Identifying Major Depressive Symptoms and Major Depressive Episodes in Adolescents with Cancer

by

Anra Lee

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

Master of Nursing

Faculty of Nursing
University of Alberta

Abstract

Cancer is the leading cause of death from disease among adolescents in Canada. Although cancer is a well-researched disease process in the medical and nursing literature, adolescence is relatively understudied, with minimal evidence on strategies to promote healthy emotional adjustment throughout the disease trajectory. Current literature on major depressive episodes (MDE) in adolescents diagnosed with cancer suggests limited evidence in screening and diagnosing MDEs. Furthermore, current practice in pediatric oncology centres do not include routine psychosocial assessments of adolescents with cancer, but rather, rely on individual clinician discretion on individuals who may benefit from referrals to a psychosocial and/or psychiatric team. Existing instruments used to screen for depression in adolescents have not previously been tested for clinical utility in pediatric oncology patients, which is problematic due to the significant overlap in MDE symptoms and adverse side effects of cancer disease and treatment. Research on adult cancer survivors suggests that age, gender, and anxiety are significantly related to depression, but this has not previously been examined among Canadian adolescent cancer patients.

This study employed a cross-sectional descriptive design to examine and compare the feasibility of utilizing the Children's Depression Inventory (CDI) and the Diagnostic Interview for Children and Adolescents (DICA-IV) to screen for MDEs, and to examine the relationships among age, gender, and anxiety and a MDE in adolescents with cancer. Of the twenty five eligible participants, fourteen adolescent patients with either a malignant cancer or tumour requiring chemotherapy treatment or a hematological disorder requiring a blood or bone marrow transplant were recruited from an outpatient pediatric oncology clinic. The CDI was found to be

a feasible tool that can be used in busy clinical settings, as it was less time-intensive compared to the DICA-IV. Further comparison of the CDI and DICA-IV indicated that there was no evidence that participants were more willing to disclose their symptoms on a self-report questionnaire compared to a face-to-face interview. As for recruitment issues, females were more willing to participate in the study than males, but overall, adolescents as a group were a difficult population to engage in the study, with only a 56% participation rate in this study. Future research will need to address these recruitment challenges. Finally gender (p=0.013) and anxiety (p=0.003) were significantly correlated with a MDE.

Preface

This thesis is an original work by Anra Lee. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Screening and Assessing Adolescents with Cancer for a Major Depressive Episode", No. Pro00040750, October 21, 2013 and the Conjoint Health Research Ethics Board, Project Name "Screening and Assessing Adolescents with Cancer for a Major Depressive Episode", No. REB13-1302, February 12, 2014. No part of this thesis has been previously published.

Dedication

This thesis was written in memory of Ty, the brave soul who taught me so much and inspired this project. Gone yet not forgotten, you still continue to be an inspiration.

You truly were too legit to quit.

I also dedicate this thesis to the courageous individuals who graciously participated in this study. Your strength, dignity and tenacity have been admirable. Thank you.

Acknowledgements

Foremost, I would like to express my sincere gratitude to my supervisor Dr. Karin Olson for her encouragement, patience and wealth of knowledge. This thesis could not have been completed without your unfailing guidance and expertise throughout my degree. To the rest of my thesis committee members: Dr. Kathy Hegadoren and Dr. Fiona Schulte, thank you for your constant motivation and insight. Your time and commitment have been greatly appreciated.

I would also like to acknowledge the following organizations for their generous provision of scholarship funds: University of Alberta, Faculty of Nursing; Women and Children's Health Research Institute (WCHRI); Canadian Institutes of Health Research (CIHR); Alberta Innovation and Advanced Education; and Alberta Registered Nurses Educational Trust (ARNET).

To Dr. Tony Truong and colleagues at the Alberta Children's Hospital, Hematology/Oncology/ Transplant Program, thank you for your assistance, support and encouragement.

And finally to all my friends who have tolerated my hectic schedule and erratic emotions over the last three years, and provided me with much needed coffee and wine dates to unwind – you have been my sustenance. Matt – thank you for your editorial expertise during the final legs of this thesis; you truly are my brother from another mother. My parents and Barb – thank you for your loving support. And finally, to my best friend and partner in crime, Ryan – thank you for never giving up on me, even when I wanted to give up on myself. You have been my knight in shining armour and you inspire me to become a better person every day. I love you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1: Introduction

Problem Statement and Significance

Cancer is the leading cause of death from disease among adolescents, with over 2,000 Canadian adolescents diagnosed annually (Canadian Cancer Society, 2009). The life-threatening diagnosis coupled with invasive treatment and adverse side effects have been shown to result in great psychological burden (Bryant, 2003; Hedström, Haglund, Skolin, & von Essen, 2003). This is particularly concerning for adolescents, as they represent a unique developmental stage, during which they normally transition from parental dependence to personal autonomy.

