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# Analysis of the child and adolescent needs and strengths assessment in a First Nation population

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Analysis of the Child and Adolescent Needs and Strengths Assessment in a First Nation Population

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**Table of Contents**

**Abstract**..... 6

**Introduction**..... 7

Determinants of Health..... 8

Contrasting Models of Mental Health..... 12

Developing Culturally and Contextually Appropriate Mental Wellness Services ..... 13

Aboriginal Mental Health and Child Welfare Service Provider ..... 14

Timely Access to Services ..... 15

Broadband Mental Health Screening Instruments ..... 17

    Behavioural Assessment System for Children (BASC)..... 18

    Achenbach System for Empirically Based Assessment (ASEBA)..... 20

    Limitations of the BASC-2 and ASEBA. .... 22

Child and Adolescent Needs and Strengths assessment (CANS)..... 23

Description of the Current Study ..... 29

**Method** ..... 32

Participants..... 32

Measures ..... 33

    Demographic information..... 33

    Child and Adolescent Needs and Strengths Assessment (CANS)..... 33

Procedure ..... 37

Statistical Analyses ..... 38

**Results** ..... 38

|  |    |
|--|----|
| MENTAL HEALTH NEEDS IN FIRST NATIONS' CHILDREN   | 4  |
| Demographic Variables .....  | 38 |
| Mental Health Needs in the Total Sample .....  | 40 |
| Stability of Mental Health Symptoms.....   | 40 |
| Predictors of Acute CANS Mental Health Symptoms.....   | 41 |
| <b>Discussion</b> .....  | 49 |
| Limitations .....  | 58 |
| Implications.....  | 61 |
| Future Research .....  | 62 |
| <b>Appendix A: Tables</b> .....  | 63 |
| Table 1. Demographics for Acute CANS, CANS-MH, and Total Sample.....   | 63 |
| Table 2. Acute CANS Domain Scores.....   | 63 |
| Table 3. Mental Health Needs on the Acute CANS .....   | 64 |
| Table 4. <i>t</i> -test comparison of Mental Health Needs at Intake Assessment and Entry into Mental Health Services ..... | 65 |
| Table 5. Frequency of Endorsement for Acute CANS Domain Items Included in Hierarchical Regression Models.....              | 66 |
| Table 6. Hierarchical regression predicting Acute CANS Anxiety, Mood, and Emotional Control scores.....                    | 67 |
| Table 7. Comparison of hierarchical regression to bootstrapped regression for Adjustment to Trauma scores .....            | 68 |
| <b>Appendix B: Figures</b> .....   | 69 |

Graph 1: Predicted mean Anxiety score for Individual Strengths (with 95% confidence intervals) ..... 69

Graph 2: Predicted mean Anxiety score for Family/Caregiver Needs and Strengths (with 95% confidence intervals)..... 69

Graph 3: Predicted mean Mood score for Individual Strengths (with 95% confidence intervals)70

Graph 4: Predicted mean Mood score for Family/Caregiver Needs and Strengths (with 95% confidence intervals)..... 70

Graph 5: Predicted mean Emotional Control score for Age at Referral (with 95% confidence intervals) ..... 71

Graph 6: Predicted mean Adjustment to Trauma score for Individual Strengths (with 95% confidence intervals)..... 71

**Appendix C: Measures** ..... 72

Acute CANS ..... 72

CANS-MH Domains & Items..... 74

**References**..... 77

### **Abstract**

First Nations youth are one of the fastest growing demographics in Canada, yet they are more likely to experience adverse health and life circumstances than non-Indigenous Canadians. Developing and implementing appropriate interventions for mental health is a priority area in decreasing this health gap, and requires the incorporation of First Nation models of mental wellness. Mental Wellness for First Nations' youth is tied to interpersonal and cultural factors such as relationships with caregivers and the greater community, caregiver and/or community access to necessary resources, and cultural identities. Examining these wider sociocultural factors, in combination with youth characteristics and strengths, provides a more comprehensive understanding of how to address mental health needs in First Nation communities. Working in collaboration with a First Nation based community health provider, the Child and Adolescents Needs and Strengths (CANS) assessment was analyzed for 178 First Nation children to identify specific mental health intervention needs and explore predictors of mental health needs. The CANS is a reliable measure that assesses youth mental health needs, caregiver needs, individual strengths, environmental strengths, as well as many other factors. The most commonly reported mental health intervention needs were seen for Anxiety, Mood, Emotional Control, and Adjustment to Trauma. Hierarchical regression identified referents' age, sex, Functioning, Individual Strengths, and Family/Caregiver Needs and Strengths domain scores as predictive of mental health intervention needs. Age and Functioning domain scores were robust individual predictors of mental health needs across most models, yet sex was not individually predictive in any model.

Analysis of the Child and Adolescent Needs and Strengths Assessment in a First Nation  
Population

Aboriginal children are one of the fastest growing demographics within Canada, yet they are also one of the most vulnerable (Canadian Council of Provincial Child and Youth Advocates [CCPCYA], 2010). Compared to non-Aboriginal children, they are more likely to experience substance use, alcohol use, and marijuana use disorder, as well as comorbidity between conduct disorder and substance use disorder (Whitbeck, Yu, Hoyt, & Walls, 2008). Furthermore, Aboriginal children are overrepresented in the child welfare system (CCPCYA; Stevenson, 2013). The Canadian government has provided services aimed at reducing the inequities that affect many Aboriginal communities in Canada (e.g., the National Aboriginal Youth Suicide Strategy, National Native Alcohol and Drug Abuse Program, Building Health Communities), however, the impact and outcomes of these services is often limited (CCPCYA, 2010) or unknown. It has been argued that these services fail to meet the needs of Aboriginal communities because they do not allow for Aboriginal communities to determine how they will be developed and provided (Dell et al., 2012). Engaging in health research where an understanding of Westernized health can come together with First Nations' understandings of wellness can help to address this (Dell et al., 2012).

Throughout this manuscript, the term "Indigenous" is used to refer to international groups of people who are the original or first inhabitants of the land. The term "Inuit" refers to Indigenous populations who historically lived in the Arctic or Sub-Arctic region of Canada, "Métis" individuals are of mixed Aboriginal and non-Aboriginal ancestry within Canada, and "First Nation" (FN) refers to individuals of Indigenous descent in Canada who are members of a band or First Nation (Policy Research Initiative, 2003; Poirier, 2015). The term "Anishinawbe"



refers to First Nations populations from the Ojibway/Chippewa, Odawa, and Pottawatomi Nations that often collaborate in a confederacy of many different Nations spanning a large geographical area from the Plains to the Great Lakes of North America (Stark, 2012). The term “Aboriginal” refers to all Indigenous populations in Canada (i.e., FN, Inuit and Métis; Policy Research Initiative; Poirier). Indigenous populations from the USA are referred to as either “Alaskan Native” (AN), reflecting descendants of Indigenous populations who historically resided in the Arctic state of Alaska, or “American Indian” (AI), reflecting descendants of Indigenous populations from the remaining states (or AI/AN combined). To maintain consistency, the terms used by authors in specific papers in the literature will be used.

### **Determinants of Health**

Social determinants of health are factors that influence the development and maintenance of health along a continuum from excellent to poor (Loppie Reading & Wein, 2009, pg. 1). Loppie Reading and Wein suggest that these determinants of health, which include systems, structures, institutions, circumstances, and environments, can be categorized into three levels: proximal, distal, and intermediate factors. Proximal factors directly influence an individual’s physical, spiritual, emotional, or mental health and include health behaviours as well as an individuals’ physical and social environment (Loppie Reading & Wein, 2009, pg. 5). Intermediate factors include community access to resources, infrastructure, systems, and capacity which often influence and exacerbate proximal factors (Loppie Reading & Wein, 2009, pg. 1). Distal factors can include historical and existing political, social, and economic factors that influence health and health behaviours (Loppie Reading & Wein, 2009, pg. 20). Each of these levels of determinants can affect individuals’ physical, spiritual, mental, and emotional health.

Aboriginal people in Canada face a number of adverse proximal health factors that influence all aspects of their health. These include disproportionate rates of lower education, income, and employment rates, lack of appropriate and attainable housing, higher rates of food insecurity, and higher rates of chronic and communicable diseases in comparison to non-Aboriginal communities (Health Canada, 2015 [MWCF], pg. 33-34; Loppie Reading & Wein, 2009). These factors often interact and compound the influence of one another. For example, Aboriginal people are more likely than mainstream Canadians to live in overcrowded houses and/or in houses that need major repairs (see Loppie Reading & Wein, 2009). Living in such houses can lead to health problems, such as an increased incidence of respiratory infection, as well as social or emotional problems such as increased levels of stress and interpersonal disputes (Loppie Reading & Wein, 2009). Furthermore, First Nations people who experience chronic illness are more likely to have attempted suicide at some point in their life (First Nations Information Governance Centre [FNIGC], 2012).

Intermediate determinants of health are often the origin of proximal determinants of health (Loppie Reading & Wein, 2009, pg. 15). Intermediate determinants include such things as the healthcare system, educational system, community infrastructure, environmental stewardship, and cultural continuity (Loppie Reading & Wein). The child welfare system is also an example of an intermediate determinant of health. Within the child welfare system, investigations are 4.2 times more likely for FN families than non-Aboriginal families in Canada, and are most frequently related to investigations of neglect or potential risks such as caregiver substance abuse, having few social supports, low income, or housing problems (Sinha, Trocmé, Fallon, & MacLaurin, 2013). One can see the connection between these intermediate determinants of health and proximal determinants of health. The healthcare system is another intermediate

determinant of health in Aboriginal populations. It can be difficult for Aboriginal people to access the health system, not only due to physical limitations such as a lack of services within the community or lack of transportation, but the accessibility of services can be dampened by a lack of understanding of influential proximal factors or culturally inappropriate services that neglect holistic, traditional models of health (Loppie Reading & Wein). The development of these systems is influenced by common beliefs, ideologies, and values within a society that can be observed by examining distal determinants of health.

Distal determinants of health are the political, social, and economic contexts that construct intermediate and proximal determinants of health (Loppie Reading & Wein, 2009). For Aboriginal people in Canada, these distal determinants include colonialism, racism and social exclusion, as well as self-determination (Loppie Reading & Wein). Colonialism has had a profound impact on the health of Aboriginal people in Canada. For many years, Aboriginal children were forcibly removed from their homes to attend residential schools in a government mandated attempt to assimilate communities into a western way of living. These schools were profoundly disruptive to Aboriginal children, families, and communities; many attendees experienced trauma related to physical, emotional, and/or sexual abuse enacted by administrators and staff (HOS, 2011), as well as a lack of appropriate training or education due to substandard instruction (Engel, Phillips, & DellaCava, 2012). This legacy of assimilation continued through the adoption of Aboriginal children to non-Aboriginal families (1950's - 1980's; sometimes referred to as the *60s scoop*), and continues to be seen in the over representation of Aboriginal children in the child welfare system (Stevenson, 2013). The resultant disruptions in mental wellness, health, and interpersonal difficulties from the assimilationist policies are often referred to as intergenerational trauma.

The effects of intergenerational trauma are widespread and self-perpetuating. Removing young children from their communities disrupts connections to family members, community members, ancestral relations, and Elders, leaving many individuals without an informal support network and disconnection from language and culture (Beaucage, 2011; MWCF, 2015, pg. 29). Parenting skills and emotional regulation are also affected, as opportunities to observe healthy displays of these life skills have been interrupted, contributing to higher rates of psychological distress, suicide attempts within the lifetime, substance abuse, and inter-partner violence for Aboriginal communities than are present in the general Canadian population (HOS, 2011; MWCF, 2015; FNIGC, 2012). Indeed, alcohol use amongst Aboriginal youth has been tied to coping with feelings of hopelessness, such that drinking is often an attempt to cope with negative feelings of depression, as well as potentially blocking pessimistic outlooks (Stewart et al., 2011).

Yet, Aboriginal communities have continuously demonstrated determination in maintaining cultural strength and continuity in traditions and practices. Aboriginal worldviews have prevailed through sacred societies, community practices, and cultural ways of living despite centuries of assimilation attempts (MWCF, 2015, pg. 36). Aboriginal populations in Canada have fought against provincial and federal policies that allowed for many systemic sources of racism to emerge. As a result, there are now policies that prioritize traditional kinship and child care practices (Engel et al., 2012; Stevenson, 2013) that can help to create a positive identity for Aboriginal children in care (Carriere, 2007). Many communities have established preferences for children to remain closely connected to their families and communities, with FN control over child welfare services providing the opportunity to maintain a connection with Aboriginal ancestry and teach traditional values (Beaucage, 2011; Engel et al., 2012). Furthermore, advocacy amongst Aboriginal communities for health services to respect and incorporate

traditional and cultural knowledge, values, and customs into the development and delivery of services is starting to take hold. Documents such as Honouring our Strengths (HOS; Health Canada, 2011) and the Mental Wellness Continuum Framework (MWCF, 2015) provide culturally appropriate outlines for how Aboriginal communities can be better served by incorporating traditional knowledge and culture into modern treatment provisioning. For example, health is exemplified in an Aboriginal context when a balance between physical, emotional, mental, and spiritual health is achieved (HOS; MWCF). Being cognizant, respectful, and knowledgeable about the social determinants of health, as well as the importance of culture in determining wellness are key to the development of appropriate services for Aboriginal communities (MWCF, 2015; HOS, 2011). These documents also provide an overview of some broad similarities between Aboriginal communities' unique concepts of mental wellness (MWCF).

### **Contrasting Models of Mental Health**

Health and mental wellness are viewed as holistic concepts in many Aboriginal communities (HOS, 2011; MWCF, 2015). Overall wellness is exemplified when a balance between physical, emotional, mental, and spiritual health is achieved (HOS; MWCF). Western concepts of mental illness tend to focus on deficits and problems as a major determinant, with health being a freedom from illness (Dell et al., 2012; MWCF). In contrast, Aboriginal views emphasize the role of traditional concepts and cultural aspects in mental wellness (Dell et al; MWCF, 2015). Developing interconnections between the four directions of wellness- physical, mental, spiritual, and emotional domains- supports the development of mental wellness (MWCF). This can be achieved when community members are supported to have hope for their future and their family's future (through identity, values, and spirit), a sense of belonging (e.g. to

family, community, culture), a sense of meaning (as part of creation/history), and purpose in their daily lives (e.g. employment, care-giving, *ways of doing*, etc.; MWCF, 2015, pg. D). Hope is influenced by spiritual behaviour that is expressed through belief in spiritual practices, identity, and values (MWCF). Belonging is influenced by emotional behaviour such as attitudes that encourage connections with others (MWCF). Meaning is influenced by mental behaviour which is expressed through a balance between intuition and rational thought (MWCF). Purpose is informed by: *ways of being*, a historical and current connection to the land and all organisms within it, as well as *ways of doing*, which are the ways of interacting with features of one's surroundings and expressing one's culture, such as language, use of traditional medicines, animals hunted for food, ways of relating to each other, etc. (HOS, 2011; MWCF). These *ways of being* and *ways of doing* contribute to strength and resilience derived from the collective identities and interdependent relationships with family, community, and creation in Aboriginal communities (MWCF, 2015; Toombs, Kowatch, & Mushquash, 2016). These interdependent relationships are the foundation for wholeness, reflecting a health and wellness of body, mind, heart and spirit (MWCF, 2015, pg. 22).

### **Developing Culturally and Contextually Appropriate Mental Wellness Services**

The prominence of these community-based relationships is emphasized in recommendations for developing mental health services for Aboriginal communities. Harnessing community knowledge in the development of services allows communities to direct services to be relevant, based on community needs, and be more effective (MWCF, 2015). Aboriginal communities in Canada are very diverse and the mental health needs experienced by each of them may differ significantly from one another. For example, Chandler, Lalonde, Sokol, and Hallett (2003), demonstrated that while some First Nation communities experienced

disproportionately high rates of suicide among their youth, other communities had lower rates than mainstream Canadian populations. Working in collaboration with resources outside of the immediate community, such as with academic researchers, can help support communities in identifying intervention priorities and developing service plans (Dell et al, 2012; HOS; MWCF). These plans may capitalize on the knowledge that each member brings, representing a balance between Indigenous and Western knowledge (Dell et al.; HOS; MWCF). Through collaborations such as these, innovative services that address communities' needs within their given capacities can be developed (MWCF). Working in collaboration with each community allows for the development of services aimed at specific, community relevant needs, that foster inherent individual, family, and community strengths (HOS, 2011; MWCF, 2015).

