numbers do not include
any acts of NSSI that did not require medical treatment. It has further been found that
instances of NSSI, while being reported for centuries, has been increasing since the late
1980s (Matthew K Nock, 2009). The intent of this research is to understand NSSI as a
unique construct within suicidal self-injurious thoughts and behaviours within a sample
of children and adolescents, as the implications of a self-injurious act without suicidal
intent distinguishes it from other behaviours.

Non-Suicidal Self-Injury

NSSI has been recently categorized within the Diagnostic Statistical Manual
[DSM] Version 5 as a distinct condition, separate from its previous characterization as a
part of the diagnosis of borderline personality disorder (American Psychiatric
Association, 2013). NSSI behaviours occur due to fundamentally different reasons and
should therefore be studied as a separate construct in order to understand the
developmental pathway from which these behaviours stem and the moderating variables
that are associated with the use of NSSI separate from the use of suicidal self-injury
(SSI).

Emotion regulation is often cited as one of the major contributors to an
individual's engagement in NSSI, as it is used to control negative emotions (Klonsky,

Muehlenkamp, Lewis, & Walsh, 2011). Children and adolescents who are being treated in both inpatient and outpatient care, are among our community's most vulnerable populations. Certain of these children and adolescents are in need of the most intensive care available and face intensive levels of clinical mental health concerns (Shannon L. Stewart, Baiden, Theall-Honey, & den Dunnen, 2013). Overall, this population requires a clear clinical appreciation of their problems in order to provide the most effective care available. Sensitivity to gender and age differences should also be considered in forming a complete understanding of the relationship between frequency of engagement in NSSI behaviours and the further impact of emotion dysregulation on these combined factors.

Stereotypic NSSI NSSI falls under the broad category of suicidal self-injurious thoughts and behaviours (Matthew K Nock & Favazza, 2009). Stereotypically, NSSI most often occurs in individuals with neuropsychiatric disorders and developmental disabilities involving high frequency, low injury NSSI episodes. However, NSSI most often occurs in nonpsychotic individuals without developmental disabilities. The injury related to NSSI must be direct and deliberate, implying that the negative health effects cannot be secondary such as in smoking where the injury is intentionally harmful but not accidental (Matthew K Nock & Favazza, 2009). However, the level of physical injury exists on a continuum through mild, moderate, and severe, which denotes the frequency and severity of the NSSI behaviours (Matthew K Nock & Favazza, 2009). Further, for the act to be considered NSSI, the destruction of the body is not committed in a socially sanctioned manner such as with tattoos and piercings unless the intention of the act is self-harm (Klonsky, 2007a). Common forms of NSSI include: burning, cutting, scratching, self-hitting and interfering with the healing of wounds (Klonsky, 2007a;

Manca, Presaghi, & Cerutti, 2013). The most common form of self harm is skin cutting, which occurs in 70% to 90% of individuals who participate in NSSI (Klonsky, 2007b).

Historically, NSSI was understood as a symptom of a major psychiatric disorder and most commonly present as a symptom of Borderline Personality Disorder (Klonsky, 2007a). However, recent research has found that NSSI is present within both nonclinical and high-functioning samples (Klonsky & Olino, 2008; Klonsky, 2007a). Further, NSSI has been implicated in other disorders such as: anxiety disorders, depression, substance use, eating disorders, and post-traumatic stress disorder (Klonsky & Olino, 2008; Matthew K Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). However, the mediating factors contributing to NSSI engagement are still not well defined when considering NSSI as a whole and how SSI populations differ from NSSI.

Suicidal Self-Injury

Within Nock and Favazza's (2009) description of self-injurious thoughts and behaviours, SSI includes suicidal attempts. Therefore, SSI is categorically different from NSSI based on the intent of the self-harm. SSI would encompass any self-harm where the intent of the act was suicide. However, NSSI and SSI can co-occur within an individual (Jacobson, Muehlenkamp, Miller, & Turner, 2008). Further research suggests that NSSI, SSI and suicide exist on a continuum, wherein NSSI and suicide are anchor points and individuals may progress towards more serious, lethal actions (Cloutier, Martin, Kennedy, Nixon, & Muehlenkamp, 2010). Overall, the relationship between NSSI, SSI and suicide is still debated and further research is required.

Emotion Regulation

Emotion regulation is conceptually understood as an ongoing process whereby individuals continuously influence and assess the following: which emotions they are experiencing, when they are experienced; and how they are experienced and expressed (Rottenberg & Gross, 2003). Emotion regulation is used to regulate both positive and negative emotions through either acceleration or deceleration (James J Gross & Thompson, 2007). Emotion regulation can be either a controlled or automatic process.

Additionally, both cognitive and behavioural processes impact the duration, expression, intensity and occurrence of emotions (Campbell-Sills & Barlow, 2007). Individuals will use both conscious and unconscious methods to control their own emotions throughout a day and often, self-regulatory methods of emotion regulation are successful (Rottenberg & Gross, 2003). Individuals will often adapt how they are responding to their emotions based on their environment (Campbell-Sills & Barlow, 2007).

Gratz (2003) presented a clinically useful definition for emotion regulation when discussing NSSI. She presented four components that must be present in an individual for proper emotion regulation. Deficit in any of the four areas would suggest emotion dysregulation. The four areas are: 1) being aware and accepting of emotions 2) flexibility in changing the intensity/duration of emotional responses 3) prepared to feel negative emotions 4) being able to commit oneself to goal directed behaviours and hold back impulsive behaviours when feeling negative emotions (Gratz, 2003). Therefore, individuals who struggle with emotional regulation may behave impulsively, be uncomfortable experiencing negative emotions and react in socially unacceptable ways to negative emotions.

The following section provides a guide to the most often cited theoretical foundations related to NSSI.

Theories Attached to Emotion Regulation

Linehan's Affect Regulation Model. Linehan (1993) introduced a model for individuals with Borderline Personality Disorder (BPD) and NSSI, since NSSI is often associated with BPD. However, Linehan's model can also be applied to other individuals engaging in NSSI. The model outlines how individuals develop NSSI behaviours. It is posited that the emergent BPD begins with an invalidating environment during a critically important developmental phase. Lacking validation, children are unable to develop and observe proper emotion regulation strategies being modeled. Without the development of these strategies, individuals who emerge from invalidating environments often develop emotion dysregulation. When emotion dysregulation is present, it is suggested that there is a higher likelihood of NSSI behaviours. Further, it is indicated that a biological predisposition to emotion dysregulation plays a role in this process (Linehan, 1993). Overall, this theory provides a framework for understanding how certain individuals can become prone to engaging in NSSI and the role that emotion regulation has in its development.

Biosocial Developmental Model. Linehan's model of affect regulation has been recently expanded. The biosocial developmental model contributes to Linehan's original theory by including the role played by impulsivity in the development of BPD and NSSI (Crowell, Beauchaine, & Linehan, 2009). It is suggested that if impulsivity is present early in development that this predisposes the individual to current and future struggles with emotion regulation. It is further theorized that impulsivity and emotion regulation

develop independently and may be involved in different parts of functioning (Crowell et al., 2009). Therefore, when considering emotion regulation as a contributing factor to NSSI engagement, impulsivity should be considered.

Experiential Avoidance Model. The Experiential Avoidance Model (EAM) provides a theoretical framework for the process in which NSSI behaviours are maintained once NSSI has been incorporated into the individual's life. Experiential avoidance involves an individual who is unwilling to participate in the feelings of certain private experiences such as emotions, thoughts, memories, or bodily sensations (Anderson & Crowther, 2012). Individuals who experientially avoid such experiences are motivated to find a way to relieve themselves of these experiences. NSSI has been found to be a negatively reinforcing behaviour to help decrease or terminate unwanted emotions (Chapman, Gratz, & Brown, 2006). Therefore, when individuals are experiencing unwanted emotions or any experience they want to avoid, NSSI is often used to sidestep that experience as it provides temporary relief from the stimulus. In this situation, NSSI is used as a maladaptive emotion regulation strategy (Chapman, Specht, & Cellucci, 2005). However, the relief provided by NSSI is only temporary and the stimulus is likely to return, thus promoting the use of further NSSI behaviours. Further, the experiential avoidance model posits that emotional regulation deficits, high emotional intensity and poor stress tolerance are all factors in engaging in experiential avoidance (Chapman et al., 2006)

Script Theory. Script theory builds on the experiential avoidance model, theorizing that when a behaviour has been found to be successful in the past, the individual is more likely to engage in the behaviour again in a similar situation (Abelson,

1976). Therefore, NSSI would continue to be used if it has been found to be successful at limiting unwanted emotions.

