2011

NON-SUICIDAL SELF-INJURY AND EATING PROBLEMS: A COMPARISON OF COPING STRATEGIES IN FEMALE UNDERGRADUATE STUDENTS

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NON-SUICIDAL SELF-INJURY AND EATING PROBLEMS: A COMPARISON OF COPING STRATEGIES IN FEMALE UNDERGRADUATE STUDENTS

(Spine Title: NSSI & Eating Problems: A Comparison of Coping in Females)

(Thesis format: Monograph)

By

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Graduate Program in Education

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Submitted in partial fulfillment
of the requirements for the degree of
Master of Education

School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario

THE UNIVERSITY OF WESTERN ONTARIO
School of Graduate and Postdoctoral Studies

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entitled:

Non-Suicidal Self-Injury and Eating Problems: A Comparison of Coping Strategies in Female Undergraduate Students

is accepted in partial fulfillment of the
requirements for the degree of
Masters in Education in Counselling Psychology

Date

Chair of the Thesis Examination Board

Abstract

Non-suicidal self-injury (NSSI) and eating problems (EP) are difficulties that affect young females. NSSI and EP are methods of coping that have been associated with trauma, prior abuse, avoidant coping, substance use and impulsivity. The present study compared coping strategies among four groups of undergraduate female participants ($N = 92$): those that exhibit NSSI alone, comorbid NSSI and EP, EP alone, and comparison females. These groups were defined by endorsement of items on the How I Deal with Stress Inventory (HIDS; Heath & Ross, 2007). A multivariate analysis (MANOVA) investigated the frequency of using items on the HIDS reflective of avoidant coping, impulsive coping and substance use. Results indicate significant differences between groups were found among the following coping strategies: risky behaviours, smoking, doing drugs, and drinking alcohol. A secondary analysis revealed significant differences between groups for shopping and exercise. Discussion focuses on the differing coping styles of groups of females in this study.

Keywords

Self-Injurious Behaviour, Eating Disorder, Comorbidity, Female, Coping.

Acknowledgements

I would like to show my profound gratitude to my supervisor, Dr. Alan Leschied, for all of his encouragement, guidance, support and patience from the very beginning. This project would not have been possible without your counsel and positivity. I would also like to thank Dr. Nancy Heath, my surrogate supervisor at McGill University, for taking a chance and allowing me to be part of her team. Without your guidance and knowledge, this project would have never come to fruition. I am also so grateful to Dr. Olga Heath for allowing me to use her data. After all your guidance over the years, I owe you my sincerest gratitude.

Thank you to my parents, family, and friends who have shown nothing but kindness and encouragement. You made the challenging times so much easier to bear. Finally, thank you Brent for all your love, emotional support and formatting expertise. I am sincerely grateful for everything you've done for me.

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Non-Suicidal Self-Injury and Eating Problems: A Comparison of Coping Strategies in Female Undergraduate Students

Introduction

Non-suicidal self-injury (NSSI) is a concern that is becoming more widely recognized, in part due to an insurgence of attention in media and youth culture (Heath et al, 2009). Non-suicidal self-injury is defined as "the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned" (Ross, Heath, & Toste, 2009, p.83). It is important to note that this definition of NSSI does not include suicidal behaviours, drug or alcohol use, or socially accepted pain-causing behaviours such as tattooing or piercing (Ross, Heath & Toste, 2009). However, there are over 33 terms that are used to refer to non-suicidal self- injury (NSSI) such as self-mutilation and deliberate self-harm (Muehlenkamp, 2005). Some of these definitions differ from that of the current research in that they include extraneous behaviours such as those that are associated with an intention of death, alcohol and drug use, promiscuity, and wound picking (Muehlenkamp, 2005). Behaviours that are associated with the current definition include self-inflicted cutting, which is the most common, burning, severe scratching, head banging and punching (Heath, Toste, Nedecheva, & Charlebois, 2008).

Prevalence rates for deliberate self-harming behaviour vary, ranging from 4% (Brown, 2009) to 39% (Heath et al., 2009) in the youth and adult populations. The differences in inclusionary characteristics within the definitions vary as a function of the populations studied, which may account for the large range in prevalence rates. However, prevalence rates for the definition employed in the present study, given the age range under investigation, range from 11%-20% in nonclinical samples (Heath et al., 2009; Heath, Toste, Nedecheva, & Charlebois, 2008; Ross, Heath & Toste, 2009). In a previous study that

examined NSSI in university students using the definition "the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned" (Ross, Heath, & Toste, 2009, p.83), 11.68% of 728 participants in a university sample reported engaging in NSSI (Heath, Toste, Nedecheva, & Charlebois, 2008).

Prevalence rates for individuals at risk of having an eating disorder are 1.9% for both sexes and 3.8% for females between the ages of 15 and 24 (Statistics Canada, 2002). While no data from Statistics Canada is available for males of this age group with respect to risk of having an eating disorder, it is evident from the difference between the prevalence rates of females and both sexes indicates that females are at a substantially higher risk of having an eating disorder than males in this age group. American statistics are similar with a prevalence rate 3.5% of women having full disorder Anorexia Nervosa, Bulimia Nervosa, or Binge Eating Disorder and prevalence rate 6% of women affected by eating disorders if substhreshold disorders are included (Agras, 2004).

Factors Associated with NSSI

Motivations. Self-injurious behaviour has been associated with many different motivations throughout the current research. The desire to feel "relief from a terrible state of mind", (Scoliers et al., 2009) thoughts or feelings (Heath et al., 2009) appears to be the most common. Other motivations for self-injuring that have been reported are to feel in control (Heath et al., 2009, self-punishment (Heath, Ross, Toste etc, 2009; Scoliers et al., 2009; Klonsky and Glenn, 2009), to get attention (Heath et al., 2009; Scoliers et al., 2009), to communicate desperation (Scoliers et al., 2009) or hurting (Heath et al., 2009) and to frighten someone (Scoliers et al, 2009). It is argued that non-suicidal self-injury differs from suicidal behaviour in that there is usually an absence of suicidal thoughts and death is not the intention (Muehlenkamp, 2005).

To a considerable extent, the available research focuses on intrinsic factors or characteristics of people who self-injure. One of the most prominent factors that has been established is a difficulty with emotion regulation (Heath et al, 2008; Mikolajczak, Petrides & Hurry, 2009; Klonsky & Glenn, 2009). Another characteristic that has been widely reported is impulsivity (Mann et al., 1999; Dougherty et al., 2009). In a study comparing clinical populations of self-injurers who had and had not attempted suicide, Dougherty et al. (2009) found that while both populations rated very high on a self-reported impulsivity scale, self injurers who had attempted suicide scored significantly higher on laboratory impulsivity tests.

Personality Characteristics. Personality is also a factor studied in populations engaging in self-injury. Brown (2009) investigated differences in the Big 5 personality traits between non-clinical deliberate self-harm (DSH) and comparison groups. He found that the DSH group reported significantly higher correlations of openness to experience and neuroticism, and lower correlations of agreeableness and conscientiousness compared to the non-self-injuring group (Brown, 2009). From these results, Brown (2009) concluded that self-injurers in his study were more likely to be more impulsive, have increased interpersonal conflict and have a "greater predisposition to experience negative emotions such as anxiety, anger and depressed mood" (Brown, 2009, p. 30). Goldstein, Flett and Wekerle (2009) also conducted a comprehensive study assessing personality and self-injurious behaviour. This study found higher correlations of openness to experience in a deliberate self-harm population, but did not find a significant difference in neuroticism between DSH and non-DSH participants (Brown, 2009). The lack of cohesion of the research in this area may be due in part to differing definitions of self-injury and/or to the contingent internal validity of the personality assessment measures that were used.

Psychopathology. Research has also focused on the possible link between self-injuring behaviour and psychopathology. Self-injury is said to be associated with disorders such as depression, bipolar disorder, borderline personality disorder, eating disorders and heavy drug and alcohol use (Hintikka et al, 2009; Stanford and Jones, 2009, Muelenkamp, 2005)). In a survey study by Goldstein, Flett, Wekerle and Wall (2009), depressive symptoms were found to have a significant positive correlation with deliberate self-harm. Dougherty et al (2009) also found significantly higher rates of depression and hopelessness in an NSSI group who had previously attempted suicide. As well, a meta-analysis by Fliege, Lee, Grimm and Klapp (2009) found that anxiety and depression are indicators of self-harming behaviour. Additionally, a Finnish study by Hintikka et al. (2009) concluded that of DSH participants, 63% met the criteria for major depressive disorder, 37% met the criteria for anxiety disorders, and 15% met the criteria for eating disorders compared to 5%, 12% and 0% respectively for non self-harmers.

NSSI Associated with Trauma and Prior Abuse. Research on the risk factors associated with self-harming behaviour has focused primarily on trauma, abuse history and parental relations. Weierich and Nock (2008) investigated the relationship between childhood sexual and nonsexual abuse with non-suicidal self-injury in an adolescent population. These authors found that sexual abuse was significantly associated with both the occurrence and frequency of NSSI even when controlling for the presence of Borderline Personality Disorder and Major Depressive Disorder symptoms. However, they did not find a significant relationship between non-sexual (physical or emotional) abuse and NSSI (Weierich & Nock, 2008).