Community ownership and capacity building of research and mental wellness services respects the need to have a shared responsibility in fostering mental wellness among individuals, families, communities and service providers in the present, as well as in future generations (Dell et al.; HOS; MWCF). Appropriate services will therefore have culturally competent staff, who value Indigenous knowledge, are aware of their own worldviews and attitudes toward cultural differences, are open to cultural realities of those they serve, and prioritize cultural safety (HOS; MWCF). Culturally safe services incorporate culturally relevant information into policies, funding mechanisms, and service provisioning (HOS; MWCF). It has also been identified that appropriate services need to be responsive in identifying individuals with the most pressing needs, intervening early, and providing effective, accessible services (MWCF).

### **Aboriginal Mental Health and Child Welfare Service Provider**

The current project partnered with a large scale community mental health provider that provides services to multiple FN communities within North Western Ontario, operating from a

culturally competent, family based provisioning of care that is tied to Anishinabek culture. The cultural basis for treatment provides an ideal environment for culturally safe treatment development. Staff are familiar with the cultural realities of the communities that they serve. An appreciation of traditional understandings of mental wellness and health permeate the services provided while also acknowledging the potential utility of Westernized treatments. Consultation with Elders and community knowledge holders is also possible as there are long-standing relationships with communities that the agency serves.

This mental health provider is a single access point to voluntary supports and services for children's mental health, Autism services, and respite services. Referrals are accepted from youth (12 years and older), parents or guardians, community workers, school personnel, physicians and many other professionals. Clinical services include direct client consultation, assessment, intervention strategies, treatment recommendations, parenting and school based strategies, coordination and consultation between clinicians, program consultations, and follow-up services. A residential treatment program provides holistic and multidisciplinary treatments for children that have long term behavioural difficulties. Individual counselling is also provided for a variety of presenting problems. Day treatment provides services and support for children and youth who are experiencing difficulties such as social, emotional, or behavioural concerns, in the regular school environment, as well as transitional community based services that assist children on the waitlist for day treatment or when children are re-entering their community school. Infant/child development services are aimed at prevention, early identification, and intervention for infants to children 6-years of age.

### **Timely Access to Services**



Although the accessibility of services with the partnering mental health care provider has not been assessed, the accessibility of current mental health services in many Aboriginal communities makes them inadequate to meet community needs (HOS, 2011). In general population Canadian samples, wait-times for child and adolescent mental health services can be quite substantial. In a survey of mental health providers for child and adolescent mental health services across the Canadian provinces and territories, Kowalewski, McLennan, & McGrath (2011) found that the typical wait time for low severity children and adolescents was 110 days, as compared to 75 for moderate severity, 29 for high severity, and 3 for extremely high severity. These times are much higher than the Canadian Psychiatric Association's recommendations of access to a mental health practitioner for emergency mental health concerns within 24 hours, urgent concerns within 1 to 2 weeks, and scheduled services addressed within 2 to 4 weeks ([CPA], 2006).

However, similar figures have not been published for Aboriginal communities, leaving the extent of waitlists in these agencies and communities unknown. Nevertheless, it is likely that some amount of wait time would be present, as the vast majority of agencies in mainstream Canadian populations demonstrate a wait for some (45.7%) or all services (26.7%) although these rates vary by the agency surveyed (Kowalewski et al.). Longer wait-times are associated with a lower likelihood of attending scheduled services, which is exacerbated when the client receiving services is of a minority status and/or mandated to receive services (either through the justice system or child welfare services; Sherman, Barnum, Buhman-Wiggs, & Nyberg, 2008). Thus, having an exceptionally long wait time could contribute to Aboriginal people not receiving needed services. Leaving mental illness untreated is associated with school failure, unstable employment, marital violence, and can contribute to less severe mental illnesses becoming more

frequent, severe, and spontaneous the longer it persists (Wang et al., 2005). It is suggested that using upstream, or pre-waitlist strategies, such as standardizing and centralizing intakes, providing preventative or early intervention services, and incorporating triage into the intake process, is associated with decreased wait-times across agencies (Vallerand & McLennan, 2013).

### **Broadband Mental Health Screening Instruments**

Standardized intake processes that are associated with decreased wait times rely on screening instruments that are able to accurately and comprehensively assess clients' needs. Two of the most commonly used screening instruments in general clinical practice and research are the Behavioural Assessment System for Children second edition (BASC-2) and Achenbach System for Empirically Based Assessment (ASEBA). These measures assess a wide variety of emotional and functioning difficulties in children and adolescents from the perspectives of the adolescents, teachers, and caregivers (Rescorla, 2009). Both systems were developed using advanced factor analytic techniques and provide scores on individual items, broadband scales (e.g. externalizing/internalizing behaviours), as well as more narrow scales (Rescorla, 2009). They allow comparisons to be made to a normative sample in order to interpret an individual's scores as well as a comparison to cut points associated with different levels of risk (e.g. clinical or borderline range; Rescorla, 2009).

For Aboriginal populations an understanding of wellness as a holistic concept, and including assessments of multiple areas of functioning for each individual, is necessary in order to appropriately assess mental wellness. While the BASC-2 and ASEBA assess deficit areas in emotional and behavioural symptoms that are necessary for informing clinical diagnoses and treatment, they often neglect environmental and cultural influences, which is not consistent with Aboriginal models of wellness. The utility of the BASC-2 and ASEBA in a community based

Aboriginal mental health provider is further limited as the instruments are not flexible to individual needs, they do not provide timely information, and they hinder the capacity building of FN service providers as they require extensive training for interpretation. Furthermore, the reliability and validity of each of these measures in Aboriginal communities is either mixed or absent. Nevertheless, these assessment systems will be reviewed in order to situate the current study in common clinical practices and to provide a reference point for comparison of another type of assessment.

**Behavioural Assessment System for Children (BASC).** The BASC is a comprehensive assessment system that provides standard scores on 14 scales (Adaptability, Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Leadership, Learning Problems, Social Skills, Somatization, Study Skills, and Withdrawal) and five composite scores (Externalizing Problems, Internalizing Problems, School Problems, Adaptive Skills, and Behavioural Symptoms Index; Bayadala et al., 2009; Merenda, 2009). Individuals of Aboriginal or Indigenous descent were included in the standardization sample of this measure but comprised less than 2% of the overall sample (Harrison, Vannest, & Reynolds, 2011).

Preliminary analyses of the appropriateness of the BASC for use in Indigenous populations in North America have shown limited support. Lefler, Hartung, Bargis, & Thomas (2015) demonstrated initial construct validity between the BASC and the Child Symptom Inventory, fourth edition (CSI-4) on the Attention Problems and Hyperactivity scale, in an AI population. Mixed findings have been found for the internal consistency of some scales in AI communities (e.g. Lefler et al.) although most scales have not been closely examined. Furthermore, significant differences have been demonstrated between the means of Aboriginal

samples and the standardization sample, as well as parents and teachers providing differential response patterns when rating the same Aboriginal children (Baydala et al., 2009). These analyses suggest a need for greater investigation of the reliability of the BASC in Aboriginal and AI/AN populations. Overall, there is a paucity of reliability research with the BASC in diverse and/or low socioeconomic groups, and should therefore be used very cautiously in these populations (Wilder & Sudweeks, 2003).

The BASC-2 was developed in 2004, but it maintained the underrepresentation of multiple cultural groups, including AI/AN populations, in the standardization sample (Foutch, 2007). Subsequent analyses among AI/AN youth from a wide variety of tribal affiliations, demonstrated significant differences in composite scale scores for Inattention/Hyperactivity when compared to a normative sample, although these differences were only seen when the AI/AN youth had low levels of acculturation to mainstream culture (Foutch, 2007). Caution in interpreting these findings must take place as investigation of differences in socio-economic or other social determinants of health was not considered. The utility of the BASC-2 self-report form for Aboriginal youth is also limited by not assessing substance abuse (Milne & Collin-Vézina, 2015), which is a pressing issue for many Aboriginal communities (HOS, 2011). The BASC-2 may also over-report Aboriginal children as having emotional difficulties. For example, in a program evaluation report for a family intervention, children from low-income, Aboriginal families consistently demonstrated more frequent “at-risk” or “clinically significant” scores on all the BASC-2 subscales, and a lower proportion of children in the “healthy range”, in comparison to the non-clinical standardization sample (Templeton, Durksen, & Zhang, 2012). The lack of standardized norms for Aboriginal or AI/AN populations makes interpreting this

finding difficult as the standardized scores were derived from a primarily Caucasian, African American, and Latin American sample in the United States (Reynolds & Kamphaus, 2004).

The research using the BASC and BASC-2 has shown differences in the response proportions, subscale and composite scores, as well as a general lack of reliability information within Aboriginal and AI/AN samples. The utility of this instrument in a clinical setting is greatly limited by the lack of appropriate comparison samples and may lead to an over endorsement of some scales for Aboriginal populations.

**Achenbach System for Empirically Based Assessment (ASEBA).** The ASEBA is a comprehensive assessment system that calculates three broad-band symptom scores (Total Problems, Internalizing, and Externalizing) as well as eight common syndromes: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thoughts Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior (Rescorla, 2009; Moretti & Obsuth, 2011). The ASEBA has been used widely with a variety of ethno-cultural groups including FN, Inuit, and AI/AN samples.

The ASEBA has been successfully used within an Inuit sample to investigate the influence of environmental factors of mental wellness. Prenatal smoking (Desrosier et al.), elevated umbilical lead and mercury levels (from fishing & hunting practices; Boucher et al., 2012), and socioeconomic status (Decaluwe et al.) were associated with higher scores on the Externalizing and Attention Problems subscales. It is interesting to note that the authors of each of the three studies above used different forms of scores (i.e. raw, standardized, and transformed) to analyze results from the same sample, suggesting that the lack of an appropriate comparison group for Aboriginal populations makes interpretation of the ASEBA complex.

The ASEBA has demonstrated mixed construct validity within North American Indigenous populations. Face validity for the CBCL was low in a sample of Dakotan/Lakotan AI parents due to the wording of specific items (Oosterheld & Haber, 1997). A number of difficulties with cultural understandings of words, applicability of concepts to the culture, and concerns about responses being misinterpreted were noted (Oosterheld & Haber). The effect of this limited face validity on the interpretation of descriptive domains is unknown (Connors, 1997). Convergent validity of the Teacher Report Form (TRF) was, however, supported in an analysis of cultural factors (e.g. Sharing, Other Centered, Circular Time, etc.) and positive outcomes on multiple scales (e.g. Learning, Works Hard, Withdrawn, Anxious, etc.; Coggins, Radin, & Williams, 1997), as well as between parental ratings of parental Over-Reactivity and Poor Monitoring/Supervision, with Externalizing behaviours (Seabridge, 2012). Conversely, scores on the Externalizing Problems subscale of the Parent Report Form were significantly lower than the standardization sample scores, suggesting that they may not be highly comparable (Seabridge).

The ASEBA is subject to the piecemeal analysis of its psychometric properties within Indigenous populations similar to that of the BASC and BASC-2. Williamson et al. (2014) found that the internalizing problems subscale of the Youth Self Report (YSR) had adequate convergent/discriminant validity, but weak factorial and face/content validity, as well as weak internal consistency in AI/AN populations. The YSR was however, one of only six measures that did show adequate psychometric properties, in at least one domain, when assessing Indigenous populations (Williamson et al., 2014). Specific subscales of the YSR have shown good convergent validity in AI populations as they have been found to correlate with: lower ratings of body image (Social Problems, Anxiety/Depression, and Somatic Complaints; Newman, Sontag,

& Salvato, 2006), lower rates of academic self-efficacy and the ability to resist negative peer influences, as well as higher depression scores and alcohol use (Externalizing Behaviour; Mileviciute, Scott, & Mousseau, 2014). Despite the widespread practicality of the YSR subscales, it does have some drawbacks, such as not specifically measuring traumatic stress responses that may be helpful in FN communities (Milne & Collin-Vézina, 2015). Furthermore, the piecemeal analyses of YSR subscales also makes any generalization to the comprehensive scale inappropriate, and very few studies have investigated the appropriateness of the entire form in an Aboriginal or AI/AN population.

The reliability of the ASEBA in North American Indigenous samples is similarly mixed. In a study of a parenting intervention for families of AI children, high internal consistency was demonstrated for the Child Behaviour Checklist (CBCL; parent form), as well as the TRF, although across forms, the internal consistency was quite low (Dionne, Davis, Sheebar, & Madrigal, 2009). Meta-analyses between the YSR, TRF, and CBCL in mainstream samples have demonstrated low to moderate correlations among the forms (i.e. inter-rater reliability), suggesting that it is necessary to obtain ratings from multiple assessors in order to get an accurate picture of any given child's functioning (Moretti & Obsuth, 2010). Most of the studies reviewed above rely on only one source of information about Aboriginal or AI/AN children, thus limiting the interpretation of results.

**Limitations of the BASC-2 and ASEBA.** In comparing the BASC-2 and ASEBA, the interpretation of scores is further complicated when considering how the tests were constructed and what the scores represent. Based on the scales that are used, the ASEBA and BASC-2 could provide differential rates of identification for children at risk or within a clinically significant range as they vary in sensitivity and specificity for many domains (Rescorla, 2009). Furthermore,

the normative group for the ASEBA excluded children who were displaying clinical symptoms from the general normative sample, whereas the BASC-2 did not, making interpretation of scores even more challenging (Rescorla). The ASEBA does not assess individual strengths, and neither system assesses the environmental or community strengths that are important for Aboriginal communities. Both of these broad-band screeners require trained professionals to transform and interpret the scores to be readily understood, which is a cumbersome and time consuming task. Ideal screening assessments are of relatively little charge, are quickly completed by children or family members, and are easily interpreted by program staff (Milne & Collin-Vézina, 2015).

**Child and Adolescent Needs and Strengths assessment (CANS).** Similar to the ASEBA, BASC, and BASC-2, the CANS is a comprehensive assessment system that can be used to identify a number of child, family, and caregiver needs. The CANS deviates from the ASEBA and BASC-2 in that it is adaptable to each setting's treatment and service provisioning. Based on the communication perspective of instrument development, the CANS was developed to be clear, concise, relevant, and comprehensive without being redundant (Lyons, Weiner, & Buddin Lyons, 2011, pg. 465). The CANS extensively assesses functional impairments such as social, educational, and daily functioning skills, which helps to inform specific service and treatment needs for individuals (Gordon et al., 2006), and contrasts the symptom based assessment of the BASC-2 and ASEBA. The needs and strengths items included in the measure were identified by focus groups as key aspects to assess when determining what services are needed (Lyons et al.). The CANS was also developed to be consistent with the Diagnostic and Statistical Manual of Mental Disorders fourth edition in order to provide ease in the diagnostic process (Lyons et al.). While the CANS measures deficits within the individual, similar to the BASC-2 and ASEBA, a broader assessment of individual and environmental strengths is also provided.



The selection of items can be coordinated to reflect treatment and decision making for each service provider and the items are anchored in a way that immediately communicates the urgency for intervention (Anderson, Lyons, Giles, Price, & Estle, 2003). Items are rated on a 0 to 3 scale, where 0 = *no need for intervention or treatment*, 1 = *watchful waiting to determine if intervention is necessary*, 2 = *intervention or treatment is necessary*, and 3 = *immediate/intensive intervention or treatment needed* (Cordell, Snowden, & Hosier, 2016). The CANS does not need to be scored in order to inform treatment as the assessor indicates the symptoms that are of highest need, making the CANS an efficient tool for treatment decisions (Anderson et al.; Lyons et al., 2011). The CANS also identifies strengths of the child that can be harnessed in treatment, and calls upon the assessor to integrate information from all relevant sources (e.g. teachers, parents, etc.) when completing the measure (Lyons et al., 2011).

The specific number of dimensions and items included on any CANS form will differ as it is adapted to each agency's needs, consisting of anywhere from over 300 individual items to less than 50 (e.g. Anderson et al., 2003; Cordell et al., 2016). However, good inter-rater reliability between clinicians and researchers for the total scale (.81), dimensions (.72 - .85), and items (.55 - .90) has been seen for the CANS-MH in prospective studies (Anderson et al., 2003). Any differences in the item ratings were often (52%) within a similar level of need for intervention (i.e. a "0" or "1", instead of a "2" or "3"), although, caseworkers did rate the psychosis, antisocial, sexual development, transportation, and relationship permanence domains higher on average than researchers (Anderson et al., 2003). Good inter-rater reliability has also been seen for a retrospective review of medical records with reliability estimates ranging from .69 to greater than .90 (Lyons et al., 2011). Factor analysis of the mental health items most relevant to treatment decisions resulted in two factors, Internalizing and Externalizing, which

explained 49% of the total variance within the sample (Alamdari & Kelber, 2016). Four factors were identified for the functioning domain that accounted for 58% of the total variance, and were labeled family functioning, social functioning, caregiver functioning, and educational functioning (Alamdari & Kelber, 2016). Good convergent validity was seen for the two mental health factors, as well as concurrent validity with the Youth Outcome Questionnaire (Alamdari & Kelber, 2016). Acceptable discriminant validity was displayed when comparing the CANS to the Child and Adolescent Functional Assessment Survey (Lyons et al., 2011).