Adolescence can be a turbulent period complicated by puberty, development of self-identity, exploration of intimate relationships, and uncertainty about the future (Abrams, Hazen, & Penson, 2007). These typical challenges of adolescence are dramatically complicated by cancer, as the illness and treatment may disrupt these normal adolescent processes (Zebrack, 2011). Among the plethora of cancer research studies, adolescence is relatively understudied, with minimal evidence on interventions to promote healthy emotional adjustment of adolescents with cancer (Engvall, Skolin, Mattsson, Hedstrom, & von Essen, 2011; Seitz, Besier, & Goldbeck, 2009).

Despite growing evidence that adolescent and childhood survivors of cancer may be at increased risk for developing depressive symptoms (Seitz et al., 2009), the few studies published are fraught with methodological limitations, such as small sample sizes and lack of validation of measurement instruments, often resulting in contradictory conclusions about major depressive symptoms and episodes among adolescents with cancer. Other limitations inherent in the literature are evident in the lack of psychometric studies to determine the predictive validity of

an assessment measure, such as using sensitivity and specificity analyses (Hopko et al., 2008). Although the gold standard for identifying a major depressive episode is through the administration of structured interviews, this process has not been integrated in most studies (Hopko et al., 2008). Furthermore, there have been minimal epidemiological studies in adolescents with cancer, making it impossible to accurately assess the prevalence of mood disorders in this population (Fisch, 2004). There is also significant overlap in diagnostic criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V) for a major depressive episode (MDE) and medically related side effects of cancer treatment (American Psychiatric Association, 2013). This poses a critical problem, as it raises concerns as to whether current practice includes assessments that provide the information required to diagnose and treat MDEs in this population. The dearth of routine psychosocial assessments may result in overlooking patients who meet the diagnostic criteria for a major depressive disorder and therefore, do not receive appropriate treatment and/or follow-up. Existing literature indicates that psychosocial assessments lack empirical validation in this population and authors often make gross generalizations of study findings with childhood cancer patients to adolescents (Kibby, Tyc, & Mulhern, 1998; Pai, Drotar, Zebracki, Moore, & Youngstrom, 2006).

MDEs in adolescent cancer patients have potentially negative impacts on health outcomes, including functional impairment, exacerbation of medical illness, maladaptive cognitive processes, and challenges to interpersonal relationships (Kazak et al., 2005; Kazak, Simms, & Rourke, 2002; Woodgate, Degner, & Yanofsky, 2003). Along with a high correlation with anxiety disorders, MDEs account for the largest proportion of variance in predicting quality of life in adult cancer patients, with consequences such as deterioration in self-care, sleep

quality, and physical activity (Hopko et al., 2008). Despite the dramatic impact of MDEs, it remains under-diagnosed and untreated in both adolescent and adult populations (Hedström, Kreuger, Ljungman, Nygren, & von Essen, 2006; Phipps et al., 2012).

Purpose of the Proposed Study

The purpose of this study is to examine and compare the feasibility of utilizing a depression screening tool versus a diagnostic interview to identify major depression in adolescent cancer patients, with a focus on variation in age, gender and anxiety. MDEs are particularly difficult to diagnose in adolescents with cancer due to the overlap in the diagnostic criteria and symptoms associated with cancer treatment (i.e., fatigue etc.). The consequences of missing a diagnosis of a MDE are significant and may range from non-compliance with treatment regimens to suicide (Hem, Loge, Haldorsen, & Ekeberg, 2004; Kunin, Patenaude, & Grier, 1995). My long term goal is to develop more proactive strategies in early identification of a MDE in adolescents with cancer.

Objectives and Hypothesis

Although survival rates of cancer among adolescents are as high as 82% with the advent of large medical advances in pediatric oncology, cancer continues to be highly associated with death, pain, and suffering. Across the cancer disease and treatment trajectory from diagnosis through to survivorship, there are potentially severe psychosocial impacts, which may include the inability to participate in daily activities, disruption in family and social roles, the threat of death, and social alienation as a result of repeated hospitalizations and physical isolation for infection precautions. Despite the growing body of evidence that suggests the importance of studying MDEs in this population, there is currently no depression screening instrument that has

been validated in pediatric oncology, thus resulting in mixed conclusions about the actual risk for MDEs in adolescent cancer patients. My central thesis is that adolescent cancer patients are at greater risk for developing a MDE, compared to adolescents who are healthy, due to the tension between typical challenges of adolescence, such as puberty and attaining independence, and challenges associated with effects of cancer disease and treatment. The presence of a MDE is sometimes missed because of the overlap between depressive symptoms and the symptoms of cancer and its treatments. This study is a first step in addressing this problem. The objectives of this study were:

1. To examine and compare the feasibility of utilizing the Children's Depression Inventory (CDI) and the Diagnostic Interview for Children and Adolescents (DICA-IV) to screen for MDEs in adolescents with cancer within an outpatient oncology clinic setting. Feasibility was assessed by considering the time required to complete the study instruments, appraisal of the willingness of adolescents to disclose depression and anxiety symptoms, and recruitment issues.
2. To examine the relationships among age, gender, and anxiety and a MDE in adolescents with cancer.

