The relationship between adverse childhood experiences and suicide-related behaviours in Indigenous clients seeking substance use treatment

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Abstract

Indigenous populations in Canada are at higher risk of adverse childhood experiences (ACEs; e.g., abuse, neglect, or other household challenges before the age of 18) when compared to non-Indigenous populations. As the number of ACEs increase, so do rates of substance use and suicide risk. In non-Indigenous populations, the presence of prior suicide-related behaviours (SRBs) signals a need for higher intensity services within substance use treatment. This thesis sought to better understand the relationship between ACEs and SRBs specifically amongst Indigenous clients undergoing substance use treatment to better inform treatment planning. The first study of this thesis analyzes previously gathered data from a community-based participatory research program at an adult residential substance use treatment facility for Indigenous people, while the second study of this thesis analyzes new data from culturally-validated SRB measures incorporated into the same research program. In both studies, clients with longstanding mental health and addictions difficulties were invited to complete two surveys during the five week culturally informed treatment program. The first survey was administered at the beginning of the program and measured substance use and SRBs, while the second survey was administered at the midpoint of the program and measured ACEs. Results from these studies demonstrate high ACEs and high SRBs within these samples, with specific ACEs (e.g., sexual abuse; household mental illness) being associated with higher odds of SRBs in Study 1. In Study 2, we found that while most clients had experienced suicide ideation at some point in their lifetime, most clients were not actively experiencing suicide ideation while in treatment. These results point towards the use of interventions that integrate ACE models in culturally appropriate ways, as well as the importance of supporting further development and capacity within culturally- and strength-based programs that support mental wellbeing and life promotion.

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General Introduction

Indigenous[1] populations in Canada experience higher rates of negative mental health outcomes (e.g., mental illness hospitalizations, suicide) than non-Indigenous populations (Kumar & Tjepkema, 2019; Public Health Agency of Canada, 2018). These negative mental health outcomes have been associated with a variety of social determinants of health. For example, higher prevalence rates of lifetime disorders such as anxiety and substance abuse have been found in Indigenous populations with lower levels of income and education (Baxter et al., 2006). Kolahdooz and colleagues (2015) also reported an association between unemployment and greater risk of mental health challenges. These social determinants of health cannot be understood without first reviewing their foundation in colonialism and historical trauma (Kim, 2019; Lavallee & Poole, 2010; Nelson & Wilson, 2017; Public Health Agency of Canada, 2018). However, before diving into the roots and impacts of colonialism and historical trauma, we must first define and describe the populations that have been most impacted by these events.

While there is no single definition of *Indigenous Peoples* under international law and policy, the United Nations Human Rights Office of the High Commissioner (2013) note that peoples in independent countries are regarded as Indigenous if they have descended from those who inhabited that geographical region during conquest, colonization, or the establishment of present State boundaries, and who retain part or all of their own cultural, economic, political and social traditions. In Canada, the term *Indigenous Peoples* is used to refer to First Nations, Inuit,

[1] For the purposes of this thesis, the terminology used to describe Indigenous populations matches the terminology referenced in the literature cited. Various terms cannot be used interchangeably. For example, the term “Indigenous” in Canada represents distinct groups of people including First Nations, Inuit, and Métis populations.

and Métis peoples collectively, who make up a variety of culturally diverse societies (Younging, 2018). More than 1.67 million people (i.e., 4.9% of the total Canadian population) self-identified as Indigenous in the 2016 Canadian census, and between 2006 and 2016, the Indigenous population grew by 42.5%, making this population the fastest growing in Canada (Statistics Canada, 2019). This present-day growth of Indigenous populations in Canada is commendable considering the countless historical and present-day efforts that have been implemented to disenfranchise these groups. Next, relevant historical events will be outlined to highlight how the present state of Indigenous populations in Canada has been, and continues to be, impacted by Canada's colonial legacy. The events included here are the introduction of the acts upon which Canada was founded, the implementation of residential schools, the Sixties Scoop, and the Millennium Scoop.

A Brief History of Major Colonial Impositions Faced by Indigenous Peoples in Canada

Foundational Legislation

The Truth and Reconciliation Commission of Canada (2015) describes cultural genocide as a devastating process in which political and social institutions are destroyed, land is seized, languages are banned, spiritual practices are persecuted, and the transmission of cultural values and identity between generations is disrupted. For over a century, the Canadian government has enacted all these processes when interacting with Indigenous peoples (TRCC, 2015). When the *Constitution Act, 1867* was issued, exclusive jurisdiction over Indigenous peoples and

Indigenous lands was designated to the federal government; following this, the *Indian*[2] *Act, 1876* was developed to consolidate the federal government's regulations for Indigenous peoples (Joseph, 2018). The *Indian Act, 1876* was used to define (and limit) who could and could not be classified as a Status (i.e., registered) Indian. It constrained the lives of Indigenous peoples in many other ways, including (but not limited to): dismissing Indigenous forms of government and imposing European political structures instead, disempowering Indigenous women (who held significant influence in many communities) by taking away their status if they married a man without status, creating reserves (i.e., a tract of land set aside for the exclusive use of an Indigenous community) in an effort to contain and control Indigenous peoples within often unsuitable land areas while providing European settlers full access to life sustaining natural resources, and deeming cultural ceremonies (e.g., the potlach; the Sun Dance) as illegal (Joseph, 2018). While these practices deprived Indigenous Peoples of connection to a variety of cultural practices, it has been argued that one of the most aggressive and most destructive policies from the *Indian Act* was the creation of residential schools (Joseph, 2018; TRCC, 2015).

Residential Schools

The Truth and Reconciliation Commission of Canada's (TRCC) report titled *Honouring the Truth, Reconciling for the Future* summarizes the longstanding impacts of Canada's residential school system on Indigenous individuals, families, and communities (TRCC, 2015). Residential schools were developed not to educate Indigenous children, but to detach them from

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[2] This term is a misnomer that can be traced back to explorer traditions. It should not be used as a general descriptor of Indigenous identity (Younging, 2018). This term will remain in use as long as there is an *Indian Act* that exists (Joseph, 2018) as this is the term continued to be used within all Canadian legislation.

their culture and identities, and to assimilate them into Western Christian society (TRCC, 2015). In 1883, the first three residential schools for First Nations children were created, and in the following years the system rapidly increased, amounting to 139 residential schools across Canada (TRCC, 2015). It was not until 1996 when the last residential school was finally closed (TRCC, 2015). The federal government has estimated that at least 150,000 First Nations, Métis, and Inuit youth passed through the residential school system (TRCC, 2015). Within residential schools, Indigenous children faced harsh living conditions, including inadequate nutrition, overcrowding, and cold, poor-quality housing, which made it easy for respiratory illnesses such as tuberculosis to spread (TRCC, 2015). Siblings were separated from each other, and children were punished for using Indigenous languages (TRCC, 2015). Beyond these circumstances, children faced omnipresent neglect and high rates of physical, emotional, and sexual abuse (TRCC, 2015). High numbers of children died due to these conditions and were buried in school or mission cemeteries, typically in poorly or unmarked graves (TRCC, 2015). The TRCC (2015) estimated that approximately 3200 students died of malnourishment, tuberculosis, and other diseases caused by poor living conditions; however, it has been suggested that this number may be 5 to 10 times higher (Moran, 2015). It is difficult to determine the true number of children who died at residential schools because documentation of these deaths is often lacking, unretained, and/or made inaccessible by entities such as the Federal Government and the Catholic Church (Press Progress, 2021). Searches for the bodies of missing children who died at residential schools are still on-going, with evidence of more than 1,100 graves being found since Spring 2021 (BBC News, 2022) and more searches of for unmarked graves planned over the next several years (CBC News, 2023).

The "Sixties Scoop"

Beyond the *Indian Act, 1876* and residential schools, there have been additional events that have worked to facilitate the cultural genocide of Indigenous communities. The "Sixties Scoop" was not a specific program or policy but was instead a larger segment of time in which thousands of Indigenous children were taken from their birth families and placed in non-Indigenous settings (Sinclair, 2007). During the 1960s, there were notable increases in Indigenous child apprehensions by child welfare agencies and this commonly occurred without the knowledge or consent of family members (Johnston, 1983). Indigenous children were often apprehended because of allegations that Indigenous parents were "unfit", based on various perceptions of risk (e.g., poverty, unsanitary living conditions; Truth and Reconciliation Commission of Canada, 2015, p. 60). Indigenous children were also apprehended at disproportionately high rates, and roughly 70% of those children were placed into non-Indigenous environments (Sinclair, 2007). Fournier and Crey (1997) noted that by the 1970s, the number of Indigenous children displaced from their families by this process was approximately one in three. Children taken during the Sixties Scoop faced similar harms as those who experienced the residential school system, as they were forced to take part in settler colonial cultural practices while being cut off from Indigenous cultural practices (Johnston, 1983). Survivors of the Sixties Scoop have also described experiences of emotional, physical, sexual, and spiritual abuse, as well as neglect, in the environments in which they were placed (Bombay et al., 2020; Fournier & Crey, 1997; Johnston, 1983; Sinclair, 2007). Beyond these experiences, the struggle of embodying an Indigenous identity in a discriminatory society is intensified when one is separated from their family and community members with whom they share their culture (Sinclair, 2007).

The "Millennium Scoop"

The legacy of the Sixties Scoop continues in the current context, evolving into what is now known as the "Millennium Scoop", in which Indigenous youth are now being institutionalized via long term foster and/or institutional care, rather than via adoption (Blackstock, 2007; Sinclair, 2007). In 2016, Indigenous children made up 52% of children 14 years or younger in foster care in Canada, despite making up only 8% of that age group in the broader Canadian population (Turner, 2016). The rate of foster care placement for Indigenous children was found to be 13 times higher than that of non-Indigenous children in Canada (Turner, 2016). While neglect is the primary maltreatment concern in several child welfare investigations in Canada (Public Health Agency of Canada, 2010), Indigenous children were involved in more than a quarter of all neglect cases in 2008 (Trocmé et al., 2013), demonstrating an overrepresentation of Indigenous children in such cases (Caldwell & Sinha, 2020). As each province and territory manages their own child welfare legislation and varies in their definitions of neglect, ambiguity in these definitions can have drastic implications for child welfare practice; this is especially true when professional definitions differ from community definitions (Evans-Campbell, 2008). Caldwell and Sinha (2020) highlight that current child welfare legislation typically emphasizes neglect from the primary care givers while excluding consideration of context and other structural factors. Current legislation mandates intervention when a child is at risk of maltreatment, even if there are no allegations that maltreatment already occurred, and this focus on risk of neglect may be disadvantageous to Indigenous families (Caldwell & Sinha, 2020). For example, a section of child welfare legislation from Newfoundland and Labrador (Child and Youth Care and Protection Act, 2010, c-12.2, 10.1a) highlights that children are in need of protection when they are *at risk* of being harmed, either physically or emotionally, by

action or lack of appropriate action by their parent. In addition, the use of assessment tools to support decision making around child welfare may not acknowledge cultural aspects of child rearing (e.g., extended family involvement; (McKenzie et al., 2016) and may inadequately assess for various protective factors within Indigenous families (Logan-Greene & Semanchin Jones, 2018), leading to potentially inaccurate assessments of risk (Caldwell & Sinha, 2020). Finally, while structural conditions (e.g., social determinants of health such as poverty and unstable housing) may increase risk in neglect assessment, these are commonly attributed to the caregiver and the household (Caldwell & Sinha, 2020). Thus, decision making within the current child welfare system fails to acknowledge the role of structural factors resulting from colonial policies, and this continues to impact Indigenous youth in Canada today via family separation and broken community and cultural connections (Caldwell & Sinha, 2020).

Social Determinants of Health among Indigenous Peoples in Canada

Reading and Wien (2009) organize Indigenous-specific social determinants of health into three categories: proximal (e.g., health behaviours, physical environment, and social environment), intermediate (e.g., community infrastructure, resources, systems, and capacities), and distal (e.g., historic, political, social, and economic contexts). The colonial impositions discussed above (e.g., residential schools, the Sixties Scoop) are included as distal determinants, which are noted to have the most profound influence on health outcomes because they make up the contexts within which proximal and intermediate determinants occur (Reading & Wien, 2009). The effects of colonization are wide reaching, impacting areas such as environmental relationships, social policies, and political power (Reading & Wien, 2009). Following the introduction of the *Indian Act, 1876,* many Indigenous peoples experienced lifestyle disruptions rooted in dispossession and displacement from their traditional lands (Reading & Wien, 2009).

After the implementation of residential schools for assimilation purposes, many Indigenous peoples experienced devastating socio-cultural change, linked with disconnection from culture and identity (Reading & Wien, 2009). Racism and social exclusion are noted as additional distal determinants of health that impact Indigenous peoples, as colonial systems were [and remain] grounded in racist policies that lead to inequitable distribution of resources, power, freedom, and control (Reading & Wien, 2009). In turn, these led to inequitable distribution of education and income as well (Reading & Wien, 2009).

These distal determinants of health are related to other intermediate and proximate determinants of health which have profound impacts on Indigenous peoples in Canada today (Reading & Wien, 2009). A systematic review published in 2015 examined the current impacts of four major social determinants of health among Indigenous peoples in Alberta (i.e., income, education, employment, and housing; Kolahdooz et al., 2015). Indigenous peoples on average reported lower levels of mean household income, higher poverty rates, and higher rates of dependency on financial aid from governments when compared to non-Indigenous populations (Kolahdooz et al., 2015). Indigenous peoples were also found to have lower participation and employment rates, as well as higher unemployment rates, when compared to non-Indigenous people (Kolahdooz et al., 2015). When considering housing variables, Indigenous peoples were more likely to live in inappropriate housing conditions and to have a limited affordability for accommodations. As well, the proportion of Indigenous peoples who lived in residences that required major repairs (e.g., repairs to plumbing or broader structural repairs) was significantly higher than the proportion of non-Indigenous peoples. Similarly, Indigenous peoples were more likely to live in crowded dwellings than non-Indigenous peoples. Finally, for education variables, there was a large gap in educational achievement between Indigenous and non-Indigenous

peoples (Kolahdooz et al., 2015). Rates of educational attainment were also lower for Indigenous peoples than for non-Indigenous peoples (i.e., 24.2% vs. 26.6% for high school completion; 36.0% vs. 55.5% for some form of post-secondary education; and 6.2% vs. 21.7% for university degree completion).

Each of these variable types (i.e., income, employment, housing, and education) have various implications for health and well-being (Hicks et al., 2023; Kolahdooz et al., 2015). Lower income was related to various maternal determinants of health (e.g., access to healthy food) and biological determinants of health (e.g., birth outcomes), and employment variables are closely linked to a variety of health outcomes (e.g., chronic diseases, mental health challenges, unhealthy diets; Kolahdooz et al., 2015). As well, inappropriate housing and lower levels of education have both been linked with various health disparities and high mortality rates (Kolahdooz et al., 2015). A recent analysis of national, population-level data from First Nations individuals living off-reserve across Canada similarly found a positive association between mental well-being and factors such as perceptions of income security, housing satisfaction, higher education, and current employment (Hicks et al., 2023). Therefore, by being at higher risk for exposure to poorer social determinants of health, Indigenous peoples may also experience greater negative health and well-being outcomes.

An additional social determinant of health to consider that is directly related to colonization is intergenerational (or historical) trauma. Brave Heart and DeBruyn (1998) highlighted how the historical legacies discussed above have created intergenerational trauma for

Indigenous peoples[3], noting that when communities are being destroyed, the following generations suffer. Colonization, cultural genocide, systemic racism, and social exclusion are all directly related to intergenerational trauma, defined by O'Neill and colleagues (2016) as the result of transgenerational transmission of trauma. The core of this type of trauma can be thought of as a ripple effect of oppression (O'Neill et al., 2016) in which the systemic effects of individual traumas expand past the initial victim and have profound impacts on their significant others (e.g., spouses, children; Morrissette & Naden, 1998). The Final Report highlights several ways in which residential school survivors and intergenerational survivors (i.e., children, grandchildren, etc., of survivors) have been negatively impacted. For example, the report discusses how the intergenerational impacts of residential schools have left some families without strong role models for parenting and have led those who experienced and/or witnessed serious acts of violence to become accustomed to similar violence later in life. Hackett, Feeny, and Tompa (2016) also examined the relationship between residential school attendance in an older generation family member and physical and mental health outcomes in younger generation family members and found that familial residential school attendance is associated with lower self-perceived health and mental health, and higher risk for distress and suicidal behaviours. Relatedly, Bombay and colleagues (2011) found that when First Nations adults had a parent who attended a residential school, they reported higher levels of depressive symptoms, as well as higher levels of adult traumas, in comparison to First Nations adults whose parents did not attend

[3] While Brave Heart and De Bruyn (1998) used examples from the Lakota experience of historical trauma and made their conclusions specifically about American Indians in the United States, they also noted that Indigenous peoples around the world would have faced similar experiences due to similar historical colonial legacies.

a residential school. Using national, population-level data from the Aboriginal Peoples Survey (2017), family residential school attendance has also been found to be associated with increased substance use (Toombs et al., 2023). Lastly, there are numerous possible routes for how intergenerational trauma effects can be transmitted from generation to generation (e.g., via impairments in appraisal of stressful events, via negative coping styles, etc.; Bombay et al., 2009).

More broadly, Smallwood and colleagues (2021) conducted a scoping review to understand the impact of historical trauma on Indigenous young people across Canada, Australia, New Zealand, and the United States (i.e., the CANZUS nations, associated together due to exposure to similar experiences of colonization). The review identified four main areas that were affected by historical trauma: mental and physical health; emotional responses; risky behaviours; and relationship breakdowns (Smallwood et al., 2021). Mental health impacts included increased thoughts about historic loss, experiences of racism, mental health issues, anxiety and depression symptoms, and suicide risk, as well as decreased physical health and mental health service provision (Smallwood et al., 2021). In terms of emotional response impacts, youth who were victimized early on in childhood were severely at risk for negative outcomes such as poor self-rated health, drug abuse, and violent offending (Smallwood et al., 2021). Similarly, factors related to historical trauma were found to be the underlying cause for risky behaviours such as parental substance abuse and gambling, resulting in poor parenting skills, child neglect, and abuse (Smallwood et al., 2021). Historical traumas in which Indigenous children were separated from their families and left to experience various forms of neglect and abuse (e.g., at residential schools) resulted in difficulties later connecting with family, language, and culture, which led to further family dysfunction (e.g., lacking knowledge around parenting skills; Smallwood et al.,

2021). Relatedly, the TRCC (2015) Final Report noted that at present, governments within Canada spend billions of dollars responding to symptoms of intergenerational trauma via financing for crisis interventions related to child welfare, family violence, crime, and poor health. Rather than working "downstream" to formulate intervention approaches for the aftermath of childhood trauma, Portwood, Lawler, and Roberts (2021) have suggested that focusing on "upstream" approaches that prevent further childhood trauma from happening can be a promising way forward (e.g., early interventions targeting parenting styles, coalitions to raise awareness of early trauma prevention strategies, etc.; Milgram Mayer & Thursby, 2012). An existing framework for childhood trauma (i.e., adverse childhood experiences, or ACEs; Felitti et al., 1998) can also be used to cohesively conceptualize these experiences of many Indigenous peoples in Canada. The following section will review ACEs definitions, some history of the broader literature on ACEs and specific impacts of ACEs on Indigenous peoples in Canada.