***Treatment and placement decisions.*** The CANS demonstrates great practicality as it can be adapted to an agency's priorities and services (Cordell & Snowden, 2015). The CANS can be used within agencies to determine behaviours that may indicate increased risks or needs for more intensive treatments. For example, Cordell and Snowden (2015) demonstrated that impairments in anger control, frustration management, and anxiety are associated with an increased rate of crisis incidents among youth in care. Within this study, treatment needs, as indicated by a composite score across four CANS domains, significantly differed among youth entering into day treatment and residential care when compared to intensive community care (Cordell & Snowden, 2015). In comparison to youth entering intensive community services, youth entering day treatment/residential care had lower scores in risk behaviours, life domain functioning, and strength development (Cordell & Snowden, 2015). Youth in day treatment/residential care showed greater reductions in behavioural/emotional needs and risk behaviours, but not life domain functioning, and almost half of these individuals demonstrated a reduction in symptoms that would suggest a decrease in the care intensity that the youth received after six months (Cordell & Snowden, 2015). Relying on the CANS for placement decisions has demonstrated

less disruption in care for children and youth in a large scale longitudinal study (Epstein, Schlueter, Gracey, Chandrasekhar, & Cull, 2015).

The CANS has also demonstrated utility in discriminating when treatments work and for which mental health, substance abuse, or risky behaviour concerns. For example, in a retrospective study, different outcomes were seen for youth based on the type of treatment received for a mental health, substance abuse, or a co-occurring mental health and substance abuse disorder (Anderson & Gittler, 2005). Adolescents that had co-occurring mental health and substance use problems that received only mental health services did not improve in their substance use symptoms and those who received only substance use services did improve in their substance use symptoms, but not mental health needs. However, individuals who received both types of service only had a significant reduction in risk behaviours (Anderson & Gittler, 2005).

***Child profiles.*** The CANS is also useful for developing profiles of needs for children and youth at an agency level. These profiles can be developed based on general profiles of youth presenting to certain treatment providers (e.g. Cordell, Snowden, & Hosier, 2016), different needs associated with age, gender, or ethnicity (e.g. Spooner & Martinovitch, 2014; Chow, Mettrick, Stephan, Von Waldner, 2014), as well as specific profiles based on presenting problems or experiences (e.g. Kisiel, Fehrenbach, Small, & Lyons, 2009). For example, Cordell et al. (2016) compared the presenting needs of youth entering two large scale community-based treatment providers and found 13 common items that predicted treatment needs across agencies. Interestingly, many of the predictive items pertain to the child's family, community, and school life, which provide support for the use of an assessment tool such as the CANS that measures a wide variety of domains (Cordell et al.). Based on these findings, a decision tree was developed identifying frustration management as a key indicator item, such that when it was endorsed as "in

need of intervention”, overall CANS needs were almost three times higher on average (Cordell et al). Other CANS items that were similar across agencies were the child’s recreational and leisure time problems, child’s poor response to consequences, and a lack of optimism in the child (Cordell et al.). The analysis displayed 16 possible profiles that accounted for over 98% of the service populations.

The CANS can also be used to identify needs in relation to demographic features. In a sample of youth (aged 12-21) seeking mental health services in Chicago, Spooner and Martinovitch (2014), found older age associated with increased risk behaviours. Ethnicity was associated with risk behaviours, and behavioral/emotional needs, such that Caucasian youth tended to have higher needs and risk behaviors than non-Caucasian youth (Spooner & Martinovitch). Non-Caucasian youth were more likely to experience traumatic stress symptoms, and the increase of these symptoms with age was especially pronounced for non-Caucasian youth in comparison to Caucasian youth (Spooner & Martinovitch). Similarly, an analysis of youth in foster care in a mid-Atlantic state in the USA, demonstrated differences in initial presenting problems, as well as differential patterns of needs and strengths over time based on age, gender, and ethnicity differences (Chow et al., 2014). Older children were found to have less impairment in life domain functioning and African American youth were found to have less behavioural and emotional needs than Caucasian youth (Chow et al.). Gender differences included males demonstrating greater improvements in strengths, and females demonstrating greater impairment in life domain functioning, child strengths, and child risk behaviours at the follow-up period in comparison to males (Chow et al).

The CANS can also be used to identify differentiating needs for children and youth, based on their presenting difficulties or experiences. For example, Kiesiel et al. (2009)

investigated the unique needs of children entering into a child welfare system, who had experienced complex trauma requiring intervention. In comparison to children without complex trauma, children with complex trauma displayed significantly higher needs in all areas of the CANS, with exception to medical and physical functioning (Kiesiel et al.). The most frequently endorsed needs in order of frequency for the complex trauma group were: Depression, Attachment Problems, Anger Control, Anxiety, Attention/Impulsivity, Oppositional Problems, and Affect Dysregulation (Kiesiel et al.). In comparison, the non-complex trauma group displayed the most frequent needs in Anger Control, Attention/Impulsivity, and Attachment Problems. Similar patterns of endorsement were seen between the groups in regards to risk behaviours, although the severity of these items was higher in the complex trauma group (Kiesiel et al.). Differences were also seen in the strengths domain such that children with complex trauma displayed greater strengths in Spiritual/Religious, Creative Talents, and Education domains (Kiesiel et al.). The differences in domain endorsements provides a guideline for how to appropriately address complex trauma as it outlines specific areas of difficulty these children often face.

The CANS is also useful for identifying functional subtypes, or levels of severity, in domains that characterize different need patterns of children and youth. In a population of treatment seeking youth, Spooner and Martinovitch (2014), identified four distinct groups of youth based on the level of their risk factors. Group 1 had the least severe problems with lower scores than the other groups on the four domains measured except the Trauma Stress score (which was lower in group 2; Spooner & Martinovitch, 2014). Group 2 had a lower score than groups 3 and 4, but not group 1, on Risk Behaviours, Emotional/Behavioural needs, and Trauma Experience, as well as the lowest mean on the Trauma Stress symptom scale (Spooner &

Martinovitch). Group 3 demonstrated the second highest mean scores on Behavioural/Emotional needs, the Trauma Stress symptoms scale, and Trauma Experiences scale (Spooner & Martinovitch). Group 4 demonstrated the highest mean on the Behavioural/Emotional needs scale, the Trauma Stress symptoms scale, and the Risk Behaviour scale, while the Trauma Experiences scale was the second highest (Spooner & Martinovitch). These profiles can be used to develop or reorganize treatments that address specific symptoms in relation to their urgency.

*Applicability to Aboriginal populations.* The CANS offers a number of advantages over other broad-band mental health assessments as it assesses a wider variety of domains in an individual's life, lending itself to be reflexive to the needs of the organization using it. This is an aspect to keep in mind when working with Aboriginal populations as cultural factors and determinants of health affect mental wellness. However, to the author's knowledge, there have been no studies using the CANS in specifically Aboriginal, American Indian, or Alaskan Native populations. The conceptualization of mental wellness can be captured by the CANS through the incorporation of domains such as emotional/behavioural needs, child strengths, caregiver strengths, life domain functioning, acculturation, language abilities, educational needs, and many more. This measure has also been widely adopted by many child-welfare agencies and is the screening assessment used by the mental health treatment provider collaborating on this project.

### **Description of the Current Study**

The objectives for this study are threefold:

- 1) To determine what the mental health needs are for the demographic served. In conducting this analysis the community organization can gain insight into what the most pressing needs are.

- 2) To investigate the stability of mental health concerns over time and to identify which symptoms are likely to persist past a waiting period from the initial referral until entering into treatment. This can help to inform possible earlier interventions that provide appropriate services and skills to bolster current and future success, potentially avoiding chronic or severely impairing mental health and addiction concerns (HOS, 2011).
- 3) Exploration and identification of the predictors of commonly occurring mental health needs.

Sex and age have consistently been found to affect mental health symptoms, thus it was expected that these variables would significantly influence mental health needs. Numerous studies have demonstrated sex differences in mental health symptoms, with males tending to display externalizing disorders (e.g. Attention Deficit Hyperactivity Disorder; ADHD) and females tending toward internalizing disorders (e.g. Major Depressive Disorder, Anxiety; e.g. Martel, 2013; Romano, Tremblay, Vitaro, Zoccolillo, & Pagani, 2001). Mental health symptoms have also been seen to have onsets at different ages (e.g. Kessler et al., 2007) as well as vary as a function of age (e.g. Biederman, Mick, & Faraone, 2000; Martel, 2013). Thus, age and sex are control variables that need to be taken into consideration.

Assessing impairments in functioning with mental health needs in children and youth is integral. A global assessment of functioning identifies if a child is capable of adapting to the demands of home, school, and the community in a developmentally appropriate way (Canino, Costello, & Angold, 1999; Hoagwood, Jensen, Petti, & Burns, 1996). Impairments in functioning can indicate if the individual may meet criteria for a diagnosis (e.g. Major Depressive Disorder, Social Anxiety Disorder, Post-Traumatic Stress Disorder; American Psychiatric Association,

2013), the urgency of intervention, as well as informing the course and outcome after the mental health episode has concluded (Canino et al., 1999). Resilience research has identified factors such as participation in community activities, the ability to use resources, a sense of belief in oneself, spirituality, as well as community support and connectedness as aspects that promote successful outcomes for Indigenous youth (Toombs, Kowatch, & Mushquash, 2016; MWCF, 2015). Furthermore, it is expected that social determinants of health such as access to resources, residential stability, and parental physical and mental health may predict mental health needs (MWCF; HOS; Costello, Farmer, Angold, Bruns, & Erkanli, 1997). Past research has shown that in an Indigenous population when a mother experiences a substance use disorder or internalizing disorder, the odds that her children will experience a psychiatric disorder nearly doubles (Whitbeck et al., 2008). These aspirations are in keeping with the goals outlined in HOS (2011) as they provide an opportunity to work collaboratively with a community based mental health service provider, in order to investigate how services can be developed to meet community specific mental health needs (HOS).

Fulfilling these objectives could inform the adaptation of interventions that have been shown to be effective in mainstream Western cultures in an effort to be more acceptable, and responsive, to Aboriginal needs. Preliminary adaptations such as this have been shown to be effective. For example, a culturally appropriate adaptation of a cognitive behavioural (CBT) intervention for adolescent drinking in a Mi'kmaq community, demonstrated significant reductions in the frequency of drinking, alcohol related problems, and abstinence from alcohol, as well as nearly significant reductions in the frequency of binge drinking (Mushquash, Stewart, & Comeau, 2007). Surprisingly, marijuana consumption decreased as well, suggesting that the intervention may have broader applications (Mushquash et al., 2007). Furthermore, training



therapists on how a CBT intervention for anxiety could be adapted to be appropriate for First Nation children in North Western Ontario demonstrated increases in therapist knowledge and confidence in using CBT in this population, as well as reductions in mental health symptoms from pre- to post-intervention for children (Nowrouzi, Manassis, Jones, Bobinski, & Mushquash, 2015). Conducting research in collaboration with a community based treatment provider contributes to the evidence base by describing the services that are effective for certain communities, individuals with specific needs, and in particular contexts (MWCF, 2015, pg. 20).

The current study used the screening instruments currently employed by the service provider, the CANS, to identify the greatest service needs across the agency. This bolsters the resilience and strength of the communities served as it provides a mechanism to identify individuals early in the assessment process, potentially allowing for more timely access to services.

## **Method**

### **Participants**

Participants in this study consisted of child and adolescent referrals to a community based mental health provider between February 2013 and November 2016. All referents who had a completed Acute CANS and CANS-MH within this time period were included in the sample. The remainder of the sample comprised of a convenience sample from the total sample of referents that had a completed Acute CANS. A total sample of 178 individuals was obtained, with 84 individuals who completed the Acute CANS and the CANS-MH, whereas 94 participants had only the Acute CANS completed. This sample represents approximately 13% of the total number of child referrals to the community organization in his time period. Referents

included individuals referred by self, school personnel, parents or guardians, physicians, and social workers for diverse mental health concerns.

### **Measures**

**Demographic information.** The referral form completed for all new referents provided extensive demographic information. The source of referral distinguished between self-referral or agency referral as well as the type of agency. The services requested include: assessment and brief treatment residential services, counselling and clinical services, day treatment services, district child and family mental health services, district family preservation services, family preservation services, infant child development services, Positive Parenting Program group, and youth in transition services. The referent's date of birth, sex, and living arrangements were assessed. Living arrangements consisted of: if the referent lives on a reserve, the family structure (e.g. biological family, foster family, etc.), if the biological mother and/or father reside in the same home, the relationship of any other individual that the referent is residing with, as well as the number of siblings and their relationship (e.g. half-siblings, step-siblings, etc.). An open-ended question assessed the presenting problem. Current involvement with child welfare services and the type of involvement was also assessed. Medical information consisted of whether the referent was premature, and by how many weeks, if the referent had any identified medical conditions, any type of medications taken, and what these medications were. School and daycare information consisted of the referents' grade at assessment, if he or she received special education, had an individual education plan (IEP), or an identification, placement and review committee decision (IRPC) including the type of exceptionality identified, and any type of disruptive behaviours displayed at school and/or daycare.

### **Child and Adolescent Needs and Strengths Assessment (CANS).**

**Acute CANS.** The acute form of the CANS is a 51-item scale that is rated on a 0 to 3 Likert-type scale with seven open-ended comment sections divided into six domains (i.e. mental health, risk behaviours, family and caregiver needs, functioning, care intensity and organization, and individual strengths; see Appendix C). Mental Health Needs is a 13-item subscale, with 12-items rated on a Likert-type scale (0 = *no evidence*, 1 = *history, mild, suspicion*, 2 = *moderate, action needed*, 3 = *severe, disabling, dangerous, immediate action needed*) and an open-ended comments section. Risk Behaviours is a 9-item subscale, with 8-items rated on a Likert-type scale (0 = *no evidence*, 1 = *history, mild, suspicion*, 2 = *moderate, action needed*, 3 = *severe, disabling, dangerous, immediate action needed*) and an open-ended comments section. Family and Caregiver Needs and Strengths is a 6-item subscale, with 5-items rated on a Likert-type scale (0 = *no evidence*, 1 = *history, mild, suspicion*, 2 = *moderate, action needed*, 3 = *severe, disabling, dangerous, immediate action needed*). Functioning, which assesses a wide range of functioning including self-care, school achievement, sexual development, etc., is a 13-item subscale with 12-items assessed on a Likert-type scale (0 = *no evidence*, 1 = *history, mild, suspicion*, 2 = *moderate, action needed*, 3 = *severe, disabling, dangerous, immediate action needed*) with an open-ended comments section. Care Intensity and Organization is a 4 item subscale, with 3 items scored on a Likert-type scale (0 = *no evidence*, 1 = *history, mild, suspicion*, 2 = *moderate, action needed*, 3 = *severe, disabling, dangerous, immediate action needed*) with an open-ended comments section. Individual Strengths is a 12-item subscale, with 11-items scored on a 0 to 3 Likert-type scale (0 = *center-piece strength*, 1 = *useful strength*, 2 = *identified strength*, 3 = *no strength identified*) and an open-ended comments section as well. The final item is an open-ended variable for any other comments.

***CANS Mental Health (CANS-MH)***. The mental health form of the CANS (CANS-MH; Appendix C) was completed when a referent entered into any mental-health specific program (e.g. counselling and clinical support). The CANS-MH is a 176-item scale that is broken into two sections, needs and strengths, and also has seven symptom or experience specific modules (i.e. Trauma, Substance Use, Violence, Sexually Aggressive Behaviour, Runaway, Youth Justice, and Fire Setting). The needs section is comprised of 11 specific skill or deficit areas assessed on a 4-point Likert type scale (0 = *no evidence of problem*, 1 = *history – watchful waiting and prevention*, 2 = *moderate need – action needed*, 3 = *severe problem/need – immediate/intensive action required*). Executive Functioning assesses the referents' decision making skills and ability to pay attention. Emotional Regulation skills ask about self-management, moodiness, anger control, and over-reaction. Cognitive Flexibility skills assess adaptation to change and transitions. Social Skills asks about social functioning, building relationships, empathy, and social perception. Receptive, expressive, and pragmatic language are assessed within the Language section. Sensory and Motor Skills consist of gross motor, fine motor, coordination, and sensory integration skills. Daily Functioning assesses activities of daily living, autonomy, eating, sleeping, and sexual development. Acculturation asks about language, identity, rituals, and parent/caregiver's cultural stress. Mental Health Needs encompasses 13 areas of potential disturbances (e.g. anxiety, psychosis, attachment, etc.). Risk Behaviours assess 12 potential behaviours such as suicide risk, cruelty to animals, fire setting, etc. Educational Needs ask about nine specific areas such as school attendance, classroom behaviour, academic persistence, etc. Each need subscale provides room for open-ended comments as well as an open-ended action plan for moderate and severe needs.