My hypotheses for this study were:

1. The self-report format of the CDI will require less time to administer compared to the DICA-IV, and will provide clinically useful information about the *potential* for a MDE in addition to significant depression symptoms.

2. Adolescents will be willing to disclose their symptoms on the self-report questionnaire, as assessed by no missing items, and in the interview, as assessed by answering each question.
3. Age, gender and anxiety symptoms will be significantly related to a MDE in adolescents with cancer.

Conceptual and Operational Definitions

Adolescence: A period of transition between youth and adulthood involving biological, cognitive, social, and emotional changes (World Health Organization, 2012). This was operationally defined as being between the ages of 13 and 18 at the time of recruitment.

Anxiety: Based on the DSM-V, it is a biological state of apprehension, uncertainty, and fear resulting from the anticipation of a realistic or fantasized threatened event or situation, leading to impaired physical and psychological functioning (American Psychiatric Association, 2013). The Multidimensional Anxiety Scale for Children (MASC) was used to operationally define anxiety in this study.

Gender: the socio-cultural identity that is constructed to differentiate characteristics of women and men in terms of norms, roles, and relationships (World Health Organization, 2013). Gender was operationally defined as what the participant indicated in his or her medical record.

Major depressive episode (MDE): Based on the DSM-V, it is an affective mood disorder that persists for a minimum of two weeks and is characterized by an inability to concentrate, insomnia/hypersomnia, loss of appetite, fatigue anhedonia, feelings of extreme sadness, guilt,

helplessness, and hopelessness, and thoughts of death (American Psychiatric Association, 2013).

Sex: the biological and physiological characteristics that define and differentiate women and men (World Health Organization, 2013)

Chapter 2: Literature Review

A review of the existing literature was conducted to explore current assessment and diagnostic practices for MDEs in adolescents diagnosed with cancer. A comprehensive search strategy was conducted in relevant computerized databases including Medline, CINAHL, and PsycINFO, using a combination of various search terms. The search terms were searched individually and in combination. Reference lists from articles were manually searched for additional literature. Figure 1 shows the search terms and varied combinations employed.

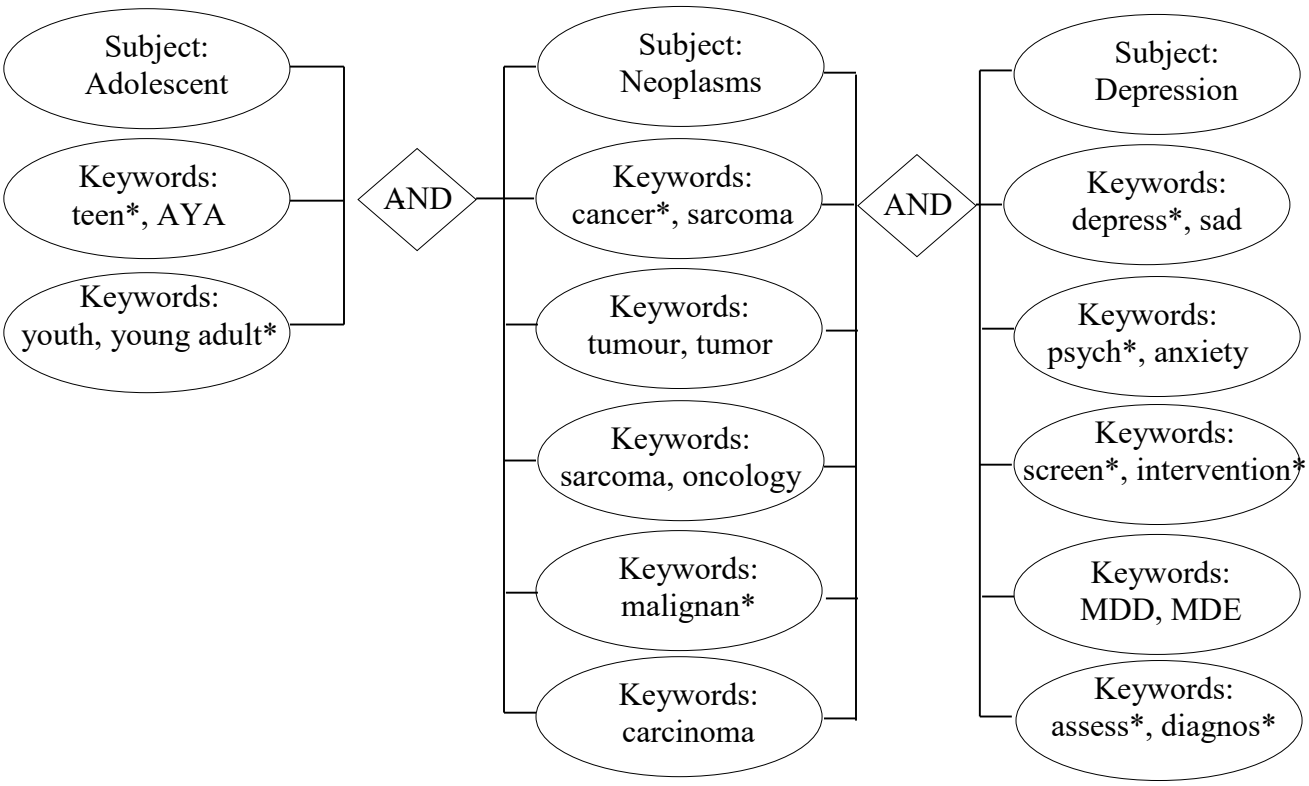

Figure 1. Search terms used to identify studies on depression in adolescents with cancer