In contrast, a study by Gratz and Chapman (2007) found contradictory results, reporting that physical abuse of male undergraduates was significantly correlated with NSSI,

while no significant relationship between NSSI and sexual abuse was found. However, very few participants reported a history of childhood sexual abuse, which may have limited the ability to find a strong relationship between self-harming behaviour and sexual abuse (Gratz & Chapman, 2007). Gratz and Chapman (2007) also found that individual factors in addition to environmental factors (like physical abuse) were associated with the development of non-suicidal self-injurious behaviour. In this study self-injuring men reported significantly higher levels of emotion dysregulation. Also, affect intensity/reactivity was negatively associated with reports of self-harming behaviour. Gratz and Chapman (2007) suggest that self-injury in male undergraduates may be perpetuated by social norms of limited emotional expressivity.

NSSI as a Coping Behaviour. Within the available research, non-suicidal self-injurious behaviour is widely referred to as a maladaptive coping strategy. A study by Litman and Lunsford (2009) looked at coping strategies among a general population of university students. They found that mental disengagement, a common characteristic in self-injury behaviour, was regarded as positively impacting problems and emotions (Litman & Lunsford, 2009). After investigating more than fifteen different coping strategies, Litman and Lunsford (2009) found that participants reported particular strategies as more effective when they perceived a sense of control. This finding provides some important implications for self-injury research, as it is possible that self-injurers repeatedly engage in NSSI to feel a temporary feeling of control.

Other Coping Strategies Associated with NSSI. Minimal research has examined the coping strategies of individuals who are involved in self harming behaviour and virtually no research has been conducted that investigates coping mechanisms in populations that exhibit both NSSI and eating pathologies. Yet the opinion that self-injurers likely employ less adaptive and/or more maladaptive coping strategies compared to non-self-injurers is widely

held. Heath et al. (2008) suggest that self-injurers "do not have a repertoire of strategies to employ when they are dealing with stress" (Heath, Toste, Nedecheva & Charlebois, 2008, p. 150). Fliege, Lee, Grimm and Klapp (2009) suggest that self-injurers show more maladaptive coping strategies, but display no differences in their use of adaptive coping strategies compared to non self-injurers. In another study, self-harm was associated with the maladaptive coping strategies of avoidance, rumination and self-blame, but was not associated with adaptive coping strategies compared to controls (Mikolajczak, Petrides, & Hurry, 2009). Mikolajczak, Petrides and Hurry (2009) suggest that self-harm may be an attempt to regulate the negative feelings that are associated with the ineffective coping mechanisms of rumination, self-blame and helplessness. Yet, within the available research, the conclusions are inconclusive and limited in terms of the range of coping strategies that were investigated.

Haines and Williams (1997) examined an Australian prison population, identifying that self-injuring prisoners used fewer cognitive resources, more problem avoidance and were generally less adaptive at coping than non-self-injuring prisoners and male college comparison groups. Also, Haines and Williams (1997) found that both self-injuring prisoners and non-self-injuring prisoners reported exhibiting fewer social resources, social support and more social withdrawal than the college comparison group. The self-injury group was comprised entirely of prison inmates and their coping styles may not be representative of non-incarcerated self-injuring individuals. The prison factor alone likely influenced the types of stressful situations and the behaviours that are linked to that context. Also, it is likely that self-injuring prisoners and self-injuring males in the community differ in coping styles due to numerous factors such as socio-economic status associated with lifestyle choices. Although this study proposes that self-injurers did not report substantial deficits in coping abilities, or a

limited repertoire of coping behaviours, the population used in this study restricts its generalizability to the broader self-injuring population.

In a study investigating coping strategies in college students who had engaged in recent NSSI behaviours, in the past or never, Brown and Williams (2007) found few differences between the three groups. Of the 15 coping strategies that were assessed, only two significant differences were found. Students who had recent and past histories of self-injury reported using behavioural disengagement strategies more often than students who had never self-injured. Interestingly, past self-injurers reported significantly more substance use than other groups. It is possible that this substance use may have been employed as a replacement strategy for self-injury. Alternately, it is also possible that the results of this study were skewed due to the self-injury group including participants who engaged in self-harm only once as well as frequent self-injurers. If this group was limited to individuals who engaged in self-injury more than once, it is possible that the results could be very different.

In a similar study that examined coping strategies in a college sample, Andover, Pepper and Gibb (2007) found that self-injurers reported using avoidance strategies significantly more often and using social support significantly less often than students who had never engaged in self-injury. This study also found evidence of gender differences in coping within the self-injuring group. Female self-injurers reported significantly less problem solving and support seeking than non-self-injuring females, while male self-injurers did not differ in these areas compared to the male comparison group. While there appears to be some consensus on differences in avoidant and social coping for self-injurers, it is apparent that more research is necessary to further investigate a broader spectrum coping behaviours as well as population (prison, nonclinical and clinical) and gender differences within the general self-injuring population.

The majority of the aforementioned studies did not include drug, alcohol or nicotine use as possible coping strategies. However, a study by Tuisku et al. (2009) found that adolescents who engaged in deliberate self-harm reported using significantly more alcohol than a non-suicidal depressed comparison group. Another study by Goldstein, Flett, Wekerle and Wall (2009) found that illicit drug use was significantly correlated with deliberate self-harm in a university sample. As well, a study by Riala, Hakko and Rasanan (2009) found that smoking was significantly higher among self-harmers (71.3%) than the general adolescent population (approximately 20%). This study on smoking was only investigating adolescent practices. It is possible that smoking may even exist in higher incidence rates in older populations when cigarettes are more readily available. Once again, these results may not be representative of the same population as one study included drinking "past the points of known tolerance" and "preventing wound from healing" (Goldstein, Flett, Wekerle, & Wall, 2009), another study included suicidal behaviour in their definition (Tuisku et al., 2009), and another omitted the above behaviours from their definition entirely (Riala, Hakko & Rasanan, 2009). As well a comprehensive study evaluating the use of drugs, alcohol, nicotine and other possible coping strategies has yet to be conducted comparing NSSI and non-self-injuring populations.

*Relationship to Gende*r. Gratz, Conrad and Roemer (2002) identified gender differences in differentiating potential risk factors contributing to self-injurious behaviour. Gratz, Conrad and Roemer (2002) reported that sexual abuse and insecure parental attachment were significantly associated with NSSI in women. An interaction between insecure parental attachment and parental emotional neglect was also found to be positively associated with self-injury in women. In men, physical separation from a caregiver, primarily a father, was a highly significant predictor of NSSI. In contrast to results from Gratz and

Chapman (2007), this study did not find physical abuse to be a significant predictor for men or women. In addition, Gratz, Conrad and Roemer (2002) also found that men from a single parent (primarily single mother) home were more likely to engage in self-injury compared to men from intact families. Interestingly, there was no relationship found between single parent upbringing and self-injurious behaviour in women (Gratz, Conrad & Roemer, 2002). The authors suggest that attachment differences between males and females may contribute to differing coping styles.

Gratz (2006) also conducted a study on risk factors associated with NSSI for female undergraduate students. Again, significant correlations were found between sexual abuse and frequent self-harm. In addition, Gratz (2006) found that the interaction of childhood maltreatment and low positive affect intensity/reactivity was a significant predictor of NSSI. A three-way interaction between childhood maltreatment, emotional inexpressivity and high levels of affect intensity/reactivity was also found to correlate with NSSI behaviour in women. Gratz (2006) proposes that childhood maltreatment likely perpetuates high affect intensity/reactivity. With this combination of risk factors interacting with emotional inexpressivity, it is likely that emotions become too overwhelming to the point that self-injury functions as a form of emotional release (Gratz, 2006). Gratz (2006) also found that lesbian and bisexual women in this study were more likely to engage in self-harm than heterosexual women (65% vs 17%). It is possible that the overwhelming homophobic stress that many women of these sexual orientations face contribute to the development of self-injurious coping behaviour.

Relationship Between NSSI and Eating Disorders.

Evidence for the prevalence of comorbidity of NSSI and eating disorders is supportive throughout the research. Favaro and Santonastaso (1996) found that 24% of purge-type

anorexic and 30% of purge-type bulimic outpatients reported self-injurious behaviour. Research by Claes, Vandereycken and Vertommen (2001) found that 44% of female inpatients with an eating disorder reported at least once incident of self-injury. Individuals suffering from purge-type anorexia (51.8%) and bulimia (43.6%) reported self-injury more often than individuals suffering from restrictive-type anorexia (34.3%) in this study. In addition, Claes Vandereycken and Vertommen (2001) found that purge-type anorexic inpatients reported significantly more self-cutting than restrictive-anorexic inpatients. From the research, it appears that there is a connection between NSSI and eating disorders, particularly of the purging type.