The strengths section of the CANS-MH assesses four potential areas of strength – Youth Individual Strengths, Youth Environmental Strengths, Caregiver/Family Needs and Strengths, and the Residential Treatment module – using a 4-point Likert-type scale (0 = *centerpiece strength*, 1 = *useful strength*, 2 = *identified strength*, 3 = *no strength identified*). Youth individual Strengths consist of 10-items assessing areas such as talents/interests, creativity/imagination, and self-expression. Youth Environmental Strengths assess family strengths, natural supports, community involvement, cultural identity, and resourcefulness. Caregiver/Family Needs and Strengths is comprised of 17-items assessing areas such as supervision, ability to communicate, organization, and substance use. The Residential Treatment Module is comprised of 7-items such as home visits, progress to goals and objectives, and discharge preparation. Each need subscale provides room for open-ended comments as well as an open-ended action plan for moderate and severe needs.

The CANS-MH has seven optional modules that assess specific need or experience based domains including Trauma, Substance Use, Violence, Sexually Aggressive Behaviour, Runaway, Youth Justice, and Fire Setting. The Trauma module is scored on a 4-point Likert-type scale that differs for each item in each module but can be roughly conceptualized as: 0 = *no evidence of harmful experience of disruption in adaptive behaviour*, 1 = *one/suspected episode of harmful experience or mild disruption in behaviour/cognitions*, 2 = *moderate/repeated exposure to harmful experiences or often/regularly engages in problematic or disruptive behaviour*, 3 = *severe/life-threatening exposure to harmful experiences or severe problematic behaviours/cognitions*. The Trauma scale consists of 16 items such as physical abuse, emotional abuse, witness to community violence, including five items that are only included if sexual abuse has been indicated, and three items assessing adjustment (affect regulation, intrusions, and

dissociation). The Substance Use module is a 7-item scale assessing areas such as severity of use, relapse skills, and environmental influences. The Violence module consists of 3 factors: historical risk factors (4 items), emotional/behavioural risks (5 items), and resilience factors (4 items). The Sexually Aggressive Behaviour module is a 10-item scale that assesses areas such as planning, type of sex act, and severity of sexual abuse. The Runaway module is a 10-item scale that assesses such things as frequency of running, likelihood of returning on his/her own, and duration of absence. The Youth Justice module is a 9-item subscale that assesses such items as seriousness, legal compliance, and parental influences. The Fire Setting module is a 9-item scale assessing areas such as history, use of accelerants, and remorse. Each need subscale provides room for open-ended comments as well as an open-ended action plan for moderate and severe needs.

### **Procedure**

Referents were assessed by intake staff, using the referral form and acute-CANS, after which they were placed on a list to receive appropriate services, when they became available. Staff within this organization completed training in using the CANS for assessment, and in order to gain certification to use the CANS, display reliability within .70 when rating a case vignette. Upon availability in a program, referents were further assessed using a form appropriate for a given program. For example, if the referent required individual counselling or mental health specific treatment, the CANS-MH would be completed to assess and triage services that would likely provide the most benefit.

Ethical approval for this study was received from the research committee at the partnering mental health organization as well as the Research Ethics Board at Lakehead University. The data was stripped of all identifying information by program staff before being

entered into a database by the researcher. The data is therefore, de-identified secondary data provided to the researchers, by the community based mental health provider.

### **Statistical Analyses**

Statistical analyses were completed using STATA 14 and included:

1. Descriptive analyses of referent's age, sex, family structure, and place of residence.
2. Descriptive analyses of mental health needs at the initial assessment.
3. Paired *t*-tests were used to examine if mental health symptoms remained stable between the initial assessment and entry into mental health services.
4. Hierarchical regression was used to explore and identify significant predictors of the most commonly occurring mental health needs (as identified in the descriptive analyses).
5. Regression diagnostics were conducted to ensure results conformed to the assumptions of linear regression, consisting of: no perfect multicollinearity, homoscedasticity, normally distributed errors, independence, linearity between the dependent variable and independent variables, and model specification (i.e. that there are no other variables, or random factors, that could account for variance in scores; Field, 2009).

Hierarchical regression is an ideal type of analysis for this information as it allows some variables (i.e. sex and age) to be accounted for, allowing researchers to demonstrate the additional impact that less well established predictor (independent) variables (e.g. Individual Strengths) may have on the outcome (dependent) variables.

## **Results**

### **Demographic Variables**

A comparison of demographic variables for the Acute CANS in relation to the CANS-MH is presented in Table 1. Due to the similarity between proportions of the demographic

variables for each form, the following results will focus on the total sample, with the exception of age. The age at assessment was calculated by subtracting the reference date from the date of birth and dividing by 365.25. 47.73% ( $n = 84$ ) of the sample was female. For the total sample, referents ranged in age from -0.19 years to 17.43 years ( $n = 168$ ,  $M = 8.83$ ,  $SD = 4.35$ ), although the mean age for the Acute CANS sample ( $n = 88$ ,  $M = 7.40$ ,  $SD = 4.56$ ) was lower than the CANS-MH ( $n = 88$ ,  $M = 10.41$ ,  $SD = 3.51$ ). The negative value for the low end of the age range represent an infant that was referred for services before birth.

The sample was primarily urban with 85.28% ( $n = 140$ ) living in or around Thunder Bay, Ontario. The majority of children (65.29%,  $n = 111$ ) resided with one or more of their biological parents, 10.59% ( $n = 18$ ) resided with their biological grandparents, 2.35% ( $n = 4$ ) resided with a biological aunt or uncle, 21.18% ( $n = 36$ ) lived in foster care, and 0.59% ( $n = 1$ ) were adopted. Most families were involved with child welfare services (64.61%,  $n = 115$ ) in some way. The most frequent type of CAS involvement was found in the *Other* category (39.55%,  $n = 70$ ) which includes ongoing services, investigations, and protective services. Customary care was the next frequent category with 10.73% ( $n = 19$ ) of children receiving these services, 9.04% ( $n = 16$ ) were crown wards, and 5.65% ( $n = 10$ ) of the sample being in temporary care.

The services that people were referred for were varied. These services included: assessment and brief treatment residential services (3.37%,  $n = 6$ ), counselling and clinical services (60.11%,  $n = 107$ ), day treatment services (8.99%,  $n = 16$ ), district child and family mental health services (6.18%,  $n = 11$ ), district family preservation (2.25%,  $n = 4$ ), family preservation services (19.66%,  $n = 35$ ), infant child development services (19.10%,  $n = 34$ ), a parenting group (8.99%,  $n = 16$ ), and youth in transition services (1.12%,  $n = 2$ ). Some referents were referred for more than one service, with 23 individuals (12.92%) being referred for two



services and 11 individuals (6.18%) referred for three or more services. No indicator of the services received was available.

### **Mental Health Needs in the Total Sample**

The mean scores and range on the Acute CANS domains can be seen in Table 2 (Appendix A). Table 3 provides frequencies of endorsement for each item contributing to the mental health domain of the Acute CANS (Appendix A). As can be seen in Table 3 (Appendix A), the items most frequently endorsed as requiring action (i.e. scoring  $\geq 2$  on an item) are Anxiety (26.03%,  $n = 44$ ), Mood (21.43%,  $n = 36$ ), Emotional Control (25.00%,  $n = 42$ ), and Adjustment to Trauma (49.7%,  $n = 83$ ). Attention Deficit/ Impulse Control and Oppositional Behaviour also displayed a high rate of need for intervention. Based on these descriptive analyses, the most frequently endorsed mental health needs that could be used for the in-depth hierarchical regression analysis were Anxiety, Mood, Emotional Control, and Adjustment to Trauma.

### **Stability of Mental Health Symptoms**

The stability of mental health needs was assessed using paired  $t$ -tests, the results of which can be seen in Table 4 (Appendix A). The average length of time between completion of the Acute CANS and the CANS-MH was 183 days ( $SD = 147$ ), although a date was only provided for 12 out of the 84 referents that completed the CANS-MH. Almost all of the mental health need symptoms displayed no significant difference between the intake assessment and the assessment when they entered into mental health services. The one exception to this was the Mood item. Intervention needs for mood were significantly lower when individuals entered into mental health services in comparison to when they were initially assessed ( $t(78) = -2.160, p = .034$ ). It should be noted that two of the mental health items – Attention Deficit/Impulse Control

and Emotional Control - on the Acute CANS did not have a singular item on the CANS-MH. However, in the CANS-MH there are two items for Attention Deficit and Impulse Control that allowed an average score to be calculated in order to conduct the comparison. Although the difference between the two scores for Attention Deficit/Impulse Control was not statistically significant, it was trending toward a significant reduction ( $t(77) = -1.794, p = .077$ ). Also of note is that the Emotional Control was assessed on the CANS-MH by taking the average of the Emotional Regulation Skills domain scores. The Emotional Regulation Skills domain is comprised of four separate items: Self-management, Moodiness, Anger Control, and Over-reaction. The comparison of Emotional Control scores was not significantly different from the intake assessment to entry into treatment. These analyses demonstrate that mental health needs were relatively stable between the intake assessment and entry into mental health services.

A comparison of mental health needs for individuals receiving mental health services, and those that did not, at the initial assessment demonstrated some differences. Anxiety scores were significantly higher for the CANS-MH group ( $M = 1.167, SD = 0.874, t = -4.026, p < .001$ ) than individuals who only completed the Acute CANS ( $M = 0.633, SD = 0.841$ ). Mood scores were also significantly higher for individuals who completed the CANS-MH ( $M = 0.987, SD = 0.875, t = -3.001, p = .003$ ) than those who only completed the Acute CANS ( $M = 0.607, SD = 0.763$ ). Nevertheless, the other mental health items – Psychosis, Emotional Control, Attention Deficit/Impulse Control, Oppositional Behaviour, Conduct Behaviour, Parent-Child Relationship, and Autism Spectrum- were not significantly different between these groups.

### **Predictors of Acute CANS Mental Health Symptoms**

Existing literature guided the order of entry for predictor variables in the hierarchical models. Age and sex were entered into the models at the first step as control variables.

Functioning domain scores were added at the second step as emerging literature base beginning to establish the robust impact that impairments in functioning (e.g. disruptions in sleep, school or work behaviour, eating, etc.) can have on mental health symptoms (e.g. Gruber et al., 2014; Wong, Brower, & Zuker, 2009). The Individual Strengths domain was subsequently entered into each model at the third step, as it demonstrates overlap with aspects of resilience in Indigenous youth (e.g. involvement in community activities, spirituality, talents and interests, etc.), that may provide a buffer against worsening of symptoms when individuals experience mental health difficulties (Toombs, Kowatch, & Mushquash, 2016). Finally, Family/Caregiver Needs and Strengths were included in the models as it provided a proxy measure of some of the social determinants of health including access to resources, residential stability, and parental mental and physical health. The items included in each of these domains, as well as the frequency of endorsement, can be seen in Table 5 (Appendix A).

Internal reliability for the domain scores ranged from adequate to good. In regard to the Functioning domain, adequate internal reliability was demonstrated ( $\alpha = 0.656$ ), however, Cronbach's alpha would marginally improve if the communication item was removed (changes to  $\alpha = 0.672$ ) as well as the Sexual Development item (changes to  $\alpha = 0.663$ ). Good internal reliability was demonstrated for the Individual Strengths domain ( $\alpha = 0.950$ ), although removal of the Spirituality/Religious item would marginally improve Cronbach's alpha (to  $\alpha = 0.954$ ). Good internal reliability was also demonstrated for the Family/Caregiver Needs and Strengths domain ( $\alpha = 0.756$ ), although removal of the Residential Stability would marginally improve Cronbach's alpha (to  $\alpha = 0.759$ ). Given the relatively small improvements in Cronbach's alpha by removing individual items, analyses were conducted using all items from the domains, retaining practical relevance for the community organization's assessment procedure.

**Regression diagnostics.** Hierarchical linear regression models were developed for the four mental health needs and post estimation diagnostics were completed. Standardized residuals, studentized residuals, dfbeta scores, leverage estimates, and Cook's D were calculated and examined for influential outliers. This analysis demonstrated that there was one observation that had consistently high levels of influence on the scores across models. Upon examination, the observation reflected accurate information and was therefore retained in the models. This observation is likely representative of sporadic extreme scores that occur in clinical settings.

Multicollinearity, as examined through the use of a variance inflation factor, tolerance, and condition index, was within an acceptable range for the analyses. The errors from a regression analysis should approximate normality, suggesting that the mean error is very close to zero, and that differences much greater than this do not occur very often (Field, 2009). The normality of residuals was determined by examining a kernel density plot with a normal line superimposed, standardized normal probability plots, quantile plots of the residuals against quantiles of the normal distribution, as well as calculation of the Shapiro-Wilk's test for normality. All of the regression analyses displayed adequate normality with the exception of the regression estimation for Adjustment to Trauma. Adjustment to Trauma demonstrated a right skewed distribution. Based on residual versus predicted plots with a locally weighted smoother that suggested non-linear relationships for age and Individual Strengths, attempts to adjust this distribution were undertaken by transforming variables, including a cubic transformation for age and a quadratic transformation for the individual strengths domain scores. These transformations did not improve the distribution of the scores, therefore, a bootstrapping sample estimation with 10,000 repetitions was used for the Adjustment to Trauma analysis. Bootstrapping is a resampling technique that draws samples from the population sample, with replacement, in order

to estimate the distribution structure (Brownstone & Valletta, 2001). The analysis develops a mean for each sample it takes (equal to the number of repetitions) and develops a distribution of the resampled means to approximate the sample distribution of the population (Brownstone & Valletta, 2001).

Homogeneity of the variances was assessed using an information matrix test, Breusch-Pagan and Cook-Weisberg test, as well as an examination of a residual versus fitted plot. All of the analyses demonstrated heteroscedasticity in errors, therefore, a robust estimator of variance was used for all of the models. The linearity of relationships among variables was examined using kernel density plots and augmented partial residual plots. Non-linearity was observed for: Age in the Emotional Control model; Individual Strengths in the Anxiety, Mood, and Adjustment to Trauma analysis; and Family/Caregiver Needs and Strengths in the Anxiety and Mood model. Polynomial transformations were applied to variables displaying non-linear patterns until linearity was approximated and entered into the model at the step where the non-transformed variable would be entered (e.g. a quadratic transformation of Individual Strengths would be entered at step three). See Table 6 (Appendix A) and Table 7 (Appendix A) for the polynomial transformation entered into each model. Finally, model specification was assessed using the Ramsey regression specification error test for omitted variables. Good model specification was demonstrated for all of the models.

**Anxiety hierarchical regression.** The results from the blocked entry regression analysis for Acute CANS anxiety scores can be seen in Table 6 (Appendix A). The final model predicting anxiety scores was significant ( $p < .001$ ) and accounted for 44.16% of the variance in Anxiety scores. Increases in age and Functioning were predictive of increased needs for intervention for Anxiety symptoms. The linear function of Individual Strengths was also significantly predictive

of Anxiety needs such that increased levels of Anxiety were associated with increased Individual Strength scores. However, a quadratic term was also entered for Individual strengths as this variable demonstrated non-linearity with the diagnostic plots. The quadratic transformation of Individual Strengths trended toward significance ( $\beta = -0.533, t = -1.79, p = .075$ ).

Family/Caregiver Needs and Strengths also demonstrated non-linearity, and was subsequently transformed into a cubic variable. The cubic transformation of Family/Caregiver Needs and Strengths was not a significant predictor. Although not statistically significant, the coefficient for sex displayed a counterintuitive relationship with Anxiety needs, such that it displayed a slight positive relationship. This is surprising as females generally experience higher levels of anxiety symptoms than males, and in this analysis females were coded with a "0" and males with a "1".

Age was significantly predictive at every step in the Anxiety model ( $p < .001$ ), however, sex was not significantly predictive at any step in the model. The introduction of the Functioning domain significantly improved the amount of variance accounted for ( $F(3, 155) = 48.93, \Delta R^2 = .124, p < .001$ ). The introduction of the Individual strengths domain and quadratic transformation also improved the  $R^2$  ( $F(4, 154) = 31.46, \Delta R^2 = .028, p = .024$ ). At this step, the Individual Strengths domain individually contributed to the model ( $\beta = .654, t = 2.20, p = .029$ ) and the quadratic transformation of Individual Strengths trended toward significance ( $\beta = -.523, t = -1.78, p = .078$ ). The graph of the adjusted mean Anxiety scores as a function of the Individual Strengths transformation (Graph 1; Appendix B) demonstrates that predicted mean Anxiety scores increased until the Individual Strengths domain reaches 25, after which they decline. The next step consisted of entering the Family/Caregiver Needs and Strengths domain as well as a quadratic and cubic transformation of this variable. The addition of these variables did not significantly improve the model ( $F(8, 150) = 19.36, \Delta R^2 = .006, ns$ ) and none of the

Family/Caregiver Needs and Strengths variables individually contributed to the model.