The searches were conducted in March 2013 for the period 1985 to 2013, with the rationale that older studies may yield foundational theories and/or knowledge. Based on the titles and abstracts, studies were included if they met the following criteria: evaluated assessment, screening and/or diagnostic measures of MDEs in participants aged 10 to 19, consistent with the World Health Organization's definition of adolescence (World Health Organization, 2012); included participants diagnosed with any type of cancer during adolescence; and was published in English. An initial inclusion criterion was that studies must pertain specifically to MDEs, but this yielded only three results, so the criterion was expanded to include all types of depression and depressive symptomatology. Studies were included if the upper age limit exceeded 19 as long as a thorough analysis was devoted specifically to the adolescent age group. Editorials, commentaries, unpublished doctoral dissertations and other non-peer reviewed sources were excluded. The full article was obtained for all studies that appeared to meet these inclusion criteria. These articles were reviewed and those that lacked relevance or that did not meet inclusion criteria were excluded. Reference lists of selected articles were also reviewed for further relevant studies that could potentially meet selection criteria.

Adolescent Growth and Development

According to Erikson's Stages of Development, adolescence is characterized by identity versus role confusion; individuals in this age group seek to obtain independence from their parents (Erikson, 1968). According to the World Health Organization (2012), adolescence is defined as the transitory period between childhood and adulthood and includes individuals between the age of 10 to 19 years. The process of adolescence is characterized by key

developmental milestones, including physical and sexual maturation, cultivation of social and economic independence, establishment of self-identity, and exploration of intimate relationships (Abrams et al., 2007).

This transitional stage may result in more tenuous outcomes including a MDE, anxiety symptoms, poor self-image, isolation from peers and regression in social skills if an individual is diagnosed with cancer during adolescence (Zebrack, 2001). Many adolescent cancer survivors report the feeling of being denied a "normal" adolescence, as cancer treatment typically results in loss of privacy, constant supervision, and isolation from peers (Woodgate, 1999b). As a result, the deprivation of normal adolescent experiences places this population at risk for engaging in risky behaviours, such as substance abuse. Such risky behaviours often lead to substantial post-treatment complications if psychological distress and depressive symptoms are not adequately assessed during treatment (Bhatia & Meadows, 2006; Hollen & Hobbie, 1996). As adolescent cancer patients develop independence and enter the adult world, they are also often lost to follow up with poor transition support into the adult health system (Jones, 2008), which may further exacerbate these issues.

Major Depressive Episode and Anxiety

Major Depressive Episode

A MDE is classified as an emotional disorder and is the most prevalent mental health problem among adolescents aged 13 to 20 (Maddage, Senaratne, Low, Lech, & Allen, 2009). A diagnosis of a MDE contrasts transitory feelings of sadness that spontaneously remit to positive environmental events, as its classification is based upon specific diagnostic criteria that persists

for at least two weeks (Parker, 2011). A key characteristic of MDEs is the persistence of its diagnostic symptoms, as opposed to their mere presence.

Diagnostic criteria of a major depressive episode. A MDE is diagnosed according to specific criteria defined by the DSM-V as laid out by the American Psychiatric Association (2013), including feelings of sadness and/or loss of interest in activities. Symptoms of depression are considered clinically diagnosable when they persist for a minimum of two weeks and result in impairment in social, occupational and daily functioning (Parker, 2011). In the context of cancer patients, the diagnosis of depression is dramatically complicated as the criteria used to diagnose depression is blurred by expected side effects of the disease and treatment such as fatigue, significant weight change, and general loss of ability to engage in previously pleasurable activities, as well as the notion that sadness is a normal reaction to having a serious medical illness (Hopko et al., 2008) (Phipps et al., 2012).(Kersun & Kazak, 2006). As a result, many potentially depressive symptoms are attributed to the cancer experience and remain largely undiagnosed and untreated (Kersun & Kazak, 2006). Table 1 summarizes the diagnostic criteria of a MDE in children and adolescents, or otherwise known as major depression, as defined by the DSM-V (American Psychiatric Association).