Adverse Childhood Experiences

The original ACEs study was conducted by Felitti and colleagues (1998) to understand the long-term relationship between negative experiences in childhood and health risk behaviours and disease in adulthood. ACEs were defined as childhood abuse (i.e., emotional, physical, and sexual abuse), neglect (i.e., emotional and physical neglect), and household dysfunction (i.e., violence towards mother, household substance abuse, household mental illness, parental separation, or divorce, and having an incarcerated household member; Felitti et al., 1998). Adverse childhood experiences have since been expanded to capture peer rejection, peer victimization, community violence exposure, school performance, and socioeconomic status (Finkelhor et al., 2013) and the scale has been adapted to better fit various client populations (e.g., for children between the ages of birth and 12 years old, screening for experiences of foster

care, parent/guardian death, and separation due to deportation, among others; for youth between 13 to 19 years old, screening for experiences of youth intimate partner violence and youth incarceration, among others; Purewal et al., 2016).

Within the original ACEs study, Felitti and colleagues (1998) found that more than half of the respondents reported at least one ACE, while one quarter of participants reported two or more ACEs. When compared to individuals who had no ACEs, individuals who had at least four or more ACEs were more likely to endorse several risk factors that contribute to leading causes of morbidity and mortality. Specifically, individuals with at least four or more ACEs were 2.2 times more likely to be a current smoker, 4.6 times more likely to have experienced two or more weeks of depressed mood in the past year, 7.4 times more likely to consider themselves as having issues with alcohol use, 10.3 times more likely to have injected drugs, and 12.2 times more likely to have attempted suicide. Examining disease conditions that are among the leading causes of mortality, individuals with four or more ACEs were 1.9 times more likely to have had any type of cancer, 2.2 times more likely to report fair or poor self-rated health, 2.4 times more likely to have had a stroke, and 3.9 times more likely to have chronic bronchitis than individuals with no ACEs. Finally, there was a significant dose-response relationship between ACEs and several disease conditions (e.g., cancer, chronic bronchitis, hepatitis). This study was one of the first studies to demonstrate how various exposures to abuse, neglect, and household dysfunction during childhood relates to various risk factors for several leading causes of death (Felitti et al., 1998).

Since that study, several others have been conducted to examine the relationship between ACEs and health behaviours and/or outcomes, which have now been summarized in various systematic reviews. Results have mirrored those from Felitti and colleagues (1998). Hughes and

colleagues (2017) conducted a systematic review of 37 studies which included a total of 253 719 participants and found that individuals with four or more ACEs were at increased risk for all health outcomes examined. When compared to individuals with no ACEs, individuals with four or more ACEs were 2.24 times more likely to report poor self-rated health, 3.70 times more likely to report experiencing anxiety, 4.40 times more likely to report experiencing depression, 5.84 times more likely to report problematic alcohol use, 7.51 times more likely to report violence victimisation, 8.10 times more likely to report violence perpetration, 10.22 times more likely to report problematic drug use, and 30.14 times more likely to report a previous suicide attempt. Hughes and colleagues (2017) highlighted that the outcomes most strongly associated with multiple ACEs (e.g., violence, mental illness, and substance use) represent ACE risk for following generations. A review of systematic reviews on ACEs (Sahle et al., 2021) similarly found that exposure to at least one ACE in general, and to specific types of ACEs (e.g., child maltreatment, maladaptive parenting behaviours) were associated with two-fold increased risk for anxiety disorders, internalizing disorders, depression, and suicidality. Broad social and family-related factors (e.g., discrimination, inter-parental conflict, parental mental illness, parental incarceration, and exposure to violence) were also associated with increased risk for mental disorders (Sahle et al., 2021). An additional systematic review assessing the associations between ACEs and various health outcomes also found a graded response to the number of ACEs to which a child was exposed (Petruccelli et al., 2019). This review supported findings from existing literature and noted the importance of developing interventions to prevent ACEs, as well as intervening after identifying that an individual has been exposed to ACEs.

ACEs have been examined specifically within Indigenous populations. Radford and colleagues (2022) conducted a systematic review of twenty-one publications examining ACE

prevalence and general health outcomes within Indigenous populations internationally (i.e., Canada, United States, Australia, Greenland). When compared to non-Indigenous populations, ACEs were reported to be higher in Indigenous populations (Radford et al., 2022). Prevalence of ACEs in Indigenous groups was associated with a variety of broader mental health difficulties (e.g., conduct disorder, post-traumatic stress disorder, attention-deficit disorder, anxiety-related symptoms, depressive symptoms, and substance use) and physical health difficulties (e.g., self-reported physical health ratings, cigarette smoking, obesity, physical victimization, and assault). As was found in Felitti and colleagues (1998), a dose-response relationship among those who experience ACEs was also found within this population (Radford et al., 2022). Specific protective factors that were found to reduce the impact of ACEs on both physical and mental health outcomes included connection with spiritual activities and a sense of cultural identity, as well as attending school and achieving higher education (e.g., graduating college; Radford et al., 2022).

ACEs have also been assessed within specific subgroups of Indigenous populations. Toombs (2021) assessed the prevalence of ACEs exclusively within Canadian First Nations individuals seeking substance use treatment. Intergenerational ACEs (i.e., experienced by parents and grandparents) were also assessed, as documentation of these could inform existing prevention and treatment efforts (Toombs, 2021). The mean ACE score for participants in this sample was 5.22 (SD = 2.14), which was noted to be higher than previously calculated means for the general Canadian population (Toombs, 2021). While all ACEs that were assessed were endorsed by at least 12.3% or more of the participants, ACEs that had notably high endorsement included household substance use (87.7%), household member mental illness (75.4%), parental separation and divorce (75.4%), sexual abuse (58.8%) and emotional abuse (58.5%). That is,

more than half of the participants from a substance use treatment setting endorsed each of these ACEs, and possibly endorsed others as well. Within the same client population, mean ACE scores have also been found to be higher for those who reported a family member who had attended residential school (Toombs, Lund, Radford, et al., 2022). Overall, these results are indicative of greater experiences of adversity and greater impacts of intergenerational trauma for First Nations clients obtaining substance use treatment.

Suicide-Related Behaviours in Indigenous Populations

Specific subgroups of Indigenous populations in Canada (e.g., First Nations clients obtaining substance use treatment) and broader Indigenous populations in Canada have also been found to have high endorsement of suicide ideations and suicide attempts (e.g., Park, 2021; Toombs, 2021). As previous research from non-Indigenous populations has demonstrated that the presence of prior suicide-related behaviours (SRBs) signals a need for higher intensity services for individuals obtaining substance use treatment in non-Indigenous populations, SRB-related findings (i.e., prevalence rates and how these behaviours are related to various social determinants of health) within Indigenous populations will be reviewed next.

Disproportionately high rates of suicide have been found for Indigenous populations when compared to non-Indigenous populations (e.g., Kirmayer et al., 2007; Park, 2021; Pollock et al., 2016; Royal Commission on Aboriginal Peoples, 1995). Rates of suicide have been found to be 2 to 3 times higher for Indigenous populations than for non-Indigenous populations in Canada (Advisory Group on Suicide Prevention, 2003). Suicide rates for Indigenous youth have also been reported as 5 to 7 times higher than those of non-Indigenous youth in Canada (Government of Canada, 2018). However, regional variation does exist. For example, Inuit youth in Northern Quebec have been found to be 20 times more likely than non-Indigenous youth to

die by suicide (Kirmayer, 1994) in contrast to First Nations youth in British Columbia, who are 4.5 times more likely than non-Indigenous youth to die by suicide (Chandler & Lalonde, 1998). Varying practices across provinces and territories for tracking records of Indigenous suicides have also been noted (Ansloos, 2018), and this may mean that the currently available suicide rates are likely under-representative (The Standing Committee on Indigenous and Northern Affairs, 2017).

Beyond deaths by suicide, suicide-related behaviours, which include reports of suicide attempts (i.e., non-fatal, self-inflicted acts in which an individual has some intent to die and there is potential for injury) and reports of suicidal ideation (i.e., any self-reported thoughts about ending one's life; (Silverman et al., 2007) can also be examined. These behaviours differ from non-suicidal self-injury (NSSI), in which there is no suicidal intent. NSSI also differs from suicide-related behaviours in terms of lethality, course, function, and response to treatment (M. Nock, 2009). In contrast, suicidal ideations are precursors to both non-fatal and fatal suicide attempts (Malchy et al., 1997). Suicidal ideations have been found to be more prevalent among Indigenous populations than among non-Indigenous populations in Canada (Kumar, 2012). One study with just over 11,000 participants from First Nations communities across Canada found that almost one-quarter (22.0%) of the total sample reported having thoughts about suicide at some point in their lifetime (McQuaid et al., 2017). Within the same sample, 12.0% of participants reported a past suicide attempt (McQuaid et al., 2017). Similar percentages were obtained from a study with 2953 First Nations participants from 63 communities located in Manitoba, Canada; that is, 28.2% of the total sample reported having a lifetime history of having suicidal thoughts and 15.1% of the total sample reported having a lifetime history of suicide attempts (Elias et al., 2012). Lemstra and colleagues (2013) found that proportions differed based

on Indigenous identity and location, such that 23% of on-reserve First Nations youth reported experiencing suicide ideations in the past year compared to 8.5% of urban non-Indigenous youth and 19% of urban Indigenous youth (Lemstra et al., 2013).

Various studies have examined explanatory factors for these high rates of suicide-related behaviours, which map onto many of the social determinants of health discussed above. For example, Hajizadeh and colleagues (2019) assessed mental health outcomes and socioeconomic inequalities amongst Indigenous peoples living off-reserve in Canada and found that mental health outcomes such as psychological distress, suicidal ideation, and suicide attempts were disproportionately concentrated among Indigenous adults with lower incomes. Food insecurity, household income, and employment status were all contributors to the income-related inequalities in these suicide-related outcomes (Elias et al., 2012; Hajizadeh et al., 2019). Other studies have examined associations between residential school exposure and suicide-related outcomes. For example, Elias and colleagues (2012) investigated how direct and indirect exposures to Canada's residential school system impacted suicide-related behaviours. For residential school attendees, having a history of abuse was associated with having past suicidal ideations and attempts and for First Nations adults who did not attend residential school, having had a parent or grandparent who attended residential school was associated with past suicide ideations and attempts (Elias et al., 2012). McQuaid and colleagues (2017) expanded these findings by assessing the cumulative links between familial residential school attendance and lifetime suicide ideations and attempts among on-reserve First Nations adults. While exposure to one previous familial generation to the residential school system was associated with increased risk for lifetime suicide ideations and attempts, having two generations who had been exposed to the residential school system was associated with even greater odds for both suicide-related

behaviours (McQuaid et al., 2017). More recent research conducted in partnership with Grassy Narrows First Nation explored how youth suicide attempts have been impacted by intergenerational harm from mercury exposure across three generations, which has led to loss of culture, traditional food, and livelihoods (Mergler et al., 2023). In this study, the prevalence of suicide attempts for youth in this First Nation were three times that of other First Nations in Canada (Mergler et al., 2023). Together, these studies demonstrate how suicide-related behaviours are impacted by various social determinants of health (e.g., income, intergenerational harm), and how these determinants can create cumulative risk across generations.

There also appear to be differences when comparing prevalence of suicide ideation and suicide attempt between broader First Nations populations in Canada with a First Nations sample accessing substance use treatment. For broader First Nations populations, suicide ideation prevalence ranged from 22.0% to 28.2% (Elias et al., 2012; McQuaid et al., 2017), whereas for those seeking treatment, suicide ideation prevalence was 43.8% (Toombs, 2021). Similarly, 12.0% to 15.1% of broader First Nations populations have reported previous suicide attempts (Elias et al., 2012; McQuaid et al., 2017), whereas 27.7% of First Nations clients seeking substance use treatment reported previous suicide attempts (Toombs, 2021). Thus, these suicide-related behaviours appear notably higher within First Nations individuals actively receiving substance use treatment.

The Relationship between ACEs and SRBs in a First Nations Treatment Seeking Sample

While it is known that both ACEs and SRBs are higher for First Nations individuals actively receiving substance use treatment (Toombs, 2021), and it is known that ACEs are associated with higher problematic substance use and SRBs within Indigenous samples more broadly (Radford et al., 2022), the association between ACEs and SRBs within a First Nations

treatment seeking sample has not yet been examined. Documenting this link between ACEs and SRBs within this sample is therefore the first step towards implementing interventions that can counteract this association. For example, impulsivity has been found to be a mediator between ACEs and suicide attempts in a youth sample in the United States (Perez et al., 2016). Similarly, emotion regulation has been documented as a mediator between ACEs and negative mental health outcomes, such as depression (Cloitre et al., 2018) and poor emotion regulation is a significant predictor of suicide ideation and attempts (Colmenero-Navarrete et al., 2022). Executive functioning difficulties have also been found to be both outcomes of ACEs (Lund et al., 2022) and predictors of suicide attempts (Fernández-Sevillano et al., 2021). Thus, while the present thesis will not attempt to clarify the theoretical mechanisms between ACEs and SRBs within a First Nations treatment seeking sample, it will examine the association between these two variables of interest to set the foundation for further development of interventions within this specific sample.

This thesis examines the relationship between ACEs and SRBs within a First Nations treatment seeking sample specifically for several reasons. First, we hope the results of this research will be used guide the development of interventions such that First Nations individuals seeking treatment in the future will be able to better understand their life experiences in a way that is less stigmatizing and more neurodevelopmental (i.e., by understanding the impacts that ACEs can have on later behaviours and mental health outcomes). Second, this research was developed based on community priorities and driven by the specific needs of service providers at the treatment facility (discussed in further details below). Thus, this work will help to address community needs by providing findings that can inform intervention development and implementation. Finally, this research will also help to contribute to broader policy and funding

decisions, with the aim of providing research that demonstrates the importance of access to culturally-appropriate, trauma-informed, mental health programming.

The Present Studies

This thesis presents two studies examining ACEs and SRBs within two samples of First Nations individuals accessing substance use treatment. In the first study, novel analyses of previously collected data (Toombs, 2021) assess the relationship between ACEs and single-item questions regarding previous suicide attempts and suicide ideations. This study also examines how individual ACE items (e.g., physical abuse, emotional neglect) predict suicide attempts and suicide ideations. The second study builds on the first study by incorporating multi-item, culturally-validated questionnaires to better assess SRBs, which are then predicted again from ACE scores. It is essential to use SRB measures that have been previously validated for use within First Nations populations, as cultural experiences and expectations are known to impact assessment context (e.g., influences on performance, familiarity with testing situations, etc.) and assessment content (e.g., language, communication; Norbury & Sparks, 2013). Using measures that have not been validated within various cultural groups can lead to inaccurate variable measurement (i.e., over- or under-reporting of symptoms), which can further lead to differences in population prevalence rates (Mashford-Pringle et al., 2019; Mushquash & Bova, 2007). A summary of results (i.e., study context, psychometric properties, administration requirements) from a non-published systematic review on SRB measures that have been validated for use within First Nations populations can be found in Appendix A (Hicks et al., in prep).

These studies pull from separate samples in the *First Nations ACE Study*, which is ongoing and examines the relationship between ACEs and various health outcomes for Indigenous people seeking treatment for substance use (Lund, 2021; Radford, 2022; Toombs,

2021; Toombs et al., 2021; Toombs, Lund, Radford, et al., 2022). The *First Nations ACEs Study* is a multi-method community-based participatory research project. It is conducted in partnership with an Indigenous health service delivery organization, (located on Fort William First Nation, just outside of Thunder Bay, Ontario, Canada) and was designed to help adapt existing treatment approaches to better incorporate trauma-informed treatment within substance use programming (Toombs, 2021). During the development of *First Nations ACE Study*, all processes were guided by an Indigenous-led Research Advisory committee, comprised of community representatives from partnering organizations, staff from the Indigenous health organization leading the project, local leadership, and research team members, interested community members, youth, and Elders (Toombs, 2021). Stakeholder experiences within the *First Nations ACE Study* have been generally positive so far, with benefits including increased client understanding of relationships between substance use and trauma and the use of data to apply for future program funding (Toombs et al., 2021).

The development of the *First Nations ACE Study* has also been guided by the First Nations principles of Ownership, Control, Access, and Possession (OCAP™), which indicate how First Nations' data and information should be collected, protected, used, and/or shared (FNIGC, 2014). These principles were developed as a tool to support First Nations data sovereignty. Several aspects of the *First Nations ACE Study*, as well as novel research projects building upon the *First Nations ACE Study*, such as this thesis, are aligned with the OCAP™ principles. For example, the Ownership principle indicates that a community or group owns their information collectively. In line with this principle, Dilico Anishinabek Family Care owns the information that comes from this line of research. The Control principle indicates that First Nations and their communities have the right to control all aspects of the research processes that

impact them (e.g., control of resources, planning processes, managing information). Relatedly, Dilico has a Research Advisory, which is composed of individuals with understanding of the First Nations people serviced by Dilico throughout the Robinson-Superior Treaty Area as well as understanding of the mandates and policies within Dilico. Prior to conducting this study, and the *First Nations ACE Study*, the Research Advisory met with the research team to discuss and approve the processes involved in the studies. The Access principle indicates that First Nations and their communities have the right to access, as well as manage and make decisions relating to access, of their collective information. In line with this principle, consent from Dilico's Research Advisory is always sought before the data, statistical analyses, and interpretations from the *First Nations ACE Study* are presented for knowledge translation (e.g., in research publications; in conference presentations). Finally, the Possession principle indicates that First Nations and their communities have the right to have physical control of data (FNIGC, 2014). In line with this principle, study data are stored within a research laboratory in which physical access to the data files can be easily obtained.

Taken together, this thesis will build upon the broader ongoing *First Nations ACE Study* while working in line with OCAP™ principles by providing additional analysis of previously collected data and by adding novel culturally validated measures of SRBs. These studies will support our broader goal of comprehensively assessing the relationship between ACEs and SRBs for First Nations individuals seeking substance use treatment. Hypotheses for these studies are presented below.

Hypotheses

Study One.