Nevertheless, Graph 2 (Appendix B) demonstrates that predicted mean Anxiety scores increase as a function of Family/Caregiver Needs and Strengths from 0 until 1, then they begin to decrease until FCNS reaches approximately 8, after which predicted mean anxiety scores decline.

**Mood hierarchical regression.** The final model from the blocked entry regression for mood can be seen in Table 6 (Appendix A). Overall the model significantly predicted need for intervention with Mood symptoms ( $F(7, 150) = 20.34, p < .001$ ) and accounted for 37.00% of the variance in Mood scores. Increases in age ( $\beta = .395, t = 5.67, p < .001$ ) and Functioning ( $\beta = .341, t = 5.54, p < .001$ ) were significantly predictive of increased needs for intervention with Mood symptoms. Sex, Individual Strengths, the quadratic transformation of Individual Strengths, Family/Caregiver Needs and Strengths and the quadratic transformation of Family/Caregiver Needs and Strengths were not statistically significant.

The initial model for Mood scores, with sex and age, was significantly predictive ( $F(2, 155) = 19.55, R^2 = .193, p < .001$ ). Age was predictive across all steps in the model, however, sex was not significant at any step. The introduction of functioning significantly improved the amount of variance accounted for by the model ( $F(3, 154) = 40.00, \Delta R^2 = .137, p < .001$ ) and changed the direction of the relationship between sex and mood, going from positive to negative ( $\beta = .032$  to  $\beta = -.022$ ) and functioning independently contributed to the model ( $\beta = -.380, t = 6.26, p < .001$ ). Next, the addition of the Individual Strengths domain and quadratic function also significantly improved the model ( $F(5, 152) = 26.04, \Delta R^2 = .031, p = .022$ ), although neither the Individual Strengths domain score ( $\beta = .518, t = 1.54, ns$ ) or the quadratic function individually contributed to the model ( $\beta = -.357, t = -1.04, ns$ ). A graph of the adjustment mean Mood scores

can be seen in Graph 3 (Appendix B), which demonstrates that mean predicted Mood scores increase until Individual Strengths reaches approximately 28, after which mean Anxiety scores start to decline. The introduction of the Family/Caregiver Needs and Strengths domain and quadratic function did not significantly improve the model ( $F(7, 150) = 20.34, \Delta R^2 = .009, ns$ ) and the other predictors remained relatively stable. Furthermore, neither the Family/Caregiver Needs and Strengths, ( $\beta = -.241, t = -1.45, ns$ ) or the quadratic transformation, ( $\beta = .246, t = 1.60, ns$ ) individually contributed to the model. As Graph 4 (Appendix B) demonstrates, mean predicted Mood scores increased until FCNS reached approximately 4, after which predicted Mood scores increased.

**Emotional Control hierarchical regression.** The final model for Emotional Control scores was significantly predictive ( $F(6, 151) = 19.31, p < .001$ ) and accounted for 29.47% of the variance in scores (see Table 6; Appendix A). Within this model, Age ( $\beta = .751, t = 3.01, p = .003$ ), a quadratic transformation of Age ( $\beta = -.679, t = -2.44, p = .016$ ), and Functioning ( $\beta = .485, t = 7.45, p < .001$ ) were significant at the  $p < .05$  level, whereas Family/Caregiver Needs and Strengths ( $\beta = -.099, t = -1.73, p = .085$ ) domain scores trended toward significance (at the  $p < .10$  level) of Emotional control scores. Referents' sex and Individual Strengths domain scores were not significantly predictive.

The initial model for Emotional Control, which included sex, age, and a quadratic transformation of age, was significantly predictive ( $F(3, 154) = 3.13, R^2 = .060, p = .028$ ). Age and the quadratic transformation of age were individually predictive across all steps of the model, however, sex was not individually predictive at any step. The adjusted mean scores of Emotional Control scores as a function of age (Graph 5, Appendix B) demonstrate that predicted Emotional Control scores increased until approximately age 11 years, after which they declined.



The addition of functioning significantly improved the model ( $F(4, 153) = 27.42, \Delta R^2 = .219, p < .001$ ) and individually contributed to the model ( $\beta = .481, t = 7.43, p < .001$ ) with increases in Functioning associated with increased need for intervention with Mood. The introduction of Individual Strengths into the model did not significantly improve it ( $F(5, 152) = 21.57, \Delta R^2 = .007, ns$ ) and Individual Strengths was not a significant independent contributor to the model. However, the introduction of Family/Caregiver Needs and Strengths trended toward significantly improving the model ( $F(6, 151) = 19.31, \Delta R^2 = .009, p = .085$ ) and the domain score trended toward being an independent contributor in the model ( $\beta = -.099, t = -1.73, p = .085$ ).

The Individual Strengths domain scores demonstrated a non-linear pattern with Emotional Control, however, neither a quadratic or cubic transformation resulted in a closer approximation to linearity. Adequately meeting the assumption of linearity helps to reduce bias in regression models. Thus, in order to assess the amount of potential bias the Individual Strengths domain was exerting over the final model, a regression was run excluding this variable. This model demonstrated many similarities to the final model presented in Table 6 (Appendix A;  $F(5, 152) = 23.49, R^2 = .291, p < .001$ ; age  $\beta = .670, t = 3.03, p = .003$ ; sex  $\beta = .035, t = 0.51, ns$ ; quadratic age  $\beta = -.617, t = -2.38, p = .018$ ; Functioning  $\beta = .489, t = 7.59, p < .001$ ; Family/Caregiver Needs and Strengths  $\beta = -.112, t = -2.07, p = 0.04$ ). This comparison demonstrates that the Individual Strengths domain was not exerting a large amount of bias over the regression model, justifying inclusion in the model.

**Adjustment to Trauma hierarchical regression.** The final model for Adjustment to Trauma was significantly predictive ( $F(7, 149) = 5.94, R^2 = .216, p < .001$ ) and accounted for 21.63% of the variance in scores (see Table 7; Appendix A). The regression diagnostics for this model demonstrated that it had non-normally distributed errors, therefore, the same model was

run using bootstrapping. A comparison of the coefficients and standard errors for these results can be seen in Table 7 (Appendix A). As can be seen, the coefficients for the models remained the same, and the largest difference in standard errors was .003. Thus, the regression analysis was determined to be stable and suitable for interpretation. Within the final model, there were no variables that were significant independent contributors.

The initial step of the model for Adjustment to Trauma with age and sex was statistically predictive ( $F(2, 154) = 4.44, R^2 = .067, p < .001$ ) and accounted for 6.66% of the variance in the scores. At this initial step, increases in Age were significantly predictive ( $\beta = .258, t = 2.98, p = 0.003$ ) of higher Adjustment to Trauma scores. Sex did not independently contribute to the model at any step. The introduction of the Functioning domain trended toward significantly improving the model ( $F(3, 153) = 5.34, \Delta R^2 = .044, p = .060$ ) as well as being an independent contributor to the model ( $\beta = .214, t = 1.89, p = .060$ ) with higher Functioning scores associated with higher Adjustment to Trauma needs. At the third step of the model, the introduction of Individual Strengths, as well as the quadratic and cubic transformation, significantly improved the model ( $F(6, 150) = 7.05, \Delta R^2 = .104, p < .001$ ). At this step, age no longer significantly contributed to the model ( $\beta = .089, t = 1.02, p = .310$ ) and Functioning was no longer trending toward significance ( $\beta = .158, t = 1.50, p = .137$ ). The adjusted mean Adjustment to Trauma scores can be seen in Graph 6 (Appendix B) and demonstrate that Adjustment to Trauma scores increased as Individual Strengths increased until Individual Strengths reached approximately 21, after which they declined. Step four introduced the Family/Caregiver Needs and Strengths domain which did not significantly improve the model ( $F(7, 149) = 5.94, \Delta R^2 = .003, ns$ ).

## Discussion

This study examined the intake assessment evaluation forms for a community based mental health care provider for a primarily urban Indigenous population in Northern Ontario. Through this examination, the rates of commonly occurring mental health care needs were identified for Indigenous children and youth aged 0 to 17 years old. In an effort to assist treatment providers in identifying and prioritizing clients to receive services, hierarchical regression analyses were employed to identify predictors of intervention needs within this sample. The current project will inform future treatment provisioning and development within the community based mental health care provider. Most notably, it is hoped that this project contributes to the early identification of children within the service provider's catchment area that have the greatest needs for intervention and to clarify the most relevant and prominent target areas.

The hierarchical regression analyses for Anxiety, Mood, Emotional Control, and Adjustment to Trauma, were significantly predictive with the inclusion of the referent's age, sex, Functioning, Individual Strengths, and Family/Caregiver Needs and Strengths domain scores in the model. However, the specific items that were independently predictive in the model differed between the mental health need symptoms. These findings support the hypotheses that functioning, resilience (as measured with the Individual Strengths domain), and social determinants of health (as assessed with the Family/Caregiver Needs and Strengths domain) are integral aspects to consider when assessing mental health needs for Indigenous children and youth.

Age significantly predicted higher intervention needs for Anxiety, Mood, and Emotional Control. Age demonstrated a positive relationship with Anxiety and Mood which is consistent with findings from past literature. For example, Hankin et al. (1998) found that clinical

depression slowly increased from age 11 to 15, after which it increased more rapidly from age 15 to 18 years of age. In regard to anxiety, the source of anxiety generally changes with age (e.g. anxiety about separation in young children versus generalized anxiety in young adults) as do the rates of onset (Kessler et al., 2005). 25% of people who experienced an anxiety disorder (excluding separation anxiety and specific phobia) within their lifetime had an onset of that disorder by approximately mid-adolescence (ranging from 8 years of age to 20 years of age), and 50% of people had an onset by mid-adolescence or early adulthood (ranging from 13 years of age to 31 years; Kessler et al., 2005). Separation anxiety and specific phobias show an earlier age of onset with 75% of people experienced the onset of these disorders before the age of 10 and 12 years, respectively (Kessler et al., 2005). The Anxiety domain scores on the Acute CANS assesses mental health needs in a variety of anxiety disorders including social anxiety, panic attacks, obsessive-compulsive disorder, phobias, and separation anxiety (Lyons et al., 1999). Thus the observed pattern of increasing Anxiety needs with increasing age demonstrates an overall pattern that is consistent with existent literature.

Both Emotional Control and Adjustment to Trauma demonstrated more complex relationships with referents' age than what was seen with Anxiety and Mood. Emotional Control scores demonstrated a quadratic relationship with age such that increased needs for intervention with Emotional Control increased until referents reached approximately 11 years of age, after which it started to decrease. In the Adjustment to Trauma analysis, age was influenced by the Individual Strengths domain. Within this model, age was individually significant until Individual Strengths, and the polynomial transformations for this variable, were introduced. This could suggest that higher scores on the Individual Strengths domain (which is representative of a decreased number of strengths) could moderate the relationship between Adjustment to Trauma

and age, although the Individual Strengths domain was not independently predictive of Adjustment to Trauma scores. The addition of the Individual Strengths factors was associated with a .104 increase in  $R^2$ . Previous research has demonstrated that resilience (measured using global assessments of individual and contextual factors) moderates the relationship between exposure to violence and re-experiencing symptoms of Post-Traumatic Stress Disorder, such that re-experiencing was only demonstrated when resilience scores were low (Zahradnik et al., 2010). Although age was not included in Zahradnik et al.'s analysis, these findings align and suggest further evidence that resilience influences adjustment to traumatic events. Nevertheless, across models, age was a fairly robust predictor of mental health needs.

Surprisingly, sex did not significantly predict mental health needs in any of the models. Almadari and Kebler (2015) found that the mental health items Anxiety, Mood, and Adjustment to Trauma loaded onto a single factor in a community based sample, which was labeled an internalizing factor. The lack of significant prediction from the sex variable may be due to the prominence of these internalizing mental health needs, although it would still be expected that females would demonstrate higher internalizing scores. Past research has demonstrated that females have consistently higher depressive symptoms than males (Hankin et al., 1998). It should be noted that the average age of referents in this sample is 8.83 years ( $SD = 4.35$ ) with 68.88% of the sample younger than 13 years. Anxiety symptoms become more prominent after the age of 11-13 (Breton et al., 1999; Kessler et al., 2005), which given the age in this sample, suggests that the lack of sex differences may be confounded by the age of referents, as sex differences would be expected to emerge after the onset of anxiety disorders.

The Functioning domain was a robust predictor across models. The addition of this domain displayed a statistically significant increase in the amount of variance accounted for in

all models and independently predicted Anxiety, Mood, and Emotional Control. This robust relationship may be due to the functioning domain acting as a proxy measure for the severity of mental health needs. Many disorders demonstrate impairment in multiple areas of functioning, such as school and interpersonal domains. Some researchers have suggested that assessing functioning in addition to mental health needs can provide information about the course and prognosis of mental health needs for children (e.g. Canino et al., 1999). However, an initial study has demonstrated that while baseline internalizing symptoms are affected by functioning impairments, the rate of increase or decrease of these symptoms over adolescence is not significantly influenced by functioning impairments (Cleverley, Bennett, & Duku, 2013).

Yet some of the areas of functioning that are assessed by the Functioning domain score are areas that could be amenable to interventions. For example, teaching parents and children about sleep hygiene has been recommended as the first line of treatment for sleep problems in children and adolescents that experience ADHD, depression, and anxiety (Ivanenko & Johnson, 2008). These behavioural interventions could include providing a consistent, positive bedtime routine and avoiding frightening or overly stimulating exposures right before bed (Ivanenko & Johnson, 2008). Interventions to improve family functioning, self-care, and school attendance are other areas where functioning could be targeted to improve mental health for children. Teaching these skills in addition to treating mental health concerns could provide a foundation for greater emotional stability throughout a child's life.

The addition of Individual Strengths to the regression models significantly predicted higher intervention needs for Anxiety, Mood, and Adjustment to Trauma but not for Emotional Control. Furthermore, a non-linear transformation of the Individual Strengths domain was required for the Anxiety and Mood model (quadratic transformation) as well as the Adjustment

to Trauma model (cubic transformation). Comparison of these graphs (Graph 1, 3 & 6; Appendix B) demonstrates similarity within the range of mental health need scores. In all of these graphs, predicted scores for Anxiety, Mood, and Adjustment to Trauma increase until Individual Strengths reaches approximately 20 and then begins to decline. The rating scale for this domain may contribute to this observed pattern. Items on the Individual Strengths domain are rated from  $0 = \textit{Centre-piece Strength}$  to  $3 = \textit{No Strength Identified}$ . It may be counterintuitive for people to rate an individual's strength as a 0 when it is an aspect that positively influences their life. When items on behavioural rating scales are negatively worded, such as the Individual Strengths items, responses on these items tend to be skewed, with few people receiving the most extreme rating (Rowe & Rowe, 2004). Furthermore, this could be a practice in client-centred care, where assessors attempt to find positive attributes of individuals that are experiencing high levels of distress to decrease the potentially negative impact of the assessment.

The addition of Family/Caregiver Needs and Strengths was not a significant predictor in any of the models. An examination of the correlation between Family Caregiver Needs and Strengths demonstrated that it was weakly correlated with Functioning ( $r = 0.294$ ) and Emotional Regulation ( $r = -0.215$ ), and very weakly correlated with Individual Strengths ( $r = -0.056$ ). It is possible that due to these correlations, the predictive ability of Family/Caregiver Needs and Strengths was subsumed by earlier predictor variables (Norman & Streiner, 2003). Indeed, this may be due to some overlap in the assessment of family functioning within some of the other domains, with family being listed as an item in the Functioning domain as well as in the Interpersonal Strengths domain. The Family item within the Functioning domain assesses parent and sibling interactions as well as the family's ability to meet the child's emotional needs (Lyons et al., 1999). Whereas the Family item within the Individual Strengths domain assesses the

family's communication and involvement with the child (Lyons et al., 1999). These descriptions of the family items in the Acute CANS assessment manual makes clear distinctions between what should be assessed by each item in the different domain scores. Thus, so long as assessors make these distinctions when rating individuals, the items should represent unique domains. A strength of the CANS in community based settings is the requirement for assessors to receive training on administering the tool. In order to become certified in the use of the CANS, raters must demonstrate a reliability of 0.70 or higher with a case vignette (Lyons et al., 2011).