Table 1
DSM-V Diagnostic Criteria for a Major Depressive Episode (American Psychiatric Association, 2013)

Minimum of five symptoms present during a two week period: (1) depressed mood and (2) loss of interest or pleasure and any three of the following:

1. Significant weight loss or decrease in appetite
2. Insomnia or hypersomnia
3. Psychomotor agitation or retardation
4. Fatigue or lack of energy
5. Feelings of worthlessness or guilt
6. Decreased concentration or indecisiveness
7. Recurrent thoughts of death or suicide

In addition to the above criteria, children and adolescents may also have some of the following symptoms:

- Persistent sad or irritable mood
- Frequent vague, non-specific physical complaints
- Frequent absences from school or poor performance in school
- Being bored
- Alcohol or substance abuse
- Increased irritability, anger or hostility
- Reckless behaviour

Anxiety

Anxiety refers to a basic emotion triggered in the brain when exposed to perceived danger or stimuli that an individual will instinctually avoid (Beesdo, Knappe, & Pine, 2009). Anxiety is characterized by excessive fear or worry and unrealistic feelings that may interfere with an individual's relationships, academic and occupational performance, and social function. Anxiety is more common among adolescents due to dramatic physical and emotional changes and the developmental need for social identification within this age group (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). In severe cases, this results in negative outcomes such as peer relationship difficulties, academic issues and the onset of comorbid disorders, such as major depressive disorder (Cunningham, Gunn, Alladin, & Cawthorpe, 2008).

According to the DSM-V, anxiety disorders are classified into a number of different types: panic disorders, agoraphobia, specific phobia, social phobia, obsessive-compulsive disorder, posttraumatic stress disorder, acute distress disorder, generalized anxiety disorder, anxiety disorder due to a general medical condition, substance-induced anxiety, and anxiety disorder not otherwise specified (American Psychiatric Association, 2013). However, despite the number of differential anxiety diagnoses, they share many common clinical features including extensive anxiety, physiological anxiety symptoms, and behavioural disturbances (American Psychiatric Association, 2013). Physiological anxiety symptoms can include, but are not limited to fatigue, irritability, sleep disturbance, decreased concentration, and nausea, which also overlap with side effects of cancer treatment (American Psychiatric Association). Anxiety is considered pathological when it persists over time with feelings of fear and distress that occur out of proportion to the actual threat or anger, resulting in avoidance from situations that invoke distress (Beesdo et al., 2009).

Comorbidity of Anxiety and Depression

Comorbid diagnoses are common within the mental health domain, due to the broadness of their diagnostic criteria and the complexity of the human psyche (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Anxiety disorders and major depression in particular, exhibit high comorbidity to the point where some question whether they can be considered two distinct disorders (Barlow, 2002; Clark & Watson, 1991; Zahn-Waxler et al., 2000). In a study on adult cancer patients undergoing palliative care, anxiety symptoms predicted 83% of the variance in major depression, suggesting that anxiety may be a significant predictor of major depression (Olson, Hayduk, et al., 2008). Similarly, in community samples of adolescents, up to 50% of

youth with depressive symptoms also met criteria for both subclinical anxiety symptoms and clinical anxiety disorders (Angold, Costello, & Erkanli, 1999; Axelson & Birmaher, 2001; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Comorbid anxiety and depressive symptoms are higher among adolescents compared to children, with evidence that suggests comorbidity rates are likely underestimated, as comorbid diagnoses often exclude cases where anxiety levels are subclinical (Zahn-Waxler et al., 2000).

The majority of studies have found anxiety to precede the onset of a MDE (Chaplin, Gillham, & Seligman, 2009; Essau, 2003; Kovacs, Gatsonis, Paulauskas, & Richards, 1989; Olson, Hayduk, et al., 2008; Reinherz et al., 1989; Rohde, Lewinsohn, & Seeley, 1991), which suggests the temporality of the relationship, such that anxiety disorders predispose individuals to major depression (Regier, Rae, Narrow, Kaelber, & Schatzberg, 1998). Although the explanation for their comorbidity remains theoretical, scholars posit that anxiety disorders and major depression may share similar etiological processes, such as loss of the ability to cope and negative affectivity (Clark & Watson, 1991; Cunningham et al., 2008; Essau & Chang, 2009). The prognosis for comorbid anxiety disorders and major depression is more severe than either condition alone, and within adolescence, the negative effects of these disorders including social and occupational impairment, tend to propagate well into adulthood (Garber & Weersing, 2010).

Measurement Challenges

Diagnosing mental health disorders in children and adolescents is particularly challenging due to differing reports of symptoms from various sources (e.g., parent, child or adolescent, clinician) and difficulties determining whose report is more valid (Kendall & Drabick, 2010). Furthermore, there is a wide range of what is considered normal behaviour, when taking into

account the developmental and medical circumstances of an individual. Although statistical norms offer valuable insight into what is considered normal, those who statistically deviate from the norm do not necessarily qualify as having a pathological disorder that requires treatment (Kendall & Drabick, 2010). Consequently, measures currently used to diagnose MDEs and anxiety disorders may not be as valid as one would like, and the validity may be further compromised by diagnosis with a medical illness, such as cancer (Hopko et al., 2008).