1. Participants with higher ACE scores will have increased odds of endorsing a previous suicide attempt than participants with lower ACE scores.
2. Participants with higher ACE scores will have increased odds of endorsing previous suicide ideation than participants with lower ACE scores.

Study Two.

1. Participants with higher ACE scores will report higher severity SRB-related concerns (occurring within the *past two weeks*) than participants with lower ACE scores.
2. Participants with higher ACE scores will report higher severity SRB-related concerns (occurring within *their general lifetime*) than participants with lower ACE scores.

Study 1

Methods

Participants.

A clinical sample of 279 adults seeking residential treatment for substance use completed this study. Among this sample, 101 participants had complete responses for our variables of interest (i.e., ACEs and suicide-related questions). Responses for this study were obtained between January 2019 and March 2022. At the time of data collection, all participants were clients at the Adult Residential Treatment Centre (ARTC), which provides treatment using client-centred, strength-based approaches to wellness, as well as cultural components such as

sweat lodges and land-based activities. ARTC is located on Fort William First Nation and is operated by Dilico Anishinabek Family Care (Dilico), a local First Nations mental health community organization. Participants attended the four-to-five-week residential treatment program at ARTC for longstanding mental health and addictions problems. To meet criteria for the study, participants had to be 18+ years of age, be a current client at the ARTC, be fully capable of providing consent and participating in all study procedures, and be able to read, speak, and understand English. As not all clients who attend ARTC self-identify as Indigenous, participants with varying cultural backgrounds have been included in this study. Ethnicity and other relevant participant demographics are included in Table 1.

Table 1
Participant Demographic Information

		Participants (n = 101)
Mean Age (*SD*)		35.36 (9.74)
	Range:	20 – 65
Gender (%)	Women	42 (41.58%)
	Man	58 (57.43%)
	Non-binary	0 (0.00%)
Sex (%)	Female	43 (42.57%)
	Male	57 (56.44%)
Ethnicity (%)	Indigenous	73 (72.28%)
	Non-Indigenous	24 (23.76%)
Employment (%)	Full-time	16 (15.84%)
	Part-time	5 (4.95%)
	Student	6 (5.94%)
	Sick Leave	5 (4.95%)
	Unemployed	23 (22.77%)
	Retired	1 (0.99%)
	On Disability	38 (37.62%)
	Parenting	3 (2.97%)
Annual Income (%)	< $10,000	38 (37.62%)
	$10,001 to $19,999	28 (27.72%)
	$20,000 to $29,999	9 (8.91%)
	$30,000 to $39,999	6 (5.94%)
	$40,000 to $60,000	5 (4.95%)
	> $60,000	6 (5.94%)
Highest Level of Education (%)	Grade 8 or less	2 (1.98%)

	Some high school	32 (31.68%)
	High school graduate or GED	25 (24.75%)
	Some college, university, technical school	36 (35.64%)
	University degree (Bachelor)	4 (3.96%)
	Professional degree (Master's or PhD)	1 (0.99%)
Living Conditions Prior to Program (%)	Living alone/single with kids	23 (22.77%)
	With spouse/partner	26 (25.74%)
	With roommates/friends	5 (4.95%)
	With family	21 (20.79%)
	No permanent residence	15 (14.85%)
	Recovery/treatment centre	4 (3.96%)
	Incarcerated	1 (0.99%)
	Other	2 (1.98%)
Prior Residential School Attendance (%)		5 (4.95%)

* Note: some frequencies do not add up to 101 as some participants did not answer all demographic questions

Initial sample size estimations using Peduzzi and colleagues' (1996) recommendations for maximum likelihood estimation for logistic regression and an a priori analysis software (G*Power version 3.1; Faul et al., 2009) were completed. To detect a medium effect size (f^2 = 0.15) with a power of .80, an alpha value of .05, and three predictors (age, gender, and ACEs), 119 participants would be needed. However, as this current sample (N = 101) has been gathered from previous rounds of data collection at ARTC before our novel suicide-related measures were included (i.e., in April 2022), no additional participants will be collected for this sample.

Measures.

Adult Residential Treatment Centre (ARTC) Intake Measure.

The ARTC intake measure is used as a clinical tool to assess a variety of factors related to substance use and mental health. This measure will be used for this study to provide the suicide-related behaviours of interest. Specifically, this measure included one question asking,

"Have you ever had one of the following? (please check all that apply)" followed by "Suicidal thoughts" and "Attempted suicide", which each had binary response options (i.e., "Yes" and "No"). These two questions are the main outcomes for the analyses included below. This measure is presented in Appendix B.

Time 1 Health History Questionnaire (HHQ).

The Time 1 HHQ is included in a larger package of questionnaires used more broadly for additional goals of the *First Nations ACE Study* (which are outside the scope of the present research), is delivered during the first session with participants (i.e., Time 1), and is used to obtain various demographic information. Specific items reported in this study include age, sex, gender, Indigenous identity, employment, income, education level, and living conditions prior to attending the ARTC program (see Table 1 for a summary for this sample). This measure is presented in Appendix C.

Time 2 Health History Questionnaire (HHQ).

The Time 2 HHQ is included in another larger package of questionnaires also used more broadly for additional goals of the *First Nations ACE Study* (which are outside the scope of the present research), is delivered during the second session with participants (i.e., Time 2), and contains items related to ACEs (e.g., child abuse, neglect, and household dysfunction), among other items not relevant for the present study. The items relating to ACEs measure five types of child harm (physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect) and five types of household dysfunction (incarceration of a family member, household substance use, household mental illness, parental divorce, and mother experienced domestic violence.

Each ACE variable is scored according to methods used by the ACE Study as described by Dube and colleagues (2003). Items assessing physical abuse and emotional abuse are scored on a 5-point Likert scale, with 1 indicating the event never occurred and 5 indicating the event occurred very often. For items assessing sexual abuse, a "yes" response to either item indicates experience of sexual abuse. Items assessing emotional and physical neglect are also scored on a 5-point Likert scale, with 1 indicating the event never occurred and 5 indicating the event occurred very often. Scores of 15 or more on the emotional neglect items represent experiences of emotional neglect, and scores of 10 or more on the physical neglect items represent experiences of physical neglect. Each item from the physical and emotional neglect categories can be added to create an overall neglect composite score, which can provide an overall composite of severity of neglect that incorporates both physical and emotional aspects. For the items assessing incarceration of a family member, household substance use, household mental illness, and parental divorce, a "yes" response indicates the participant had that experience. For items assessing each respondent's mother's experiences of intimate partner violence, items were again assessed on a 5-point Likert scale with 1 indicating it was never experienced and 5 indicating it was experienced very often. A response of "Sometimes", "Often", or "Very Often" to the first two items of this category, or any response except "Never" for the third and fourth items of this category indicate whether the respondent's mother had experienced domestic abuse (Dube et al., 2003). Relevant questions from the HHQ are presented in Appendix D.

Procedure.

Recruitment.

Recruitment occurred at the ARTC across 26 treatment cycles between January 2019 and March 2022. Participants were recruited from nine treatment cycles in 2019, six treatment cycles in 2020, nine treatment cycles in 2021, and two treatment cycles in 2022. Recruitment for this sample was interrupted at various points. In March 2020, the ARTC was closed due to government health mandates at that time in response to the COVID-19 pandemic, and given REB and university research requirements, all in person research activities were suspended. In person research activities resumed in July 2020, but as the capacity for clients during treatment cycles were greatly reduced, participants recruited for this study were also reduced during this time.

During each recruitment session, the study was explained to ARTC clients both verbally and with an information letter (see Appendix E). Clients were informed that their decision to participate or not participate in the study (or to drop out of the study at a later date) would never impact their access to services or the quality of care they receive from ARTC staff. Clients were also informed that their data would remain confidential. If participants chose to take part in the study after receiving this information, they were given a consent form (see Appendix F) to sign.

Data Collection.

Initial data collection (i.e., Time 1) occurred immediately after participants provided informed consent. Participants completed Time 1 measures (i.e., the ARTC Intake Measure and the Time 1 HHQ) at this point either individually or with a staff member if support was required. Roughly two weeks later (i.e., Time 2), participants had the option to complete an additional

self-report questionnaire package containing the Time 2 HHQ questions regarding ACEs. Completion of this questionnaire was done either individually, or in the presence of the clients' counsellors if they wanted additional support. Given that the Time 2 questionnaire package included questions that were more sensitive in nature than the Time 1 questionnaire package, participants were reminded of their ability to decide whether they wanted to participate in the study again. As well, participants were reminded that they could withdraw from the study and/or request their data be removed from the study at any time point.

Data Management and Cleaning.

De-identification of data was completed to ensure participant confidentiality. Participant names were replaced with ID codes in de-identified datasets. All study records are being stored for a period of five years past the date of publication, and any physical documentation (e.g., signed consent forms and paper participant measures) is stored in a restricted, secure area in a locked filing cabinet for which only the researchers have access to the key. Following this time, records will be destroyed in accordance with current best-practice research principles.

Relevant variables were cleaned (e.g., qualitative data transposed to numerical values; reverse-coding) if needed to complete relevant statistical analysis. Data were also assessed for common assumptions needed for logistic regression (i.e., linearity, independence of errors, and multicollinearity; Field et al., 2012). The linearity assumption in logistic regression is that there is a linear relationship between any continuous predictors (i.e., age, ACEs) and the log of itself (Field et al., 2012). This assumption was tested by looking at whether the interaction term between each predictor and the log of itself was significant when included in the logistic regression models discussed below. Since the two interaction variables for each continuous predictor (i.e., age and ACEs) had significance values of greater than .05, the assumption of

linearity of the logit was met (i.e., the continuous predictor variables are linearly related to the log of themselves). The independence of errors assumption indicates that for any two observations, the residual terms should be uncorrelated. This assumption was tested using the Durbin-Watson statistic, and all logistic regression models discussed below were not significant, indicating the independence of errors assumption was met. Finally, multicollinearity was assessed by examining for predictors that might be too highly correlated. Variance inflation factor (VIF) values (i.e., a metric of multicollinearity) were calculated for each model presented below, and all VIF values were less than 10, indicating multicollinearity was not an issue.

Results

Descriptive Information: Prevalence of ACEs and Suicide-Related Behaviours

Participant ACE scores were calculated using Dube et al.'s (2003) method of quantifying ACEs using the ACE Family Health questionnaire (WHO, 2018). The mean ACE score of participants was 4.83 (*SD* = 2.67) and the median score was 4. Ninety-eight (97.03%) participants reported experiencing at least 1 ACE, while 91 (90.10%) participants reported experiencing 2 or more ACEs. Twenty-nine (28.71%) individuals in this sample endorsed having a previous suicide attempt, while 72 (71.29%) did not. Fifty-four (53.47%) individuals in this sample endorsed having suicidal thoughts, while 47 (46.53%) did not. Mean ACE scores and frequencies for each of the SRB measures broken down by sex and age are presented in Table 2. The frequencies of each ACE subtype endorsed by participants in each of these categories (i.e., previous suicide attempts; no previous suicide attempts; previous suicidal thoughts; no previous suicidal thoughts) and in the overall sample are reported in Table 3.

Table 2

ACE and SRB Descriptives by Sex and Age

	Mean ACEs (SD)	No suicide attempt	Previous suicide attempt	No suicide ideations	Suicide ideations
Female	4.98 (2.65)	29 (67.44%)	14 (32.56%)	20 (46.51%)	23 (53.49%)
Male	4.68 (2.71)	42 (73.68%)	15 (26.32%)	26 (45.61%)	31 (54.39%)
20 – 29 yrs	4.33 (2.58)	18 (66.67%)	9 (33.33%)	14 (46.67%)	16 (53.33%)
30 – 44 yrs	4.92 (2.71)	34 (66.67%)	17 (33.33%)	24 (47.06%)	27 (52.94%)
45+ yrs	5.04 (2.77)	16 (88.89%)	2 (11.11%)	7 (38.89%)	11 (61.11%)

Table 3

Frequency of Individual ACE Endorsement by Participant Category

	Overall Sample	No suicide attempt	Previous suicide attempt	No suicide ideations	Suicide ideations
	N = 101	N = 72	N = 29	N = 47	N = 54
		71.29%	28.71%	46.53%	53.47%
Mean ACEs Score (SD)	4.83 (2.67)	4.18 (2.56%)	6.45 (2.26%)	4.06 (2.40%)	5.50 (2.74%)
Physical Abuse	52 (51.48%)	31 (43.06%)	21 (72.41%)	20 (43.55%)	32 (59.26%)
Emotional Abuse	33 (32.67%)	19 (26.39%)	14 (48.28%)	12 (27.66%)	20 (37.04%)
Sexual Abuse	49 (48.51%)	27 (37.50%)	22 (75.86%)	15 (31.91%)	34 (62.96%)
Physical Neglect	45 (44.55%)	26 (36.11%)	19 (65.52%)	13 (27.66%)	32 (59.26%)
Emotional Neglect	28 (27.72%)	16 (22.22%)	12 (41.38%)	8 (17.02%)	20 (37.04%)
Household Substance Use	63 (62.37%)	43 (59.72%)	20 (68.87%)	31 (65.96%)	32 (59.26%)
Parental Separation or Divorce	74 (73.27%)	49 (68.06%)	25 (86.21%)	37 (78.72%)	37 (68.51%)
Intimate Partner Violence	43 (42.57%)	27 (37.50%)	16 (55.17%)	16 (34.04%)	27 (50.00%)
Household Member Incarceration	34 (33.66%)	22 (30.56%)	12 (41.38%)	13 (27.67%)	21 (38.89%)
Household Member Mental Illness	67 (66.34%)	41 (56.94%)	26 (89.65%)	25 (53.19%)	42 (77.78%)

Independent t-tests were conducted to examine for significant differences in ACE total scores between individuals with varying suicide-related behaviours. On average, participants who endorsed a previous suicide attempt reported higher ACEs (M = 6.45, SD = 2.26) than participants who did not endorse a previous suicide attempt (M = 4.18, SD = 2.56), and this difference was significant $t(58.21) = -4.39$, $p < .001$. Similarly, on average, participants who endorsed having previous suicide ideations reported higher ACEs (M = 5.50, SD = 2.74) than participants who did not endorse having previous suicide ideations (M = 4.06, SD = 2.40), and this difference was significant $t(98.99) = -2.81$, $p = .006$.

Primary Analyses: Predicting Suicide-Related Behaviours from Total ACEs and ACE Cut-Off Values

A logistic regression assessed the hypothesis that higher ACE scores will be associated with increased odds of reporting a suicide attempt. In the first step of this model, age was included as a predictor, as a higher number of suicide attempts occur for every death by suicide in younger adults and a lower number of suicide attempts occur for every death by suicide in older adults (Rossom et al., 2017). Sex was also included as a predictor, as females demonstrate disproportionately higher rates of suicide attempts compared to males, while males are more likely to demonstrate more serious (i.e., more intent to die) suicide attempts (Freeman et al., 2017). In the second step, a continuous ACE variable (i.e., total ACEs) was included in addition to age and sex, while in the third step, a categorical ACE variable (i.e., 7 or more ACEs vs. 6 or less ACEs) was included in addition to age and sex. The first step (i.e., age and sex as predictors) was not better than chance at predicting suicide attempts, $\chi^2(2) = 2.83$, $p = .243$, $R^2 = 0.02$, $AIC = 122.91$. The second step (i.e., age, sex, and the continuous ACE variable as predictors) of the

model became significant in comparison to the first step, $\chi^2(1) = 18.85$, $p < .001$, $R^2 = 0.18$, *AIC* = 106.06, and demonstrated that the odds of someone endorsing a suicide attempt are 1.5 times higher for each additional ACE that they endorse (*OR* = 1.52, 95% CI = 1.24–1.91). The third step (i.e., age, sex, and the categorical ACE variable as predictors) of the model also became significant in comparison to the first step, $\chi^2(1) = 13.11$, $p < .001$, $R^2 = 0.13$, *AIC* = 111.80, and demonstrated that an ACE score of 7 or more was associated with a 6-fold increase in risk of suicide attempt in comparison to an ACE score of 6 or fewer. Full results for these regressions are found in Table 4.

As the number of participants who endorsed having a previous suicide attempt was 29, and as (Babyak, 2004) recommends having at least 10 to 15 events per explanatory variable (while more recent recommendations are to have at least 20 events per explanatory variable; Riley et al., 2020), these regression models may have been at slight risk of being overfitted (i.e., capitalizing on the idiosyncratic characteristics of this sample). As such, Benjamini-Hochberg (BH) p-value adjustments were applied to control false discovery rates in these models (Mangiafico, 2015). All significance values in these models remained significant even after applying the BH adjustments.

Table 4

Logistic Regression Predicting Reports of Suicide Attempts

		B (SE)	95% CI for Odds Ratio		
Step			Lower	Odds Ratio	Upper
1	Intercept	0.54 (0.89)	0.31	1.72	10.36
	Age	-0.04 (0.03)	0.91	0.96	1.01
	Sex	-0.20 (0.45)	0.34	0.82	1.99
2	Intercept	-0.85 (1.04)	0.05	0.42	3.33
	Age	-0.06 (0.03) *	0.88	0.94	0.99
	Sex	-0.11 (0.50)	0.33	0.90	2.42
	Total ACEs	0.41 (0.11) ***	1.24	1.52	1.91
3	Intercept	0.63 (0.98)	0.29	1.89	13.53

Age	-0.06 (0.03) *	0.88	0.94	0.99
Sex	-0.17 (0.49)	0.32	0.84	2.20
7+ ACEs	1.78 (0.51) ***	2.22	5.91	17.07

Note: * $p = .05$, *** $p = .001$

A logistic regression assessed the hypothesis that higher ACE scores will be associated with increased odds of reporting a suicide ideation. In the first step of this model, age was included as a predictor again, as rates of suicidal ideation are known to be higher among younger adults than older adults (Rossom et al., 2017). Sex was also included as a predictor again, as rates of suicide ideation are known to be higher for females than for males (M. K. Nock et al., 2008). In the second step, a continuous ACE variable (i.e., total ACEs) was included in addition to age and sex, while in the third step, a categorical ACE variable (i.e., 7 or more ACEs vs. 6 or less ACEs) was included in addition to age and sex. The first step (i.e., age and sex as predictors) was not better than chance at predicting reports of past suicide attempts, $\chi^2(2) = 0.47$, $p = .791$, $R^2 < 0.01$, $AIC = 141.96$. The second step (i.e., age, sex, and the continuous ACE variable as predictors) of the model became significant in comparison to the first model, $\chi^2(1) = 8.30$, $p = .003$, $R^2 = 0.06$, $AIC = 135.65$, and demonstrated that the odds of someone endorsing having suicide ideation are 1.26 times higher for each additional ACE that they endorse ($OR = 1.26$, 95% CI = 1.07–1.49). The third step (i.e., age, sex, and the categorical ACE variable as predictors) of the model became significant in comparison to the first step, $\chi^2(1) = 5.19$, $p = .023$, $R^2 = 0.04$, $AIC = 138.76$, and demonstrated that an ACE score of 7 or more was associated with a 2.75-fold increase in risk of suicide ideation in comparison to an ACE score of 6 or fewer. Full results for these regressions are found in Table 5.