In comparison to self-injury studies, more research is focused on coping and Eating Disorders. Noteworthy studies have found that coping styles of eating disordered individuals are similar to coping styles found in self-injury studies. Extensive literature has focused on risk factors associated with eating pathology. Risk factors such as the perceived pressure to be thin, body dissatisfaction, dieting, negative affect and substance use have been documented (Stice, Ng & Shaw, 2010). However, other predictors of eating disorders appear to be more closely related to the predictors of self-injury. Beradis et al. (2009) found that female undergraduate alexithymics, individuals who have difficulty experiencing and expressing emotion, were at greater risk for developing an eating disorder. This finding mirrors the research that has reported the influence of emotional inexpressivity (Gratz, 2006) and affects intensity/reactivity (Gratz & Chapman, 2007) on self-injurious behaviour. Emotion dysregulation has been reported as a common risk factor to both NSSI (Gratz & Chapman, 2007) and eating disorders as well. Buckholdt, Para and Jobe-Sheilds (2010) found that difficulties regulating emotion and parental expression of sadness were related to binge eating and lack of control of eating behaviours in their undergraduate sample.

Eating Disorders Associated with Trauma and Prior Abuse. Similar to NSSI, it appears that family factors can influence problematic eating behaviours as well. Kluck (2010) found that weight focused families as well as parental criticism, teasing, and encouragement to control one's weight were significantly associated with disordered eating for college women. Also, much like NSSI, trauma and sexual abuse have been associated with the development of eating disorders. In a study by Carter, Bewell, Blackmore and Woodside (2006), 48% of eating disordered women in their clinical sample reported a history of childhood sexual abuse. In addition, patients with a history of sexual abuse indicated significantly higher severity of eating-related pathological symptoms (Cater, Bewell, Blackmore, & Woodside, 2006). A Colombian study by Rodriguez, Perez and Garcia (2005) found similar results. Forty-five percent of patients with an eating disorder reporting a history of sexual abuse, violent trauma or both in their study. Similar to results found by Carter Bewell, Blackmore and Woodside (2006), Rodriguez, Perez and Garcia (2005) found that patients who had been sexually abused had more adverse outcomes and greater therapy dropout and relapse rates than patients without a sexual abuse history. In addition, a study by Kong and Bernstein (2009) found significant correlations between aspects of eating pathology and emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. From the available literature, it appears clear that NSSI and eating disorders are influenced by very similar risk factors – which may account for the high comorbidity of the two pathologies.

Other Coping Styles and Strategies Associated with Eating Disorders. It has been suggested that pathological eating behaviours may serve similar functions as self-injury as strategies for coping and stress release for individuals suffering from eating disorders (Bloks,

Furth, Callewaert & Hoek, 2004). Bloks, Furth, Callewaert and Hoek (2004) found that in a study involving Dutch women with severe Anorexia Nervosa (AN) and Bulimia Nervosa (BN) the use of more avoidant coping strategies and less cognitive problem solving than healthy women. Researchers of this study also compared recovered, partially recovered and full syndrome eating disordered adolescent girls after 2.5 years of treatment. They found that recovered and partially recovered girls exhibited significantly improved scores on passive reacting, avoiding, active tackling and seeking social support compared to initial testing scores (Bloks, Furth, Callewaert, & Hoek, 2004). Girls in this study who still exhibited the full syndrome after 2.5 years also had significantly improved active tackling scores compared to initial testing. However, recovered and partially recovered patients showed more active tackling than the full syndrome group. In this study, recovered girls scored the closest to 'normal' girls in terms of coping compared to partially recovered and full syndrome patients. The results suggest that improving coping strategies may be an important aspect of therapeutic intervention for eating disordered individuals. However, this study did not articulate if differences were found in coping styles between AN, BN and EDNOS (eating disorder not otherwise specified) as individuals with these disorders were grouped together. It is possible that individuals with AN, BN and EDNOS used different coping strategies in this study, while treatment remained identical for individuals with each disorder. It is possible that inappropriate focus on coping strategies may have affected treatment outcomes in this study.

Lobera et al. (2009) noted in their study that differences in coping styles were found between AN and BN outpatients. In this study, AN outpatients scored significantly higher on self-criticism compared to BN outpatients. In addition, BN outpatients scored significantly higher on impulsivity and significantly less on cognitive restructuring than AN outpatients.

Lobera et al. (2009) also found that eating disordered outpatients exhibited a generally deficient use of coping strategies in comparison to a non-clinical population. The ED group reported more self-criticism, social withdrawal and inadequate control than non-clinical and 'other mental disorder' groups. In addition, the non-clinical student group showed the highest scores on adaptive strategies like problem solving, social support and cognitive restructuring compared to the two clinical groups (Lobera et al., 2009). The differences in this study suggest that individuals dealing with these disorders have different coping styles. Thus, treatment should reflect and address these differences. It also suggests that further research should approach these disorders separately to appreciate a more representative view of coping strategies in eating disordered individuals.

In a study that investigated coping strategies with Bulimic individuals, it was found that BN was not only associated with maladaptive coping strategies, but also with a limited repertoire of overall coping behaviours (Binford, Crosby, Mussell, & Crow, 2005). These researchers reported that individuals with BN reported less social support-seeking and more passive-avoidance, cognitive rumination and maladaptive emotion-focused coping in response to stressful situations compared to a control group. Bulimic participants in this study were evaluated before and after treatment using The Coping Scale for Bulimia Nervosa (CS-BN). Binford, Crosby, Mussell and Crow (2005) found that after therapy, Bulimic participants showed significant improvement in adaptive coping implementation. However, this improvement was not significantly associated with improvement in symptom severity at a 6-month follow up. It is interesting to note that a relapse of poor coping at the 1-month follow up predicted poor outcomes at the 6-month follow up (Binford, Crosby, Mussell, & Crow, 2005). These results suggest that some correlation appears to exist between poor

coping skills and symptom severity for individuals with BN and that coping strategies may be an important focal topic for therapy.

Similar to individuals exhibiting NSSI behaviour, substance use has also been associated with women with eating disorders (ED). Holderness et al. (1994) assert that approximately 50% of individuals with an eating disorder are also dependent on alcohol or illicit drugs compared to 9% of the general population. In a study by Baker, Mitchel, Neale and Kendler (2010), ED diagnosis was significantly related to substance use disorders. They found that women with BN were more likely to be regular smokers, have a clinical drinking problem and have an illicit drug disorder compared to women without a BN diagnosis. Researchers of this study also found that women with AN were more likely to have a clinical drinking problem and be regular smokers compared to women without a AN diagnosis (Baker, Mitchel, Neale & Kendler, 2010).

In a large scale study in Sweden using 13 297 female participants, substance use was significantly more prevalent in all eating disorder groups (including AN, BN, an ANBN combination and Binge eating disorder or BED) than in participants without an eating disorder (Root et al., 2010) Females in this study diagnosed with AN, BN, and ANBN were at increased risk of alcohol dependence/abuse compared to the referent group. However, females with BN (22%) and ANBN (22%) were significantly more likely to abuse alcohol than females with AN (12%), (Root et al., 2010). Also, females in eating disorder groups in this study were significantly more likely to use diet pills (AN: 21%, BN: 37%, ANBN; 59%, BED: 14%) compared to the referent group (9%). Females in eating disorder groups were also significantly more likely to use several illicit drugs, including cannabis, opioids, sedatives and stimulants, compared to the referent group (Root et al., 2010).

Interestingly, this study found no difference between ED groups and the referent group with regard to smoking (Root et al., 2010). A Canadian study by Piran and Robinson (2006) however revealed conflicting results indicating that binging and dieting was associated with tobacco use, but not with alcohol use. Another Canadian study involving 20 211 women between ages 15-24 revealed that women who were at risk of eating disorders reported significantly more cannabis use, illicit drug use and dependence on and interference of illicit drugs compared to women who were not at risk of ED (Piran & Gadalla, 2006).

It appears from the available research that individuals that engage in NSSI and problematic eating behaviors may have similar coping and behaviour styles. However, because there is minimal research devoted to comparing the coping styles of individuals with these issues on similar measures, such a conclusion cannot be made with a high degree of certainty.

Comparing NSSI and Eating Problems (EP) in the current study

While research has been conducted in the area of coping in Eating Disorders and Non-suicidal Self-injury, the scope of the available material lacks cohesion. The methods of assessment differ greatly across studies and the types of coping strategies investigated are limited in most of the research. While it appears that avoidance, impulsivity and substance use are common coping trends for both types of pathology, it is difficult to compare coping strategies of individuals challenged with Eating Disorders and NSSI within the available research in the area. The research pertaining to Eating Disorders uses primarily clinical populations of adolescent or college educated female participants while the research pertaining to NSSI uses a myriad of male, female, clinical, non-clinical and prison populations. One study in particular found gender differences in coping for individuals who engage in NSSI (Andover, Pepper & Gibb, 2007). Thus, it is possible that gender differences

in coping also exist between males and females with eating disorders. However, with the current research, this is unknown as these studies focus mainly on females. Clearly, more research is needed in this area.