Screening versus diagnostic measures. Currently it is not standard practice to widely use diagnostic tools to assess psychological distress in adolescent cancer patients, unless they have received a referral to a psychologist or psychiatrist from the medical team. Rather, screening instruments are used both in clinical and research settings, possibly due to the higher cost and time required to administer diagnostic interviews (Warner, 2004). However, there are key differences between screening and diagnostic measures. Screening tests are designed to identify the possibility of a *potential* disorder, whereas, diagnostic tests are meant to identify the *actual* presence of a disorder (Warner, 2004). Although no diagnostic test is 100% accurate, it is widely accepted in the field of mental health and psychiatry that diagnostic tests and procedures are considered the gold standard to which other tests, such as screening measures, are compared (Warner, 2004).

Measuring depression. The difficulty in screening for the presence of a major depressive is that instruments that are typically used have not been validated in pediatric oncology. This is particularly concerning because the close resemblance of symptoms of cancer treatment and depressive symptoms makes it difficult to assess the reliability and validity of current screening tools (Hopko et al., 2008). Furthermore, typical instruments used to screen

depression all lack diagnostic capabilities, and do not differentiate transient depressive symptoms from a MDE. Few Canadian pediatric centres have routine psychosocial screening measures (Public Health Agency of Canada, 2012), resulting in inconsistent consults to psychiatry, missed diagnoses, and reliance on pharmacotherapy, which has been largely misused in pediatric centres in the United States (Phipps et al., 2012; Portteus, Ahmad, Tobey, & Leavey, 2006). The use of psychopharmacotherapy in adolescent oncology in Canadian pediatric centres has yet to be investigated. The costs of a missed diagnosis of a MDE are severe, ranging from non-compliance to developing chronic mental health issues that will consequently require time, resources and financial expenditures from the health care system and well as long-term psychological stress on patients and their families (Carlson & Bultz, 2003; Chiles, Lambert, & Hatch, 1999).

Additionally, there is typically incongruence between adolescents' perceptions of their own psychological distress compared to the perceptions of their health care providers, warranting further research on more accurate screening tools for MDEs (Dyson, Thompson, Palmer, Thomas, & Schofield, 2012; Kersun, Rourke, Mickley, & Kazak, 2009). Self-report measures of depression have also been shown to be vulnerable to social desirability bias in pediatric cancer patients and other populations with chronic illness, whereby participants may falsely report lower scores for depression in a subconscious attempt to appear more socially favourable (Canning, Canning, & Boyce, 1992; Logan, Claar, & Scharff, 2008; van de Mortel, 2008). Furthermore, patients may be so preoccupied with the physical side effects of cancer that they may not notice their own psychosocial distress, thus lending to low self-reports of depression.

Measuring anxiety. The assessment of anxiety disorders in pediatric populations is particularly challenging as children and adolescents typically manifest fears and anxieties as part of typical development, thus making it difficult to determine when significant anxiety symptoms are present (Beesdo et al., 2009). In recognition of this problem, the latest DSM-V offers specific criteria for diagnosing anxiety disorders in children and adolescents, but the age range that the "child-specific" diagnostic criteria refer to is not specified. Although explicit diagnostic criteria have informed the development of diagnostic instruments for assessing anxiety disorders, they are limited due to their lack of consideration of developmental issues associated with adolescence (Campbell, Rapee, & Spence, 2000; Schniering, Hudson, & Rapee, 2000). Similar to measuring MDEs, self-report measures of anxiety symptoms also carry the risk for social desirability bias, and thus similar concerns about the accuracy of assessment (Arabiat, Al Jabery, & Wardam, 2013).

In the context of oncology patients, the diagnosis of anxiety typically counts cancer as an Axis IV psychosocial stressor (American Psychiatric Association, 2013). Similar to the overlapping diagnostic criteria of a MDE, several of the diagnostic criteria of anxiety are also common side effects of cancer disease and treatment, such as fatigue, restlessness, and disturbed sleep. The propensity for adolescents to channel parental anxiety during the cancer experience may also contribute to missed diagnoses of anxiety, since anxiety may be misrepresented as exclusively a parental issue (Santacroce, Asmus, Kadan-Lottick, & Grey, 2010). In light of the limitations of the DSM-V taxonomy, alternative screening instruments for anxiety have been developed, such as the Multidimensional Anxiety Scale for Children (MASC) (March, Parker,

Sullivan, Stallings, & Conners, 1997), which assesses a wide spectrum of anxiety symptoms that are not necessarily captured by the DSM-V (Baldwin & Dadds, 2007).

Prevalence of Major Depressive Episodes and Anxiety

In Canada, the lifetime prevalence of major depression is over 12%, with significantly higher rates among females and individuals between 15 and 25 years of age (Patten et al., 2006). According to the Canadian Community Health Survey (CCHS 1.2), using weighted calculations of each stratified group's representation in the population, the lifetime prevalence of depression in Canadian adolescents is 7.6%, with significant differences in gender, with 11.1% of females diagnosed with depression but only 4% of males diagnosed with depression (Cheung & Dewa, 2006). Within the oncologic context including both pediatric and adult populations, the prevalence of psychological distress, which includes depression and anxiety symptoms, ranges from 20 to 47%, (Croyle & Rowland, 2003; Hopko et al., 2008; Zabora, Brintzenhofeszoc, Curbow, Hooker, & Piantadosi, 2001). The large range of prevalence rates may be due to differences in assessment approach, the definition of psychological distress, timing of assessment, type of cancer, medical morbidity, pain, gender, and age (Croyle & Rowland, 2003)