As the number of participants who endorsed having a previous suicide attempt was 47, and as Babyak (2004) recommends having at least 10 to 15 events per explanatory variable (while more recent recommendations are to have at least 20 events per explanatory variable;

Riley et al., 2020), these regression models may have been at slight risk of being overfitted. As such, Benjamini-Hochberg (BH) p-value adjustments were applied to control false discovery rates in these models (Mangiafico, 2015). All significance values in these models remained significant even after applying the BH adjustments; however, the significance value for Total ACEs did increase slightly (p = .006 to p = .017) and the significance value for 7+ ACEs increased so much so that it was no longer significant (p = .026 to p = .079).

Table 5

Logistic Regression Predicting Suicide Ideation

		B (SE)	95% CI for Odds Ratio		
Step			Lower	Odds Ratio	Upper
1	Intercept	-0.33 (0.78)	0.14	0.72	3.31
	Age	0.01 (0.02)	0.97	1.01	1.06
	Sex	0.04 (0.41)	0.47	1.04	2.34
2	Intercept	-1.32 (0.89)	0.04	0.27	1.48
	Age	0.01 (0.02)	0.97	1.01	1.05
	Sex	0.13 (0.43)	0.49	1.14	2.66
	Total ACEs	0.23 (0.08) *	1.07	1.26	1.49
3	Intercept	-0.44 (0.80)	0.13	0.64	3.07
	Age	0.01 (0.02)	0.96	1.01	1.05
	Sex	0.07 (0.42)	0.47	1.08	2.47
	7+ ACEs	1.01 (0.45)	1.15	2.75	6.94

Note: * $p < .05$

Exploratory Analyses: Predicting Suicide-Related Behaviours from Individual ACEs

Finally, exploratory logistic regressions were used to obtain odds ratios for suicide-related behaviours from each individual ACE. Each model included the two control variables (i.e., age and sex) and one of the 10 ACEs (i.e., physical abuse, emotional abuse, sexual abuse, physical neglect, emotional neglect, household mental health issues, household substance abuse, household incarceration, parental separation and/or divorce, and household intimate partner

violence), resulting in 10 models predicting reports of suicide attempts and 10 models predicting reports of suicide ideation. As discussed above, Benjamini-Hochberg (BH) p-value adjustments have been applied to control false discovery rates in these models (Mangiafico, 2015). Logistic regression models predicting reports of suicide attempts from individual ACEs as well as the two control variables are presented in Table 6, while logistic regression models predicting reports of suicide ideation from individual ACEs and the two control variables are presented in Table 7. Odds ratios and confidence intervals predicting reports of suicide attempts and reports of suicide ideation from individual ACEs are shown in Figures 1 and 2, respectively.

Table 6

Logistic Regressions Predicting Reports of Suicide Attempts from Individual ACEs

	B	*SE*	Z	*P*	Odds Ratio	CI (95%)	
						Lower	Upper
Age	-0.08	0.03	0.95	.017*	0.92	0.86	0.98
Sex	-0.27	0.50	-0.53	.593	0.77	0.29	2.05
Physical Abuse	1.20	0.32	3.75	.001***	3.33	1.84	6.53
Model Statistics	$\chi^2(3) = 19.85$, $p < .001$, $R^2 = 0.17$, $AIC = 107.89$						
Age	-0.06	0.93	0.74	.069	0.95	0.89	1.00
Sex	-0.13	0.47	-0.28	.777	0.86	0.35	2.23
Emotional Abuse	0.72	0.28	2.53	.034*	2.05	1.19	3.64
Model Statistics	$\chi^2(3) = 9.42$, $p = .024$, $R^2 = 0.08$, $AIC = 118.32$						
Age	-0.05	0.03	-1.76	.118	0.95	0.90	1.00
Sex	0.36	0.52	0.70	.481	1.44	0.53	4.09
Sexual Abuse	1.84	0.54	3.40	.002 **	6.32	2.30	19.62
Model Statistics	$\chi^2(3) = 16.27$, $p < .001$, $R^2 = 0.14$, $AIC = 111.47$						
Age	-0.04	0.03	-1.43	.231	0.96	0.91	1.01
Sex	-0.26	0.46	-0.57	.568	0.77	0.31	1.92
Physical Neglect	0.10	0.05	2.05	.120	1.11	1.01	1.23
Model Statistics	$\chi^2(3) = 7.20$, $p = .065$, $R^2 = 0.06$, $AIC = 120.54$						
Age	-0.05	0.03	-1.88	.091	0.95	0.89	1.00
Sex	-0.29	0.47	-0.62	.535	0.75	0.29	1.89
Emotional Neglect	0.14	0.05	2.69	.021*	1.15	1.04	1.28
Model Statistics	$\chi^2(3) = 10.81$, $p = .013$, $R^2 = 0.09$, $AIC = 116.93$						
Age	-0.04	0.03	-1.43	.456	0.96	0.92	1.01
Sex	-0.18	0.45	-0.40	.686	0.83	0.34	2.04
Household Substance Use	0.29	0.48	0.61	.686	1.34	0.53	3.53
Model Statistics	$\chi^2(3) = 3.20$, $p = .361$, $R^2 = 0.03$, $AIC = 124.54$						
Age	-0.04	0.03	-1.42	.234	0.96	0.91	1.01
Sex	-0.20	0.46	-0.44	.663	0.82	0.33	2.03
Household Separation/Divorce	1.09	0.60	1.80	.216	2.96	0.99	11.07
Model Statistics	$\chi^2(3) = 6.56$, $p = .087$, $R^2 = 0.06$, $AIC = 121.18$						
Age	-0.05	0.03	-1.83	.101	0.95	0.90	1.00
Sex	0.04	0.48	0.09	.929	1.04	0.41	2.71
IPV	0.39	0.17	2.22	.079	1.47	1.05	2.10
Model Statistics	$\chi^2(3) = 7.89$, $p = .048$, $R^2 = 0.07$, $AIC = 119.85$						
Age	-0.04	0.03	-1.53	.381	0.96	0.91	1.01
Sex	-0.18	0.45	-0.41	.684	0.83	0.34	2.03
Household Incarceration	0.50	0.47	1.07	.426	1.65	0.66	4.11
Model Statistics	$\chi^2(3) = 3.97$, $p = .264$, $R^2 = 0.03$, $AIC = 123.77$						
Age	-0.05	0.03	-1.76	.117	0.95	0.89	1.00

Sex	-0.20	0.52	-0.38	.708	0.82	0.29	2.31
Household Mental Health	1.63	0.38	4.30	.001***	5.10	2.56	11.46
Model Statistics	$\chi^2(3) = 28.41$, $p < .001$, $R^2 = 0.24$, $AIC = 99.33$						

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

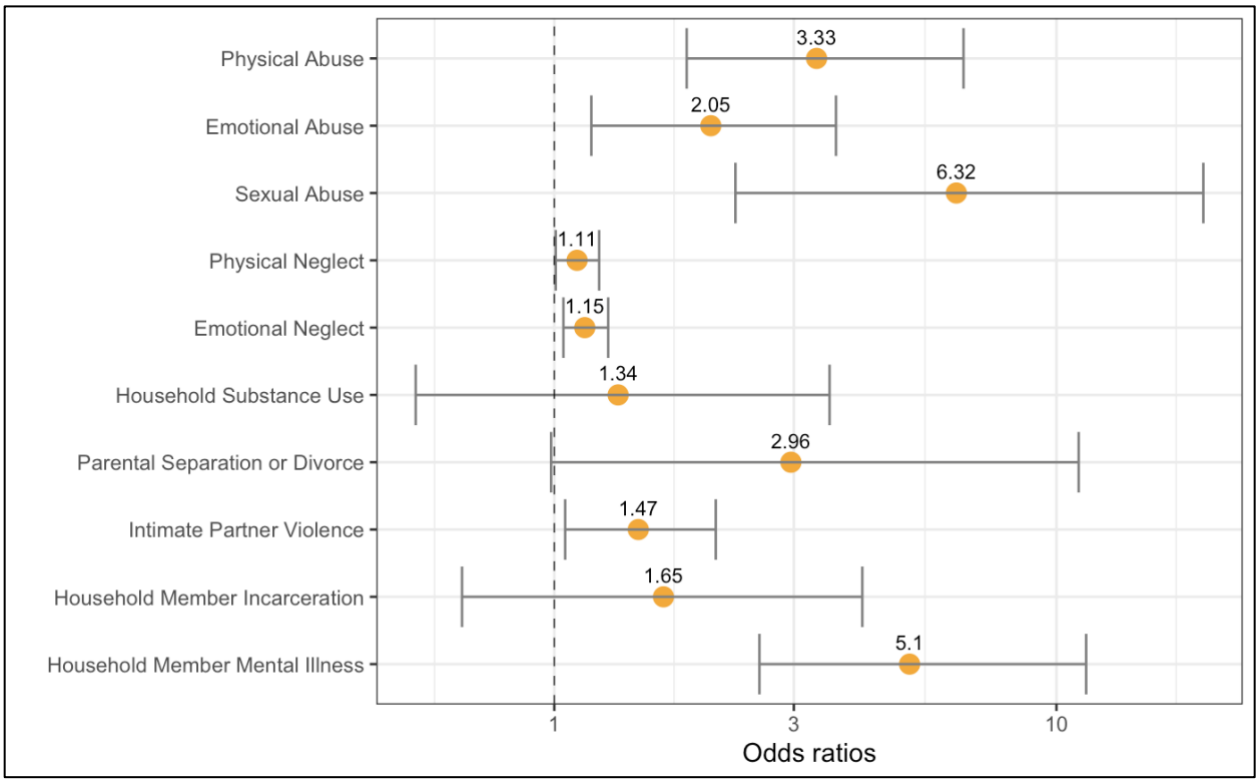

Figure 1. Odds Ratios Predicting Reports of Suicide Attempts. This figure demonstrates the odds ratios of reports of suicide attempts from individual ACEs; household member mental illness was significant at the $p < .001$ level, physical abuse and sexual abuse were significant at the $p < .01$ level, and emotional abuse and emotional neglect were significant at the $p < .05$ level.

Table 7

Logistic Regressions Predicting Suicide Ideation from Individual ACEs

	B	*SE*	Z	*P*	Odds Ratio	CI (95%)	
						Lower	Upper
Age	0.01	0.02	0.20	.944	1.00	0.96	1.05
Sex	0.03	0.42	0.07	.944	1.03	0.45	2.33
Physical Abuse	0.42	0.25	1.69	.275	1.52	0.94	2.50
Model Statistics	$\chi^2(3) = 3.39$, $p = .336$, R^2 0.03, $AIC = 141.04$						
Age	0.01	0.02	0.46	.879	1.01	0.97	1.05
Sex	0.06	0.41	0.15	.879	1.06	0.47	2.40
Emotional Abuse	0.24	0.26	0.94	.879	1.28	0.77	2.16
Model Statistics	$\chi^2(3) = 1.36$, $p = .715$, $R^2 = 0.01$, $AIC = 143.07$						
Age	0.01	0.02	0.54	.587	1.01	0.97	1.56
Sex	0.54	0.47	1.15	.251	1.72	0.70	4.48
Sexual Abuse	1.51	0.47	3.23	.001**	4.53	1.87	11.81
Model Statistics	$\chi^2(3) = 11.99$, $p = .007$, $R^2 < 0.17$, $AIC = 132.44$						
Age	0.02	0.02	0.82	.954	1.02	0.98	1.06
Sex	-0.02	0.43	-0.06	.617	0.96	0.42	2.27
Physical Neglect	0.15	0.05	2.75	.018*	1.16	1.05	1.30
Model Statistics	$\chi^2(3) = 9.31$, $p = .025$, $R^2 = 0.07$, $AIC = 135.11$						
Age	0.01	0.02	0.34	.975	1.01	0.96	1.05
Sex	0.01	0.44	0.03	.975	1.01	0.43	2.39
Emotional Neglect	0.16	0.05	3.25	.003**	1.17	1.07	1.30
Model Statistics	$\chi^2(3) = 12.63$, $p = .006$, $R^2 = 0.09$, $AIC = 131.80$						
Age	0.01	0.02	0.57	.852	1.01	0.97	1.06
Sex	0.02	0.41	0.06	.954	1.02	0.45	2.30
Household Substance Use	-0.29	0.43	-0.67	.852	0.75	0.32	1.73
Model Statistics	$\chi^2(3) = 0.92$, $p = .821$, $R^2 = 0.01$, $AIC = 143.50$						
Age	0.01	0.02	0.56	.862	1.01	0.97	1.06
Sex	0.04	0.41	0.09	.929	1.04	0.46	2.33
Household Separation/Divorce	-0.45	0.47	-0.96	.862	0.64	0.25	1.57
Model Statistics	$\chi^2(3) = 1.41$, $p = 703$, $R^2 = 0.01$, $AIC = 143.01$						
Age	0.01	0.02	0.49	.675	1.01	0.97	1.05
Sex	0.18	0.42	0.42	.675	1.20	0.52	2.78
IPV	0.22	0.16	1.37	.628	1.25	0.91	1.74
Model Statistics	$\chi^2(3) = 2.40$, $p = .492$, $R^2 = 0.02$, $AIC = 142.02$						
Age	0.01	0.02	0.67	.758	1.01	0.97	1.06
Sex	0.08	0.42	0.20	.844	1.08	0.48	2.46
Household Incarceration	0.57	0.44	1.30	.579	1.77	0.76	4.29
Model Statistics	$\chi^2(3) = 2.20$, $p = .533$, $R^2 = 0.02$, $AIC = 142.23$						
Age	0.02	0.02	0.76	.667	1.02	0.97	1.07

Sex	0.09	0.45	0.20	.843	1.09	0.45	2.66
Household Mental Health	1.09	0.29	3.81	.001***	2.98	1.74	5.39
Model Statistics	$\chi^2(3) = 17.24$, $p < .001$, $R^2 = 0.13$, $AIC = 127.19$						

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

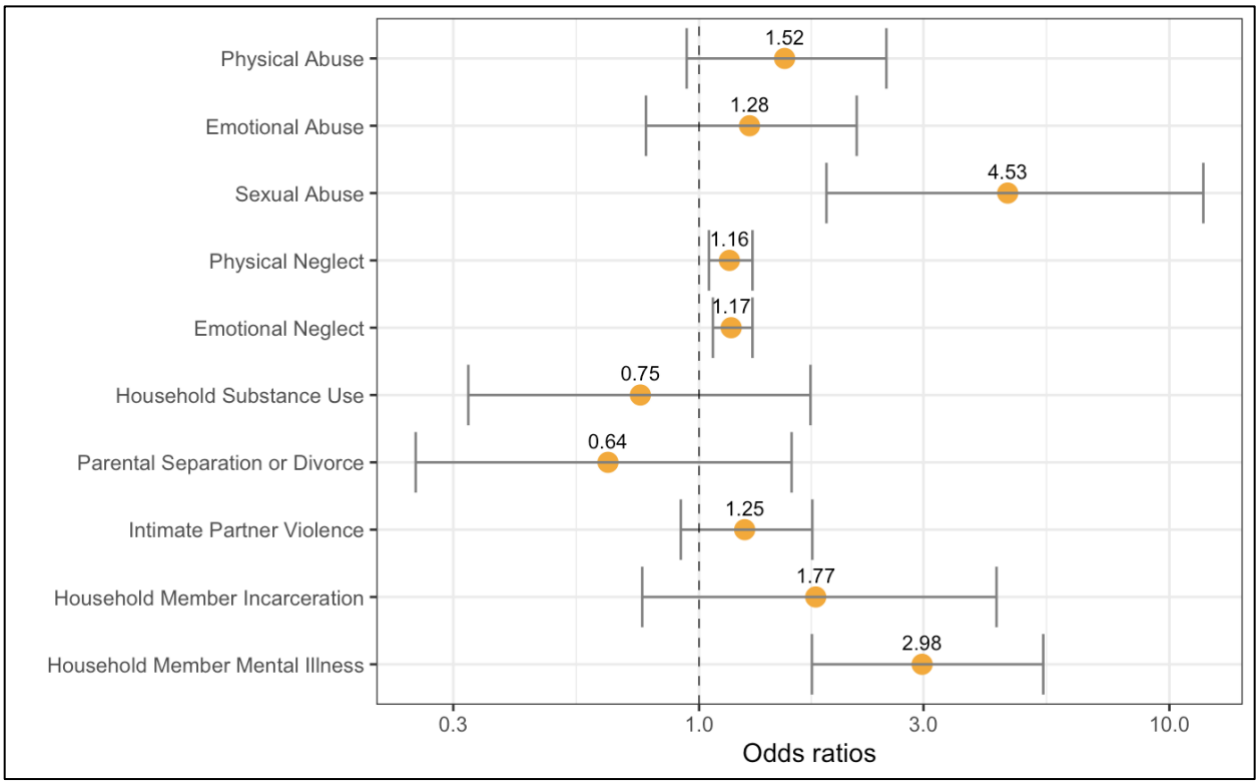

Figure 2. Odds Ratios Predicting Suicide Ideation. This figure demonstrates the odds ratios of suicide ideation from individual ACEs; was significant at the $p < .001$ level, sexual abuse was significant at the $p < .01$ level, and physical neglect were significant at the $p < .05$ level.

Study 2

Methods

Participants.

A clinical sample of 72 adults seeking residential treatment for substance use completed this study. Among this sample, 34 participants had complete responses for our variables of interest (i.e., ACEs and suicide-related questionnaires). Again, this sample was gathered from clients attending the ARTC for treatment of longstanding mental health and addictions problems. Responses for this study were obtained between March 2022 and May 2023. To meet criteria for the study, participants had to be 18+ years of age, be a current client at the ARTC, be fully capable of providing consent and participating in all study procedures, and be able to read, speak, and understand English. As not all clients who attend ARTC self-identify as Indigenous, participants with varying cultural backgrounds have been included in this study. Ethnicity and other relevant participant demographics are included in Table 8.