There are virtually no studies comparing the coping strategies of populations who engage in NSSI and eating problem comorbidity (NSSI +EP), NSSI alone, and eating problems (EP) alone while investigating differences in employment of coping strategies between these four groups. It is important to note that the current study investigated eating problems and not eating disorders. Due to the manner in which the groups were selected, the use of the term 'Eating Problems' was deliberate so as not to inappropriately infer psychiatric diagnosis. The primary goal of the current study is to examine, compare the endorsement, and gather a more comprehensive understanding of particular types of coping strategies among the four groups. It was hypothesized that the NSSI + EP group would engage in more maladaptive coping strategies than other groups. This is based on previous research that proposes that adolescents who engaged in NSSI and eating problems reported significantly more impulsivity and feelings of ineffectiveness and distrust than those who engages in NSSI alone (Ross, Heath, & Toste, 2009). Based on the assumption that people who engage in NSSI and eating problems have significantly more negative feelings and higher impulsivity, this group was expected to report more maladaptive coping strategies than other groups.

Method

Participants

Participant data for the current analysis was obtained from existing data that were collected for previous studies by Dr. Olga Heath of Memorial University in collaboration with Dr. Nancy Heath of McGill University.

For the current study, ninety-two female participants were selected from the full sample of 1685 participants. This study included only female participants because the full sample did not contain enough male participants to make a statistically sound gender comparison. These participants were selected on the basis of their endorsement or absence of particular responses indicating NSSI, eating problems (EP), a combination of NSSI and eating problems, or no reported NSSI or EP issues. The latter grouping was used for comparative purposes. This selection process yielded four distinct groups: NSSI only group, EP only group, NSSI + EP group and a comparison group. The nomenclature used for the "Eating Problem' groups deliberately avoided the term "Disorder" as the method of group classification to eschew inappropriate diagnostic inference.

Group classification was based on the responses to the items "Physically hurt myself on purpose" and "Try to control my weight" on the HIDS questionnaire. Participants classified in the NSSI only group answered 0 on the weight control question and 1, 2, or 3 on the self-harm question, those in the ED only group answered 0 on the self-harm question and 3 on the weight control question, those classified in the NSSI + EP combination group answered 1,2, or 3 on the self-harm question and 3 on the weight control question ad participants in the comparison group answered 0 on both questions. Participants were matched based on age as closely as possible resulting in 23 participants assigned to each group. The participants ranged in age from 17 years to 22 years (M=18.15) and were students at Memorial University of Newfoundland. 84.8% of the participants identified as heterosexual, 3.3% identified as gay/lesbian, 5.4% identified as bi-sexual, 3.3% were questioning their sexual orientation and 3.3% did not provide information regarding their sexual orientation. Canada was the country of birth for 95.7% of participants with 2.2%

indicating an origin that was non-Canadian and 2.2% did not provide information regarding their birth country.

Measures

How I Deal With Stress Questionnaire. The How I Deal With Stress (HIDS) questionnaire, designed by Heath and Ross (2002), was used in the study. The title of the HIDS was purposefully worded to increase initial comfort with a survey designed to assess the subject of non-suicidal self-injury. This questionnaire was designed to assess the indication, prevalence, and factors associated with non-suicidal self-injury. The HIDS questionnaire was chosen over other standardized assessments for ethical reasons. As the population studied was a community sample, the HIDS was chosen because it assessed NSSI without drawing specific attention to this sensitive topic. Measures specifying intent to assess Non-suicidal self-injury could deter people from participants and possibly arouse negative emotional responses. Items pertaining to self-injury were embedded in the HIDS to function as a screening measure from which participants could be allocated into groups. It contains an inventory of 30 coping strategies, such as exercising, using drugs, and watching television, in which participants indicate on a 4-point scale (0=never, 1=once, 2=a few times, or 3=frequently) how often they engaged in these particular strategies. If the participant has checked 'once', 'few times' or frequently' to any of the strategies in bold print on the questionnaire, then the participant is asked to answer the coordinating open-ended questions after completing the inventory. The coordinating questions are designed to specify the aspects of the particular coping mechanism. For participants who report engaging in self-injury, the questions reflect the prevalence of the behaviour, types of behaviour (i.e. cutting, burning scratching etc.), suicidal intent and feelings associated with self-injurious behaviour. Preliminary psychometric information on the HIDS questionnaire shows a high test-retest

reliability of $r=.88$ over a four-week period with a sample of 102 first year university students in a large mid-western university (Holly, S. (2011) Validity measures are not yet available for the HIDS questionnaire.

Procedure

Dr. Nancy Heath and Dr. Olga Heath, contributing researchers to the area of NSSI and problematic eating behaviour, provided 92 completed HIDS questionnaires from their previous studies for the current investigation that adhere to the aforementioned four groups. From this secondary data, a primary analysis selective in nature compared these groups in terms of their reported use of particular coping strategies.

The variables selected for this primary analysis were chosen based on evidence from previous research. Avoidant coping strategies (Haines & Williams, 1997; Pepper & Gibb, 2007; Binford, Crosby, Mussell, & Crow, 2005), and impulsivity (Mann et al., 1999; Dougherty et al., 2009; Lobera et al., 2009), have been associated with both NSSI and EP, while substance use (Brown & Williams, 2007; Tuisku et al., 2009; Goldstein, Flett, Wekerle & Wall, 2009; Riala, Hakko & Rasanan, 2009) has been associated with NSSI behaviour in previous studies. Based on this previous research, the coping strategy 'Doing risky things' in the realm of sensation seeking and disregard of possible negative consequences is considered to be an aspect of impulsivity (Whiteside & Lyndam, 2001; Franken e al., 2008). The coping strategies "Try not to think about it" (Nemeth et al., 2009; Garcia-Grau et al., 2001), 'Say to myself it doesn't matter' (Garcia-Grau et al., 2001) and 'Do something to keep busy' (Garcia-Grau et al., 2001) and 'Sleep' (Garcia-Grau et al., 2001) were considered to be indicative of avoidant coping. 'Do drugs' (Goldstein, Flett, Wekerle & Wall, 2009; Root et al., 2010; Piran & Gadalla, 2006), 'Drink alcohol' (Tuisku et al., 2009; Root et al., 2010) and

'Smoke' (Riala, Hakko & Rasanan, 2009; Piran & Robinson, 2006) were considered to be indicative of substance use.

Hence 'Try not to think about it' (avoidant), 'Say to myself it doesn't matter' (avoidant), 'Do something to keep busy' (avoidant), 'Sleep' (avoidant), 'Doing drugs' (substance use), 'Drinking alcohol' (substance use) and 'Smoking' (substance use) were the chosen variables for the primary analysis. A multivariate analysis of variance (MANOVA) was used to compare the endorsement of coping strategies among the four groups. The use of a MANOVA allows for a simultaneous comparison of the endorsement levels of multiple coping strategies across the four different participant groups. In addition, MANOVA is time efficient and guards against type 1 error. Following significant MANOVA results, subsequent univariate analyses and independent samples t-tests were used to further compare the independent variables (eating problems, NSSI, and a combination of the two, and absence of NSSI and eating problems) on the basis of individual coping strategies.

Minimal research has focused on the endorsement of adaptive and neutral coping strategies. Hence, a secondary analysis explored possible relationships among a number of variables on the HIDS questionnaire. Multivariate analyses of variance (MANOVAs) were used to compare the endorsement of coping strategies among the four groups for the secondary analysis as well. The coping strategies were grouped as either being maladaptive, adaptive or neutral based on heuristic knowledge of coping. Three separate MANOVAs were conducted for each category. Subsequent univariate analyses and independent samples t-tests were used to further compare the independent variables (eating problems, NSSI, and a combination of the two, and absence of NSSI and eating problems) on the basis of individual coping strategies.

Results

The purpose of the primary analysis was to investigate specific variables on the HIDS questionnaire that are reflective of impulsivity, avoidant behaviour and substance use, which have been associated with NSSI and EP in previous research. The selected variables in the current study were 'Doing risky things', which is indicative of impulsive coping; 'Try not to think about it', 'Sleep', 'Say to myself it doesn't matter', and 'Do something to keep busy, which is indicative of avoidant coping; and 'Doing drugs' 'Drinking alcohol' and 'Smoking' which are substance oriented coping strategies on the HIDS questionnaire. By selecting these seven variables, the primary analysis examined whether associations from previous research would be replicated in the current study.

Primary analysis

A MANOVA revealed a significant interaction between the selected coping strategies or variables (Say to myself it doesn't matter, Try not to think about it, Do something to keep busy, Do risky things, Drink alcohol, Do drugs, Smoke and Sleep) and the four grouping variables (Roy's Largest Root= 0.245, $F(3, 89) = 3.28$, $p<0.05$).

Table 1.

Means and Standard Deviations of Items from the Primary Analysis

	NSSI n = 23		NSSI + EP n = 22		EP n = 22		Comparison n = 23	
Items	M	SD	M	SD	M	SD	M	SD
Say to Myself it Doesn't Matter	1.68	1.25	1.09	1.07	1.39	1.16	1.13	.97
Do Something to Keep Busy	2.14	.71	2.36	.90	2.30	.77	2.00	.85
Try Not to Think About It	2.27	.83	1.91	1.15	2.13	.83	1.52	.99
Sleep	2.09	.81	1.81	1.14	1.87	1.01	1.61	.94
Do Risky Things	.87	.92	1.18	1.05	.65	.98	.35	.78
Drink Alcohol	1.14	1.21	1.18	1.22	1.65	.94	.61	.99
Do Drugs	.36	.73	.73	1.03	.13	.46	.13	.63
Smoke	.73	1.12	.32	.84	.09	.29	.13	.63

*0= never
1= once
2= a few times
3= frequently

A series of one-way analyses of variance explored the relationships between the selected factors and the grouping variables. These results revealed a pattern of differences that identified 'Do risky things', 'Drink alcohol', 'Do drugs', and 'Smoke' as being endorsed by some groups significantly more than others.