In the general population, anxiety disorders are the most prevalent mental illness affecting Canadians, with a prevalence rate of over 12% (Government of Canada, 2006) and a lifetime prevalence rate of 14 to 17% among children and adolescents (British Columbia Medical Association, 2010). Studies conducted outside of Canada report prevalence rates of anxiety disorders among adolescents to range from 5.7 to 28.8% (Essau, Conradt, & Petermann, 2000; Verhulst, van der Ende, Ferninand, & Kasius, 1997; Woodward & Fergusson, 2001). Differences in reports of anxiety prevalence rates vary significantly between studies, possibly

due to variances in measurement methods and stringency of diagnostic criteria (Cunningham et al., 2008).

Age and gender differences. Differences in prevalence of anxiety disorders, major depression, and depressive symptoms have been well documented in the literature, with unanimous findings that females have a marked increase in anxiety and depressive disorders (Altemus, 2006; Bitsika, Sharpley, & Melhem, 2010; Kelly, Tyrka, Price, & Carpenter, 2008; Leach, Christensen, Mackinnon, Windsor, & Butterworth, 2008). Although it is debatable as to the cause of gender differences in developing anxiety and depression, it has largely been attributed to the fact that females may have a genetic or biological predisposition for anxiety and affective disorders (Altemus, 2006). Evidence also suggests that adolescents are at a particular high risk for developing anxiety, which may be linked to pubertal and developmental changes (Malcarne & Hansdottir, 2001). It has been hypothesized that structural and neuroendocrine changes in the brain during puberty may be a possible cause of increasing the risk for anxiety during this age group (Bernstein & Borchardt, 1991). Based on data collected from the CCHS 1.2, Table 2 summarizes differences in prevalence of anxiety and depression among males and females between the ages of 15 and 24.

Table 2
Prevalence of Individuals between 15 to 24 Years Meeting the Criteria for Depression and Anxiety (Government of Canada, 2006)

	Depression	Anxiety
Females	13.9	14.7
Males	6.6	9.6

Cancer in the Context of Adolescents

Incidence and Mortality

There are approximately 2,000 adolescents diagnosed with cancer each year in Canada, representing approximately 16,000 potential years of life lost, 320 deaths per year, and a lower survival improvement rate, compared to children and adults (Canadian Cancer Society). The incidence of adolescent cancer has remained stable between 1992 and 2007, with an average of 199 cases per one-million (Statistics Canada, 2008). The most common types of cancers in adolescents are lymphomas (29%), carcinomas (20%), germ cell tumours (13%), and leukemias (12%), with leukemia being the leading cause of cancer death (30% in males and 24% in females) (Canadian Cancer Society; Statistics Canada, 2012). Of the lymphoma diagnoses, 90% are represented by Hodgkin and Non-Hodgkin lymphoma, and about 75% of carcinomas are typically thyroid or malignant melanomas (Canadian Cancer Society).

Survival and Late Effects

With the advent of large technological medical advances in pediatric oncology, survival rates of adolescent cancer beyond five years is as high as 85%, with the greatest prognosis observed in thyroid cancers and Hodgkin lymphoma (Prithwish et al., 2011). However, despite high survival rates, adolescents with cancer have not witnessed the same gains in survival as younger children or adults, likely due to factors including but not limited to, low participation in clinical trials and lack of specialized care centres for adolescents in Canada (Ferrari, Montello, Budd, & Bleyer, 2008; Klein-Geltink, Shaw, Morrison, Barr, & Greenberg, 2005). Furthermore, despite higher survival rates among adolescent cancer patients compared to adults, at least two-thirds of survivors experience adverse health outcomes, referred to as late effects (Public Health

Agency of Canada, 2012). Adverse late effects include cardiopulmonary, endocrine, renal or hepatic dysfunctions; female infertility; male gonadal toxicity; neurocognitive impairment; psychosocial difficulties and development of other cancers (Bottomley & Kassner, 2003). The National Cancer Institute estimates that adolescent survivors of cancer are five times more likely to experience adverse health outcomes, compared to their healthy siblings, which include numerous psychological late effects, including poor peer relations, social stigma, major depressive disorder, anxiety disorders, and posttraumatic stress disorder (Reuben, 2004). Some studies indicate that up to 20% of adolescent survivors of cancer develop psychological distress and impairment, including a MDE (B. Jones, 2008).

However, there is also a body of research suggesting that adolescent survivors may develop adaptive capacity through resiliency and deriving spiritual meaning from their experiences (Woodgate, 1999a; Zebrack et al., 2002). Adaptive capacity refers to one's ability to respond to stressors and create new routines. In adult oncology, adaptive capacity has been studied extensively and has been conceptualized as the behavioural and physiological response to the stressors associated with advanced cancer (Olson, Turner, et al., 2008). In other chronic medical illness populations, various studies suggest that harrowing experiences may lead to positive psychosocial change, known as posttraumatic growth, which may also be a possible marker of adaptive capacity (Turner-Sack, Menna, & Setchell, 2012; Zoellner & Maercker, 2006). These findings suggest that enhancing an individual's adaptive capacity may safeguard adolescent cancer patients and survivors from developing a MDE.