Social Learning Theory. Social learning theory suggests that when an individual is in an ambiguous situation they will often imitate actions that they have seen in the past completed by others in similar situations due to their perceived reinforcement potential (Bandura, 1977). Social learning theory has been expanded to describe the impact that media can have on an individual's engagement with NSSI behaviours including sources such as: the internet, movies, and music (Matthew K Nock, 2010). Disinhibition theory suggests that when an individual sees another perform a task, it reduces their own inhibition to complete the same task (Freedman, 1982). Overall, social theories support the premise that when an individual observes another engaging in a behaviour it increases the likelihood of engaging in the behaviour themselves, this may impact the frequency of NSSI behaviours in residential care samples (Whitlock, Purington, & Gershkovich, 2009).

Extending the Impact of Emotion Regulation Theory

Development. The development of emotion regulation begins at the time of birth. Caregivers attempt to give direction to the newborn's arousal levels to aid in emotion regulation (Thompson & Goodman, 2010). Prior to three months of age, the majority of emotion regulation skills are governed by innate physiological mechanisms (Calkins & Hill, 2007). By six months of age, infants are able to actively disengage from stimuli that induce negative affect (Calkins & Hill, 2007). Throughout their first and second years, infants become more industrious and determined in their ability to control affective arousal and begin to employ active methods of emotion regulation (Calkins & Hill,

2007). From the age of two through preschool, children begin to make comments about emotions and understand the associations between emotions and when they may occur (Thompson & Goodman, 2010). Preschool represents a developmental milestone of emotion regulation, moving from parent-child co-regulation to the child being able to fully self-regulate their own emotions for periods of time in the midst of non family care givers (Cole, Michel, & O'Donnell Teti, 1994). Overall, emotion regulation development is primarily dependent on having supportive caregivers who can respond with flexibility and helps to develop a secure attachment (Calkins & Hill, 2007). The development of emotion regulation is further impacted by the broader context of the family's emotional life, caregiver models of coping, and the expectations placed on the child for emotional self-control (Thompson & Goodman, 2010). In sum, emotion regulation skills and deficits begin in childhood and are largely impacted by the family environment.

Emotion Dysregulation. Emotion dysregulation occurs when an individual is ineffective in regulating their emotions. He or she will experience either the inability to reduce unwanted emotions or, the long-term cost of their emotion regulation strategy, will outweigh what they gained in the short-term reduction of the unwanted emotion (Campbell-Sills & Barlow, 2007). Further, emotion dysregulation can be defined as an inflexible integration of emotions into other processes, limited control over the expression and experiencing of affect, and difficulty processing information from emotional events (Cole et al., 1994). Emotion-related symptoms are relevant to many psychological diagnoses of children and adults including: anxiety disorders, affective disorders, disruptive behaviour disorders, eating disorders, substance use disorders, and

personality disorders (Cole et al., 1994). Further, emotion dysregulation has been implicated in more than half of the DSM-IV clinical disorders (Oschner & Gross, 2007).

Role in Childhood and Adolescence

The majority of research completed on the development of emotion regulation has focused on the critical period from infancy through adolescence (James J Gross & Thompson, 2007). The role that infancy and early childhood plays has been outlined above. In late childhood and adolescence, emotions begin to be understood in more complex terms and individual differences begin to play a role in emotion regulation. Therefore, children are able to begin to regulate their feelings in a manner that is consistent with their personalities and needs (James J Gross & Thompson, 2007). It is further believed that emotion regulation continues to develop through adult years.

When children are developing their emotional regulation skills, they may fail to develop key skills to allow them to function within a normal trajectory. Primarily, these children lack an awareness of emotions (Stegge & Terwogt, 2007). When children lack an awareness of emotions, they are unable to adaptively regulate their emotions. Both depressive symptoms and anger/aggression have been implicated as part of a larger inability to regulate emotions (Stegge & Terwogt, 2007).

Role in Tertiary Care Sample

Tertiary care samples consist of children and youth who are in need of the greatest amount of care within the children's mental health system. Tertiary care facilities are recommended for individuals with multiple, complex mental heath, social and developmental difficulties. Tertiary care is suggested for individuals when evidence based treatment programs offered within the community have already failed (St. Pierre,

Leschied, Stewart, & Cullion, 2008). Within tertiary care samples, internalizing and externalizing behaviours are most commonly found within the clinical range (den Dunnen, Stewart, Currie, Willits, & Baiden, 2013). Further, internalizing and externalizing problems have been associated with emotion dysregulation (Neumann, van Lier, Gratz, & Koot, 2010). This implicates emotion dysregulation as a common problem within children and youth in tertiary care.

Factors Relevant to Non-Suicidal Self-Injury

Age of Onset. Early studies have suggested that NSSI is rare in children under the age of 14 years (Rodham & Hawton, 2009). However, the age of onset for NSSI is widely agreed upon to most often develop around 12-14 years of age (Manca et al., 2013; Rodham & Hawton, 2009). In a sample of children and adolescents in residential or intensive home care, it was found that 39% of children who reported NSSI were under the age of 12 (Preyde et al., 2012). This data suggests that while it is possible for NSSI to occur before the age of 12 years, it is of much lower frequency. Few studies have investigated NSSI below the age of 12 years. Some research has suggested that recurrent NSSI may have a younger age of onset (*M*=12.4) than intermitted NSSI (*M*=15.5; Yates, Carlson, & Egeland, 2008). However, the most common age for first episode of self-harm in the United States has been found to be 16 years of age (Skegg, 2005). This is consistent with the theory that NSSI may be linked to puberty (Skegg, 2005).

Prevalence. The prevalence of NSSI behaviours among adolescents in clinical samples ranges from 40%-61% (Darche, 1990; DiClemente, Ponton, & Hartley, 1991). Within clinical samples, NSSI is found at significantly higher rates than in nonclinical samples (Klonsky et al., 2011). The prevalence within community samples is

significantly lower, with studies reporting a prevalence rate between 14% to 17% (Muehlenkamp & Gutierrez, 2004; Ross & Heath, 2002; Whitlock, Eckenrode, & Silverman, 2006). Comparatively, a Canadian sample examining youth presenting for emergency crisis services found that 45.3% had self-harmed within the last 24 hours with 91% of those instances being classified as NSSI (Cloutier et al., 2010). Further, 48% of adolescents in a depression and suicide program were found to report use of deliberate self-harm (Jacobson et al., 2008). A recent study on children and adolescents in tertiary care completed at the same institute as the present study found a prevalence rate of 35% engaging in deliberate self-harm (Shannon L. Stewart et al., 2013). It was noted that low rates of self-harm might have been due to parental report measures. However, this research is in line with a sample of adolescents accessing residential or intensive home-based treatment which found a prevalence rate of 34% for NSSI (Preyde et al., 2012). There is speculation that the higher rates of NSSI within clinical samples could be attributed to the contagion of NSSI behaviours among the adolescents or that there are a larger number of more severe psychiatric difficulties present among these adolescents (Klonsky et al., 2011). Differentially, it could simply be due to clinical populations presenting with more severe psychiatric difficulties (Klonsky et al., 2011). Overall, the prevalence rates of NSSI within clinical samples are still highly contested and require further investigation to identify the prevalence of NSSI.