A One-Way ANOVA indicated a significant main effect for "do risky things", $F(3,90)=3.18$, $p<0.05$.

Table 2.

ANOVA Summary of Effect of Do Risky Things (Impulsive)

Source	*SS*	*df*	*MS*	*F*
Risky Things	8.37	3	2.79	3.18
Error	76.32	87	.88	
Total	84.68	90		

Independent samples t-tests identified that the NSSI only group (M=.87, SD=.92) reported impulsivity in the form of doing risky things significantly more often than the comparison group (M=.35, SD=.78), $F(1,45)=1.91$, $p<.05$. T-tests revealed that the NSSI + EP group (M=1.18, SD=1.05) also reported doing risky things significantly more often than the comparison group (M=.35, SD=.78) No other groups differed significantly for doing risky things.

The primary analysis yielded no significant differences among groups for the avoidant variables of 'Say to myself it doesn't matter', 'Try not to think about it', Do something to keep busy' and "Sleep'.

All of the variables involving substance use yielded significant results. A One-way ANOVA revealed a main effect for 'Drink alcohol', $F(3,91)=3.50$, $p<0.05$.

Table 3.

ANOVA Summary of Effect of Drink Alcohol (Substance Use)

Source	*SS*	*df*	*MS*	*F*
Alcohol	12.55	3	4.19	3.50
Error	105.13	88	1.20	
Total	117.69	91		

Independent samples t-tests indicated that the EP only group (M=1.65, SD=.94) reported 'Drink alcohol' significantly more than the comparison group (M=.61, SD=.99), $F(1,45)=.021$, $p<.05$. No other groups differed significantly for drinking alcohol.

An ANOVA also identified a main effect for drug usage $(3,91)= 3.05$, $p<0.05$.

Table 4.

ANOVA Summary of Effect of Doing Drugs (Substance Use)

Source	*SS*	*df*	*MS*	*F*
Drugs	4.91	3	1.64	3.05
Error	47.30	88	.54	
Total	52.22	91		

Independent samples t-tests examined differences between the grouping variables for the coping strategy 'Doing drugs'. The NSSI + EP group (M=.70, SD=1.02) reported using drugs as a coping strategy significantly more than the comparison group (M=.13, SD=.63),

F(1,45)=19.71, p<0.05, and the EP only group (M=.13, SD=.46), F(1,45)=31.31, p<0.05. Interestingly, the comparison group (M=.13, SD=.63) and the EP only (M=.13, SD=.46) group had identical means for the endorsement of drugs, F(1,45)=.006, p=1.000. There were no other significant differences between grouping variables for 'Doing drugs'.

Another univariate analysis investigating substance use identified a significant main effect for smoking, F(3,91)=2.98, p<0.05.

Table 5.

ANOVA Summary of Effect of Smoking (Substance Use)

Source	*SS*	*df*	*MS*	*F*
Smoking	5.30	3	1.77	2.98
Error	52.17	88	.59	
Total	57.48	91		

Independent samples t-tests investigated differences between the grouping variables for smoking. The NSSI only group (M=0.70, SD=1.11) reported that they smoked as a coping strategy significantly more than the comparison group (M= 0.13, SD=0.63), F(3,45)=14.49, p<0.05. The NSSI only group (M=0.70, SD=1.11) also reported smoking significantly more than the EP only group (M=0.09, SD=0.29), F(1,45)=30.89), p<0.05. No other t-tests garnered significant differences between grouping variables with regard to smoking.

The results from the primary analysis indicated that the NSSI only group in the current study also reports engaging in more risky behaviour than the comparison group.

Individuals in the NSSI only group also report engaging in smoking significantly more than the comparison group and the EP only group. The EP only group reported drinking significantly more alcohol than those in the comparison group. The NSSI + EP group reported doing drugs significantly more often than the comparison group and the EP group. These results indicate that as shown in previous research, substance use and impulsivity are behaviours that are highly relevant for these populations.

Secondary Exploratory Analysis

There is minimal research focused on adaptive, neutral and other forms of maladaptive coping strategies in the available literature. Hence, a secondary analysis that was exploratory in nature was conducted to investigate the broad spectrum on coping strategies that are indicated on the HIDS questionnaire. The secondary analysis was comprised of three separate MANOVAs assessing the interactions between the grouping variables and other maladaptive, adaptive and neutral coping strategies. Subsequent univariate analyses and independent samples t-tests were used to investigate specific differences between groups. Means and standard deviations of the secondary analysis are found in Table 6.

Table 6.

Means and Standard Deviations of Items from the Secondary Analysis

	NSSI n = 23		NSSI + EP n = 22		EP n = 22		Comparison n = 23	
Items	M	SD	M	SD	M	SD	M	SD
Play Sports	1.09	.65	2.00	.97	2.05	1.02	1.05	1.28
Listen to Music	2.36	1.00	2.48	.81	2.00	1.14	1.70	1.22
Talk to Someone	2.32	.65	2.00	.89	2.05	1.02	2.00	.92
Pray	.50	.80	.38	.74	.57	.93	.25	.72
Try to Solve the Problem	2.09	.81	2.52	.51	2.29	.90	2.20	.89
Exercise	1.27	1.08	1.90	.83	2.29	.96	1.40	1.14
Go Out	2.00	.76	2.17	.83	2.27	.83	1.86	.89
Go Shopping	.81	.93	1.65	.94	1.91	.97	1.45	.96
Cry	2.33	.58	2.48	.85	1.95	.99	1.91	.92
Get into an Argument with Someone	1.18	1.10	1.43	.99	1.23	.97	1.05	.84
Hit Someone	.090	.29	.26	.62	.090	.29	.050	.21
Eat	1.86	.89	1.61	1.27	1.73	.83	1.73	1.08

*0 = never
1 = once
2 = a few times
3 = frequently

Adaptive Coping Strategies. One MANOVA examined associations between Adaptive coping strategies ('Exercise', 'Playing sports, 'Listening to music', 'Talking to

someone', 'Praying' and 'Trying to solve the problem') and the grouping variables (NSSI only, EP only, NSSI + EP and comparison).

These results showed a significant interaction between adaptive passive strategies and the grouping variables (Roy's Largest Root=0.243, $F(3,83)=3.12$,$p<0.05$).

A subsequent One-Way ANOVA indicated a significant main effect for exercise, $F(3,90)=4.33$, $p<0.05$.

Table 7.

ANOVA Summary of Effect of Exercise (Adaptive)

Source	*SS*	*df*	*MS*	*F*
Exercise	13.11	3	4.37	4.33
Error	87.88	87	1.01	
Total	100.99	90		

Independent samples t-tests were conducted to investigate differences between groups as reflected in the exercise variable. The EP only group (M=2.26, SD=.915) reported endorsing exercise significantly more than the comparison group (M=1.26, SD=1.123), $F(1,45)=2.10$, $p<0.05$. The EP only group (M=2.26, SD=.915) reported exercising significantly more than the NSSI only group (M=1.26, SD=1.054), $F(1,45)=.851$, $p<0.05$. These results indicate that exercise as the EP only group endorsed 'Exercise' as a coping strategy significantly more than the Comparison and NSSI only groups.

There were no significant differences between grouping variables in terms of 'Playing sports, 'Listening to music', 'Talking to someone', 'Praying' or 'Trying to solve the problem'.

Maladaptive Coping Strategies. Of the maladaptive coping strategies on the HIDS questionnaire, most were selected in the primary analysis. Those that were not included in the primary analysis were investigated in the secondary analysis. A MANOVA was used to investigate possible interactions between the variables 'Get into an argument', 'Hit someone' and 'Eat', and the grouping variables. No significant differences were found.

Neutral Coping Strategies. The third MANOVA of the secondary analysis showed a significant interaction between Neutral coping strategies ('Going out', 'Go shopping' and 'Cry') and the four grouping variables (Roy's Largest Root=.199, $F(3,88)=5.64$, $p<.005$).

An ANOVA showed a significant relationship between the grouping variable for shopping, $F(3,91)=4.14$, $p<0.05$. No other neutral coping strategies differed significantly between groups.

Table 8.

ANOVA Summary of Effect of Shopping (Neutral)

Source	*SS*	*df*	*MS*	*F*
Shopping	11.58	3	3.86	4.14
Error	81.11	87	.93	
Total	92.68	91		

Independent samples t-tests indicated that the ED only group (M=1.87, SD=.968) reported endorsing shopping significantly more often than the NSSI only group (M=.91, SD=.996), $F(1,45)=.008$, $p<0.05$. T-tests also found that the NSSI + ED group (M=1.65, SD=.935) reported going shopping as a form of coping significantly more than the NSSI only group (M=.71, SD=.996), $F(1,45)=.020$, $p<0.05$. No other significant differences were found between groups for shopping.