In this study, the most common mental health needs were seen for Anxiety, Mood, Emotional Control, and Adjustment to Trauma. This contrasts with past research that has found conduct disorder to be more common than anxiety disorders, and ADHD and substance use disorder to be more common than depressive disorders, in an American Indian population ranging in age from 9 to 13 years old (Costello, Farmer, Angold, Burns, and Erkanli, 1997). In this community based study, any anxiety disorder was seen in 5.3% of the sample, any depressive disorder occurred in 0.3%, conduct disorder was seen in 6.5%, ADHD was seen in 1.2%, and substance use disorders were seen in 1.2% of children (Costello et. al., 1997). These findings are slightly different than an examination of mental health diagnoses among teenage American Indian youth (14-16 years old), with rates of conduct disorder lower in comparison to anxiety disorders, however there is overlap as ADHD and substance use disorder were more common than anxiety or depression (Beals et al., 1997). Within the Beals et al. (1997) study, substance use disorder was the most common disorder, affecting 18.3% of the sample, followed by ADHD which affected 10.6%, any type of anxiety disorder which affected 5.5%, any depressive disorder affecting 4.7%, conduct disorder affecting 3.8%, and oppositional defiance disorder affecting 2.9%. It should be noted that neither of these studies assessed emotional



control or adjustment to trauma (or post-traumatic stress disorder). Thus, it is surprising to find comparatively low rates of attention deficit/impulse control and substance use concerns in relation to depression concerns. The lower age in this sample in comparison to both the Costello et al. (1997) and Beals et al. (1997) study may account for the lower rates of substance abuse seen, however, this does not account for the lower rates of ADHD.

The rates of anxiety in the current study align with findings from a general population sample in Quebec, although the lower rate of ADHD symptoms and higher occurrence of depressive symptoms is surprising. Breton et al. (1999) found that between 5.8% -17.5% of children aged 6-14 were experiencing an anxiety disorder, between 1.1% -3.5% of children experienced a depressive disorder, 3.8% -9.8% of children experienced ADHD, 0.2% -2.3% experienced conduct disorder, and 0.7% - 5.8% experienced oppositional disorders. For each of these disorder categories there were significant age by sex interactions. In regard to anxiety, rates of disorder were increased in females aged 9-11 and 12-14 years in comparison to younger females and males. Depression was higher in adolescent females than adolescent males and females in the 6 to 8 year category (Breton et al., 1999). Depression among males was more common during younger years (e.g. 6-11 years) in comparison to adolescents (Breton et al., 1999). In regard to ADHD, males had a consistently higher rate of disorder than females and children aged 6-8 years had higher rates than adolescents (Breton et al., 1999). Rates of conduct and oppositional disorders were elevated among males in comparison to females, as well as children aged 9-11 years in comparison to adolescents (Breton et al., 1999). In comparison to these findings, the current study did not find sex to be predictive of mental health needs for any of the models. This study deviates in methodology from the Breton et al. study. The current study was examining mental health needs which may correspond more toward mental health

symptoms as opposed to mental health diagnoses, whereas the Breton et al. study relied on a structured diagnostic interview.

The identified mental health needs in the current study align with the research surrounding transdiagnostic symptoms. Transdiagnostic symptoms are features of mental health impairments that are common across different diagnostic categories (Clark, & Taylor, 2009; Tippin, Dawson, & Mushquash, 2017). Negative affect (or neuroticism) is a sensitivity to negative stimuli which can lead to host of negative emotions including fear, anxiety, sadness, guilt, and hostility, among others (Clark et al., 1994; Tippin et al., 2017). Negative affect has been noted within disorders such as depression and anxiety (Clark et al., 1994; Tippin et al., 2017). Repetitive negative thought, which includes rumination about past events, thoughts, or experiences, and worry about future events, has also been seen to influence depressive and anxious disorders (Segerstrom, Tsao, Alden, & Craske, 2000; Tippin et al., 2017). In the current study, the high incidence of elevated Mood and Anxiety needs corresponds with the transdiagnostic symptoms of negative affect and repetitive negative thought. Elevated needs in the Emotional Control domain correspond with the transdiagnostic symptom of emotional regulation that is comprised of being aware of, and understanding emotions, accepting those emotions, modulating emotions to be expressed in a situationally appropriate way, and the ability to behave in a way that is in accordance with goal directed behaviour, which often requires the restraint of impulsive behaviours (Gratz & Raemer, 2004; Tippin et al., 2017). Post-Traumatic Stress Disorder (PTSD) has demonstrated similarities in processing with various anxiety disorders and depression (Wilamowska et al., 2010). While the Adjustment to Trauma domain score is not a diagnosis of PTSD, there is overlap in the type of symptoms experienced such as intrusive thoughts, flashbacks, or dissociative episodes (Lyons, Griffin, Fazio, & Lyons, 1999).

The similarity between the mental health needs identified, and transdiagnostic symptoms, suggests that an appropriate avenue for treatment might be a transdiagnostic intervention that can address most of these symptoms with one round of intervention.

The observed mental health symptoms remained relatively stable from client intake until they began receiving mental health services, with the exception of need for intervention with Mood. Need for intervention with mood decreased significantly from the initial assessment to entry into mental health treatment. The decrease in Mood symptoms is consistent with literature that has found mood disturbance symptoms decrease during a waitlist period for adolescents, although these decreases are not as substantial when compared to treatment groups (e.g. Clarke et al., 1999; Rosselló & Bernal, 1999). These findings suggest similarities in the course of Mood symptoms between this sample of First Nation children and mainstream populations.

These analyses demonstrate that the existing measures being used to assess mental health needs in a sample of First Nation children and youth offers insight into increased mental health needs. Overall, mental health needs were significantly predicted when age, sex, Functioning, Individual Strengths, and Family/Caregiver Needs and Strengths were included in the models. Across models there was no significant difference in mental health needs based on sex. Furthermore, the Family/Caregiver Needs and Strengths domain did not independently contribute to any model.

### **Limitations**

While conducting community-based mental health research can be informative for clinical relevance and long-term practicality, it often requires flexibility and adaptation to the availability of data and methods. This study was no exception to some of these difficulties. For example, the sample in this study represents a small portion of all the referents to this

organization within the assessment time frame, which limits the generalizability of the findings from this study. The following section further discusses how the outcome of this study was potentially influenced by the different measures and type of analysis used.

The CANS forms can be tailored to the needs of the agency or intended use. While this flexibility is ideal for assessment and triage, it can complicate statistical analyses, as items that are present on one form may not be present, or may be made up of multiple items, on another form. For example, in the assessment of stability of mental health needs from the intake assessment to referents' entry into treatment in the current study, it was necessary to take an average score for two of the mental health need items. While this is statistically comparable, taking an average score of multiple items resulted in a high incidence of scores in-between the scale anchors (e.g. 1.5 or 2.5 when the scale anchors are 0, 1, 2, and 3). It is possible that if these items were measured with a more directly comparable scale, there would be more differences seen between the two time-points as assessors would be forced to choose between scale anchor points.

The analysis of stability in mental health symptoms was also limited by the number of CANS forms available when referents entered into treatment. Follow-up forms were available for just under half of the sample that was assessed using the Acute CANS and were only available for individuals entering into mental health services. Thus, it is possible that mental health intervention needs could increase, or decrease, for individuals entering into different types of programs or service delivery streams. Furthermore, the age of individuals who completed the CANS-MH was approximately 3 years older than the children who completed only the Acute CANS. It is possible that these younger children would experience more instability in their mental health needs.

Past research has consistently identified that mental health disorders are influenced by children's age and sex, however, the current study did not find any sex differences. While there is a possibility that sex differences in First Nation population do not follow the same pattern as non-Indigenous populations, the analyses failed to include an interaction term between sex and age that may have allowed for some of the intricacies of these sex differences to emerge. Thus, no conclusions can be made in regard to sex differences in mental health needs in this population until such analyses are conducted.

The classic dilemma of breadth of predictors versus the parsimony of statistical analyses played out in the analysis for this project. Although there are no specific rules about an appropriate sample size for a multiple regression, Baybak (2004) states that in order to demonstrate model stability and avoid spurious findings, researchers should maintain a ratio of 10-15 observations per predictor. Thus, the sample size in the current study limited the potential specificity of predictors that could be included in the analysis. It would be ideal to identify more specific factors that may influence mental health needs such as particular Functioning items or Individual Strengths items.

Past research has demonstrated that depressive symptoms increase more substantially with age for females in comparison to males (Hankin et al., 1998). The lack of significant sex differences found in this analysis may be due to the absence of an interaction term between sex and age in the regression analyses, with most of the variance accounted for by the age variable. However, this interaction term was not included in the regression analyses in order to maintain predictive ability among the less well established variables (i.e. Functioning, Individual Strengths, and Family/Caregiver Needs and Strengths).

The sample size may have influenced the analysis further by dictating the type of analysis that could be conducted. Multiple regression treats the dependent variable as a continuous variable, assuming that individuals can score any score between the maximum and minimum scores, and that the differences between numbers are the same (e.g. the difference between a 1 and 2 versus the difference between 2 and a 3). However, the dependent variables in this study consist of an ordinal scale, with higher scores communicating higher needs for intervention. The differences between an individual that scores a 2 or 3 on the mental health needs items could be very different from one another. More intricate analyses that take the ordinal ranking of the dependent variable into account (e.g. ordinal logistic regression) may have been able to provide a more detailed account of how the Functioning, Individual Strengths, and Family/Caregiver Needs and Strengths scores influence individuals at each level of mental health need. However, these analyses were not appropriate as the number of individuals' observed in the highest level of mental health needs (i.e. scoring a "3") was very infrequent for Mood, making ordinal regression inappropriate. Collecting more data may allow for more people to enter into this highest level category.

The use of multilevel modeling was also explored, however, clustering individuals into the type of service requested was not appropriate as there was not sufficient variance between groups. While this may suggest that individuals' scores are independent from others within the same referral service, it may also be due to a small number of individuals referred for particular services. Thus, the authors plan to continue with data collection in order to increase the sample size and conduct analyses that may be able to capture more intricacies in the patterns among variables.

## **Implications**

The finding that common mental health needs align with transdiagnostic factors suggests that one way to address unmet mental health needs in Indigenous populations would be to provide transdiagnostic treatments. Some transdiagnostic treatments, such as motivational interviewing, have been identified as being congruent with aspirational Indigenous cultural values (e.g. Mushquash, 2015) and many are empirically supported treatments (Tippin et al., 2017). These interventions could also potentially reduce wait times by addressing multiple symptoms within one course of intervention. Furthermore, research has demonstrated that transdiagnostic treatment can successfully be implemented in a group format (e.g. de Ornales Maia, Braga, Nunes, Nardi, & Silva, 2013; Westra, Aviram, & Doell, 2011) which could further reduce wait-times by allowing multiple individuals to receive treatment concurrently.

### **Future Research**

The current study established base rates and predictors of mental health needs for children and youth in a largely urban First Nation sample. While, the scope of predictors was limited by the sample size obtained, the identification of Functioning and Individual Strengths as robust predictors can guide future research in identifying specific areas within those domains that are associated with greater impairments. For example, in the Individual Strengths domain, does a child's involvement in the community have as much influence over their mental health needs as their involvement in activities or specific interests?

Furthermore, the overlap in mental health needs with transdiagnostic factors suggests that transdiagnostic interventions may be fruitful interventions in a community based mental health organization. Future research could examine the acceptability of some types of transdiagnostic treatments in Indigenous populations. If these transdiagnostic treatments are acceptable, implementation and evaluation would be the next step in determining if they are effective.

**Appendix A: Tables**

**Table 1. Demographics for Acute CANS, CANS-MH, and Total Sample**

| Demographic variable             | Acute CANS |              | CANS-MH  |              | Total    |              |
|----------------------------------|------------|--------------|----------|--------------|----------|--------------|
|                                  | <i>N</i>   | <i>n</i> (%) | <i>N</i> | <i>n</i> (%) | <i>N</i> | <i>n</i> (%) |
| Sex ( <i>n</i> female, % female) | 91         | 46 (50.55)   | 84       | 37 (44.05)   | 175      | 83 (47.43)   |
| Age ( <i>M</i> , <i>SD</i> )     | 88         | 7.40 (4.56)  | 80       | 10.41 (3.51) | 168      | 8.83 (4.35)  |
| Living off reserve               | 84         | 74 (88.10)   | 79       | 65 (82.28)   | 163      | 139 (85.28)  |
| Family Structure                 | 88         |              | 82       |              | 170      |              |
| Biological parent(s)             |            | 60 (68.18)   |          | 51 (62.20)   |          | 111 (65.29)  |
| Biological grandparent(s)        |            | 8 (9.09)     |          | 10 (12.20)   |          | 18 (10.59)   |
| Other biological relative        |            | 1 (1.14)     |          | 3 (3.66)     |          | 4 (2.35)     |
| Foster care                      |            | 18 (20.46)   |          | 18 (21.95)   |          | 36 (21.18)   |
| Adopted                          |            | 1 (1.14)     |          | 0 (0)        |          | 1 (0.59)     |
| Child Welfare Involvement        | 93         |              | 84       |              | 177      |              |
| Crown Ward                       |            | 8 (8.60)     |          | 8 (9.52)     |          | 16 (9.04)    |
| Customary Care                   |            | 10 (10.75)   |          | 9 (10.71)    |          | 19 (10.73)   |
| Temporary Care                   |            | 3 (3.23)     |          | 7 (7.53)     |          | 10 (5.65)    |
| Other                            |            | 39 (41.94)   |          | 31 (36.91)   |          | 70 (39.55)   |

**Table 2. Acute CANS Domain Scores**

| <i>Acute CANS Domains (n = 178)</i> | <b>Minimum</b> | <b>Maximum</b> | <b>Mean</b> | <b><i>SD</i></b> |
|-------------------------------------|----------------|----------------|-------------|------------------|
| Mental Health                       | 0              | 26             | 6.31        | 5.26             |
| Risk Behaviours                     | 0              | 13             | 1.33        | 2.23             |
| Family/Caregiver Needs & Strengths  | 0              | 9              | 1.05        | 2.23             |
| Functioning                         | 0              | 25             | 4.27        | 3.95             |
| Care Intensity and Organization     | 0              | 6              | 0.22        | 0.76             |
| Individual Strengths                | 0              | 33             | 20.44       | 10.96            |



**Table 3. Mental Health Needs on the Acute CANS**

| Mental Health Need                    | No evidence/ Need for action <i>n</i> (%) | History/ Watchful Waiting <i>n</i> (%) | Moderate Need/ Action Required <i>n</i> (%) | Severe Need/ Intensive Action Required <i>n</i> (%) |
|---------------------------------------|---|--|---|---|
| Psychosis                             | 153 (90.53)                               | 8 (4.73)                               | 8 (4.73)                                    | -   |
| Anxiety                               | 71 (42.01)                                | 54 (31.95)                             | 37 (21.89)                                  | 7 (4.14)  |
| Mood                                  | 76 (45.24)                                | 56 (33.33)                             | 32 (19.05)                                  | 4 (2.38)  |
| Attention Deficit/<br>Impulse Control | 104 (61.54)                               | 45 (26.63)                             | 14 (8.28)                                   | 6 (3.55)  |
| Oppositional Behaviour                | 96 (57.49)                                | 47 (28.14)                             | 18 (10.78)                                  | 6 (3.59)  |
| Conduct Behaviour                     | 145 (85.80)                               | 16 (9.47)                              | 7 (4.14)                                    | 1 (0.59)  |
| Emotional Control                     | 70 (41.37)                                | 56 (33.33)                             | 36 (21.43)                                  | 6 (3.57)  |
| Parent Child-<br>Relationship         | 119 (70.83)                               | 35 (20.83)                             | 9 (5.36)                                    | 5 (2.98)  |
| Adjustment to Trauma                  | 39 (23.35)                                | 45 (26.95)                             | 70 (41.92)                                  | 13 (7.78)   |
| Autism Spectrum<br>Disorder           | 155 (93.37)                               | 6 (3.61)                               | 3 (1.81)                                    | 2 (1.20)  |

**Table 4. *t*-test comparison of Mental Health Needs at Intake Assessment and Entry into Mental Health Services**

| Mental Health Need                              | Acute CANS |       |           | Mental Health CANS |           | <i>t</i> -test |
|---|------------|-------|-----------|--------------------|-----------|----------------|
|   | <i>n</i>   | Mean  | <i>SD</i> | Mean               | <i>SD</i> |                |
| Psychosis                                       | 78         | 0.218 | 0.550     | 0.218              | 0.617     | 0.000          |
| Anxiety   | 79         | 1.165 | 0.869     | 1.101              | 1.008     | -0.600         |
| Mood  | 79         | 0.987 | 0.870     | 0.747              | 0.993     | -2.160**       |
| Attention Deficit/ Impulse Control <sup>a</sup> | 78         | 0.551 | 0.767     | 0.686              | 0.842     | -1.794         |
| Oppositional Behaviour                          | 79         | 0.696 | 0.822     | 0.747              | 0.980     | 0.434          |
| Conduct Behaviour                               | 79         | 0.241 | 0.625     | 0.278              | 0.639     | 0.445          |
| Emotional Control <sup>b</sup>                  | 78         | 0.962 | 0.829     | 0.981              | 0.829     | 0.202          |
| Parent Child-Relationship                       | 78         | 0.474 | 0.833     | 0.641              | 0.882     | 1.326          |
| Adjustment to Trauma                            | 77         | 1.494 | 0.927     | 1.377              | 0.987     | -0.953         |
| Autism Spectrum Disorder                        | 77         | 0.104 | 0.416     | 0.039              | 0.253     | -1.923         |