Table 8
Participant Demographic Information

		Participants (n = 34)
Mean Age (*SD*)		39.32 (8.76)
	Range:	23 – 54
Gender (%)	Women	13 (38.24%)
	Man	21 (61.76%)
	Gender non-conforming	0 (0.00%)
Sex (%)	Female	12 (35.29%)
	Male	20 (58.82%)
Ethnicity (%)	Indigenous	22 (64.70%)
	Non-Indigenous	12 (35.29%)
Employment (%)	Full-time	5 (14.71%)
	Sick Leave	4 (11.76%)
	Unemployed	12 (35.29%)
	On Disability	13 (38.24%)
Annual Income (%)	< $10,000	9 (26.47%)

	$10,001 to $19,999	9 (26.47%)
	$20,000 to $29,999	2 (5.88%)
	$30,000 to $39,999	2 (5.88%)
	$40,000 to $60,000	5 (14.71%)
	> $60,000	3 (8.82%)
Highest Level of Education (%)	Grade 8 or less	1 (2.91%)
	Some high school	7 (20.59%)
	High school graduate or GED	6 (17.65%)
	Some college, university, technical school	14 (41.18%)
	University degree (Bachelor)	6 (17.65%)
Living Conditions Prior to Program (%)	Living alone/single with kids	11 (32.35%)
	With spouse/partner	4 (11.76%)
	With roommates/friends	1 (2.94%)
	With family	6 (17.65%)
	No permanent residence (5/7)	7 (20.59%)
	Recovery/treatment centre (8)	4 (11.76%)
	Other	1 (2.94%)
Prior Residential School Attendance (%)		3 (8.82%)

* Note: some frequencies do not add up to 34 as some participants did not answer all demographic questions

G*Power version 3.1 was used to calculate that a sample size of 119 participants was required to detect a medium effect size ($f^2 = 0.15$) with a power of .80, an alpha value of .05, and three predictors (age, gender, and ACEs) within the statistical analyses below. As the actual sample size of this study is smaller ($N = 34$), initial descriptive statistics and preliminary relationships will be presented, as such data are useful for informing existing ACE literature related to Indigenous populations and inform clinical practices within ARTC.

Measures.

Time 1 Health History Questionnaire (HHQ).

The Time 1 HHQ is the same as the Time 1 HHQ measure presented in Study 1. This measure is included in a larger package of questionnaires delivered during the first session with

participants (i.e., Time 1) and is used to obtain various demographic information. Specific items reported in this study include age, sex, gender, Indigenous identity, employment, income, education level, and living conditions prior to attending the ARTC program (see Table 8 for a summary for this sample). This measure is presented in Appendix C.

Time 2 Health History Questionnaire (HHQ).

The Time 2 HHQ is the same as the Time 2 HHQ measure presented in Study 2. This measure is included in another larger package of questionnaires delivered during the second session with participants (i.e., Time 2) and contains items related to ACEs (e.g., child abuse, neglect, and household dysfunction), among other items not relevant for the present study. The items relating to ACEs measure five types of child harm (physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect) and five types of household dysfunction (incarceration of a family member, household substance use, household mental illness, parental divorce, and mother experienced domestic violence.

As done in Study 1, each ACE variable is scored according to methods used by the ACE Study as described by Dube and colleagues (2003). Items assessing physical abuse and emotional abuse are scored on a 5-point Likert scale, with 1 indicating the event never occurred and 5 indicating the event occurred very often. For items assessing sexual abuse, a "yes" response to either item indicates experience of sexual abuse. Items assessing emotional and physical neglect are also scored on a 5-point Likert scale, with 1 indicating the event never occurred and 5 indicating the event occurred very often. Scores of 15 or more on the emotional neglect items represent experiences of emotional neglect, and scores of 10 or more on the physical neglect items represent experiences of physical neglect. Each item from the physical and emotional neglect categories can be added to create an overall neglect composite score, which can provide

an overall composite of severity of neglect that incorporates both physical and emotional aspects. For the items assessing incarceration of a family member, household substance use, household mental illness, and parental divorce, a "yes" response indicates the participant had that experience. For items assessing each respondent's mother's experiences of intimate partner violence, items were again assessed on a 5-point Likert scale with 1 indicating it was never experienced and 5 indicating it was experienced very often. A response of "Sometimes", "Often", or "Very Often" to the first two items of this category, or any response except "Never" for the third and fourth items of this category indicate whether the respondent's mother had experienced domestic abuse (Dube et al., 2003). Relevant questions from the HHQ are presented in Appendix D.

Suicide Measures.

Depressive Symptom Inventory – Suicide Subscale (DSI-SS). The DSI-SS is a four item self-report measure that assesses the frequency and intensity of suicidal ideations within the past two weeks (Metalsky & Joiner, 1997). Total scores range from 0 to 12, with each of the four items being scored on a scale from 0 to 3. Higher scores indicate higher severity of suicidal ideations. The DSI-SS has been shown to have good psychometric properties broadly (Joiner & Rudd, 1995, 1996) and has been shown to have good psychometric properties when used specifically with American Indian participants (Cole et al., 2013, 2020b; O'Keefe & Wingate, 2013). Additional studies have used the DSI-SS with Aboriginal and Torres Strait Islander participants in Australia (Shand et al., 2013; Tighe et al., 2017, 2020), but this study will be the first of our knowledge to use the DSI-SS with First Nations participants in Canada. The DSI-SS is presented in Appendix G.

Suicidal Behaviours Questionnaire – Revised (SBQ-R). The SBQ-R is a four item self-report measure that assesses different elements of suicidality, which are: (1) lifetime suicide ideation and/or attempts; (2) threat of a suicide attempt; (3) frequency of suicidal ideation over the past 12 months; and (4) likelihood of suicidal behaviour in the future (Osman et al., 2001). Items can be aggregated together to measure general suicide risk, and items are rated on a 5-point or 6-point Likert scale, with higher scores indicating greater suicide risk. Total scores can range from 3 to 18. The SBQ-R can also be used to code responses into 3 mutually distinct categories: never suicidal, brief suicidal ideation, and serious suicidal ideation and/or a previous suicide attempt (Rieger et al., 2015). The SBQ-R has been shown to have good psychometric properties broadly (Osman et al., 2001) and has been shown to have good psychometric properties when used specifically with American Indian participants (Fitzpatrick et al., 2020; Stanley et al., 2020). The SBQ-R was also used with a sample of Indigenous participants from an inner-city primary care clinic in Western Canada (Tu et al., 2019) and a sample that included First Nations, Métis, and Inuit students from a university in the prairie region of Canada (Rieger et al., 2015), however no psychometric properties were reported for use of this measure within these samples of interest. Therefore, this study will be the first of our knowledge to assess the psychometric properties of the SBQ-R with a sample of First Nations participants in Canada. The SBQ-R is presented in Appendix H.

Procedure.

Recruitment.

Recruitment occurred at the ARTC across 8 treatment cycles between April 2022 and May 2023. Participants were recruited from six treatment cycles in 2022 and two treatment

cycles in 2023. During each recruitment session, the study was explained to ARTC clients both verbally and with an information letter (see Appendix E). Clients were informed that their decision to participate or not participate in the study (or to drop out of the study at a later date) would never impact their access to services or the quality of care they receive from ARTC staff. Clients were also informed that their data would remain confidential. If participants chose to take part in the study after receiving this information, they were given a consent form (see Appendix F) to sign.

Data Collection.

Initial data collection (i.e., Time 1) occurred immediately after participants provided informed consent. Participants completed Time 1 measures (i.e., the Time 1 HHQ, the SBQ-R, and the DSI-SS) at this point either individually or with a staff member if support was required. Roughly two weeks later (i.e., Time 2), participants had the option to complete an additional self-report questionnaire package containing the Time 2 HHQ questions regarding ACEs. Completion of this questionnaire was done either individually, or in the presence of the clients' counsellors if they wanted additional support. Given that the Time 2 questionnaire package included questions that were more sensitive in nature than the Time 1 questionnaire package, participants were reminded of their ability to decide whether they wanted to participate in the study again. As well, participants were reminded that they could withdraw from the study and/or request their data be removed from the study at any time point.

Data Management and Cleaning.

De-identification was completed to ensure participant confidentiality. Participant names were replaced with ID codes in de-identified datasets. All study records are being stored for a

period of five years past the date of publication, and any physical documentation (e.g., signed consent forms and paper participant measures) are stored in a restricted, secure area in a locked filing cabinet for which only the researchers have access to the key. Following this time, records will be destroyed in accordance with current best-practice research principles.

Relevant variables were cleaned (e.g., qualitative data transposed to numerical values; reverse-coding) if needed to complete relevant statistical analysis. Data were also assessed for common assumptions needed for linear regression (i.e., linearity, normality, homoscedasticity, and multicollinearity; Field et al., 2012). Given that the data are cross-sectional, independence of errors was assumed, however potential violations of other assumptions were assessed. Descriptive tests, including visual examination of data using box plots, scatter plots, and bar graphs were used to describe data normality and homoscedasticity, a measure of the distribution of error. Normality of data was examined through skewness and kurtosis. Kim (2013) proposed that values closer to 0 indicate increased data symmetry, while absolute values of 2.1 or more suggest a significant deviation from normality. Most study variables were within the range of 0.16 to 0.52, however one variable within the sample was skewed. The total scores for the DSI-SS variable (i.e., suicide ideations in the past two weeks) indicated a positive skewness (skewness = 2.50). However, given the nature of this variable, positive skewness makes sense, indicating that most individuals had low total scores for suicide ideation in the past two weeks. Kurtosis values ranged from 2.03 to 2.50, however, the DSI-SS total scores variable also demonstrated excess kurtosis (kurtosis = 7.98), indicating the distribution is too peaked. This distribution also makes sense, indicating again that most individuals had low total scores for suicide ideation in the past two weeks.

Multicollinearity was then assessed to see if any predictors were too highly correlated. VIF values were calculated for each model present below, and all VIF values ranged between 1.17 and 1.128, indicating multicollinearity was not an issue. Heteroscedasticity (i.e., the assumption that the error terms are normally distributed; Field et al., 2012) was examined for using the Breusch Pagan test. As the Breusch Pagan tests were not significant for any models run in the analyses below, this suggests that heteroscedasticity is not present within any of the models.

Results

Prevalence of ACEs and Suicide-Related Behaviours

Participant ACE scores were calculated using Dube et al.'s (2003) method of quantifying ACEs using the ACE Family Health questionnaire (WHO, 2018). The mean ACE score was 5.29 (*SD* = 2.97) and the median score was 5. Thirty-one (91.18%) participants reported experiencing at least 1 ACE, and similarly 31 (91.18%) participants reported experiencing 2 or more ACEs. The frequencies of individual ACEs endorsed by participants is described in Table 9. The mean SQB-R score was 7.44 (*SD* = 3.45), while the mean DSI-SS score was 0.53 (*SD* = 1.28). Histograms of the frequency of responses for overall SBQ-R and DSI-SS scores are displayed in Figure 3 and 4, respectively. Frequencies of response option endorsement for individual items from the SBQ-R and the DSI-SS are displayed in Tables 10 and 11, respectively. Mean ACE scores and frequencies for each of the SRB measures broken down by sex and age are presented in Table 12.

Table 9

Frequency of Individual ACE Endorsement

	Overall Sample
	N = 34
Mean ACEs Score (SD)	5.29 (2.93)
Physical Abuse	22 (64.71%)
Emotional Abuse	13 (38.24%)
Sexual Abuse	20 (58.82%)
Physical Neglect	17 (50.00%)
Emotional Neglect	10 (29.41%)
Household Substance Use	21 (61.76%)
Parental Separation or Divorce	23 (67.65%)
Intimate Partner Violence	18 (53.94%)
Household Member Incarceration	12 (35.29%)
Household Member Mental Illness	24 (70.59%)

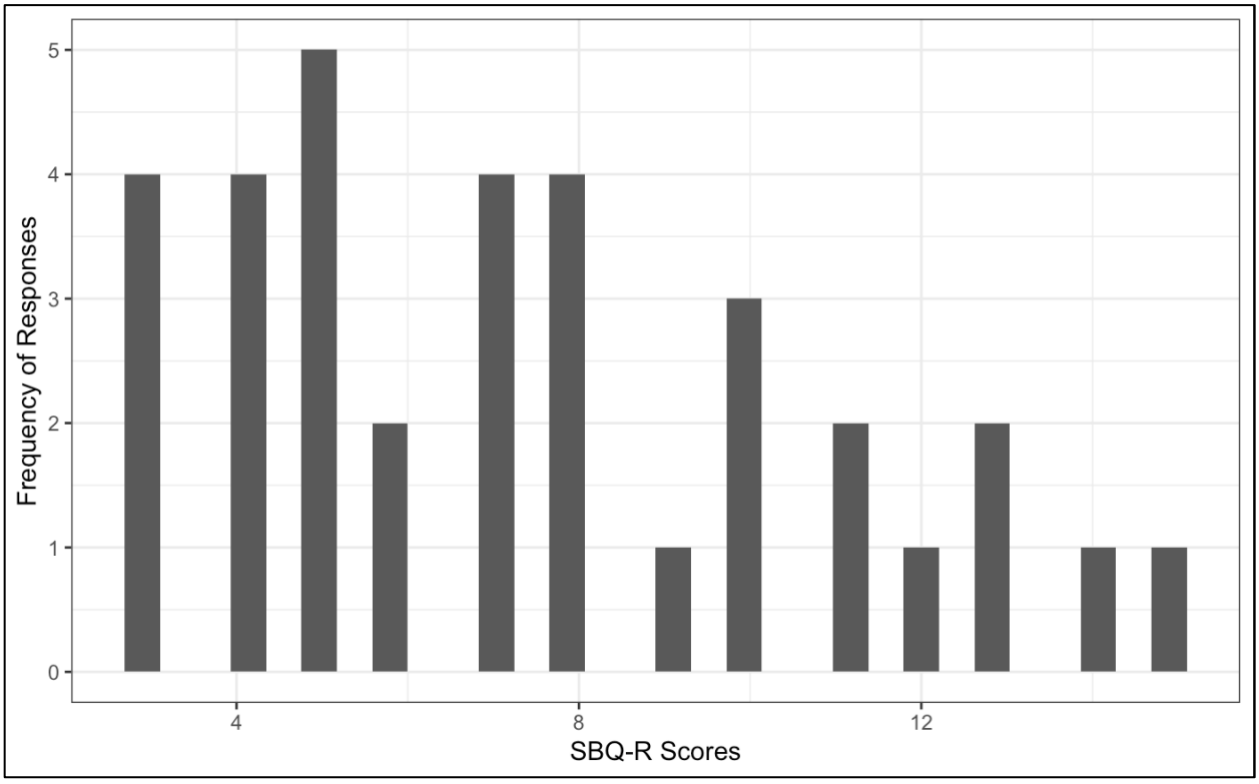

Figure 3. Frequency Distribution of SBQ-R Total Scores.

Table 10

Frequency of SBQ-R Response Options Endorsement

Question	Response Options	Frequency (%)
Have you ever thought about or attempted to kill yourself?	Never	5 (14.71%)
	It was just a brief passing thought	10 (29.41%)
	I have had a plan at least once to kill myself	6 (17.65%)
	I have attempted to kill myself	13 (38.24%)
How often have you thought about killing yourself in the past year?	Never	14 (41.18%)
	Rarely (1 time)	8 (23.53%)
	Sometimes (2 times)	7 (20.59%)
	Often (3 – 4 times)	4 (11.76%)
	Very Often (5 or more times)	1 (2.94%)
Have you ever told someone that you were going to commit suicide, or that you might do it?	No	16 (47.06%)
	Yes, at one time	12 (35.29%)
	Yes, more than once	6 (17.65%)
How likely is it that you will attempt suicide someday?	Never	20 (58.82%)
	No chance at all	7 (20.59%)
	Rather unlikely	2 (5.88%)
	Unlikely	3 (8.82%)
	Likely	2 (5.88%)
	Rather likely	0 (0.00%)
	Very likely	0 (0.00%)

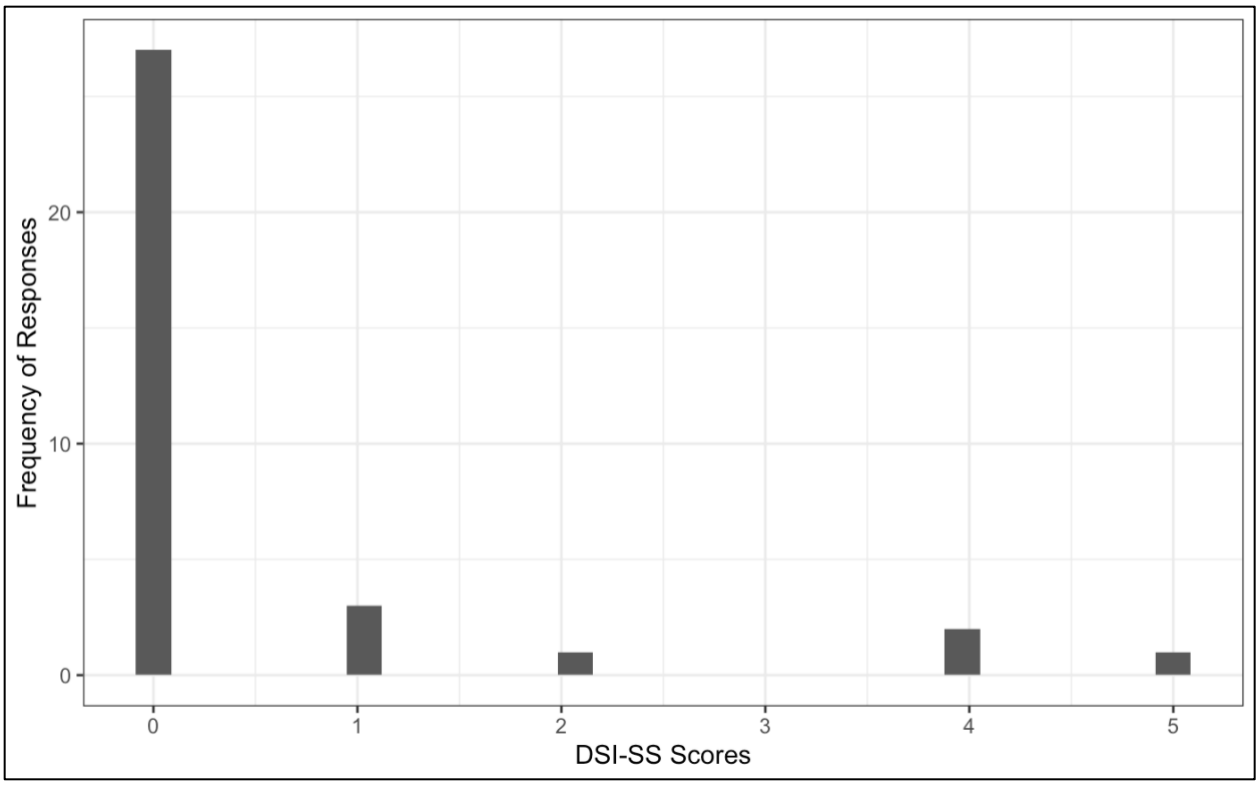

Figure 4. Frequency Distribution of DSI-SS Total Scores.