Discussion

The purpose of the current study was to investigate how females who engage in NSSI only, NSSI + EP, EP only and those that do not report self-injury or eating issues use different coping strategies. The results reveal that the NSSI-only group reported being involved in significantly more 'Risky things' than the comparison group, and more 'Smoking' than both the comparison group and the EP only group. The NSSI + EP combination group reported being involved in doing significantly more 'Risky things' than the comparison group, and significantly more "Drugs' than both the comparison group and the EP only group. The NSSI + EP group also reported shopping significantly more than the NSSI only group. The EP only group reported 'Drinking Alcohol' significantly more than the comparison group; "Exercising' more than the comparison group and the NSSI-only group; and 'Shopping' more than the NSSI-only group. The original hypothesis that the NSSI + EP group would engage in the most maladaptive coping strategies compared to other groups was not fully supported. However, the NSSI + EP group did report engaging in, arguably, the most maladaptive coping strategies reflected on the questionnaire ("Doing drugs" and "Risky things"). This finding may be indicative of a higher degree of distress for this group and/or a higher predisposition towards maladaptive behaviour. The overall results from the current study indicate that females who engage in self-harming behaviour, both with and without comorbid eating issues, are likely to engage in other self-destructive/dangerous forms of coping such as doing risky things, drugs, and smoking. The overall results also indicate that females who report eating problems, both with and without comorbid conditions, are more likely to engage in forms of coping associated with physical appearance such as exercise, and shopping. Females that report eating problems were also more likely to drink alcohol to cope. Although the "pathological" groups reported significantly more maladaptive coping

strategies than the comparison group, these groups did not differ with regard to adaptive coping strategies. This finding suggests that females challenged with self-harm and eating problems have the same repertoire of adaptive coping strategies, but they tend to employ maladaptive coping strategies more often than females without self-harming and problematic eating behaviour.

Relevance to Previous Research

Contrary to some previous research (Heath, Toste, Nedecheva & Charlebois, 2008; Bloks, Furth, Callewaert & Hoek, 2004; Binford et al., 2005), findings from the current study suggest that females who self-injure and women with eating problems do not differ from comparison participants in terms of their use of adaptive coping strategies. However, the conclusion that women challenged with NSSI show more maladaptive coping strategies, but display no differences in their use of adaptive coping strategies compared to comparison females is consistent with research by Fliege, Lee, Grimm and Klapp (2009). Although participants in the NSSI only, EP only, and NSSI + EP groups endorsed maladaptive coping behaviours more than the comparison group, this indicates that these individuals actually have a larger coping repertoire than the comparison group; albeit this repertoire includes more maladaptive coping behaviours. This finding is inconsistent with previous studies that have suggested that individuals who manage NSSI and eating problems have a limited repository of coping strategies, specifically adaptive coping strategies, compared to non-self-injuring counterparts (Heath, Toste, Nedecheva & Charlebois, 2008). The larger repertoire and higher endorsement of maladaptive coping strategies by the NSSI only, EP only and NSSI + EP groups may be a result of higher stress levels and personal history of psychological distress. Previous research has revealed associations between trauma and abuse with both NSSI (Weierich & Nock, 2008; Gratz & Chapman, 2007) and eating

disorders (Carter, Bewell, Blackmore & Woodside, 2006; Kong & Bernstein, 2009; Rodriguez, Perez & Garcia, 2005). If females in this study that manage NSSI and eating problems are also dealing with substantially higher levels of stress and are more likely to have been exposed to trauma and abuse, it is possible that adaptive coping strategies, though endorsed on some occasions, are not sufficient for dealing with intense personal problems.

Previous research by Herpentz, Henning and Armando (1997), Brown (2009) and Dougherty et al. (2009) has identified impulsivity as a characteristic associated with self-injurious behaviour. Ross, Heath and Toste (2009) revealed that adolescents who engaged in NSSI displayed eating pathology, body dissatisfaction, bulimic behaviour and greater impulsivity than their peers. Participants in Ross, Heath and Toste's (2009) study were not grouped explicitly as having coincident pathological eating issues and self-harming behaviour. However, their findings suggest that there is a relationship between characteristics such as impulsivity, eating problems and NSSI. Results from the current study are consistent with previous research that has suggested that the NSSI + EP combination group and the NSSI only group both reported 'Doing Risky Things' significantly more than the comparison group. Persons with impulsivity and NSSI have been linked to purge-type and Bulimic behaviour more often than to Anorexic behaviour (Claes, Vandereycken and Vertommen, 2001; Lobera et al, 2009). Based on this knowledge, it is possible that the NSSI + EP combination group may include more participants who engage in purging and bulimic type eating problems than the EP only group, which may include more restrictive eating concerns. If the NSSI + EP combination group included more individuals who engaged in purging behaviour, this could explain how this group was linked to impulsivity to a greater extent than the EP only group.

Previous studies have identified avoidance as a coping style that is associated with self-harm, (Mikolajczak, Petrides & Hurry, 2009; Haines & Williams, 1999; Pepper & Gibb, 2007) and eating disorders (Bloks, Furth, Callewaert & Hoek, 2004), particularly for individuals diagnosed with Bulimia Nervosa (Lobera et al., 2009). However, participants in the NSSI only, EP only and NSSI + EP combination group in the current study did not differ significantly from the comparison group, or from each other, on the items 'Try not to think about it', 'Say to myself it doesn't matter', 'Do something to keep busy' and 'Sleep'. Although the groups did not differ significantly on these items identifying avoidant type behaviour, this does not necessarily indicate that females in this study responding to NSSI, eating problems, or a combination of the two, did not engage in some forms of avoidant coping differently than the non-pathological comparison group. The acts of self-harm, restrictive eating and purging, in and of themselves, may be considered as avoidant forms of coping. As well, coping that involves altering one's state of consciousness with the use of drugs and alcohol could also be considered an extreme form of avoidant coping. In this context, the NSSI only, EP only and NSSI + EP groups reported significant levels of avoidant coping in the form of substance abuse, but not in the form of cognitive structuring.

Substance use has been associated with problematic eating and self-injurious behaviour in a number of studies. Baker, Mitchel, Neal and Kendler (2010) revealed that participants with AN and BN were more likely to have a drinking problem. A study by Root et al. (2010) found that while females with AN, BN and a combination of ANBN were at an increased risk of alcohol dependence/abuse, that females with a purge-type disorder (BN and ANBN) were more likely to abuse alcohol than females with AN. The results from the current study are consistent with the findings from these studies in that the EP only group reported "Drinking Alcohol" significantly more than the comparison group.

However with regard to drinking alcohol, the results are not consistent with Piran and Robinson's (2006) study. Piran and Robinson (2006) indicated that bingeing and dieting was not associated with alcohol use. The results are also inconsistent with findings of a study by Tuisku et al. (2009) who indentified that drinking alcohol was associated with self-harming behaviour. The current study did not find a significant difference between the NSSI only, the NSSI + EP and the comparison group for drinking alcohol. A possible explanation for this inconsistency is that the aforementioned studies differed significantly in their definitions of self-harm. Tuisku et al. (2009) included suicidal behaviour in their definition of self-harm, while the definition of NSSI in the current study explicitly omits suicidal behaviour by virtue of its title. With such discrepant definitions, it is difficult to compare the two studies.

In other research on substance use, Goldstein, Flett, Wekerle and Wall (2009) found a significant correlation between DSH and illicit drug use, while other studies have identified associations between illicit drug use and eating disorders in females (Root et al., 2009) and females at risk for eating disorders (Piran & Gadalla, 2006). Illicit drug use has been associated with BN in particular, but not necessarily with AN (Baker, Mitchel, Neale & Kendler, 2010). Results of the present study are somewhat consistent with the previous research. Participants in the current study indentified that the NSSI + EP group reported "Doing Drugs" significantly more than both the comparison group and the EP only group. It is difficult to draw parallels to previous research in this area since there are no previous studies that have focused on individuals who are both self-harming and have eating concerns with respect to illicit drug use. However, if the eating problems of the NSSI + EP group are more likely purge-type behaviours compared to the EP-only group, then research evidence associating BN to illicit drug use could explain the difference between the NSSI + EP group and the EP only group (Baker, Mitchel, Neale & Kendler, 2010).

The results of the current study are also inconsistent with previous research on the association between self-harm and drug use. The NSSI only group marginally reported doing drugs more than the comparison group. Also the EP only group had an identical mean (M=.13) to the comparison group, and thus reflected no differences in the relationship between eating problems and 'Doing Drugs' compared to the comparison group. It is possible that the inconsistency between the results of the current study and previous studies may be attributed to differences in the nature of the populations under study, i.e. between clinical and non-clinical populations. Participants in the EP only group in the current study are not known to be clinically diagnosed with an eating disorder and the type of eating problem (i.e. restrictive or purge-type) is not specified. Participants in the aforementioned previous studies used clinical populations in their research while the sample of participants in the current study was drawn from a university population. Individuals in a clinical setting are expected to exhibit symptoms of a higher level of severity than individuals in the community. Thus, it is possible that drug use may be associated with eating problems for individuals with more extreme symptoms.