Frequency. Research suggests that once an individual engages in an episode of NSSI it is common to repeat the behaviour. In a study following individuals who had previously engaged in NSSI, the best predictor of continued NSSI was past NSSI; 63% of participants who had previously engaged in NSSI were found to engage in NSSI in the

next year (Glenn & Klonsky, 2011). Other predictive factors included the recency of the last NSSI, overall frequency of NSSI, and the number of different methods utilized to engaged in NSSI (Glenn & Klonsky, 2011). In an adolescent inpatient sample, approximately two-thirds reported engaging in NSSI prior to hospitalization. At a 9 month follow up, 34% reported to have engaged in NSSI in the past 3 months; at 15 months 23% reported NSSI in the past 3 months (Guerry & Prinstein, 2010).

Research has shown that lifetime instances of NSSI have on average, ranged from 3.4 to 50 (Klonsky, 2007b). However, instances have been reported into the thousands (Jenkins & Schmitz, 2012). Inpatient samples report more frequent instances of NSSI, with an average above 50 episodes per year (Matthew K Nock & Prinstein, 2004). Overall, research on the frequency of NSSI behaviours for children and adolescents is scarce and requires further attention to understand the repetitive nature of NSSI within some populations.

Impact of Emotion Dysregulation on NSSI

Empirical research within the field of emotion regulation and NSSI is widely supportive of an association between a deficit in emotion regulation and the engagement in NSSI. Many studies support emotion dysregulation being a defining factor between individuals who use NSSI and those who do not (Gratz & Roemer, 2008; Gratz & Tull, 2010; Gratz, 2006; Perez, Venta, Garnaat, & Sharp, 2012). When daily emotions are considered, individuals who engage in NSSI are found to report more negative emotions, specifically an increase in self-dissatisfaction, along with fewer positive emotions (Victor & Klonsky, 2013). Further, these effects were still present when Axis 1 disorders and

BPD was controlled for, which indicates a problem beyond the nature and degree of psychopathology that self-injurers experience.

Within undergraduate student samples, females were found to engage in NSSI at higher rates (Jenkins & Schmitz, 2012) .Within this study, frequencies of NSSI acts over the lifetime were significantly predicted by positive affect following the episode, which supports the experiential avoidance model and script theory. Further, emotion dysregulation was found to significantly predict a greater number of NSSI acts. Finally, it was suggested that emotion dysregulation, emotional reactivity and affective experience following an episode of NSSI may partially mediate the relationship between sex and number of NSSI episodes (Jenkins & Schmitz, 2012). However, this sample was 73% female, which may have biased the results. With male undergraduates, it has been found that emotion dysregulation and childhood physical abuse characterized males with frequent NSSI from those without NSSI (Gratz & Chapman, 2007). Further, emotion dysregulation was associated with more frequent NSSI among the males who reported any NSSI. Overall, within undergraduate student samples, emotion dysregulation has been found to be significantly associated with NSSI.

Within a youth and adolescent inpatient sample, difficulties with emotion regulation significantly predicted NSSI; in particular when the individual endorsed having limited access to emotion regulation strategies (Perez et al., 2012). Through the use of the Difficulties in Emotion Regulation Scale (DERS), limited access to emotion regulation strategies was the only emotion regulation subscale to remain significant in predicting NSSI when controlling for other emotion regulation subscales, sex, and psychopathology (Perez et al., 2012). Further, through the use of the DERS, it has been

suggested that an individual's level of emotional reactivity largely explains the relationship between psychopathology and self-injurious thoughts and behaviours (Matthew K Nock, Wedig, Holmberg, & Hooley, 2008). Studies measuring difficulties in emotion regulation and NSSI have helped to delineate the factors within emotion regulation that are the most influential to NSSI, including emotional reactivity and limited access to emotion regulation skills.

Limited access to emotion regulation skills has further been supported as a factor increasing NSSI amongst substance use disorder patients. In addition to emotional non-acceptance and difficulty engaging in goal directed behaviours, these three features of emotion regulation were found to be most relevant to NSSI engagement in substance use disorder patients (Gratz & Tull, 2010). Finally, this study supported an association between emotion dysregulation and NSSI when controlling for PTSD, childhood abuse, BPD and substance use severity (Gratz & Tull, 2010). Overall, the association between emotion dysregulation and NSSI continue to be supported amongst different populations even when mitigating factors are controlled for.

In a female adolescent psychiatric inpatient sample, emotion dysregulation was found to be the underlying process in NSSI (Adrian, Zeman, Erdley, Lisa, & Sim, 2011). Further, it was found that both peer and family interpersonal problems impacted the individual's ability to regulate the function of emotions, therefore, supporting an association between NSSI and emotion dysregulation being fostered through unsupportive social contexts.

Additional adolescent samples have focused on self-report statements of the motivators for self- harm using The Functional Assessment of Self-Mutilation (FASM)

Scale. Based on the FASM, it has been found that between 53-65% of adolescents in inpatient and incarcerated settings endorsed the statement that they used NSSI 'to stop bad feelings' (Matthew K Nock & Prinstein, 2004; Penn, Esposito, Schaeffer, Fritz, & Spirito, 2003). These findings indicate that emotion regulation plays a strong role in motivating adolescents to use NSSI. However, the sample in the Nock and Prinstein (2004) study was relatively small (N=108) and relied solely on self-report measures. Nonetheless, it does support the notion that NSSI has a relationship with emotion regulation in adolescents who are in residential facilities.

In summary, there has been a substantial amount of recent research into the understanding of emotion dysregulation and NSSI. However, there has been a lack of samples focusing on tertiary care children and adolescents. Additionally, many studies group together NSSI and SSI to form a deliberate self-harm variable or solely focus on NSSI, which leaves the differentiation between the two constructs relatively unknown. Further, since emotion dysregulation is present at all ages, the developmental process of when emotion regulation becomes a contributing factor to NSSI needs to be explored. Finally, the comorbidity of emotion dysregulation and NSSI with other disorders such as affective and anxiety disorders should be considered.

Influence of Age on Emotion Regulation and NSSI

There is limited literature exploring NSSI throughout the lifecycle of childhood and adolescence. The majority of information available about age-related self-harm comes from the deliberate self-harm literature. Additionally, within the deliberate self-harm literature there are mixed findings concerning an age-related understanding of self-harm. Stewart et al. (2013) found that there was no significant correlation between age

and the presence of deliberate self-harm. Further, it has previously been found that self-harm increased with age in a child and adolescent sample who presented to hospital care (Hawton et al., 2012). Although both studies were completed using similar populations as the present study, they were limited by their inclusion of self-harm with the intention of suicide, which may limit the generalizability of the findings.

Within the deliberate self-harm literature, an exploration into the lifecycle was completed. Age and gender related differences for children and adolescents presenting in hospital were found. Overall, children and adolescents were presenting for deliberate self-harm at a ratio of 1.5 females for every 1 male (Hawton & Harriss, 2008). However, when this ratio was examined as a function of age, the relationship shifted. When considering 10-14 year olds, the ratio was 8:1 and with 15-19 year olds, the ratio was 3:1. The female: male ratio continues to decrease until age 19, where it remains stable across the lifespan. Further, this study found that the peak age for self-harm differed for females and males. For females, the peak age was found to be 16 years of age, compared to 20-24 for males (Hawton & Harriss, 2008). Overall, this study indicates that females may begin to self-harm at a younger age when compared to males and that age is a significant factor in NSSI.

In a recent study examining the nature of repetitive versus occasional NSSI in a community sample of adolescents, it was found that age of onset of NSSI did not influence the frequency of NSSI (Manca et al., 2013). Therefore, age of onset may not influence the frequency of NSSI but age in general may be a factor.

In summary, within the developmental range of childhood through adolescence, there appears to be an indication that increased age is related to increased prevalence of

self-harm, especially when considering the average age of onset to be around 12-14 years of age. However, there has yet to be a similar study examining age related changes in NSSI in a tertiary care sample.