Note: <sup>a</sup> Attention deficit/impulse control for the Mental Health CANS is the average of 2 items (Attention Deficit/Hyperactivity and Impulse Control). <sup>b</sup> Emotional Control for the Mental Health CANS is the average of 4 items (Self-management, Moodiness, Anger Control, and Over-reaction). \*\*  $p < .05$ . \*\*\* $p < .001$

**Table 5. Frequency of Endorsement for Acute CANS Domain Items Included in Hierarchical Regression Models**

| <b>Acute CANS Domain</b>           | <b>No evidence/<br/>Need for action<br/><i>n</i> (%)</b> | <b>History/ Watchful<br/>Waiting <i>n</i> (%)</b> | <b>Moderate Need/<br/>Action Required<br/><i>n</i> (%)</b> | <b>Severe Need/<br/>Intensive Action<br/>Required <i>n</i> (%)</b> |
|------------------------------------|--|---|--|--|
| <b>Functioning Domain</b>          |  |   |  |  |
| Sensory Processing                 | 143 (84.12)  | 20 (11.76)  | 5 (2.94)   | 2 (1.18)   |
| Communication                      | 122 (70.93)  | 26 (15.12)  | 17 (9.88)  | 7 (4.07)   |
| Motor                              | 150 (87.72)  | 14 (8.19)   | 6 (3.51)   | 1 (0.58)   |
| Self-care                          | 154 (91.12)  | 8 (4.73)  | 5 (2.96)   | 2 (1.18)   |
| Sleep                              | 108 (63.53)  | 41 (24.12)  | 14 (8.24)  | 6 (3.53)   |
| Family                             | 115 (68.86)  | 36 (21.56)  | 15 (8.98)  | 1 (0.60)   |
| Peer                               | 108 (63.91)  | 38 (22.49)  | 17 (10.06)   | 6 (3.55)   |
| School Achievement                 | 105 (62.87)  | 34 (20.36)  | 17 (10.18)   | 11 (6.59)  |
| School Behaviour                   | 106 (63.47)  | 34 (20.36)  | 16 (9.58)  | 11 (6.59)  |
| School Attendance                  | 112 (67.07)  | 20 (11.98)  | 15 (8.98)  | 20 (11.98)   |
| Sexual Development                 | 156 (92.86)  | 8 (4.76)  | 2 (1.19)   | 2 (1.19)   |
| Culture Stress                     | 160 (94.67)  | 5 (2.96)  | 3 (1.78)   | 1 (0.59)   |
| <b>Individual Strengths Domain</b> |  |   |  |  |
|                                    | <b>Centrepiece<br/>Strength<br/><i>n</i> (%)</b>         | <b>Useful Strength<br/><i>n</i> (%)</b>           | <b>Identified<br/>Strength<br/><i>n</i> (%)</b>            | <b>No Strength<br/>Identified<br/><i>n</i> (%)</b>                 |
| Family                             | 40 (23.53)   | 20 (11.76)  | 61 (35.88)   | 49 (28.82)   |
| Interpersonal                      | 33 (19.30)   | 29 (16.96)  | 32 (18.71)   | 77 (45.03)   |
| Relationship Permanence            | 33 (19.30)   | 29 (16.96)  | 38 (22.22)   | 71 (41.52)   |
| Life Skills                        | 50 (29.41)   | 18 (10.59)  | 16 (9.41)  | 86 (50.59)   |
| Well-being                         | 40 (23.39)   | 29 (16.96)  | 16 (9.36)  | 86 (50.29)   |
| Optimism                           | 40 (23.39)   | 25 (14.62)  | 27 (15.79)   | 79 (46.20)   |
| Spiritual/Religious                | 15 (8.77)  | 19 (11.11)  | 30 (17.54)   | 107 (62.57)  |
| Talents/Interests                  | 35 (20.59)   | 30 (17.65)  | 48 (28.24)   | 57 (33.53)   |
| Community Involvement              | 16 (9.41)  | 25 (14.71)  | 34 (20.00)   | 95 (55.88)   |
| Self-expression                    | 17 (10.00)   | 39 (22.94)  | 31 (18.24)   | 83 (48.82)   |
| Flexibility/Adaptability to change | 24 (14.12)   | 38 (22.35)  | 22 (12.94)   | 86 (50.59)   |

| Family/Caregiver Needs and Strengths Domain | No evidence/<br>Need for action<br><i>n</i> (%) | History/<br>Watchful<br>Waiting <i>n</i> (%) | Moderate Need/<br>Action Required<br><i>n</i> (%) | Severe Need/<br>Intensive Action<br>Required <i>n</i> (%) |
|---|---|--|---|---|
| Physical/mental health                      | 115 (68.54)                                     | 40 (23.81)                                   | 12 (7.14)   | 1 (0.60)  |
| Knowledge                                   | 136 (80.47)                                     | 29 (17.16)                                   | 4 (2.37)  | 0 (0.00)  |
| Residential Stability                       | 154 (91.12)                                     | 7 (4.14)                                     | 5 (2.96)  | 3 (1.78)  |
| Resources                                   | 137 (81.07)                                     | 26 (15.38)                                   | 6 (3.55)  | 0 (0.00)  |
| Safety                                      | 156 (92.31)                                     | 9 (5.33)                                     | 2 (1.18)  | 2 (1.18)  |

**Table 6. Hierarchical regression predicting Acute CANS Anxiety, Mood, and Emotional Control scores**

| Predictor                          | Acute CANS Mental Health Need for Intervention |          |         |              |          |         |                   |          |         |
|------------------------------------|--|----------|---------|--------------|----------|---------|-------------------|----------|---------|
|                                    | Anxiety  |          |         | Mood         |          |         | Emotional Control |          |         |
|                                    | $\Delta R^2$                                   | <i>b</i> | $\beta$ | $\Delta R^2$ | <i>b</i> | $\beta$ | $\Delta R^2$      | <i>b</i> | $\beta$ |
| Step 1                             | .283***  |          |         | .193***      |          |         | .060**            |          |         |
| Sex                                |  | .059     | .033    |              | -.024    | -.014   |                   | .063     | .036    |
| Age                                |  | .103     | .497*** |              | .079     | .395*** |                   | .153     | .751**  |
| Age: Quadratic                     |  | -        | -       |              | -        | -       |                   | -.008    | -.679** |
| Step 2                             | .125***  |          |         | .137***      |          |         | .279***           |          |         |
| Functioning                        |  | .074     | .333*** |              | .072     | .341*** |                   | .107     | .485*** |
| Step 3                             | .28**  |          |         | .031**       |          |         | .007              |          |         |
| Individual Strengths               |  | .057     | .660**  |              | .044     | .538    |                   | .006     | .065    |
| IS: Quadratic                      |  | -.001    | -.533†  |              | -.001    | -.392   |                   | -        | -       |
| Step 4                             | .006   |          |         | .009         |          |         | .009†             |          |         |
| Family/Caregiver Needs & Strengths |  | .069     | .144    |              | -.110    | -.241   |                   | -.047    | -.099†  |
| FCNS: Quadratic                    |  | -.030    | -.403   |              | .017     | .246    |                   | -        | -       |
| FCNS: Cubic                        |  | .002     | .205    |              | -        | -       |                   | -        | -       |
| Total $R^2$                        | .442***  |          |         | .370***      |          |         | .295***           |          |         |
| <i>n</i>                           | 159  |          |         | 158          |          |         | 158               |          |         |

Note: IS = Individual Strengths domain. FCNS = Family/Caregiver Needs and Strengths domain. †  $p < .10$ . \*\*  $p < .05$ . \*\*\*  $p < .001$

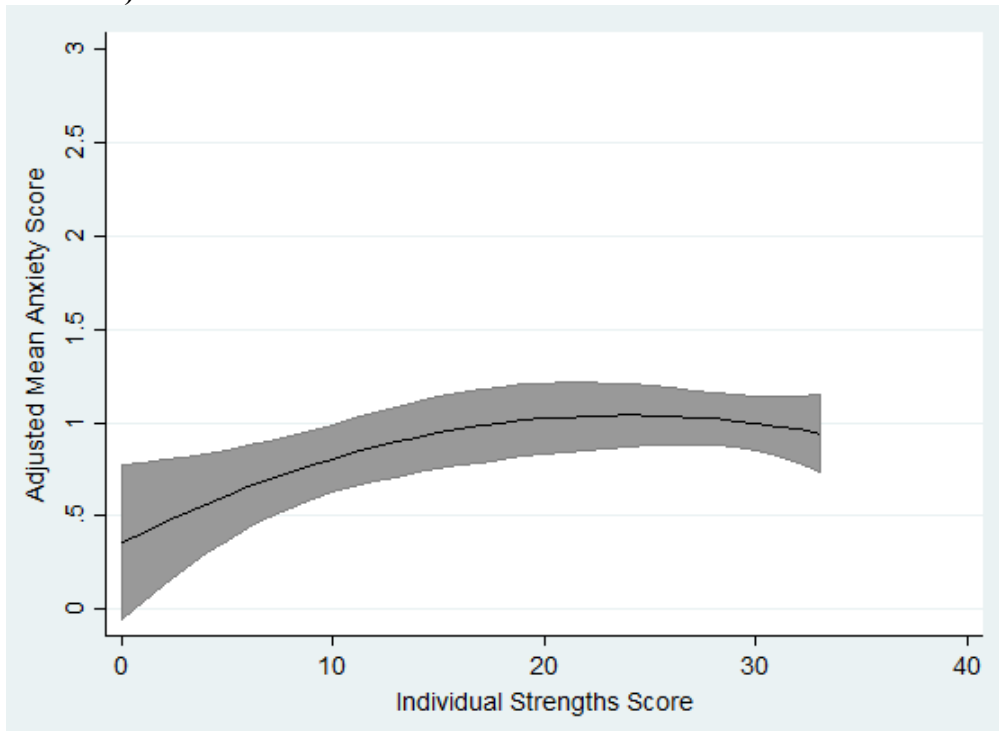
**Table 7. Comparison of hierarchical regression to bootstrapped regression for Adjustment to Trauma scores**

|   | Non-Bootstrapped Regression |          |      |         | Bootstrapped Regression |          |                |      |
|---|-----------------------------|----------|------|---------|-------------------------|----------|----------------|------|
|   | $\Delta R^2$                | <i>b</i> | SE   | $\beta$ | $\Delta R^2$            | <i>b</i> | BCI            | BSE  |
| Step 1                                  | .067**                      |          |      |         | .067**                  |          |                |      |
| Sex                                     |                             | -.081    | .130 | -.045   |                         | -.081    | -.334 to .171  | .129 |
| Age                                     |                             | .019     | .018 | .089    |                         | .019     | -.018 to .056  | .019 |
| Step 2                                  | .044†                       |          |      |         | .044†                   |          |                |      |
| Functioning                             |                             | .036     | .024 | .158    |                         | .036     | -.011 to .083  | .024 |
| Step 3                                  | .104**                      |          |      |         | .104***                 |          |                |      |
| Individual Strengths                    |                             | .063     | .098 | .718    |                         | .063     | -.136 to .262  | .101 |
| IS: Quadratic                           |                             | -.001    | .006 | -.423   |                         | -.001    | -.013 to .011  | .006 |
| IS: Cubic                               |                             | -.000    | .000 | -.563   |                         | -.000    | -.000 to -.000 | .000 |
| Step 4                                  | .003                        |          |      |         | .003                    |          |                |      |
| Family/Caregiver<br>Needs and Strengths |                             | .026     | .045 | .054    |                         | .026     | -.062 to .115  | .045 |
| Total $R^2$                             | .216***                     |          |      |         | .216***                 |          |                |      |
| <i>n</i>                                | 157                         |          |      |         | 157                     |          |                |      |

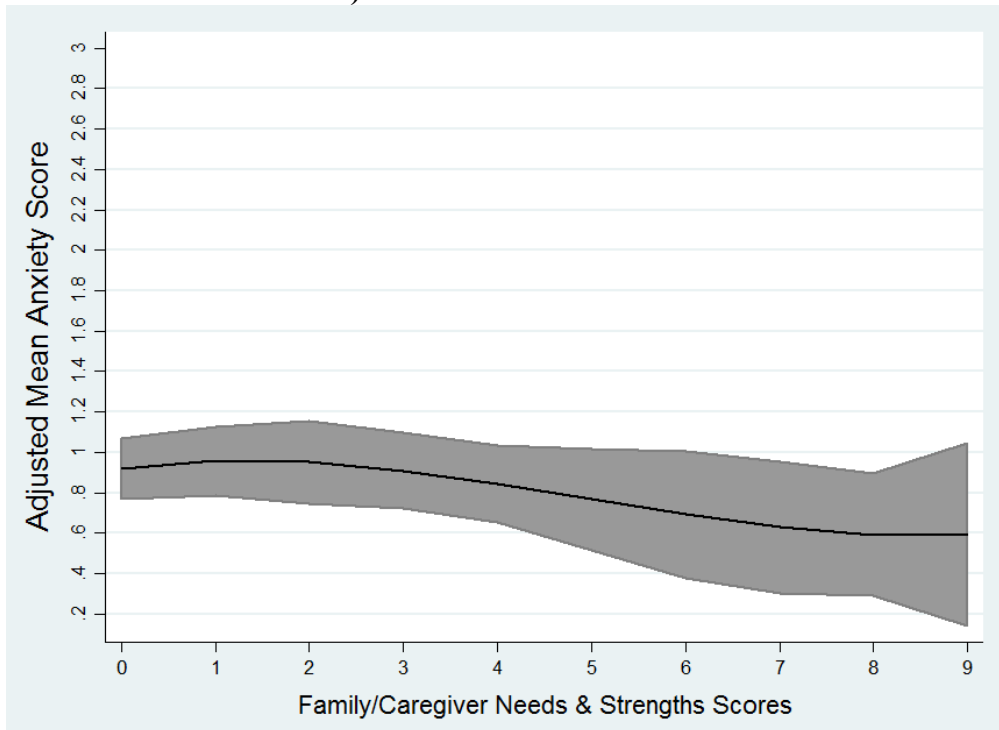
Note: IS = Individual Strengths domain scores. BCI = bootstrapped 95% confidence interval. BSE = Bootstrapped standard error.  
 †  $p < .10$ . \*\*  $p < .05$ . \*\*\*  $p < .001$

**Appendix B: Figures**

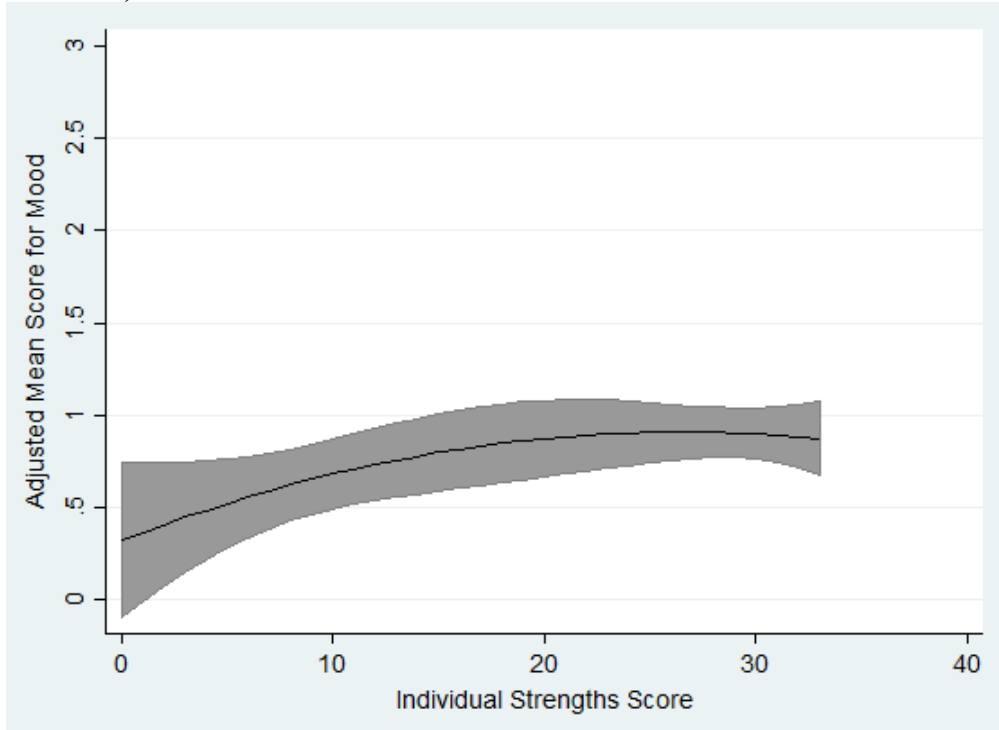
**Graph 1: Predicted mean Anxiety score for Individual Strengths (with 95% confidence intervals)**