Consistent with the findings of Riala, Hakko and Rasanan (2009), the current study found that the NSSI-only group reported smoking significantly more than the comparison group. There are inconsistencies in the findings of previous studies regarding an association between smoking and eating disorders. The current study did not find a significant difference between the EP only or the NSSI + EP group and the comparison group, which coordinates with the findings of Root et al. (2009), but not with those of Baker, Mitchel, Neale and Kendler (2010) or Piran and Robinson (2006). It is apparent that more research is needed in this area.

It is noteworthy that the NSSI only group reported significantly more smoking than the EP only group. This may be indicative of a self-destructive motivation for smoking, and also of a societal change reflecting that smoking is now considered an unattractive behaviour in today's media. For women with eating problems, there is an assumption that being attractive is of very high importance. If smoking is unattractive, than this group may avoid smoking as a coping strategy.

Statistical analysis from the exploratory analysis revealed that the EP only group reported 'Exercising' as a coping strategy significantly more than the comparison group and the NSSI only group. While exercise was originally characterized as an adaptive method of coping, it may be maladaptive for some individuals if it is engaged in to excess. According to Kerr, Lindner, and Blaydon (2007) individuals, and particularly females with eating disorders, often exercise to the point where it becomes harmful and/or part of a compulsive behaviour pattern. Exercise can be adaptive, however considering the population under study, it is possible that the EP only group is exercising in a maladaptive manner with strong appearance-related motivations as opposed to health reasons. The EP only group also reported 'Exercising' significantly more than the NSSI only group. The differences between these two groups are likely reflective of coping styles and motivational differences and between the two groups.

Shopping may also be an appearance related coping strategy, particularly for females challenged with eating problems. The current study found that women in both the EP only group and the NSSI + EP combination group reported shopping as a form of coping significantly more than the females in the NSSI only group. The commonality of eating problems of these two high endorsing groups suggests a commonality in motivations and possibly compulsion to buy. "Shopping' was classified as a neutral coping strategy, as in

itself, it does not have an intrinsic maladaptive or adaptive quality. However, similar to the item exercise, shopping in excess can be maladaptive leading to financial problems and feelings of guilt and shame. Trautmann-Attmann and Johnson (2009) found a positive relationship between compulsive clothing buying and disordered eating behaviour. Based on this research, it is possible that participants with eating problems in this study were reporting maladaptive shopping as opposed to a neutral coping strategy.

It is also noteworthy that the NSSI-only group endorsed shopping and exercise the least compared to all other groups. This appears to be indicative of motivational differences suggesting that individuals who engage in NSSI without eating problems are less likely to use coping strategies related to appearance. Further research on motivations and coping types however is necessary.

Implications for Counsellors

Knowledge of the differing coping styles among groups with NSSI and eating disorders can provide insight for practitioners regarding which coping strategies are likely to be employed. Awareness of differing coping trends and styles among groups with NSSI and eating issues can provide practitioners with understanding of coping strategies that are likely employed and how particular coping strategies can limit the therapeutic process. For example, knowing that females who simultaneously manage NSSI and eating problems are more likely to also use drugs and do risky things to cope with stress would be important in discussing client safety. In addition, knowledge of differing coping styles can provide awareness and insight into a client's motivations for behaviour. For example, motivation for attractiveness may influence the coping styles of females with eating problems in the form of excessive exercise or overspending. Females who engage in NSSI (by itself or in combination with EP) however may be more prone to behaviours that are more overtly self-

destructive in nature, such as smoking, taking drugs and being involved in risky endeavors. Also, awareness of endorsed maladaptive coping strategies can provide insight into an individual's level of distress and how they have learned to manage with their pain in the past. The understanding that coping strategies are learned is generally accepted in the clinical arena. Uncovering how an individual learned to rely on maladaptive strategies such as through drug taking or alcohol consumption can provide important information regarding a client's background, history of trauma, abuse, neglect and psychological distress.

Also, as NSSI and problematic eating behaviours are often employed as coping strategies in and of themselves, it is important to be aware of other coping strategies in an client's coping repertoire. Assuming that the extinction of self-harming and problem eating would be goals in therapy, it is important for practitioners to be aware of other maladaptive coping strategies could be exacerbated if the self-injurious and problematic eating behaviours were to be extinguished.

Implications for Social Policy

Further understanding and awareness of non-suicidal self-injury and eating problems is necessary in approaching these concerns in both therapeutic and social contexts. Self-injury is considered to be reprehensible and highly stigmatized in Western culture today. This is likely a result of a lack of public comprehension and extreme discomfort with the concerns related to self-injurious behaviour. As a socially stigmatized behaviour, NSSI is often accompanied by feelings of shame and guilt. With the stigma that is attached to mental illness in general, and NSSI in particular, it is understandable that self-injury is practiced and discussed mostly in private settings.

Similar to self-injury and other mental health concerns, eating problems such as restrictive eating, bingeing and purging are also stigmatized by the general public. This sense

of reproach can provide a significant barrier for individuals challenged by NSSI and eating problems to self-disclose and seek help. Public campaigns promoting the de-stigmatization of mental illness, specifically of NSSI and eating disorders, are important in raising social awareness and understanding. Health education programs in school systems are also important in providing knowledge and support in an open and respectful environment. Frank and open discussion of coping behaviours such as NSSI, bingeing, purging and restrictive eating can also include prevention efforts in educational settings. Raising awareness through social and educational programs has the potential to increase understanding and decrease stigmatization of non-suicidal self-injury and eating problems.

Recommendations for Future Research

Considering the modest amount of research in the area of NSSI and eating disorders, there are numerous avenues that future research can explore. Namely, future research endeavors could focus on developing greater understanding in regards to specific coping and behavioural concerns, and in particular, prospective studies could explore the different types of eating problems. As previous research has identified, behavioural differences between individuals with AN and BN, in the context of coping (Claes, Vandereycken & Vertommen, 2001; Lobera et al. (2009) may also be revealed if restrictive and purge-type behaviours are regarded separately. There may also be differences in coping styles between individuals who engage in comorbid NSSI and restrictive eating and those that engage in comorbid NSSI and purge-type eating problems. Differentiation between eating problems could increase understanding through an exploration of these differences.

Investigation of specific self-injurious behaviours may also reveal differences within the NSSI cohort. For example, individuals who cut themselves may be more likely to exhibit different coping trends compared to individuals who self injure through physically strike

themselves when frustrated. While all self-injurious behaviours are concerning, there are behaviours of varying severity and hazard potential within this group. More in-depth investigations of these behaviours could provide an improved understanding of the reality and experience of individuals who harm themselves.

Qualitative research is another prospective direction in the area of NSSI and eating problems. As a methodology, qualitative research can provide a more in-depth understanding and awareness of NSSI and eating behaviours. While the current quantitative study is limited to the items and Likert scales on the HIDS, the use of qualitative methods like semi-structured interviews can use open-ended questions on a variety of topics that are difficult to assess with quantitative research. This type of methodology could explore patterns of behaviour, motivations for behaviour, effectiveness and functions of particular coping strategies as well as specific methods of coping and the cognitions and emotions associated with a wider range of coping behaviours.

Future research could also investigate other coping behaviours that were not listed on the HIDS questionnaire. Reactions to stress such as insomnia, loss of appetite, intrusive thoughts, rumination, decreased libido, and negative self-talk are less action-oriented in nature than the coping behaviours described in the HIDS questionnaire The behaviours on the HIDS questionnaire such as doing drugs, exercising, listening to music and eating are generally associated with committing to an action. Individuals that are involved with negative self-talk and insomnia in times of stress are inclined to feel less control over these behaviours compared to shopping or drinking alcohol. There is a plethora of coping behaviours that are not included on the HIDS questionnaire as well. Future research could explore if other coping strategies like painting, drawing and sculpture, gambling, journaling, seeking sexual stimulation and a variety of others are associated with NSSI and eating

problems. Broadening the scope of the research could provide more information regarding how individuals who are managing with NSSI and eating problems (or both) and their response to stress.

Prospective studies with clinical populations could investigate trauma and abuse history as well as a function of the degree of distress that they experience. Self-injurious behaviour and eating problems have been associated with trauma and abuse in previous research (Weierich & Nock, 2008; Gratz & Chapman, 2007; Carter, Bewell, Blackmore & Woodside, 2006; Kong & Bernstein, 2009; Rodriguez, Perez & Garcia, 2005). Investigation of a possible relationship between highly impactful experiences such as trauma could shed light on why 'maladaptive' coping is employed over 'adaptive' coping strategies for certain individuals. By investigating the impact of stress level and personal histories, differences in maladaptive coping could be associated with differing levels of psychological distress and/or traumatic history in addition to behaviours such as NSSI and eating problems.