Table 11

Frequency of DSI-SS Response Options Endorsement

Question	Frequency (%)
I do not have thoughts of killing myself	29 (85.29%)
Sometimes I have thoughts of killing myself	5 (14.71%)
Most of the time I have thoughts of killing myself	0 (0.00%)
I always have thoughts of killing myself	0 (0.00%)
I am not having thoughts about suicide	31 (91.76%)
I am having thoughts about suicide but have not formulated any plans	3 (8.82%)
I am having thoughts about suicide and am considering possible ways of doing it	0 (0.00%)
I am having thoughts about suicide and have formulated a definite plan	0 (0.00%)
I am not having thoughts about suicide	28 (82.35%)
I am having thoughts about suicide but have these thoughts completely under my control	4 (11.76%)
I am having thoughts about suicide but have these thoughts someone under my control	2 (5.88%)
I am having thoughts about suicide but have little or no control over these thoughts	0 (0.00%)
I am not having impulses to kill myself	32 (94.12%)
In some situations I have impulses to kill myself	2 (5.88%)
In most situations I have impulses to kill myself	0 (0.00%)
In all situations I have impulses to kill myself	0 (0.00%)

Table 12

ACE and SRB Descriptives by Sex and Age

	Mean ACEs (SD)	Mean SBQ-R Score (SD)	Mean DSI-SS Score (SD)
Female	6.33 (2.71)	8.08 (4.14)	0.50 (1.17)
Male	4.45 (2.91)	7.35 (3.08)	0.60 (1.43)
20 – 29 yrs	6.00 (2.65)	6.33 (0.58)	0.33 (0.58)
30 – 44 yrs	5.32 (2.67)	7.00 (3.50)	0.42 (1.22)
45+ yrs	5.08 (3.55)	8.42 (3.73)	0.75 (1.54)

Predicting Suicide-Related Behaviours from Total ACEs and ACE Cut-Off Values

A linear regression assessed the hypothesis that higher ACE scores will be associated with increased lifetime suicide risk (i.e., SBQ-R scores; see Table 10). In the first step of this model, age and sex were included as predictors due to the reasons highlighted above in Study 1. In the second step, a continuous ACE variable (i.e., total ACEs) was included in addition to age and sex, while in the third step, a categorical ACE variable (i.e., 7 or more ACEs vs. 6 or less ACEs) was included in addition to age and sex. The second step of the model did not significantly improve the fit of the model to the data compared to the first step of the model $F(1, 28) = 1.58$, $p = .219$. Similarly, the third step of the model did not significantly improve the fit of the model to the data compared to the first step of the model, $F(1, 28) = 0.01$, $p = .932$. Full results for these regressions are presented in Table 13.

Table 13

Linear Regression Predicting Lifetime Suicide-Related Behaviours (SBQ-R)

	ΔR^2	Estimate	SE	95% Confidence Intervals		*p*
				Lower CI	Upper CI	
Step 1	0.03					.642
Age		0.06	0.07	-0.10	0.21	.455
Sex		-0.62	1.30	-3.28	2.03	.635
Step 2	0.08					.487
Age		0.09	0.08	-0.07	0.25	.251
Sex		0.02	1.38	-2.81	2.85	.989
Total ACEs		0.30	0.24	-0.19	0.80	.219
Step 3	0.03					
Age		0.06	0.08	-0.10	0.22	.468
Sex		-0.58	1.43	-3.50	2.34	.688
7+ ACEs		0.13	1.46	-2.87	3.12	.932

A linear regression assessed the hypothesis that higher ACE scores will be associated with suicide ideations in the past two weeks (i.e., DSI-SS total scores; see Table 11). In the first

step of this model, age and sex were included as predictors due to the reasons highlighted above in Study 1. In the second step, a continuous ACE variable (i.e., total ACEs) was included in addition to age and sex, while in the third step, a categorical ACE variable (i.e., 7 or more ACEs vs. 6 or less ACEs) was included in addition to age and sex. The second step of the model did not significantly improve the fit of the model to the data compared to the first step of the model $F(1, 28) = 2.56$, $p = .121$. Similarly, the third step of the model did not significantly improve the fit of the model to the data compared to the first step of the model, $F(1, 28) = 0.122$, $p = .730$. Full results for these regressions are presented in Table 14.

Table 14

Linear Regression Predicting Suicide-Related Behaviours in Past Two Weeks (DSI-SS)

	ΔR^2	Estimate	SE	95% Confidence Intervals		*p*
				Lower CI	Upper CI	
Step 1	0.02					.799
Age		0.02	0.03	-0.04	0.08	.526
Sex		0.14	0.50	-0.88	1.15	.787
Step 2	0.10					.401
Age		0.04	0.03	-0.03	0.10	.241
Sex		0.44	0.52	-0.62	1.51	.401
Total ACEs		0.15	0.09	-0.04	0.33	.120
Step 3	0.02					.904
Age		0.02	0.03	-0.04	0.08	.485
Sex		0.21	0.54	-0.91	1.32	.707
7+ ACEs		0.19	0.56	-0.95	1.34	.730

Discussion

The purpose of these studies was to further explore the relationship between SRBs and ACEs in Indigenous clients with problematic substance use. The mean ACE score reported for Study 1 was 4.83 (*SD* = 2.67) while the mean ACE score reported for Study 2 was 5.29 (*SD* = 2.97). These scores are close to the mean ACE score of 5.22 (*SD* = 2.14) found by Toombs (2021), which was expected for Study 1 because there was some overlap in the clients included in Toombs' (2021) analyses. However, the clients included in Study 2 participated after results were reported for Toombs (2021), and therefore represent ACE scores from a separate group of participants within the same client population (i.e., those attending the First Nations treatment center for longstanding substance use and mental health concerns). In each of these scenarios, mean ACE scores are higher than mean ACE scores previously reported for Indigenous samples (i.e., between 2.5 to 3.05 ACEs; Radford et al., 2021). Similarly, the percentage of participants in these studies who had experienced at least one ACE (i.e., 97.03% in Study 1 and 91.18% in Study 2) were higher than the percentage of individuals who had experienced at least one ACE in a broader Canadian population (i.e., 66.60%; Joshi et al., 2021). The same pattern was observed for the percentage of participants who had experienced two or more ACEs (i.e., 90.10% in Study 1 and 91.18% in Study 2, compared to 35.60% in the general Canadian population; Joshi et al., 2021). Overall, these results demonstrate higher ACE scores for this specific sample (i.e., Indigenous clients seeking treatment for substance use) than the broader Indigenous and Canadian populations.

Similar patterns arose when examining the percentages of these samples who endorsed SRBs. In Study 1, nearly 30% of this sample endorsed having a previous suicide attempt while just over 50% of the sample endorsed having suicidal thoughts. From Q1 in Study 2, about 40%

of this sample endorsed having a previous suicide attempt, and only 15% of the sample endorsed never having any thoughts about dying by suicide, indicating that about 85% did at one point have thoughts about dying by suicide. These percentages are greater than those found in studies conducted in broader Indigenous communities across Canada, which found that 22.00% of just over 11,000 participants had experienced suicide ideation at some point in their life, while 12.00% of participants had reported a past suicide attempt (McQuaid et al., 2017). Overall, these results demonstrate the higher severity of SRBs for this specific sample of treatment seeking Indigenous clients when compared to Indigenous populations outside of treatment-specific settings.

Results from Study 1 also indicated that ACEs were significantly higher for (a) participants who had endorsed a previous suicide attempt than for those who did not, and (b) participants who had endorsed having previous suicide ideations than for those who did not. Logistic regressions from Study 1 demonstrated that total ACEs were predictive of both reports of suicide attempts and reports of suicide ideation, with the odds of someone endorsing a suicide attempt being 1.5 times higher with each additional ACE and the odds of someone endorsing suicide ideation being 1.26 times higher with each additional ACE. P-values for total ACEs in both logistic regression models remained significant even after BH p-value adjustments were applied to control for false discovery rates. While odds ratios predicting SRBs from total ACEs have been examined within a Native American sample in the United States (Brockie et al., n.d.), our study is the first study to our knowledge to report odds ratios of this kind for an Indigenous sample in Canada.

Relatedly, Study 1 is also the first study to our knowledge to report exploratory odds ratios that predict SRBs from *individual types* of ACEs within an Indigenous sample in Canada.

Odds ratios predicting SRBs from individual ACEs have been examined within the broader Canadian population (Fuller-Thomson et al., 2016), and results from that study indicated that three specific ACEs (i.e., sexual abuse, physical abuse, and parental domestic violence) were associated with higher odds of ever attempting suicide. It should be noted, however, that not all ACEs included in our study were included by Fuller-Thomson and colleagues (2016) due to more specificity in their research questions. Nonetheless, our exploratory results similarly indicated that sexual abuse and physical abuse, among other predictors (i.e., household mental illness, emotional abuse, emotional neglect), were associated with higher odds of ever attempting suicide. Similar patterns were found in endorsement of suicide ideation, with sexual abuse and household mental illness having the largest odds ratios, followed by emotional neglect and physical neglect. Overall, these findings are in line with previous work demonstrating that early life sexual abuse is a significant risk factor for both suicide ideation (Pérez-González, 2015) and suicide attempts (Ng et al., 2018). The inclusion of household mental illness as a significant predictor of suicide ideation and suicide attempts is also aligned with previous research demonstrating the impacts of historical and intergenerational trauma on following generations (Hackett et al., 2016; Smallwood et al., 2021; Toombs, Lund, Radford, et al., 2022; TRCC, 2015). These exploratory odds ratios are a novel contribution to the available research on ACEs and SRBs within Indigenous treatment-seeking populations and should be seen as a reference point for future examinations in similar contexts.

Finally, our results from Study 2 differed from our results in Study 1, indicating that for our second sample total ACEs were not significant predictors for lifetime SRBs (i.e., total SBQ-R scores) or for SRBs in the past two weeks (i.e., total DSI-SS scores). However, the non-significance of total ACEs as a predictor in these models may be due to limited observations (*N*

= 34) in these analyses. In addition to limited observations, there was also some range restriction within the DSI-SS total scores which may have also impacted the significance of our model. However, this range restriction of SRBs in the past two weeks is useful because it indicates that most participants were not actively indicating suicide risk while in treatment. Further detail is gleaned from examining the responses to individual items on the DSI-SS. For example, responses to Q2 on the DSI-SS indicate that no participants were actively considering possible plans to die by suicide, and responses to Q3 on the DSI-SS indicate that no clients were experiencing thoughts about suicide that were completely outside of their control. In addition, while most participants were not actively indicating suicide risk, only 15% of the sample endorsed *never* having thoughts about or attempts to kill themselves. Taken together, results from the SBQ-R and the DSI-SS indicate that, while most clients have experienced suicide ideation at some point in their lifetime, most clients (i.e., 85% as per Q1 of the DSI-SS) were not actively experiencing suicide ideation while in treatment. While this study does not compare SRBs between individuals who have access to treatment to those who do not, these results point towards the benefit of providing comprehensive supports (e.g., food, shelter, cultural connection, trauma-informed mental health treatment) for reducing SRBs for Indigenous individuals seeking substance use treatment. These results are also in line with the *First Nations Mental Wellness Continuum Framework,* which highlights that access to a range of services (e.g., housing, land and resources, language, heritage, and culture) is needed to help promote mental wellness (Assembly of First Nations et al., 2015).

Study Limitations

There are a few limitations that should impact the generalizability of the present findings. First, it should be noted that the exploratory analyses from Study 1 should be deemed “tentative

at best" (Babyak, 2004; p. 419). While BH p-value corrections were applied to help control for false discovery rates in Study 1 (Mangiafico, 2015), these exploratory analyses were conducted as a starting point that future research assessing the impact of individual ACEs on SRBs in Indigenous treatment-seeking populations can be built on and compared to. Future studies with much larger samples may even consider running one logistic regression that includes all 10 individual ACEs, which may speak to the relative predictive impact of each type of ACE. In the meantime, our results from the exploratory analyses of Study 1 provide insight on some general trends that can be used to inform treatment provision (e.g., incorporating empirically validated treatments for childhood sexual abuse, which had the highest odds ratios for both reports of suicide attempts and reports of suicide ideations).

An additional limitation can be found within our ACE measure, which includes conventional ACE items but not expanded ACE items (Cronholm et al., 2015). Cronholm and colleagues (2015) note that to more accurately represent adversities experienced across various sociodemographic groups, the conventional ACEs measure should be expanded to include community-level indicators (i.e., witnessing community violence; experiencing racial discrimination; living in a neighborhood that feels unsafe; experiencing bullying; and living in foster care). Additional research demonstrates that exposure to community violence, economic hardship in childhood, bullying, absence/death of a parent or significant others, and discrimination are the most frequently added categories to ACE tools, and supports the expansion of ACE screening tools (Smithbattle et al., 2022). As these expanded indicators of ACEs were not included in the present studies, ACE scores reported here likely underrepresent the prevalence of true adversity experienced by individuals in these samples. This hypothesis about the present underrepresentation of ACEs is supported by findings such as the

pervasiveness of anti-Indigenous racism in various Canadian systems (Bailey, 2015; Browne et al., 2022) and the overrepresentation of Indigenous children in the child welfare system in Canada (Turner, 2016). Even still, results from our measures without the extended ACEs indicate that childhood adversity is more prevalent in Indigenous individuals seeking treatment for substance use than either the broader Indigenous population or the broader Canadian population, providing sufficient evidence for the use of interventions that aim to treat ACEs. However, including more nuanced measures of adversity – such as the expanded ACEs scale used by Cohen-Cline and colleagues (2019) which included additional questions assessing experiences with foster care, economic insecurity, neighborhood safety, and discrimination – in future research with this population will provide an even greater understanding of the impact that such community factors have on SRBs and substance use.

A final limitation of the present research is the lack of generalizability for individuals with varying intersecting identities within these studies. For example, this research cannot speak to the experiences of ACEs and SRBs for gender diverse individuals because no participants indicated that they identified as non-binary, and the differences in frequencies between responses for gender and sex indicated that only one participant from Study 1 identified with a gender that was different from their reported sex. Similarly in Study 2, only one participant identified with a gender that was different from their reported sex. Relatedly, no demographics were reported in terms of sexual orientation for these studies. Recent research indicates that ACEs (especially childhood sexual abuse) have been found to be elevated in 2SLGBTQIA+ individuals and linked with poorer mental health, and this relationship is exacerbated within populations who have experienced racialization (Zhang et al., 2023). As such, future research should examine the nuances of how aspects such as gender identity and sexual orientation impact the relationships

between ACEs and SRBs in Indigenous treatment seeking populations as these nuances have important implications for clinical treatment recommendations (e.g., learning about the challenges of multiple identities; ensuring the use of affirmative approaches; Zhang et al., 2023).

Study Implications and Future Directions

This study demonstrated that higher levels of ACEs and SRBs exist within an Indigenous treatment-seeking sample than levels within broader groups, and these results point towards the use of interventions that integrate ACE models. While ACEs cannot be treated with psychological interventions alone and community-based approaches to health and wellness promotion are needed to authentically prevent ACEs (Toombs, Lund, & Mushquash, 2022), we will first highlight specific psychological interventions that can be used within treatment settings to support Indigenous clients with high ACEs. We will then review a broader framework that identifies more holistic pathways towards ACE prevention and towards supporting Indigenous communities impacted by ACEs, and we will review future research directions.

Starting with psychological interventions, no systematic reviews have been conducted assessing interventions specifically for ACEs within Indigenous populations in Canada. Two systematic reviews of trauma interventions used within international Indigenous communities (e.g., Canada, United States, Australia, New Zealand) were available (Gameon & Skewes, 2020; Pride et al., 2021). While some studies included in Gameon and Skewes (2020) used psychological interventions such as CBITS, which uses CBT strategies while also incorporating traditional beliefs and narrative practices (Goodkind et al., 2012), the available research on these interventions was limited by small sample sizes and lack of control. Overall, this research highlighted a need for culturally appropriate, evidence-based interventions for Indigenous communities (Gameon & Skewes, 2020). Similarly, Pride and colleagues (2021) noted a

shortage of relevant sources in their scoping review of trauma-informed approaches to substance use interventions with Indigenous Peoples. Multi-pronged, intersectional intervention approaches that are culturally-adapted or culturally grounded were also advocated (Pride et al., 2021). Some literature was also found that looked at interventions designed to treat specific ACEs. For example, the Pathway to Hope program is an Indigenous approach to multigenerational healing from childhood sexual abuse that was developed by and for Alaskan Native communities in the United States (Payne et al., 2013). This intervention provides strength-based solutions built on truth, honesty, compassion, and shared responsibility for healing. As well, interventions aiming to reduce family violence in Indigenous communities were also found, and included approaches such as psycho-educational group counselling models that integrate cultural healing via spiritual practices and ceremonies (Shea et al., 2010). Overall, each of these systematic reviews and primary research articles discussing interventions for childhood trauma within Indigenous populations emphasize the importance of the inclusion of culturally appropriate interventions that are rooted in specific beliefs and practices of the communities for which they were developed.

Beyond psychological interventions, there are many other pathways for ACE treatment and prevention. Many of these pathways are presented in the newly developed *Indigenous Wellness Pyramid* (Rides At The Door & Shaw, 2023). This model provides suggestions for numerous pathways towards increased well-being in Indigenous communities, which can then set the foundation for the interruption of historical and intergeneration trauma, and in turn work towards preventing ACEs. At the base of the pyramid is intergenerational healing/ intergenerational sovereignty, which places emphasis on restoring decision-making power to Indigenous communities in order to restore Indigenous sovereignty. This level focuses on the

importance of decolonization (e.g., via the revitalization of traditional languages and healing practices) that is grounded in Indigenous epistemology which honours both how the community historically and in modern times defines and heals from these issues. The next level of the pyramid highlights thriving and safe communities, which establish physical and psychological safety. Rides At The Door and Shaw (2023) note that improving the social conditions of communities (e.g., poverty, injustice, unemployment, houselessness) is prevention for community violence and community traumas. The next level of the pyramid discusses protective and compensatory experiences (i.e., PACEs), which correlate with later mental health support, as well as social and emotional support in adulthood, and can be achieved through culturally specific processes (e.g., support programs grounded in Indigenous values that promote community well-being). Following this, Rides At The Door and Shaw (2023) discuss the importance of consistent corrective experiences and cultural identity development, which may include returning to places of trauma to redefine the meaning of the experience and to create new healing experiences via in vivo exposure and reprocessing. This can allow for recognition of the impact of trauma on one's identity, community, belongingness, and pride, and can restore cultural roles within the family and community (Rides At The Door & Shaw, 2023). The development of cultural values and coping skills are highlighted in the next level of the pyramid, which highlights the use of self-regulation skills and psychoeducation that can be learned in coordination with cultural values (e.g., using traditional language to describe feeling states; incorporating cultural practices such as smudging while learning about interpersonal conflicts; Rides At The Door & Shaw, 2023). In the next step, emphasis is placed on wellness and balance, and on holistic healing that encompasses mind, body, emotion, and spirit (Rides At The Door & Shaw, 2023). In the final step, Rides At The Door and Shaw (2023) highlight that all of the

healing efforts discussed here will eventually restore meaningful life longevity. Overall, the *Indigenous Wellness Pyramid* framework honours decision-making authority of Indigenous communities in deciding how healing happens, and highlights the importance of individuals, programs, communities, and systems in healing (Rides At The Door & Shaw, 2023).