In terms of emotion regulation, there is limited research completed in the area of age differences in the prevalence of emotion regulation difficulties. The majority of research within the area has focused on emotion regulation strategies and how the use of emotion regulation strategies changes with age. One factor that has been found to change across the lifespan is the use of social supports for emotion regulation (Nolen-Hoeksema & Aldao, 2011). This could be particularly relevant when considering the developmental changes experienced through childhood and adolescence, as individuals begin to move away from the family unit as the main point of social support and begin to spend more time with friends (Heard, Lake, & McCluskey, 2009). Finally, early studies identified that emotion regulation abilities peaked during an individual's early 20's and then began to decline. However, recent studies have disproven the belief in age-related declines in emotion regulation. Nevertheless, these studies only investigated adults and an age related understanding of emotion regulation capacity among children and adolescents requires further research.

Influence of Gender on Emotion Regulation and NSSI

Early research has suggested that females are more likely to engage in NSSI than males (Klonsky et al., 2011). However, there is a predominance of research focusing on the construct within BPD samples, a diagnosis more common in females (Chapman et al., 2005). Further, only recently with the DSM-V has NSSI been classified as its own distinct condition and not solely a symptom of BPD (American Psychiatric Association,

2013). Recent research has begun to focus on gender differences present within different populations and their engagement in NSSI. Current research has found no gender differences in prevalence of self-harm (Manca et al., 2013; Shannon L. Stewart et al., 2013). However, the Stewart et al. (2013) sample consisted of 79.6% males and focused on deliberate self-harm, which may have reduced the reliability of the comparison. In addition, Stewart et al. (2013) posited that the non-significant finding might have been due to parental report being used in the study, as parents may have been more aware of self-harm at younger ages. Therefore, there needs to be further research conducted on adolescents to measure for gender differences. Further, Manca et al. (2013) found no difference in gender in terms of age of onset or frequency of NSSI. However, those findings are restricted to a community sample, limiting the generalizability to a clinical sample. Finally, Nock and Prinstein (2004) found that there was no significant difference in the frequency of NSSI by gender. However, it may be difficult to detect gender differences in a low incidence construct such as NSSI within a community sample.

In a study examining NSSI differences by gender in an undergraduate student sample, the prevalence of NSSI did not significantly differ by gender, but age of onset was significantly older for males ($M = 13.83$) than females ($M = 11.57$; Andover, Primack, Gibb, & Pepper, 2010). Further, the method of NSSI was reported to be different, with males reporting more hitting and burning and females reporting more cutting and scratching. Finally, there was no significant difference found in the frequency of NSSI when both lifetime events and events per year were considered. Overall, there seems to be limited research supporting gender differences in the prevalence of self-harm. However, there is a lack of research outlining gender differences in method, age of

onset and prevalence in tertiary care samples. Further research is required to understand any potential gender differences within NSSI.

In terms of emotion regulation, there is a paucity of research examining the prevalence of emotion regulation versus dysregulation by gender. However, research has focused on gender differences in emotion regulation strategies. Females have been found to endorse higher levels of emotional reactivity but overall emotion regulation was not found to differ by gender (Jenkins & Schmitz, 2012). In a community sample of children and adolescents, girls reported more overall difficulties with regulating their emotions, less effective emotion regulation strategies, higher non-acceptance of negative emotions and less emotional clarity. Boys reported more difficulty with emotional awareness (Bender, Reinholdt-Dunne, Esbjørn, & Pons, 2012). However, there were no sex differences found in the ability to engage in goal directed behaviour or impulse control when stressed. Impulse control has been theoretically linked to emotion regulation and significant in overall emotion regulation abilities (Crowell et al., 2009). Additionally, women have been found to report significantly more emotion regulation strategies when compared to men (Nolen-Hoeksema & Aldao, 2011). Finally, males and females have been found to significantly differ in their endorsement of different cognitive emotion regulation strategies (Zlomke & Hahn, 2010). Overall, these studies highlight the sex differences in method and engagement of emotion regulation within community samples but tertiary care samples still need to be explored.

Rationale

Recent research into the field of self-injurious thoughts and behaviours is often confounded with suicidal and non-suicidal intent being analyzed as a single construct or

without mention of the other. However, Nock and Favazza (2009) have outlined the intent of the act as being a defining feature. Therefore, the current study will examine the difference between individuals who self-harm without the intent of suicide (NSSI) versus those with the intent (SSI), with the addition of a no self-harm control group. This will allow for a comparison between the two constructs to begin to understand the impact of intent. Additionally, with the DSM-5 classification of NSSI as a distinct disorder, the implication of the act requires further understanding (American Psychiatric Association, 2013). Finally, the developmental trajectory of NSSI and emotion regulation has yet to be understood within the tertiary and community care sample. Therefore, a focus on high-risk children and adolescents will help to understand the complexities of self-harm within the specific population.

Hypothesis

The theoretical and empirical literature suggests that emotion regulation can be a primary contributor to the engagement of NSSI. Therefore, it is hypothesized that:

1. Individuals in the NSSI and SSI group will display higher levels of emotion dysregulation than the control group.

2. Individuals in the NSSI and SSI group will self-harm at a higher frequency than the control group.

3. Considering that the age of onset for NSSI is most often around 12-14 years of age (Rodham & Hawton, 2009) and NSSI is theorized to progress towards SSI (Cloutier et al., 2010), it is hypothesized that the SSI group will be significantly older than the NSSI and control group.

4. Finally, considering recent literature indicating few if any significant gender differences in self-harm samples, no gender differences are expected between groups.

Further, a preliminary exploration beyond the primary hypothesis will be completed; the role of age, gender and emotion regulation will be explored within each group to understand the impact on frequency of NSSI/SSI. Appropriate inferential analyses were used to address all previously stated hypotheses.

Method

Participants

The current study involved participants from both care and community facilities in Ontario. The primary tertiary research facility provides highly specialized treatment services, as well as being a research-based institute. The Ontario Ministry of Children and Youth Services has licensed all programs available through the tertiary care facility (St. Pierre et al., 2008). The primary facility provides voluntary services to children and youth who have developmental and complex mental health difficulties. Further, they provide assessment, care plans, treatment and educational services in both residential and community settings (St. Pierre et al., 2008). It is considered a tertiary care facility and therefore the focus is on helping those individuals with the greatest need.

InterRAI is a not-for-profit organization that created the Child and Youth Mental Health [ChYMH] suite of instruments. The majority of the participants were recruited from a tertiary care facility. However, there were additional data collection sites involved in the data pool from which participant were drawn for analysis. These additional 7 centers offer a mixture of inpatient and outpatient care.

The population that the primary facility serves is children and youth 4-18 years of age with developmental and mental health concerns. For the present study, only youths aged 8-18 years without developmental disability were included. Children below the age of 8 are unlikely to engage in NSSI, considering age of onset is normally around 12-14 years of age (Rodham & Hawton, 2009). Further, true NSSI is rarely found in individuals with developmental disabilities as they normally engaged in stereotypic NSSI (Matthew K Nock & Favazza, 2009). As a whole, NSSI in children and adolescents requires further study to understand the developmental course of NSSI within the tertiary care sample, as it is an understudied group. The current study used secondary data with no identifiable information within interRAI's dataset. The data is originally collected and saved on a secure sever at interRAI Canada at the University of Waterloo. Each participant is assigned a randomly generated participant number, which no personal identifiers are attached to. The de-identified data is then provided to the lead interRAI developer on a quarterly basis. The data is kept on a secure standalone computer without internet/intranet or USB ports (Stewart et al., in press). Therefore, recruitment of participants was not required as they voluntarily participated as part of treatment at their treatment facility

The sample size for the current study began with 1,745 ChYMH assessments. All ChYMH rapid screeners and ChYMH development disability assessments were removed; the remaining number of participants was 1083. Following this, all subsequent assessments were removed; many participants were assessed using the ChYMH multiples times throughout their treatment, the sample size for initial ChYMH assessments was 622. Finally, all participants who were not between the ages of 8-18 were removed. The final sample size was 519.

The participants were divided into three groups: NSSI, SSI, and control. Group classification was based on the endorsement of the question "intent of any self-injurious behaviour was to kill him/herself". The response options were: no, yes and no attempt. Participants who were scored as "no" but engaged in NSSI were placed in the NSSI group. Participants who were scored as "yes", were placed in the SSI group. Participants who were scored as "no attempt" were placed into the control group.