A final recommendation for future research is to include males in the sample in providing a broader perspective on coping for individuals who deal with self-injurious behaviour and problematic eating. Previous research has indicated that there are differences between males and females regarding emotion-focused coping (Green & Diaz, 2008; Watson & Sinha, 2008), aggression control, avoidance and social diversion (Watson & Sinha, 2008). Research including males could reveal differences in aggression and other gender-typic behaviours compared to females. In addition, future research could use sample populations from other demographic areas, varying age ranges, socio-economic status, level of education and cultural background in adding to a broader understanding of NSSI and eating disorders.

Limitations

One of the primary limitations of this study is that it relies on self-report to determine group assignment and assessment of coping behaviour. In relying on self-report, there is a possibility of group misrepresentation. If participants perceived the items "Physically hurt myself on purpose" or "Try to control my weight" differently than they were intended, then it is possible that some participants may have been grouped inappropriately. Ideally, a semi-structured interview would have been conducted to address the extent of heterogeneity of the group. As well, when relying on self-report of sensitive content, reluctance to admit to stigmatized behaviour is to be anticipated. If some participants in this study were reluctant to respond reliably on the HIDS questionnaire, then there is question as to the extent to which members within the groups were reliably represented.

A second limitation of this study is the method in which participants were allocated into groups. Classification of participants into the NSSI only and EP only groups was determined by responses on a single, non-specific item ('Physically hurt myself on purpose' or "Try to control my weight"), and classification of participants into the NSSI + EP and Comparison groups was determined by responses on two non-specific items (both 'Physically hurt myself on purpose" and "Try to control my weight"). The basis of assignment to groups as reflected on a single item is consistent with previous research in this area (Ross, Heath, & Toste, 2009). However, in using only one or two items to classify participants into behaviour specific groups, the internal consistency of participant's responses is, while unknown, likely lacking in reliability. Without internal consistency of these items, it is difficult to determine the degree to which allocated groups are homogenous. As well, the use of the non-specific items "Physically hurt myself on purpose" and "Try to control my weight" have the potential to be misinterpreted. While the wording was purposeful to

decrease the affective impact that these sensitive topics can initiate, these items may have been perceived differently than intended, thus leading to erroneous group assignment. The method of assigning participants specifically into the NSSI only and NSSI + EP categories is also a limitation. Participants were allocated into these groups if they responded "once", "few times", or "frequently" to the items "Physically hurt myself on purpose". This group may not be homogenous in the NSSI context, as individuals who hurt themselves frequently may have different coping trends than those who have engaged in NSSI only once.

A third limitation is that the sample is limited to a female undergraduate population. Thus, the results are restricted in their generalizability to variables within the designated sample; namely, they cannot be generalized to males or individuals of different ages, cultural backgrounds, education levels and socio-economic status. While this study focuses on an important demographic and arguably the most likely to be affected by self-injury and problematic eating, it is unknown how other demographics compare to female undergraduates with these concerns.

This study was also limited by the sample size. The total number of participants was 92. However, only 23 participants were included in each group as a result of limited secondary data. With more participants, the statistical power of this study could be substantially improved.

Summary

Despite the limitations of the current research, it is evident that females who reported NSSI and eating problems exhibited more maladaptive coping strategies than females in the comparison population, but did not differ from comparisons with regard to adaptive coping strategies. Thus, females managing NSSI and eating problems in this study report exhibiting similar adaptive coping behaviours to the comparison population, but they exhibit additional

maladaptive coping behaviours as well. Furthermore, these findings indicate that females in this study who manage NSSI and eating problems experience coping differently than comparison females. Clearly more research is necessary in this area to assess possible explanations for the differences in coping between these groups. Broadening the scope of knowledge and understanding in the area of NSSI and eating problems would not only be of epistemological benefit, but also assist in therapeutic interventions and community campaigns lobbying for the destigmatization of mental illness.

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Appendix A

How I Deal With Stress Questionnaire (HIDS)

HOW I DEAL WITH STRESS

Please begin by completing the following information:

Age: _____ **Sex:** ❑ Male **Faculty:** _____

❑ Female **Major:** _____

Sexual orientation: ❑ Heterosexual ❑ Gay/Lesbian ❑ Bisexual ❑ Questioning

What **languages** do you speak at home? ❑ English ❑ French ❑ Other (please specify): _____

Country of **permanent residence** ❑ Canada ❑ USA ❑ Other (please specify): _____

Country of **birth** ❑ Canada ❑ USA ❑ Other (please specify): _____

Young adults have to deal with a lot of stress. In a recent survey, young adults said they used the following list of strategies to help them deal with problems. We are interested in knowing if you have also used any of these strategies to help you deal with stress.

Please read each item and indicate whether you:

never used this strategy (0)
used this strategy **only once** (1)
used this strategy a **few times** to cope with stress (2)
frequently used this strategy to cope with stress (3)

➢ Please note that some items are printed in **bold**. If you answer that you have used a bolded strategy (once, a couple of times, or frequently), please fill out the follow-up questions at the end of the survey.

Coping strategies	*Never*	*Once*	*Few times*	*Frequently*
1. Try not to think about it	0	1	2	3
2. Spend time alone	0	1	2	3

3. Go out	0	1	2	3
4. **Talk to someone**	0	1	2	3
5. Try to solve the problem	0	1	2	3
6. Do something to keep myself busy	0	1	2	3
7. Say to myself it doesn't matter	0	1	2	3
8. Listen to music	0	1	2	3
9. Exercise	0	1	2	3
10. Play sports	0	1	2	3
11. Read	0	1	2	3
Coping strategies	*Never*	*Once*	*Few times*	*Frequently*
12. Go shopping	0	1	2	3
13. Eat	0	1	2	3
14. Stop eating	0	1	2	3
15. Drink alcohol	0	1	2	3
16. Hit someone	0	1	2	3
17. Get into an argument with someone	0	1	2	3
18. Do drugs	0	1	2	3
19. Smoke	0	1	2	3
20. **Do risky things**	0	1	2	3
21. **Physically hurt myself on purpose**	0	1	2	3
22. Cry	0	1	2	3
23. Sleep	0	1	2	3
24. Pray or engage in religious activities	0	1	2	3
25. Interactive online gaming (e.g., WoW)	0	1	2	3
26. Video games (e.g., PlayStation, Xbox)	0	1	2	3
27. Chat online (e.g., MSN)	0	1	2	3
28. General computer/internet use	0	1	2	3
29. Watch television	0	1	2	3
30. Other: _____	0	1	2	3

On a scale of 1 to 10, where 1 is no stress at all and 10 is the most stressed you have ever felt, **how stressed have you been over the past two weeks?** (circle one)

1 2 3 4 5 6 7 8 9 10

"Talk to someone"

Please fill out this section if you answered that you indicated that you have used this strategy.

Who do you talk to? (check all that apply)

q Parents q Other family members q Friends
q Romantic partner q Teachers q Other (specify):

_____

When you talked to someone to deal with stress, how did this make you feel? (check all that apply)

q Calm q Nervous q Ashamed
q Tense q Overwhelmed q Energetic
q Angry q Anxious q Confident
q Sad q Excited q Guilty
q Happy q Scared q Other (specify):

_____

"Do risky things"

Please fill out this section if you answered that you indicated that you have used this strategy.

What kind of risky activities have you engaged in? (check all that apply)

q Reckless driving q Uncontrolled drug abuse q Uncontrolled alcohol abuse
q Theft q Vandalism q Promiscuous/unprotected sex q Excessive gambling q Other (specify):

_____

When you engaged in risky activities, how did you feel? (check all that apply)

q Calm q Nervous q Ashamed
q Tense q Overwhelmed q Energetic
q Angry q Anxious q Confident
q Sad q Excited q Guilty
q Happy q Scared q Other (specify):

_____

"Physically hurt myself on purpose"

Please fill out this section if you answered that you indicated that you have used this strategy.

Please circle any way that you have intentionally hurt yourself <u>without suicidal intent</u>:

1. Cut your wrists, arms, or other areas of your body
2. Burned yourself
3. Scratched yourself, to the extent that scarring or bleeding occurred
4. Banged your head against something, to the extent that you caused a bruise to appear
5. Punched yourself, to the extent that you caused a bruise to appear
6. Other (please specify):

_____

What parts of your body have you hurt? (check all that apply)

q Arms	q Legs
q Stomach	q Thighs
q Chest	q Face
q Genitals	q Other (specify):

_____

When you hurt yourself on purpose without suicidal intent, how did you feel? (check all that apply)

q Calm	q Nervous	q Ashamed
q Tense	q Overwhelmed	q Energetic
q Angry	q Anxious	q Confident
q Sad	q Excited	q Guilty
q Happy	q Scared	q Other (specify):

_____

How old were you when you first hurt yourself on purpose? _____

When was the last time you hurt yourself on purpose? (circle one)

past week	past month	past six months
past year	within the past two years	more than two years ago

Has this ever resulted in hospitalization or injury severe enough to require medical treatment? ❑ Yes ❑ No

Have you ever hurt yourself with the intent to die/kill yourself?

❑ Yes ❑ No

How many times have you hurt yourself on purpose throughout your life? (circle one)

One time	2 to 4 times	5 to 10 times
11 to 50 times	51 to 100 times	More than 100 times