Beyond these interventions and frameworks targeting ACEs, some interventions and frameworks targeting SRBs are highlighted next. The Task Group on Mental Wellness note that, "a critical first step in suicide prevention is changing the narrative to life promotion" (Thunderbird Partnership Foundation Task Force on Mental Wellness, 2022, p. 5). As focusing on suicide prevention and intervention from Western models alone can be harmful for Indigenous Peoples in Canada, life promotion initiatives are highlighted instead as they shift the focus towards addressing unresolved intergenerational traumas and social determinants of health that impact one's ability to live well (Task Force on Mental Wellness, 2022). This report highlights a continuum of care that supports individuals experiencing immediate crisis but also individuals, families, and communities at any stage of need. Key principles of this approach include health promotion (e.g., building capacity within community-based programs; ensuring Indigenous communities have ownership and control on ways to heal from trauma), prevention (e.g., holistically reducing risk and harm while enhancing protective factors that encourage choosing life; addressing disparities), treatment (e.g., ensuring culture is embedded within treatment), and maintenance/postvention (e.g., reinforcing the positive effects of treatment and reducing the risk in future situations). Relatedly, another report highlighted land-based healing as an approach to support life promotion and suicide prevention, specifically within the context of substance use treatment (Task Group on Mental Wellness, 2021). Relationship to land was emphasized as being critical to mental wellness, demonstrated via examples in which wellbeing

is supported through the development of connections to family and Elders, as well as through connections to one's sense of peace and purpose. This report also highlighted that, while data for specific programs and services that foster connection to land is beginning to emerge, there is a need to support further development and capacity within these types of culturally- and strength-based programs that can support mental wellbeing and life promotion (Task Group on Mental Wellness, 2021).

Future research directions related to ACEs, SRBs, and the *First Nations ACE Study* could aim to better understand theoretical mechanisms linking ACEs and SRBs within this population to improve treatment planning. For example, emotion regulation, impulsivity, and executive functioning difficulties were all highlighted in the introduction as possible mechanisms by which increased ACEs lead to increased SRBs. As some of these variables (e.g., executive functioning) are already incorporated in the measures included for the broader *First Nations ACE Study*, this would be an accessible next step, should ARTC staff find it relevant and useful for treatment planning. Future research directions could also attempt to follow participants after treatment to see how positive factors, such as maintained access to cultural connections, or negative factors, such as unstable housing situations, impact SRBs following treatment. This research could then be used to advocate for additional transitional supports following treatment that may maintain benefits seen (i.e., reduced SRBs as demonstrated by lower DSI-SS scores) during treatment. Finally, future research could also be used to demonstrate how some of the frameworks discussed above (e.g., the *Indigenous Wellness Pyramid*; land-based mental health initiatives) are already incorporated into and benefiting ARTC programming, allowing for opportunities to advocate for further funding to support ongoing programming. For example, future research could aim to better understand how land-based mental health initiatives currently available at

ARTC help to facilitate healing for First Nations individuals with substance use disorders and high ACEs. This research could also assess what facilitators and barriers exist for the incorporation and use of land-based interventions in First Nations treatment facilities, as doing so would help to (1) outline what is needed at an organizational level to ensure that these more holistic interventions are accessible and available long term and (2) inform public policy regarding resource allocation for mental health supports. In line with OCAP principles, whatever next steps are taken with the *First Nations ACE Study* will be guided by client, practitioner, program, and organizational needs to ensure these steps are community-driven and community-approved.

Conclusion

ACEs and SRBs are higher within treatment-seeking Indigenous samples than within broader Indigenous samples and national samples, and ACEs are predictive of such SRBs. As such, culturally-based psychological interventions that target ACEs are needed, as are broader initiatives guided by the *Indigenous Wellness Pyramid* (Rides At The Door & Shaw; 2023). Examples of these initiatives include decolonization efforts that support the revitalization of traditional healing practices, working towards improving the social conditions of communities, and placing emphasis on wellness and balance (e.g., through life promotion initiatives). Approaches towards holistic ACE treatment and prevention are needed to genuinely stop cycles of trauma and authentically address ACEs and SRBs within Indigenous populations.

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Appendix A: Examining for Culturally Validated SRB Measures for First Nations Populations

After a scan of a variety of data bases and broader grey literature sources, 25 different SRB-related measures were found to have been used within Indigenous populations globally. To determine which measures would be best suited for the present study, various practical considerations were reviewed for each measure. These considerations included administration method (i.e., self-report vs. clinician administered), administration requirements (i.e., varying educational qualifications), survey time frame (i.e., brief vs. long), and cost (i.e., low vs. high), and study context (i.e., Canada vs. other countries). These factors ensure that the chosen measures could match the current format of the *First Nations ACEs Study* (i.e., self-report, brief), while avoiding adding additional time burden for participants. Psychometrics were also reviewed to better understand the reliability and validity of the most relevant measures for use within our study context. Lastly, study context (i.e., Canada or North America) was examined to see if measures had been used specifically with First Nations populations in Canada, however, this was exploratory rather than constraining (i.e., we did not avoid using a measure if it had not been used yet within First Nations populations in Canada).

The most used SRB assessments were the Depressive Symptom Inventory – Suicidality Subscale (DSI-SS; used in 6 studies), the Suicide Ideation Questionnaire and the Suicide Ideation Questionnaire – Junior (SIQ and SIQ-JR; used in 6 studies each), and the Suicide Behaviours Questionnaire – Revised (SBQ-R; used in 4 studies). Some measures were included in three studies (e.g., the Mini International Neuropsychiatric Interview – Suicide Module) or two studies (e.g., the Beck Scale for Suicide Ideation; BSS), while others appeared only in one (e.g., the Suicide Probability Scale).

Practical considerations varied from assessment to assessment. While many were self-report questionnaires (e.g., the DSI-SS and the SBQ-R), others were clinician administered (e.g., the Suicide Status Form or SSF). As the *First Nations ACE Study* is currently completed in self-report format, only the SRB assessments that could be completed in self-report format were considered for use. The SRB assessments also varied in administration requirements, with some requiring specific qualifications for use (e.g., the BSS requires Pearson Qualification Level B; (Pearson, 2022), while others have no specific qualifications for use (e.g., the DSI-SS). Those SRB assessments with specific qualifications for use were not considered as some research assistants for the ACE study (e.g., those with an undergraduate degree only) would not be able to administer those assessments. Finally, there was large variation in the time required for completion (measured by the number of items included). For example, the Self-Injurious Thoughts and Behaviours Interview (SITBI) assesses the nature and timing of past suicidal behaviours via 169 questions, which would be far too long to be added into the current ACE study. In contrast, the Suicide Status Form (SFS) assess various suicide risk factors via 5 questions.

Study contexts also varied. Most studies were conducted within the United States, while Australia contributed the second most studies. Other studies were reported from Canada, New Zealand, and Sweden. Variation also occurred within countries. Studies came from various reservations and other locations throughout the United States, ranging from Anchorage, Alaska (Buckingham, 2021) to the Fort Apache Indian Reserve in northeastern Arizona (Cwik et al., 2016) to New Mexico (Poole et al., 2021). Similar variation was seen in the studies from Australia (e.g., Northern Territory, Davison et al., 2020; Queensland, Shand et al., 2019) and

from Canada (e.g., Northern British Columbia, Harder et al., 2015; prairie regions, (Rieger et al., 2015).

After examining the practical considerations (i.e., self-report questionnaire, limited number of items included), four measures (i.e., the Depressive Symptom Inventory – Suicide Subscale (DSI-SS), the Suicidal Behaviours Questionnaire – Revised (SBQ-R), the Suicidal Ideation Attributes Scale (SIDAS), and the Suicide Ideation Questionnaire (SIQ)) that seemed like a good fit for the present study context were reviewed further based on their psychometrics. The DSI-SS was highlighted for having good reliability and validity in several of the studies (Cole et al., 2020; O'Keefe & Wingate, 2013; Shand et al., 2013; Tighe et al., 2017). Researchers noted that the DSI-SS has demonstrated excellent reliability in American Indian samples in both past and more recent studies (Cole et al., 2013, 2020a), with the most recent study finding particularly good reliability ($\alpha = .93$; Cole et al., 2020). The SBQ was also highlighted as having strong validity and reliability, and as being a gold standard self-report instrument (Stanley et al., 2020). As well, two studies noted good internal consistency (i.e., $\alpha = .86$, [Fitzpatrick et al., 2020]; $\alpha = .84$, [Stanley et al., 2020]) in recent studies with American Indian/Native American participants. While the SIDAS was noted to have high internal consistency and good convergent validity within non-Indigenous samples (Van Spijker et al., 2014), no psychometrics were available from any Indigenous samples. Finally, the SIQ was noted as having good reliability and validity within past and more recent samples of Native American participants (Keane et al., 1996; Peters & Peterson, 2019). However, this measure was copyrighted and is not freely available online.

While each of the four measures discussed above had evidence of good psychometrics, the SIDAS lacked psychometric evidence specifically for Indigenous samples and use of the SIQ

came with an associated cost. Both the DSI-SS and the SBQ-R had been validated with Indigenous participants and were freely available online. As well, they were preferable based on other practical considerations (e.g., length, self-report), and they assessed different time frames (i.e., the DSI-SS assesses the past two weeks, while the SBQ-R assesses lifetime and future aspects of SRBs), making both measures useful options within the present thesis.

Appendix B: Adult Residential Treatment Centre (ARTC) Intake Measure

These questions will ask about your mental health. This information will allow us to better understand clients who attend Dilico Anishinabek Family Care's Adult Residential Treatment Centre. You do not have to answer any question that you don't want to.

Addiction History

Primary Substances

Please list up to 3 primary substances used over the past 12 months

Primary Substance	Age of first use:	Age regular use began:

Substances used in the last 12 months: (please check all that apply)

☐ Alcohol ☐ Methadone ☐ Oxycontin ☐ Cocaine ☐ Barbiturates (i.e. Phenobarbital)	☐ Crack ☐ Glue/inhalant ☐ Hallucinogens (i.e., Ecstasy) ☐ Heroin/Opium ☐ Cannabis	☐ Over the counter Codeine (i.e., Tylonel 1 & 3) ☐ Amphetamines (i.e. Ritalin) ☐ Benzodiazepine (i.e. Ativan, Valium) ☐ Prescription Opioids (i.e., Morphine)

Have you ever experienced: (please check all that apply)

☐ Hangovers	☐ Vomiting	☐ Shakes	☐ Paranoia
☐ Black out	☐ Seizures	☐ Hallucinations	☐ Health Problems

Have you ever engaged in:

Injection drug use:	☐ Yes	☐ No

Mental Health Treatment

Have you previously attended substance use treatment? ☐ **Yes** ☐ **No**

If yes, please complete the section below.

Substance use treatment attempts	Completed?	
1	☐ Yes	☐ No
2	☐ Yes	☐ No
3	☐ Yes	☐ No

Please indicate:

Length of time sober following treatment:	
Reasons for returning to substances:	

Please indicate (regardless of attending substance use treatment in the past):

Have you ever been hospitalized due mental health problems?	☐ Yes	☐ No
Have you ever had counselling for mental health issues?	☐ Yes	☐ No

Mental Health History

Do any of the following apply to you? (please check all that apply)	
☐ Tension, anxiety, nervousness	☐ Depression
☐ Eating concerns (bingeing, starving)	☐ Fears, phobias
☐ Sexual abuse/assault	☐ Sexuality concerns
☐ Physical/emotional/mental abuse	☐ Anger/aggression problems
☐ Low self-esteem	☐ Difficulty expressing emotions
☐ Grief issues	☐ Sleeping concerns

Legal Status and History

Have you been incarcerated in the past?	☐ Yes	☐ No
On Probation:	☐ Yes	☐ No
On Parole:	☐ Yes	☐ No

Dependent Child(ren)

Do you have any children in care (e.g., Dilico, CAS, etc.)?	☐ Yes	☐ No
How many of your children are in care?		

Appendix C: Time 1 Health History Questionnaire (HHQ)

Time 1: Health History Questionnaire

These questions will ask about yourself and your family. This information will allow us to better understand problems that may occur early in life, and may help others in the future. Some of these questions ask about sensitive topics and some people may feel uncomfortable with these questions. You do not have to answer any question that you don't want to.

1. How old are you?	AGE: _____
2. Where were you born? (community and province)	BIRTH PLACE: _____
3. What was your biological sex determined at birth?	Male Female Intersex Other: _____
4. What is your gender identity? (ie: your own personal experience of gender)	Male Female Transgender woman Transgender man Gender queer or nonbinary Unsure Other (please specify): _____
5. Do you self-identify as Indigenous?	1= YES 2= NO

6. If YES, what band, reserve, or community are you affiliated with?	NAME: _____ DOES NOT APPLY
7. How far did you get in school?	1= Didn't go to school/Lower than grade 6 2= Elementary (Grade 6) 3= Middle School (Grade 8) 4= Some high school 5= High school graduate or GED 6= Some college or technical school 7= University Degree (Bachelor) 8= Professional Degree (Master's or PhD)
8. What is your current marital status? Are you now:	1= Married 2= Common Law (not married but living together) 3= In a serious relationship 4= Widowed 5= Separated 6= Divorced 7= Single/Not in a serious relationship
9. How many times have you been married?	1= 1 2= 2 3= 3 4= 4 or more 5= Never married
10. How old were you when you were first married?	AGE: _____ DOES NOT APPLY

11. Prior to treatment at ARTC, what was your living situation?	1= Living Alone 2= With spouse/partner 3= With roommates/friends 4= With parents/other family 5= No permanent resident 6= None of the above, my living status is: _____
12. Where do you anticipate living after ARTC?	1= Living Alone 2= With spouse/partner 3= With roommates/friends 4= With parents/other family 5= No permanent resident 6= None of the above, my living status is: _____
13. What is your current annual income?	1= < $10 000 2= <$10 001 to $19 999 3= $20 0000 to $29 999 4= $30 000 to $39 999 5= $40 000 to $60 000 6= > than $60 000
14. Which of the following best describes your employment status before coming to ARTC?	1= Full time (35 hours or more) 2= Part-time (1-34 hours) 3= Student

	4= Sick leave 5= Unemployed looking for work 6= Unemployed not looking for work 7= Retired 8= Disability (ODSP, OW) 9= Home/parenting
15. During the 30 days prior to entering treatment at ARTC, how many days did you miss work due to stress or feeling depressed?	# of days _____ DOES NOT APPLY
16. During the 30 days prior to entering treatment at ARTC, how many days of work did you miss due to poor physical health?	# of days _____ DOES NOT APPLY
17. Have you ever attended a residential school?	1= YES 2= NO
18. If so, what age did you attend and for how many years?	AGE _____ Years attended _____

Childhood & Family Questions

19. During your childhood, how many times did you move residences, even in the same town/community?	# of times _____
20. How much education does/did your mother have?	1= Didn't go to school/Lower than grade 6 2= Elementary (Grade 6) 3= Middle School (Grade 8) 4= Some high school 5= High school graduate or GED 6= Some college or technical school 7= University Degree (Bachelor) 8= Professional Degree (Master's or PhD) 9= DON'T KNOW/ DOES NOT APPLY
21. How much education does/did your father have?	1= Didn't go to school/Lower than grade 6 2= Elementary (Grade 6) 3= Middle School (Grade 8) 4= Some high school 5= High school graduate or GED 6= Some college or technical school 7= University Degree (Bachelor) 8= Professional Degree (ie: MA) 9= DON'T KNOW/ DOES NOT APPLY

Pregnancy

22. Have you ever been pregnant? *If no, skip to question 35*	1= YES 2= NO
23. Are you pregnant now?	1= YES 2= NO 3= DON'T KNOW
24. How many times have you been pregnant?	# of times: _____
25. How many pregnancies resulted in the birth of a child?	# of births: _____
26. How old were you the first time you became pregnant?	AGE: _____
27. The first time you became pregnant, how old was the person who got you pregnant?	AGE: _____
28. How did your first pregnancy end?	1= Live birth 2= Stillbirth/miscarriage 3= Tubal or ectopic pregnancy 4= Elective abortion 5= Other: _____
29. When your first pregnancy began, did you intend to get pregnant at that time in your life?	1= YES 2= NO 3= DON'T KNOW

Sexual Health

In order to get a more complete picture of the health of our patients, the next three questions are about voluntary sexual experiences.