Measures

The measure used in the current study was the interRAI ChYMH. InterRAI is an international collaborative organization that works to help vulnerable persons thorough the development of assessment suites. InterRAI consists of multiple suites of instruments to help assess and treat varying populations and life stages. Further, the separate suites are designed to work together to follow an individual throughout their lifetime (Stewart, Currie, Arbeau, Leschied, & Kerry, in press). The ChYMH is a standardized assessment tool that is used in clinical settings and collects information from children and youth, their parents/guardians and any other available sources/reports about social life, health, safety, education and autonomy. By using multiple sources of information to assess the individual, the convergent reliability is increased for the assessment. Finally, The ChYMH had been found to be valid and reliable measure, however exact psychometric properties are forthcoming (Stewart et al., in press). Preliminary data on two subscales has been explored with positive results. The aggressive behaviour subscale was found to strongly predict the use of control interventions such as physical restraint, mechanical restraint and seclusion in a tertiary care facility (Stewart et al., in press). The anhedonia subscale has been found to be strongly associated with the diagnosis of a mood disorder

(Stewart et al., in press). Further, there has been rigorous testing on interRAI measures worldwide, which has found the suite of instruments to be reliable (Hirdes et al., 2008; Stewart et al., in press).

The ChYMH uses a semi-structured interview format with both child/adolescent and parents/guardians (Stewart et al., in press). Further information is obtained from any available reports, service providers and through direct contact with the client. Clinical judgment and observation is used to determine the scoring, within the coding rules following the original intent, definition and assessment process as outlined by the manual (Stewart et al., in press). The ChYMH collects information covering a large number of mental health concerns common in children and adolescents including: substance use, excessive behaviours, harm to self and others, mental state indicators, cognition and executive functioning, strengths and resilience, independence in daily activities, health conditions, family and social relations, communication and vision, medications, service utilization, stress and trauma, nutritional status, treatments, education, environmental assessment, and diagnostic and other health information (Stewart et al., in press). Finally, the ChYMH produces Collaborative Action Plans (CAPs), which are recommendations that support evidence-informed practice, based on the results of the assessment. CAPs support clinicians in targeting individual interventions but are not prescriptive in nature (Stewart et al., in press).

The current study employed two subscales and demographic information. Age and gender were collected from the demographics section of the assessment. For the measurement of frequency of self-harm, three items were employed. The first item is "most recent self-injurious behaviour". The response options are: never, more than 1 year

ago, 31-days to 1 year ago, 8-30 days ago, 4-7 days ago, and in the last 3 days. These responses are coded 0-5 in corresponding order. The second item is "Self-injurious behaviour – e.g. bangs head; pinching; biting; scratching; hitting self; pulling own hair". The third item is "Extreme risk taking – e.g. jumping off high rooftop; playing with firearms". Both the second and third item response options are: not present, present but not exhibited in last 3 days, exhibited 1-2 of last 3 days, exhibited daily in last 3 days (1-2 episodes), exhibited daily last 3 days (3 or more episodes or continuously). The responses were coded from 0-4 in corresponding order. All items were summed to create a frequency of self-harm variable with a maximum score of 13 for the scale.

For the measurement of emotion regulation, there is not currently a subscale created to measure this construct. For the present study, an emotion regulation subscale has been constructed based on items within the ChYMH. The items were based on the theoretical understanding of emotion regulation, prior research into the field of emotion regulation and previously tested emotion regulation scales. The subscale consists of 12 questions, capturing both positive and negative features of emotion regulation. All items were summed to create an emotion regulation variable. All positive aspects of emotion regulation were negatively scored. Therefore, higher emotion regulation scores indicated increased difficulty with emotion regulation.

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) categorizes emotion regulation into subcategories of emotion regulation. One of the subcategories is difficultires with emotion control. To capture this subcategory of the DERS, three questions from the ChYMH were used. The first, explored impulsive behaviours (Impulsive – e.g. running into traffic; tacking risky actions without thinking;

difficulty taking turns; intertupts). The second question measured difficulty controlling

anger (Outbursts of anger - intense flare-up or anger in reaction to a specific action or

event e.g. tantrums when told "no"). The third measured uncontrollable feelings of panic

(Episodes of panic – Cascades of symptoms; fears; anxiety; loss of control). All three

questions were scored from 0-4 defined by the following order: not present, present but

not exhibited in last 3 days, exhibited 1-2 of last 3 days, exhibited daily in last 3 days (1-2

episodes), exhibited daily last 3 days (3 or more episodes or continuously).

     The DERS further supports the subcategory of non-acceptance of emotions

increasing emotion dysregulation (Gratz & Roemer, 2004). One question from the

ChYMH measured the individual's acceptance of emotions by accessing the occurrence

of the secondary emotions of guilt/shame (Expressions of guilt or shame – e.g. " I've

done something awful; this is all my fault; I am a terrible person"). This item is scored

from 0-4 following the definitions previously provided.

     The difficulties engaging in goal-directed behaviour subcategory within the

DERS was measured by two questions within the ChYMH. The first, measured the

cognitive disruption in goal-directed behaviour (Obsessive thoughts – unwanted ideas or

thought that cannot be eliminated). The second measured the thought patterns that can

interfere with goal- directed behaviour (Self-deprecation – e.g. "I am stupid" "I am bad"

"I cant do anything right"). These items are scored from 0-4 following the definitions

previously provided.

     The last subcategory in the DERS covered in the ChYMH is the limited access to

emotion regulation strategies section. This was measured through feelings of

hopelessness, indicating that the individual feels no other way to regulate their emotions

(Expressions of hopelessness – e.g. "There's no hope for the future; nothing's going to change for the better"). This item was scored from 0-4 following the definitions previously provided.

The Emotion Regulation Q Sort Scale supports being emotionally labile and being easily irritated to indicate poor emotion regulation skills (Shields & Cicchetti, 1997). Therefore, the ChYMH variables on being both emotionally labile and easily irritated were included in the emotion regulation subscale (Labile affect – Affect fluctuates frequently with or without an external explanation; Irritability – Marked increase in being short-tempered or easily upset). These items were scored from 0-4 following the definitions previously provided.

The Q Sort scale further supports the presence of genuine and close relationships to positively influence emotion regulation skills (Shields & Cicchetti, 1997). Therefore, the ChYMH was used to measure the presence of close relationships with both family and friends/peers (Strong and supportive relationship with family; Strong and supportive relationship with friends/peers). These items were scored based on the presence of the relationships. If strong relationships were present, a score of "yes" is given and coded as 1. If strong relationships were not present, a score of "no" is given and coded as 0.

Finally, the Emotion Regulation and Others and Self (EROS) scale recommends that individuals who are capable of thinking about positive aspects within situations are better able to regulate their emotions (Niven, Totterdell, Stride, & Holman, 2011). Therefore, the item measuring consistent positive outlook within the ChYMH was included (Consistent positive outlook). This item was scored based on the presence of a consistent positive outlook and is scored as the previous item.

Ethics

All participants in the study were voluntarily participating in the assessment as part of accessing the primary facilities or other service providers' services. They could withdraw from the assessment at any time. All children /youth and their parents/guardians signed a consent form as part of the administration of the measures as part of their service delivery experience at the mental health agencies. Further, individuals could decline to participate in the interRAI assessment and still access services. Participants in the study could experience some emotional distress due to the personal nature of the questions when completing the interRAI assessment. It is possible that experiences of maltreatment might be disclosed during the assessment that must be reported if they have not been previously disclosed. However, the assessment is done within a clinical setting with support from an interdisciplinary team that can assist the individual and their family. There is no deception used in the study and all files will be kept confidential. Finally, an interRAI fellow is required to participate in all research utilizing the data to ascertain that the integrity of the research is within interRAI's guidelines to assist vulnerable populations.