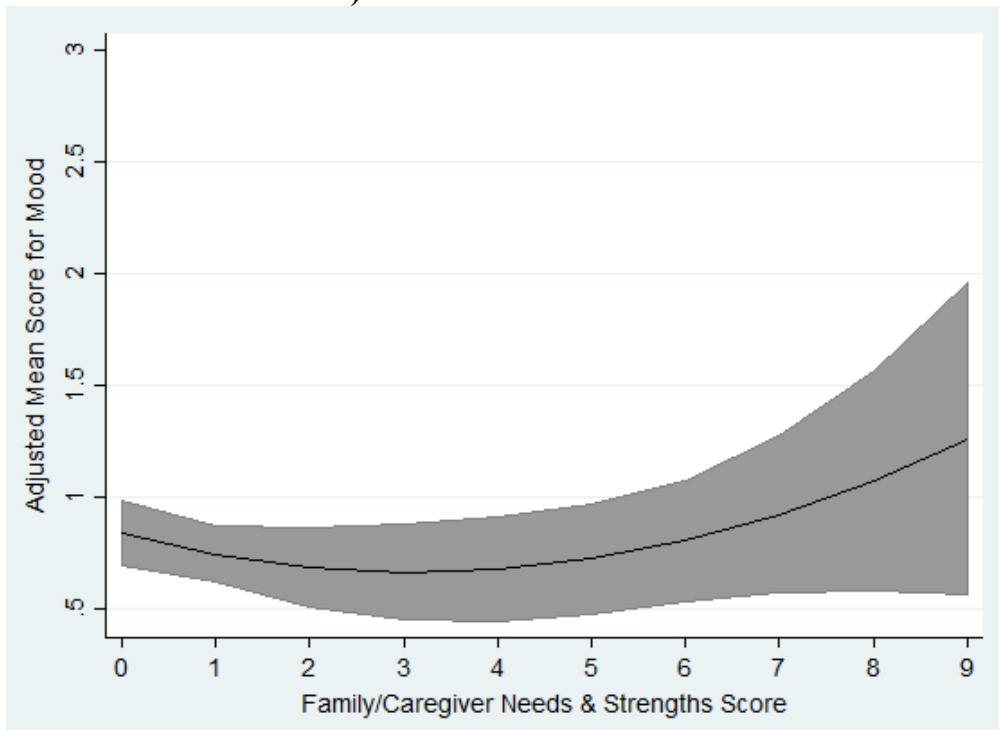
**Graph 2: Predicted mean Anxiety score for Family/Caregiver Needs and Strengths (with 95% confidence intervals)**



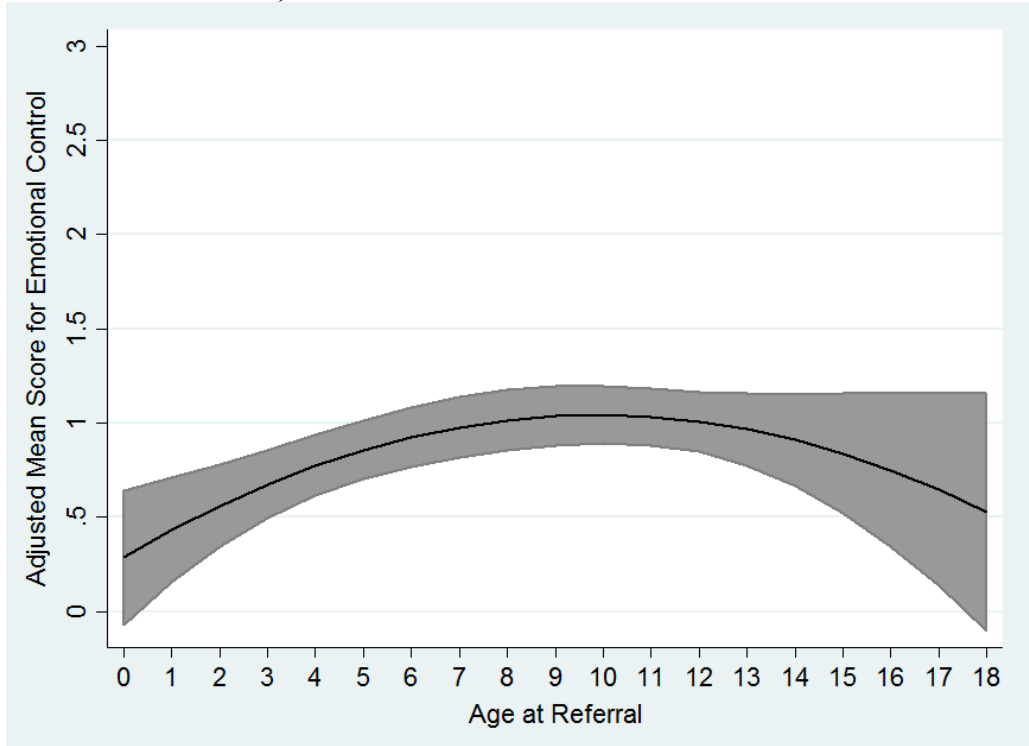
**Graph 3: Predicted mean Mood score for Individual Strengths (with 95% confidence intervals)**



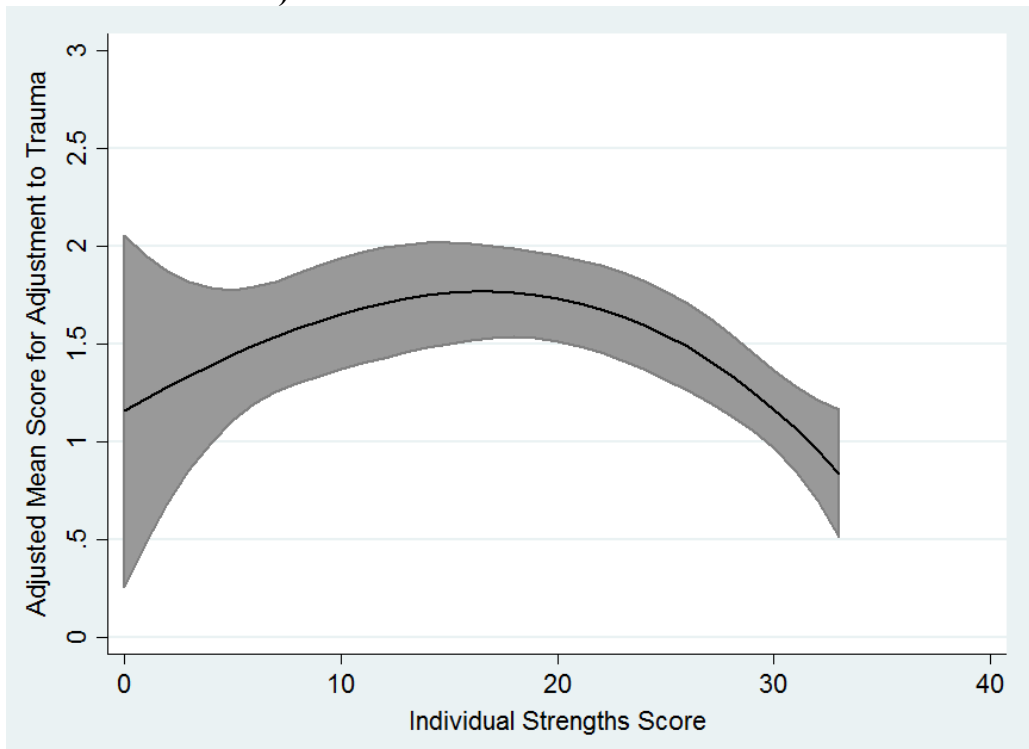
**Graph 4: Predicted mean Mood score for Family/Caregiver Needs and Strengths (with 95% confidence intervals)**



**Graph 5: Predicted mean Emotional Control score for Age at Referral (with 95% confidence intervals)**



**Graph 6: Predicted mean Adjustment to Trauma score for Individual Strengths (with 95% confidence intervals)**





**Appendix C: Measures**

**Acute CANS**

| CHILD AND ADOLESCENT NEEDS AND STRENGTHS (CANS) |              |      |             | CANS-MENTAL HEALTH ACUTE |            |                 |  |
|---|--------------|------|-------------|--------------------------|------------|-----------------|--|
| Child's Name:                                   |              | DOB: |             | Gender:<br>[ ] M [ ] F   |            | Race/Ethnicity: |  |
| Caregiver(s):                                   | Form Status: |      | [ ] Initial | [ ] Subsequent           | [ ] Annual | [ ] Discharge   |  |
|   | Case Name:   |      |             |                          |            |                 |  |
|   | File #:      |      |             |                          |            |                 |  |
| Assessor:                                       |              |      |             | Date of Assessment       |            |                 |  |

Insert an X into appropriate box

| MENTAL HEALTH NEEDS               |   |   |   |   |
|-----------------------------------|---|---|---|---|
| 0 = no evidence                   | 1 = history, mild, suspicion                              |   |   |   |
| 2 = moderate, action needed       | 3 = severe, disabling, dangerous, immediate action needed |   |   |   |
|                                   | 0   | 1 | 2 | 3 |
| Psychosis                         |   |   |   |   |
| Anxiety                           |   |   |   |   |
| Mood                              |   |   |   |   |
| Attention Deficit/Impulse Control |   |   |   |   |
| Oppositional Behaviour            |   |   |   |   |
| Conduct Behaviour                 |   |   |   |   |
| Emotional Control                 |   |   |   |   |
| Parent-Child Relational Problems  |   |   |   |   |
| Adjustment to Trauma              |   |   |   |   |
| Autism Spectrum                   |   |   |   |   |
| Situational Consistency           |   |   |   |   |
| Temporal Consistency              |   |   |   |   |
| Comments:                         |   |   |   |   |

| RISK BEHAVIOURS             |   |   |   |   |
|-----------------------------|---|---|---|---|
| 0 = no evidence             | 1 = history, mild, suspicion                              |   |   |   |
| 2 = moderate, action needed | 3 = severe, disabling, dangerous, immediate action needed |   |   |   |
|                             | 0   | 1 | 2 | 3 |
| Suicide Risk                |   |   |   |   |
| Self-Injuring Behaviour     |   |   |   |   |
| Danger to Others            |   |   |   |   |
| Elopement                   |   |   |   |   |
| Substance Abuse             |   |   |   |   |
| Social Behaviour            |   |   |   |   |
| Crime/Delinquency           |   |   |   |   |
| Involvement in Treatment    |   |   |   |   |
| Comments:                   |   |   |   |   |

| FAMILY/CAREGIVER NEEDS AND STRENGTHS |   |   |   |   |
|--------------------------------------|---|---|---|---|
| 0 = no evidence                      | 1 = history, mild, suspicion                              |   |   |   |
| 2 = moderate, action needed          | 3 = severe, disabling, dangerous, immediate action needed |   |   |   |
|                                      | 0   | 1 | 2 | 3 |
| Physical/Mental Health               |   |   |   |   |
| Knowledge                            |   |   |   |   |
| Residential Stability                |   |   |   |   |
| Resources                            |   |   |   |   |
| Safety                               |   |   |   |   |
| Comments:                            |   |   |   |   |

| Functioning               |   |   |   |   |
|---------------------------|---|---|---|---|
| 0=no evidence             | 1=history, mild, suspicion                              |   |   |   |
| 2=moderate, action needed | 3=severe, disabling, dangerous, immediate action needed |   |   |   |
|                           | 0   | 1 | 2 | 3 |
| Sensory Processing        |   |   |   |   |
| Communication             |   |   |   |   |
| Motor                     |   |   |   |   |
| Self-Care                 |   |   |   |   |
| Sleep                     |   |   |   |   |
| Family                    |   |   |   |   |
| Peer                      |   |   |   |   |
| School Achievement        |   |   |   |   |
| School Behaviour          |   |   |   |   |
| School Attendance         |   |   |   |   |
| Sexual Development        |   |   |   |   |
| Culture Stress            |   |   |   |   |
| Comments:                 |   |   |   |   |

| CARE INTENSITY AND ORGANIZATION |   |   |   |   |
|---------------------------------|---|---|---|---|
| 0 = no evidence                 | 1 = history, mild, suspicion                              |   |   |   |
| 2 = moderate, action needed     | 3 = severe, disabling, dangerous, immediate action needed |   |   |   |
|                                 | 0   | 1 | 2 | 3 |
| Monitoring                      |   |   |   |   |
| Service Permanence              |   |   |   |   |
| Educational                     |   |   |   |   |
| Comments:                       |   |   |   |   |

| INDIVIDUAL STRENGTHS               |                            |   |   |   |
|------------------------------------|----------------------------|---|---|---|
| 0 = Center-piece strength          | 1 = Useful strength        |   |   |   |
| 2 = Identified strength            | 3 = No strength identified |   |   |   |
|                                    | 0                          | 1 | 2 | 3 |
| Family                             |                            |   |   |   |
| Interpersonal                      |                            |   |   |   |
| Relationship Permanence            |                            |   |   |   |
| Life Skills                        |                            |   |   |   |
| Well-Being                         |                            |   |   |   |
| Optimism                           |                            |   |   |   |
| Spiritual/Religious                |                            |   |   |   |
| Talents/Interests                  |                            |   |   |   |
| Community Involvement              |                            |   |   |   |
| Self-Expression                    |                            |   |   |   |
| Flexibility/Adaptability to Change |                            |   |   |   |
| Comments:                          |                            |   |   |   |

Other Comments:

**CANS-MH Domains & Items**

**Needs Domains**

- 0 = No evidence of problem – no need for action*
- 1 = History – Watchful waiting and prevention*
- 2 = Moderate need – Action required*
- 3 = Severe problem/need – Immediate/Intensive action required*

**Executive Functioning Domain**

- Decision Making Skills
- Ability to Pay Attention

**Emotional Regulation Skills Domain**

- Self-Management
- Moodiness
- Anger Control
- Over-Reaction

**Cognitive Flexibility Skills Domain**

- Adaptation to Change
- Transitions
- Social Skills Domain
- Social Functioning
- Building Relationships
- Empathy
- Social Perception

**Language Domain**

- Receptive Language
- Expressive Language
- Pragmatic Language

**Sensory Motor Skills Domain**

- Gross Motor
- Fine Motor
- Coordination
- Sensory Integration

**Daily Functioning Domain**

- Activities of Daily Living
- Autonomy
- Eating
- Sleeping
- Sexual Development

**Acculturation Domain**

- Language
- Identity
- Ritual
- Parent/Caregiver Cultural Stress

**Mental Health Needs Domain**

- Psychosis
- Anxiety

Mood Disturbance  
 Attention Deficit/ Hyperactivity  
 Impulse Control  
 Eating Disturbance  
 Oppositional Behaviour  
 Conduct Behaviour  
 Adjustment to Trauma  
 Attachment  
 Substance Use  
 Autism Spectrum  
 Parent-Child Relationship

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**Risk Behaviours Domain**

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Suicide Risk  
 Self-Injuring Behaviour  
 Other Self Harm  
 Aggression Towards Objects  
 Cruelty to Animals  
 Danger to Others  
 Sexual Aggression  
 Elopement/Running away  
 Delinquent Behaviour  
 Fire Setting  
 Intentional Misbehaviour  
 Bullying

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**Educational Needs Domain**

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School Attendance  
 Classroom Behaviour  
 Non-classroom Behaviour  
 School Discipline  
 School Achievement  
 Academic Persistence  
 Learning Disability  
 Special Education  
 Intellectual

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**Strengths Domains**

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**Youth Individual Strengths Domain**

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Talents/Interests  
 Extra-curricular Activities  
 Optimism  
 Leadership  
 Creativity/ Imagination  
 Peer Relations  
 Self-Expression  
 Flexibility/Adaptability to Change  
 Life Skills

Resiliency

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**Youth Environmental Strengths Domain**

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Family Strengths

Natural Supports

Community Involvement

Cultural Identity

Resourcefulness

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**Caregiver/Family Strengths & Needs Domain**

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Supervision

Involvement with Care

Problem Solving

Knowledge

Ability to communicate

Understanding of Own Behaviour on Child

Organization

Social Resources

Stable Living Situation

Physical Health

Mental Health

Substance Use

Development

Family Functioning

Family Nurturance

Family Stress

Safety

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Note: This list does not include the optional modules domain and items.

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