30. How old were you the first time you had voluntary sexual intercourse?	AGE: _____ NEVER HAD INTERCOURSE
31. How many different partners have you had sexual intercourse with?	# of partners: _____ NEVER HAD INTERCOURSE

Tobacco Use

32. Have you smoked at least 100 cigarettes in your life?	1= YES 2= NO
33. How old were you when you began to smoke cigarettes fairly regularly?	AGE: _____ DOES NOT APPLY
34. Do you smoke cigarettes now or chew tobacco?	1= YES 2= NO
45. If yes, on average, how many cigarettes per day do you smoke?	# of cigarettes: _____ DOES NOT APPLY
46. If you used to smoke cigarettes but don't smoke now, about how many cigarettes a day did you smoke?	# of cigarettes: _____

	DOES NOT APPLY
47. How old were you when you quit?	AGE: _____ DOES NOT APPLY
48. During your first 18 years of life did your father smoke?	1= YES 2= NO 3= DON'T KNOW/DOES NOT APPLY
49. During your first 18 years of life did your mother smoke?	1= YES 2= NO 3= DON'T KNOW/DOES NOT APPLY

Exercise/Health

50. During the past month, about how many days per week did you exercise for recreation or to keep in shape?	# of times per week: _____
51. During the past month, when you did exercise, how long did you usually exercise for? (in minutes)	0=0 1=1-19 2=20-29 3=30-39 4=40-49 5=50-59 6=60 or more
52. What is the most you have ever weighed? (in lb)	WEIGHT in LB: _____

53. How old were you at your heaviest weight?	AGE: _____

Substance Use

54. How old were you when you had your first drink of alcohol, other than a few sips?	AGE: _____ NEVER DRANK
During each of the following age intervals, what was your usual number of drinks of alcohol per week? Remember, 1 standard alcoholic drink = one bottle of beer, one cooler, one small (4-ounce) glass of wine, or one shot/ mixed drink containing an ounce of hard liquor.	
55. AGE 12 to 14	1=None 2=Less than 6 per week 3=7-13 per week 4=14 or more per week
56. AGE 15 to 18	1=None 2=Less than 6 per week 3=7-13 per week 4=14 or more per week
57. AGE 19 to 29	1=None 2=Less than 6 per week 3=7-13 per week 4=14 or more per week
58. AGE 30 to 39	1=None

	2=Less than 6 per week 3=7-13 per week 4=14 or more per week
59. AGE 40 to 49	1=None 2=Less than 6 per week 3=7-13 per week 4=14 or more per week
60. AGE 50 and older	1=None 2=Less than 6 per week 3=7-13 per week 4=14 or more per week
61. In the 30 days prior to entering treatment at ARTC, did you drink any alcohol?	1= YES 2= NO
62. In the 30 days prior to entering treatment at ARTC, how many <u>days per week</u> did you drink any alcoholic beverages on average?	DOES NOT APPLY # of days per week: _____
63. On the days when you drank, about how many <u>drinks per day</u> did you have on average?	DOES NOT APPLY # of drinks per day: _____
64. How many times during the past month did you have more than 5 drinks at one occasion?	# of times: _____

65. In the 30 days prior to entering treatment at ARTC, how many times have you driven when you've had perhaps too much to drink?	# of times: _____
66. In the 30 days prior to entering treatment at ARTC, how many times did you ride in a vehicle drive by someone who had been drinking?	# of times: _____

Family Alcohol Use

67. During your first 18 years of your life, did you live with anyone who was a problem drinker or alcohol?	1= YES 2= NO
68. Who? *Check all that apply:*	o Father o Mother o Brothers o Sisters o Other Relatives: _____ o Other non-relatives: _____ # of CIRCLES CHECKED: _____
69. Have you ever been married to someone (or lived with someone as if you were married) who was a problem drinker or alcoholic?	1= YES 2= NO

Substance Use

70. Have you ever used street drugs? *(i.e., cocaine, speed, LSD, heroin)*	1= YES 2= NO
71. If yes, how old were you the first time you used them?	

	AGE: _____
72. About how many times have you used street drugs?	0=0 1=1-2 2=3-10 3=11-25 4=26-99 5=100+
73. Have you ever considered yourself to be addicted to street drugs?	1= YES 2= NO

Appendix D: Time 2 Health History Questionnaire (HHQ)

These questions will ask about yourself and your family. This information will allow us to better understand problems that may occur early in life and may help others in the future. Some of these questions ask about sensitive topics and some people may feel uncomfortable with these questions. You do not have to answer any question that you don't want to.

The next questions ask about the first 18 years of your life, and about family members in your household.

1. Did you live with anyone who used street drugs?	1= YES 2= NO
2. Did your mom ever drink alcohol when she was pregnant with you	1= YES 2= NO 3= DON'T KNOW
3. Were your parents ever separated or divorced?	1= YES 2= NO
4. Did you ever live with a stepfather?	1= YES 2= NO
5. Did you ever live with a stepmother?	1= YES 2= NO
6. Did you ever live in a foster home?	1= YES 2= NO
7. If yes, at what age were you first placed in foster care?	AGE: _____
8. If yes, how many foster family placements did you have during your childhood?	# of placements: _____
9. If yes, what age was your last foster family placement?	AGE: _____
10. Did you ever run away from home for more than one day?	1= YES 2= NO
11. Did your brothers or sisters run away from home for more than one day	1= YES 2= NO

12. Was anyone in your household depressed or mentally ill?	1= YES	2= NO
13. Did anyone in your household attempt suicide?	1= YES	2= NO
14. Did anyone in your household go to prison?	1= YES	2= NO
15. Did anyone in your household commit a serious crime?	1= YES	2= NO

Sometimes physical blows occur between parents. While you were growing up, in the first 18 years of your life, how often did your mother's partner (i.e.: father/stepfather/boyfriend) do any of these things to your mother (or stepmother)?

16. Push, grab, slap, or throw something at her?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often
17. Kick, bite, hit her with a fist, or hit her with something hard?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often
18. Repeatedly hit her over at least a few minutes?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often

19. Threaten her with a knife or gun to hurt her?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often

While you were growing up, during the first 18 years of your life, how true were each of the following statements?

20. You didn't have enough to eat.	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
21. You knew there was someone to take care of you and protect you	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
22. People in your family called you things like "lazy" or "ugly"	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true

23. Your parents were too drunk or high to take care of the family?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
24. There was someone in your family who helped you feel important or special?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
25. You had to wear dirty clothes?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
26. You felt loved?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
27. You thought your parents wished you had never been born?	1= Never true 2= Rarely true

	3= Sometimes true 4= Often true 5= Very often true
28. People in your family looked out for each other?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
29. You felt that someone in your family hated you?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
30. People in your family said hurtful or insulting things to you?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
31. People in your family felt close to each other?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true

32. You believe that you were emotionally abused?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
33. There was someone to take you to the doctor if you needed it?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
34. Your family was a source of strength and support?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true
35. Your family did not send you to school, even when it was available?	1= Never true 2= Rarely true 3= Sometimes true 4= Often true 5= Very often true

Sometimes parents or other adults hurt children. While you were growing up, during the first 18 years of your life, how often did a parent, stepparent or adult living in your home:

36. Swear at you, insult you, or put you down?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often
37. Threaten to hit you or throw something at you, but didn't do it?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often
38. Actually push, grab, shove, slap you, or throw something at you?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often
39. Hit you so hard that you had marks or were injured?	1= Never 2= Once, twice 3= Sometimes 4= Often 5= Very often
40. Act in a way that made you afraid that you might be physically hurt?	1= Never 2= Once, twice 3= Sometimes

	4= Often 5= Very often

Some people, while growing up in their first 18 years of life, had a sexual experience with an adult or someone at least five years older than themselves. These experiences may have involved a relative, family friend, or stranger.

41. During the first 18 years of your life, did an adult, older relative, family friend, or stranger ever sexually abuse you? This can include an adult touching your body in a sexual way, having you touch their body in a sexual way, attempting to have any type of sexual intercourse (oral, anal, or vaginal) with you, or having sexual intercourse with you.	1= YES 2= NO
42. If yes, the first time this happened, how old were you?	AGE: _____
43. About how many times did this happen to you?	# of times: _____ DOES NOT APPLY

As an adult, (age 19 or older), did:

44. Anyone ever force or threaten you with harm in order to have sexual contact, such as touching your sexual parts or trying to have intercourse with you?	1= YES 2= NO

Appendix E: Information Letter

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Study Information Letter:

Understanding Childhood Experiences and Relation to Substance Use for First Nations People

Principal Investigator: Dr. Christopher Mushquash, Lakehead University, in collaboration with Dilico Anishinabek Family Care

Co-Investigators: Dr. Elaine Toombs, Dilico Anishinabek Family, and Dr. Jessie Lund.

Email: etoombs@lakeheadu.ca or jlund@lakeheadu.ca

Student Investigators: Abbey Radford and Lydia Hicks, Lakehead University

Email: arradfor@lakeheadu.ca or lhicks2@lakeheadu.ca

Dear potential participant,

We invite you to take part in a research study being conducted by Dr. Christopher Mushquash, Dr. Elaine Toombs, Dr. Jessie Lund, Abbey Radford, and Lydia Hicks in partnership with Dilico Anishinabek Family Care. As someone seeking treatment for substance use, your experiences and perspectives may help us understand how childhood experiences may influence substance use across your lifetime.

Your participation in this study is voluntary and you may withdraw from this study at any time**. Your decision to take part or not to take part in the study, or to drop out of the study at a later time, will never affect your access to services or supports at Dilico Anishinabek Family Care.** You should discuss any questions you have about this study with Dr. Mushquash, Dr. Elaine Toombs, Dr. Jessie Lund, Abbey Radford, Lydia Hicks, or your counsellor at Dilico. Please take as much time as you need to decide if you'd like to participate.

Purpose of this study

The purpose of this study is to understand how childhood experiences of trauma may influence substance use and other health outcomes for First Nations people.

Who can participate in this study?

You must be a current client at the Adult Residential Treatment Centre (ARTC) and aged 18 years or older to participate in this study.

Who will be conducting the research?

Dr. Christopher Mushquash, Dr. Elaine Toombs, Dr. Jessie Lund, Abbey Radford, Lydia Hicks and staff at Dilico Anishinabek Family Care will be conducting the research.

What will I be asked to do?

You will be asked to complete questionnaires with your individual counsellors at ARTC. Some of these questionnaires will be used for your treatment at ARTC and would be completed with your individual counsellor whether you agree to participate in this study or not (ie: for clinical purposes). Some questionnaires however will only be used for research purposes. If you consent to participant in this study, some information collected as part of your intake to ARTC (including prior treatment history, substance use history, and health history) will also be shared with study researchers. No identifying information (such as your birth date, home address, or health insurance information) will be shared. **The only scenario in which your information may be shared is if your responses to the questions about suicide indicate current risk. In this scenario, the ARTC program manager would be notified and your responses to the suicide-related questionnaires would be shared with your counsellor to ensure you receive appropriate treatment. No other questionnaire responses would be shared.**

Additional questions will ask you about individual and family life experiences about substance use, addiction, health outcomes, and trauma. Some questions will ask about difficult experiences you may have had in your life, which may be difficult to answer or

may cause distress. It will take approximately 90 minutes to complete these questions, which will be completed in two sessions. If you agree to participate, you will have the option to complete questions individually using pen and paper or have the questions read to you and you respond orally. You do not have to answer all questions and can skip questions that you are not comfortable answering.

What are the burdens and potential harms to participation?

There is a possibility that answering some of the questions may make you feel upset. There is a small burden of time associated with the completion of the assessment questions and program content. If you feel upset at any time completing the study, please contact your counsellor at ARTC as they can connect you with appropriate resources. If you have research related questions, please contact your Dr. Mushquash by phone at (807) 343-8239 or by email at chris.mushquash@lakeheadu.ca.

What are the potential benefits?

There are minimal individual benefits to participating in this study. You may find it satisfying to contribute to research programs and/or help First Nations communities understand how adverse childhood experiences may influence substance use.

Can I withdraw from the study?

This study is voluntary. You are free to withdraw from the study at any time, and free to remove your answers from the study, up until the point at which the study is complete (approximately December 2026). Your decision to take part or not to take part in the

study, or to drop out of the study at a later time, will never affect your access to services or supports at Dilico Anishinabek Family Care.

How will my privacy be protected?

Anonymity: Your individual information will not appear in any reports or publications. All information will only be used when it is combined with other participants' information, without your name or other information that would identify you. Several steps have also been taken to protect your confidentiality (see below).

Confidentiality: All information obtained is strictly confidential. The information you provide will only be accessed by designated members of the research team. All Dilico staff are trained to maintain your confidentiality and have signed confidentiality agreements. **As stated above, the only scenario in which your information may be shared is if your responses to the questions about suicide indicate current risk. In this scenario, the ARTC program manager would be notified and your responses to the suicide-related questionnaires would be shared with your counsellor to ensure you receive appropriate treatment. No other questionnaire responses would be shared.**

Consistent with Lakehead University's policy on research data storage, paper copies of your information will be securely stored for 5 years after the completion of the study at Dilico. Your consent form will be stored separately from any collected data. These files will be stored in a locked filing cabinet in a locked office at Dilico, like all other client

files. Electronic versions of de-identified data will be held for an indefinite period of time and will be kept in a password-protected USB drive in Dr. Mushquash's locked laboratory for a brief time and then will be held for 5 years at Dilico.

Electronic versions of the data will never include your name or contact information but will contain the following information about you: age, sex, ethnicity (i.e., self-reported ethnicity and country of birth), occupation, and nature of employment (e.g., full-time, part-time, etc.). Electronic information will be used by researchers at Lakehead University for a brief time and then stored at Dilico.

How can I receive a copy of the study results?

If you would like to receive a summary of study results, you can indicate this on the study consent form and provide your contact information. Individual results will not be made available to participants.

What if I have study questions or problems?

If you have any questions about this study or your participation, you may contact Dr. Mushquash by emailing chris.mushquash@lakeheadu.ca.

What are my research rights?

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Lakehead University's Research Ethics Board for assistance at (807) 343-8283.

This study has been approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team please contact Sue Wright at the Research Ethics Board at 807-343-8283 or research@lakeheadu.ca.

Appendix F: Consent Letter

Department of Psychology
t: (807) 343-8239 f: (807) 346-7734
e: chris.mushquash@lakeheadu.ca

CONSENT FORM: Understanding Childhood Experiences and Substance Use for First Nations People

Agreement to Participate

1) **Study Purpose**: Dilico Anishinabek Family Care, in collaboration with Dr. Christopher Mushquash at Lakehead University, is doing this study to understand how childhood experiences of trauma may influence substance use and other health outcomes for First Nations people.

2) **Participation:** We are inviting clients of the Adult Residential Treatment Centre (ARTC) to participant in approximately an hour interview asking about individual and family life experiences about substance use, addiction, health outcomes, and trauma.

3) **Confidentiality:** All information given is private and we will not share your individual answers with anyone outside of the research team. All Dilico staff are trained to maintain participant confidentiality and have signed confidentiality agreements. The only exception in which your information may be shared is if your responses to the questions about suicide indicate current risk; in this scenario, the ARTC program manager and your counsellor will be notified to ensure you receive appropriate treatment. Study information will be kept in locked cabinets at Dilico Anishinabek Family Care offices in Thunder Bay for 5 years, and then destroyed. Your consent form will be stored separately from any collected data. Electronic information will be password protected. All information that you provide will be combined with information from all the other people interviewed, so no one will know what you said specifically. We will never use your name in our reports or presentations.

4) **Benefits and Risks**: There are minimal benefits and risks to you during your study participation. Some people may find it satisfying to participate in research activities. There is a possibility that answering some of the questions or participating in this study may make you feel upset. If you do feel uncomfortable or upset during your participation, please tell your counsellor at ARTC as they can help support you and connect you with appropriate resources to help.

5) **Reporting:** When our study is complete, we will prepare a summary of findings. You will also be able to request a summary of results by contacting the research team. In collaboration with the project advisory, we may prepare additional reports for publication in order to share the information for the benefit of others working with First Nations people with substance use

concerns. Again, as a participant in this study, we will never include your name – your confidentiality and privacy will always be respected.

6) **Further Information**: If you have questions about the study after the study is completed or wish to receive a copy of the study results, you can contact Dr. Christopher Mushquash by telephone at (807) 343-8239 or by email at chris.mushquash@lakeheadu.ca. If you wish to speak to someone other than a researcher about the study, you may call the Lakehead University Research Ethics Board at (807) 343-8283.

7) **Confirmation of Agreement to Participate**: It is your choice if you would like to participate in this study. Your decision to take part, or not take part, will **never** affect the services you receive from Dilico Anishinabek Family Care.

a) I agree to the following:

- ✓ I have read and understand the information contained in the Information Letter
- ✓ I agree to participate
- ✓ I understand the risks and benefits to the study
- ✓ That I am a volunteer and can withdraw from the study at any time, and may choose not to answer any question
- ✓ That the data will be securely stored at Dilico for a minimum period of 5 years following completion of the research project
- ✓ I understand that the research findings will be made available to me upon request
- ✓ I will remain anonymous
  - ✓ However, should my responses to the questions about suicide indicate current risk, I am aware that the ARTC program manager and my counsellor will be notified to ensure I receive appropriate treatment
- ✓ All of my questions have been answered
- ✓ By consenting to participate, I have not waived any rights to legal recourse in the event of research-related harm.

b) Would you like to receive a copy of the study results?

_____ Yes _____ No

If you would like to receive a copy of the results, please provide us with your contact information:

Mailing Address **Email Address**

Participant Name: _____ **Witness Name**: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Optional study information:

In order to understand more about how childhood experiences affect health outcomes for First Nations people, we would like to contact study participants again to ask other questions that relate to your overall health and wellbeing, including how biological stress hormones may influence overall health.

Would you like to be contacted to receive more information about these studies?

_____ Yes _____ No

To receive more information, please provide us with your contact information:

Mailing Address **Email Address** **Telephone Number**

Appendix G: Depressive Symptom Index – Suicidality Subscale (DSI-SS)

Instructions: On this questionnaire are groups of statements. Please read all of the statements in a given group. Pick out and circle the one statement in each group that describes you best for the past TWO WEEKS. If several statements in a group seem to apply to you, pick the one with the higher number. BE SURE TO READ ALL OF THE STATEMENTS IN EACH GROUP BEFORE MAKING YOUR CHOICE.

A) 0 I do not have thoughts of killing myself.

1 Sometimes I have thoughts of killing myself.

2 Most of the time I have thoughts of killing myself.

3 I always have thoughts of killing myself.

B) 0 I am not having thoughts about suicide.

1 I am having thoughts about suicide but have not formulated any plans.

2 I am having thoughts about suicide and am considering possible ways of doing it.

3 I am having thoughts about suicide and have formulated a definite plan.

C) 0 I am not having thoughts about suicide.

1 I am having thoughts about suicide but have these thoughts completely under my control.

2 I am having thoughts about suicide but have these thoughts somewhat under my control.

3 I am having thoughts about suicide but have little or no control over these thoughts.

D) 0 I am not having impulses to kill myself.

1 In some situations I have impulses to kill myself.

2 In most situations I have impulses to kill myself.

3 In all situations I have impulses to kill myself.

Appendix H: Suicide Behaviours Questionnaire – Revised (SBQ-R)

Instructions: Please check the number beside the statement or phrase that best applies to you.

1. **Have you ever thought about or attempted to kill yourself?** (check one only)
    - 1. Never
    - 2. It was just a brief passing thought
    - 3a. I have had a plan at least once to kill myself but did not try to do it
    - 3b. I have had a plan at least once to kill myself and really wanted to die
    - 4a. I have attempted to kill myself, but did not want to die
    - 4b. I have attempted to kill myself, and really hoped to die

2. **How often have you thought about killing yourself in the past year?** (check one only)
    - 1. Never
    - 2. Rarely (1 time)
    - 3. Sometimes (2 times)
    - 4. Often (3-4 times)
    - 5. Very Often (5 or more times)

3. **Have you ever told someone that you were going to commit suicide, or that you might do it?** (check one only)
    - 1. No
    - 2a. Yes, at one time, but did not really want to die
    - 2b. Yes, at one time, and really wanted to die
    - 3a. Yes, more than once, but did not want to do it
    - 3b. Yes, more than once, and really wanted to do it

4. **How likely is it that you will attempt suicide someday?** (check one only)
    - 0. Never

- 1. No chance at all
- 2. Rather unlikely
- 3. Unlikely
- 4. Likely
- 5. Rather likely
- 6. Very likely