Results

All analyses were completed on a sample of 519 children who ranged between the ages of 8-18 and who completed the initial ChYMH assessment as part of inpatient or outpatient treatment. Within the sample, 143 (27.6%) of the participants were receiving inpatient care during their initial ChYMH assessment and 376 (72.4%) were received outpatient care. The descriptive statistics of the sample are presented in Table 1.

The purpose of this study was to investigate the potential relationship between

gender, age, emotion regulation and the frequency of self-harm in NSSI, SSI and control samples.

Table 1

Descriptive Statistics by Group

	N	%	Male	%	Female	%	Mean Age
Overall	519	100	346	66.7	173	33.3	12.18
NSSI	325	62.6	218	67.1	107	32.9	12.12
SSI	46	8.9	23	50	23	50	14.15
Control	148	28.5	105	70.9	43	29.1	11.71

Emotion Regulation Subscale

The emotion regulation scale was tested to ensure its reliability and validity. Reliability was examined through internal consistency reliability estimates. Cronbach's alpha of 0.746 reflects that the scale had a good level of internal consistency.

Table 2 presents the matrix of inter-item correlations. Further, testing measured construct validity within the emotion regulation scale. Pearson's Product-Moment correlations assessed the association between the emotion regulation scale and existing subscales within the ChYMH. Correlations were expected for subscales that measure constructs associated with emotion regulation. The correlations are presented in Table 3. Major relationships were found in the association between the emotion regulation scale and 17 of the existing subscales ($p = .001$). The associations with the existing scales included the: Aggressive Behaviour Scale, Anhedonia Scale, Anxiety Scale, Disruptive Behaviour Scale, Distractibiliy/Hyperactivity Scale, Depression Severity Index, Positive

Symptoms of Psychosis Scale, Risk of Harm to Others Scale, Sleep Scale, Mania Scale, Severity of Self-Harm Scale, Communication Scale, Cognitive Performance Scale, Peer Relationship Scale, School Disruption Scale, Strengths Scale (Individual), and Strengths Scale (Relational). Further, associations were found with the Caregiver Wellbeing Scale and the Family Functioning Scale ($p = .05$).

Hypothesis 1 – Emotion Regulation by Group

A one-way analysis of variance (ANOVA) was completed to examine if emotion regulation scores differed between the NSSI, SSI and control group. Means and standard deviations are reported for the one-way ANOVA. And appear in Table 4. The emotion regulation score was not statistically significant between groups ($F(2,516)=1.735$, $p=.177$). Emotion regulation scored scores increased from the control group (14.73 ± 7.818), to the NSSI group (15.80 ± 7.414) and the SSI group (16.87 ± 7.926), in the presented order although the differences were not statistically significant.

Hypothesis 2 – Frequency of Self-Harm by Group

A one-way ANOVA was performed to examine if the frequency of self-harm was different across the NSSI, SSI and control groups. Means and standard deviations are reported for the one-way ANOVA and appear in Table 5. The frequency of self-harm was statistically significant between groups ($F(2,516)=3.196$, $p < .05$). Frequency scores increased from the control group (2.93 ± 2.181), to the NSSI group (3.48 ± 2.335) and the SSI group (3.57 ± 2.197), in the presented order. Tukey HSD post-hoc analyses revealed that the mean increase in frequency of self-harm from was between the control group and the NSSI group of 0.58 (95% CI, .02 to 1.08) and was statistically significant ($p=.042$). No other groups were statistically significantly different.

Table 2
Inter-Item Correlation Matrix for Emotion Regulation Scale

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Impulsive											
2. Self-deprecation	.191										
3. Expressions of guilt/Shame	.068	.462									
4. Expressions of hopelessness	.026	.420	.395								
5. Irritability	.413	.321	.164	.197							
6. Labile Affect	.231	.217	.173	.277	.394						
7. Obsessive thoughts	.232	.172	1.78	.144	.221	.220					
8. Episodes of panic	.027	.158	.226	.249	.184	.282	.314				
9. Outbursts of anger	.508	.269	.163	.148	.574	.335	.271	.128			
10. Strong/supportive relationships with family*	.049	.014	.060	.167	.060	.047	-.056	-.020	.031		
11. Consistent positive outlook*	.054	.196	.168	.326	.306	.187	.104	.155	.160	.137	
12. Strong/supportive relationships with friends/peers*	.227	.103	.075	.087	.221	.123	.133	.107	.223	.192	.232

*Item is negatively score

Table 3

Pearson's Product-Moment Correlations of the Emotion Regulation Scale and Existing Subscales

	Emotion Regulation Scale
Aggressive Behaviour Scale	.571**
Anhedonia Scale	.317**
Anxiety Scale	.590**
Disruptive Behaviour Scale	.629**
Distractibility/Hyperactivity Scale	.528**
Depression Severity Index	.769**
Pain Scale	.014
Positive Symptoms of Psychosis Scale	.493**
Risk of Harm to Others Scale	.429**
Sleep Scale	.337**
Mania Scale	.729**
Severity of Self-Harm Scale	.292**
Parenting Strengths Scale	.086
Caregiver Wellbeing Scale	.104*
Communication Scale	.212**
Cognitive Performance Scale	.297**
Family Functioning Scale	.101*
Peer Relationships Scale	.170**
School Disruption Scale	.338**
Strengths Scale (Individual)	.182**
Strengths Scale (Relational)	.283**

Note. * $p < .05$, ** $p < .001$

Table 4

Emotion Regulation One-Way ANOVA Means and Standard Deviations

	M	SD
SSI	16.87	7.926
NSSI	15.80	7.414
Control	14.73	7.818

Table 5

Frequency of Self-Harm One-Way ANOVA Means and Standard Deviations

	M	SD
SSI	3.57	2.197
NSSI	3.48	2.335
Control	2.93	2.181

Table 6

Age One-Way ANOVA Means and Standard Deviations

	M	SD
SSI	14.15	2.828
NSSI	12.12	2.594
Control	11.71	2.783

Hypothesis 3 – Relationship of Age

A one-way ANOVA investigated if age varied between the NSSI, SSI and control groups. The ANOVA identified significant differences between groups based on age ($F(2,516)=14.928$, $p = .000<.0005$). Age at assessment increased from the control group (11.71 ± 2.783), to the NSSI group (12.12 ± 2.594) and the SSI group (14.15 ± 2.828), in the presented order. The Tukey HSD indicated that the control group and NSSI group mean were not statistically significantly different from each other based on age (.411, 95% CI -.21 to 1.03). However, the SSI group was statistically significantly different from both the NSSI group (2.032, 95% CI 1.04 to 3.02) and the control group (2.443, 95% CI 1.38 to 3.50), indicating that the participants in the SSI group were significantly older ($p <.05$). Means and Standard Deviations for age and the three groups appear in Table 6.

Hypothesis 4 – Relationship of Gender

A chi-square test of association was conducted between gender and group (NSSI, SSI, and control) to examine the degree to which gender is associated with NSSI or SSI. The chi-square test revealed no statistically significant differences between groups based on gender ($\chi^2(2) = 6.994$, $p = .030$). Table 1 displays the distribution of gender by group.

Post-Hoc Analysis – Age, Gender and Emotion Regulation Predictions by Group

A series of multiple regression analyses examined the degree of association of age, gender and emotion regulation in the frequency of self-harm within each group.

NSSI Group

Multiple regression analysis examined the frequency of self-harm in the NSSI group based on age, gender, and emotion regulation. The assumptions of linearity,

independence of errors, and homoscedasticity were met. There was an independence of residuals, as assessed by the Durbin Watson statistic of 2.079. The variables statistically significantly predicted frequency of self-harm ($F(3,321)= 42.663$, $p = .000<.0005$, adj. $R^2=.278$). Only the emotion regulation variable added statistically significantly to the prediction, $p < .001$. Regression coefficients and standard error are summarized in Table 7.

SSI Group

A multiple regression analysis examined the frequency of self-harm in the SSI group from age, gender, and emotion regulation. The assumptions of linearity, independent of errors, and homoscedasticity were met. There was an independence of residuals as assessed by the Durbin Watson statistic 2.256. The variables statistically significantly predicted frequency of self-harm ($F(3,42)= 5.149$, $p = .004$, adj. $R^2=.217$). Only the emotion regulation variable added statistically significantly to the prediction, $p < .05$. Regression coefficients and standard error are presented in Table 8.

Control Group

A multiple regression analysis examined the frequency of self-harm in the control group from age, gender, and emotion regulation. The assumptions of linearity, independent of errors, and homoscedasticity were met. There was an independence of residuals as assessed by the Durbin Watson statistic 2.208. The variables statistically significantly predicted frequency of self-harm ($F(3,144)= 30.654$, $p = .000 <.0005$, adj. $R^2=.377$). Only the emotion regulation variable added statistically significantly to the prediction, $p < .05$. Regression coefficients and standard error can be found in Table 9.

Table 7

Summary of NSSI Group Multiple Regression Analysis

Variable	*B*	SE_B	β
Intercept	1.083	.636	
Age	.007	.043	.007
Gender	-.240	.238	-.048
Emotion Regulation	.167	.015	.530**

Note. ** $p < .001$; *B*=unstandardized regression coefficient; SE_B =Standard error of the coefficient; β = standardized coefficient.

Table 8

Summary of SSI Group Multiple Regression Analysis

Variable	*B*	SE_B	β
Intercept	5.040	2.285	
Age	-.183	.126	-.235
Gender	-.271	.620	-.062
Emotion Regulation	.090	.044	.325*

Note. * $p < .05$; *B*=unstandardized regression coefficient; SE_B =Standard error of the coefficient; β = standardized coefficient.

Table 9

Summary of Control Group Multiple Regression Analysis

Variable	*B*	SE_B	β
Intercept	2.076	.815	
Age	-.096	.052	-.123
Gender	-.339	.312	-.071
Emotion Regulation	.165	.018	.590**

Note. ** $p < .001$; *B*=unstandardized regression coefficient; SE_B =Standard error of the coefficient; β = standardized coefficient.

Summary of Major Findings

There were five primary findings within the study. 1) Emotion regulation did not significantly differentiate the NSSI, SSI or the control group. 2) The frequency of self-harm was statistically significantly higher in the NSSI group compared to the control group, 3) The participants in the SSI group were statistically significantly older than both the NSSI and control groups and 4)Gender did not significantly differentiate any of the groups from one another. These finding are in support of Hypotheses 3 and 4 and provide partial support for Hypothesis 2. Finally, the measure of emotion regulation differentiated all groups with the frequency of self-harm.

Discussion

The current study examined the relationship between age, gender, emotion regulation and the incidence and frequency of NSSI and SSI in a sample of 8-18 year olds. Within this objective, there were five primary aims. 1) To explore the extent of emotion dysregulation in the NSSI and SSI populations. 2) To explore the impact that emotion dysregulation has on the frequency of self-harm. 3) To understand the relationship between age and the engagement in NSSI or SSI. 4) To examine the role of gender in the incidence of NSSI or SSI. 5) To explore which variables are associated with the frequency of self-harm and examined if age, gender or emotion regulation differed between the groups.

The following sections will explore the current findings in the context of their meaning and how these findings relate to past research. Subsequently, the findings will be explored in terms of their implications for clinical practice. Finally, suggestions for future research and limitations of the study are discussed.

Relevance of Current Findings in Research

The theoretical knowledge of emotion regulation based on Linehan's affect regulation model (1993) appears to be supported by the Emotion Regulation Scale from the current study. A relationship between emotion regulation and challenges to family functioning and low caregiver wellbeing highlight the importance of child/youth early relationships with caregivers in the formation of emotion regulation skills. Bandura's (1977) work on social learning theory highlighted that the individual's skills will be limited by the absence of positive role models.

Overall, the current study found that emotion regulation scores were not found to influence group membership for either the NSSI or SSI allocation, suggesting that overall, emotion regulation skills were not significantly different between the groups. These findings were not as hypothesized as it had been anticipated that those in the NSSI and SSI groups would report significantly more emotion dysregulation than the control group. These findings may be best explained by Hypothesis 2 presented below. The results of the current study may have been impacted by the use of a primarily tertiary care sample in which there were uniformly lower rates of emotion regulation across all groups.

Hypothesis 2 predicted that the NSSI and SSI groups would have a higher frequency of self-harm than the control group. This study found that the frequency of self-harm only significantly differed between the non-NSSI / SSI group and the NSSI group, even though the SSI group had the highest frequency of self-harm. In this sample of children/youth who were all being seen within the child mental health system, all three groups presented with some engagement in self-injurious or extreme risk taking

behaviour at some point in the past. Even though the non-NSSI / SSI children / youths would have indicated "no attempt" to the question about ever having an intent of self-injurious behaviour. This anomaly may help to explain why, in hypothesis one, there were no significant differences in emotion regulation scores between the three groups, as all groups were engaging to some degree in self-harming or extreme risk taking behaviour but they may not have all recognized their behaviours as self-harm.

Hypothesis 3 predicted that the SSI group would be significantly older than the NSSI and control group, based on the theoretical understanding that individuals begin engaging in NSSI and can progress towards SSI (Cloutier et al., 2010). This study found that age was significantly higher with the SSI group in comparison to the NSSI and non-NSSI/SSI groups. This finding supports the theory that NSSI and SSI can act on a continuum that progresses towards more lethal acts (Cloutier et al., 2010). It is noteworthy that these findings challenge past research that has indicated that NSSI is rare for youth under the age of 14 years, as the mean age of the current sample was 12 years (Rodham & Hawton, 2009). However, this finding does lend support to Preyde et al. (2012) and Yates et al. (2008) who noted that children and adolescents in residential or intensive home care may have a younger age of onset, and that recurrent NSSI may also have a younger age of onset. Further, the mean age for the NSSI group was 12 years of age which is at the lower end of age and consistent with past research indicating that age of onset for NSSI to be around 12-14 years of age (Rodham & Hawton, 2009).

Hypothesis 4 predicted that males and females would be equally likely to engaged in NSSI or SSI. The current study found support for this hypothesis, and gender was not found to influence group allocation. This finding is consistent with recent research into

the field of gender engagement in NSSI and thus should encourage a shift in NSSI

research away from utilizing female only samples with BPD to explore the impact of self-

harm in male samples as well. Further, these findings extend the work of Manca et al.

(2013) who found no gender differences in onset or frequency of NSSI in their

community sample that now, in light of the nature of his sample, includes a children's'

mental health sample. It should be noted however, that the Canadian Institute for Health

Information (CIHI, 2014) has recently challenged in part these findings in their data,

indicating that females are significantly more likely to be *hospitalized* for their self-harm.

However, hospitalizations do not account for self-harm that is unreported. It has been

proposed that males may be more stigmatized in their use of NSSI, believing it to be a

female issue with males more likely to conceal their self-harm and professionals less

likely to identify it.

  Finally, emotion regulation was found to be the only variable that correlated with

the frequency of self-harm. Neither age nor gender was significantly linked to the

frequency of self-harm in any of the three groups. This finding suggests that an

individual's ability to regulate their emotions is more relevant than their gender or age in

the predictive accuracy regarding engagement in self-harm. These findings are in line

with the recent research on gender and NSSI as previously discussed, suggesting that

gender is not linked to the possibility of self-harm (Manca et al., 2013). In terms of age,

these findings challenge the previous research indicating that self-harm is a rare event for

youth under the age of 14 years (Rodham & Hawton, 2009). Rodham and Hawton,

(2009) highlight the need to be aware of the possibility of self-harm at younger ages.

These findings do support previous research that strongly suggests that emotion

regulation is a critical predisposing factor in potential engagement in NSSI behaviour

(Gratz & Roemer, 2008; Gratz & Tull, 2010; Gratz, 2006; Perez et al., 2012).

Implications for Clinical Practice

These findings have implications in two main areas of clinical practice:

assessment and treatment.

Assessment. The implications for assessment point to the importance of the

client's gender, age and degree of emotion regulation skills. The present findings put into

question the past focus of self-harm in female only populations and promote the need for

clinicians to be aware of the potential for self-harm in males as well. When working with

male clients, it is important to remember that risk-taking behaviours that comprise NSSI

may be a more common method of self-harm in males than previously considered.

Clinicians should ensure that their assessments are encompassing to the point of

including methods of assessing self-harm that may be more gender stereotypic in

ensuring that they are able to identify all potential clients of both genders who are self-

harming.

In terms of age, clinicians need to be aware that self-harm is occurring at younger

ages than previous studies have reported. The current study has highlighted the

importance of assessing self-harm in children as young as 8 years of age. Therefore,

assessment should be more inclusive of younger age children.

Finally, an assessment of the client's emotion regulation skills has been identified

as one of the most important factors in predicting whether or not an individual will self-

harm. Clinicians should be mindful of individuals with low emotion regulation skills and

the need to assess for personal safety and possible alternatives in their treatment choice.

Emotion dysregulation should be seen as a warning sign for potential current or future self-harm. The use of an emotion regulation scale such as the DERS, EROS or the Q Sort scale would be recommended for any clinicians who want to use a formal assessment (Gratz & Roemer, 2004; Niven et al., 2011; Shields & Cicchetti, 1997).

Treatment. The implications for treatment are most notable in the need for all individuals to develop their ability to regulate their emotions to help reduce the risk/frequency of self-harm. This could be done in two ways. First, it could be through systemic efforts to engage parents and working with the child/adolescent to examine family concerns that may be tied to self-harm. Systemic approaches capitalize on the theoretical underpinnings of Linehan's (1993) work, which highlight the importance of the parent's role in building the emotion regulation skills of their children. Clinicians working with parents whose children are struggling to regulate their emotions at a young age could play a critical role in helping to build the emotion regulation skills needed.

Second, when working with children/adolescents in one-on-one therapy or group therapy who have been identified as self-harming, the focus should be on developing appropriate emotion regulation skills. This approach is based in part on the early work of Abelson (1976) and 'script theory' which pointed to the importance of clients being better able to regulate their emotions and draw on a larger repertoire of emotion regulation skills.

Summary of Clinical Implications. Overall, clinicians need to be aware of the critical role that emotion regulation plays in the incidence of self-harm, and that thorough assessment of the client's emotion regulation skills should be considered in developing a risk assessment for current or future self-harm. Following this assessment, treatment

would appropriately be aimed at increasing the emotion regulation skills of the individual. The current study found that it is more important than knowing either the individual's gender or age. In addition, neither gender or age is necessarily linked to the use of self-harm and hence consideration for its potential should not be ruled out on these bases.

Future Directions

Although the current study added to the literature, there remains considerable work to be done to understand the intricacies and differences in NSSI and SSI. Suggestions for future directions based on the present research fall into three categories. Firstly, the future direction of research within the interRAI ChYMH suite of instruments will be discussed. Secondly, future research recommendations for the area of NSSI/SSI research will be explored. Thirdly, research into the role of emotion regulation within the construct of NSSI/SSI research is addressed.

InterRAI ChYMH. The interRAI ChYMH is in its infancy in terms of research potential. There remains considerable research to be done in terms of validating and testing the reliability of all subscales within the ChYMH. Currently, the majority of the subscales have undergone reliability and validity testing but have not been published. However, this study has underscored that the ChYMH has very strong research potential and recommendations will be limited to research in the area of the current study. Future research should consider investigating NSSI and SSI as part of a developmental study to expand the understanding of how emotion regulation and NSSI/SSI unfolds throughout the lifespan. Variables of interest to explore include age of onset and how NSSI/SSI changes throughout each year of development. This could include investigating different

means of self-harm, frequency and the ability of the individual to regulate their emotions. Further, a longitudinal study using the ChYMH to track frequency of NSSI/SSI throughout treatment would be recommended to explore the impact of treatment on emotion regulation and NSSI/SSI.

NSSI/SSI Research. Research investigating NSSI and SSI as separate but similar constructs needs to be further explored. Future research is needed to investigate the differences between NSSI and SSI, as many studies explore either NSSI or SSI or they are combined into a single self-harm variable without differentiation. This would include additional research into the type of NSSI/SSI used by each gender and age, as the means of NSSI/SSI was not investigated in the present study. Additionally, this would include exploration into extreme risk taking behaviour as a form of NSSI.

Emotion Regulation. Emotion regulation as an underlying problem within NSSI research has been around since the 1990's as part of Linehan's theoretical understanding of NSSI (1993). Future research is needed to replicate the results from the current study in different populations to support the theoretical connection between NSSI and emotion regulation. Future research into the means of NSSI/SSI used and the role of emotion regulation in terms of lethality of the method chosen could examine the connection between these factors. Finally, an investigation into psychotherapies aimed at increasing emotion regulation to treat NSSI and SSI is recommended to ensure the efficacy of increasing emotion regulation skills.

Limitations of Design

Limitations of the current study include: shortcomings in the measures used, generalizability of the results, and sample size.

Measurement. The current study collected all data through the interRAI ChYMH. Within the ChYMH a measure for emotion regulation was created for the purpose of this study, as multiple existing subscales in the ChYMH were employed. Currently, there have been limited studies testing the reliability and validity of the subscales within the ChYMH. However, research that has been completed on the anhedonia and aggressive behaviour subscales has shown positive results (Stewart et al., in press). Additionally, the internal validity of the study could be questioned based on the use of the emotion regulation scale. The emotion regulation scale was tested through the comparison of other existing subscales within the ChYMH. It requires more rigorous testing to explore its reliability and validity. However, the emotion regulation scale was created through the use of established emotion regulation scales (Gratz & Roemer, 2004; Niven et al., 2011; Shields & Cicchetti, 1997). Further research is needed into the ChYMH to ensure reliability and validity of all aspects of the suite of instruments.

Further, working with such a large dataset presented some concerns. Different parties at each data collection site complete data scoring for the participants. This data is then collected into a larger database. Data entry was completed by an unknown source. There were some participants with missing data, or data entries that appeared to be coded incorrectly. As the original data sources were not accessible, these entries had to be removed. Further, although all raters are trained on use of the ChYMH, there is currently no research into inter-rater reliability within the ChYMH.

Finally, there were limitations within the data collection possibilities of the ChYMH. The ChYMH does not collect data on the method of NSSI or SSI, which would have been valuable information into understanding the differences between the groups.

Further, the ChYMH allows individuals to endorse the option of "no attempt" for self-injurious behaviour while later on endorsing self-injurious behaviour within other questions. This limited the comparison potential for the control group, as the control group was still presenting with the use of self-harm.

Sample size. The sample size within the study presented some concerns. The sample size for the SSI group was significantly smaller than for the NSSI and control group. The decision was made to separate the SSI and NSSI group with the goal of gaining an understanding of the differences between the two groups. However, there were few individuals who presented with SSI. The low sample size limited the statistical power of some findings. However, both genders and age range were divided equally within all three groups.

Generalizability. The current study was completed on a sample of in and out patient children and adolescents in mental health care settings. However, the exact breakdown of where the participants were being treated is unknown which limits the possibility for generalizability to similar populations. The location of treatment was kept private for the confidentiality of the participants involved. Further, in terms of generalizability to past research in the field, previous research has focused on undergraduate students and adolescent samples (Adrian et al., 2011; Gratz & Chapman, 2007; Jenkins & Schmitz, 2012; Matthew K Nock & Prinstein, 2004; Penn et al., 2003; Perez et al., 2012).

Summary

The major findings within the current study indicate that emotion regulation is an important factor in the presence and frequency of NSSI and SSI. Emotion regulation had

greater accuracy relative to gender and age variables in predicting self-harm. This knowledge extends our understanding within the self-harm literature by allowing for a comparison between NSSI and SSI, and exploring the impact of age and gender. Despite the presented limitations of the study, it is suggested that clinicians integrate emotion regulation skills into treatment protocols to help individuals presenting with self-harm. Further, it is suggested that researchers continue to investigate the differences between NSSI and SSI to increase understanding of these two constructs.

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