The Canadian Context

The Canadian national task force on adolescents and young adults with cancer is supported by the Canadian Partnership Against Cancer (2012), an independent organization funded by the federal government. Stakeholders at this organization recently established the C17 International Workshop on Adolescent and Young Adult Oncology and have identified psychosocial needs as a top priority that requires further advocacy and research (McGoldrick et al., 2011). There is increasing evidence that adolescent and young adult cancer patients' physiological and psychosocial needs have been poorly met by traditional pediatric and adult care systems, due to their unique health issues (Barr, Rogers, & Schacter, 2011). This has resulted in delays in diagnosis, lack of age-appropriate care, low participation rates in clinical trials, and long-term psychosocial challenges in the trajectory of treatment to survivorship (Barr et al., 2011). Although adolescent cancer patients comprise a small percentage of the population, there is ostensible disparity in their health outcomes compared to pediatric and adult cancer groups, related to the developmental, educational, and transitory life stage associated with teen years (Sutcliffe, 2011).

Summary of Anxiety and Depression in Adolescents with Cancer

Due to variances in instrumentation; study methodology; heterogeneity of cancer diagnoses; and phases of treatment and survival, rates of anxiety and depressive disorders in adolescents with cancer remain contested and varied from study to study. Among studies that examined prevalence of anxiety and depression in this population, rates of anxiety and depression ranged from 4.9% to 25% (Dyson et al., 2012; Hedström et al., 2006; Kersun et al., 2009). Based on self-reports that may not necessarily indicate diagnosable conditions of anxiety

and depression, greater than 50% of adolescent cancer patients reported psychological distress, both when on and off treatment (Enskar & von Essen, 2007). Not all studies differentiated prevalence rates between anxiety and depression, but rather grouped the two disorders collectively as "psychological distress." Thus, specific rates on anxiety and depression remain unclear or are only based on singular studies with small sample sizes. In an American study on the use of psychopharmacotherapy in children and adolescents with cancer, over 10% of pediatric patients were prescribed antidepressant medication and adolescents over the age of 12 years were 80% more likely to receive antidepressants (Portteus et al., 2006). As antidepressants are often used to treat both anxiety and depressive disorders, these findings provide a general approximation of the prevalence of these disorders in adolescent cancer patients, despite lack of evidence on whether formal diagnoses and assessments were made prior to these prescriptions.

Conceptual Framework

Although there is significant improvement in survival rates among adolescents with cancer, negative outcomes such as decreased quality of life complicated by psychological distress raise many questions. Effective care and support by health care providers could help to ameliorate concerns with long-term psychosocial function and quality of life (Engvall et al., 2011). However, the ability to support adolescent cancer patients is severely handicapped by inadequate screening, assessment, and differentiation of a MDE from transient feelings of sadness and medical side effects of cancer treatment.

Adolescents, particularly females, are at increased risk for anxiety and depressive symptoms. The vulnerable stage of adolescent development is significantly complicated by a cancer diagnosis, due to potentially devastating psychosocial impacts, including the inability to

participate in daily activities, disruption in family and social roles, the threat of death and social alienation due to repeated hospitalizations (Woodgate et al., 2003). As a result, adolescents with cancer may be at even greater risk for anxiety and depressive symptoms compared to their healthy counterparts due to the tension between normal tasks associated with growth and development and the challenges related to managing a cancer diagnosis. This tension may be attributed in part to the symptoms associated with cancer disease and treatment that reduce the ability of an individual to adapt to typical stressors normally encountered during the adolescent period (Zebrack, 2011). These conceptualizations suggest that adolescent cancer patients may follow similar patterns of modifying their adaptive capacity when encountering extreme stressors, as proposed by Olson, Turner, et al. (2008) in their examination of adults with advanced cancer.

Research on MDEs is characterized by a common finding in both the general population and in adolescent cancer patients that age, gender and anxiety symptoms play a significant role in the development of a MDE (Dyson et al., 2012; Jörngården, Mattsson, & von Essen, 2007; Mattsson, El-Khouri, Ljungman, & von Essen, 2009; Patten et al., 2006). Within the conceptual framework for my thesis research, I propose that adolescents are at increased risk for a MDE and anxiety, due to the concerns that are typical within their age group. Thus, age is a mediator of both a MDE and anxiety. Additionally, a cancer diagnosis may affect an adolescent's psychological well-being, moderating the relationship between age and a MDE, and age and anxiety. Similarly, as females are typically at greater risk for developing anxiety and a MDE, gender also moderates the relationship between age and a MDE, and age and anxiety. A mediator, as defined in the context of this study, is an independent variable that is able to

influence the dependent variable of interest, whereas a moderator functions as a third variable, which affects the strength of the relationship between an independent variable and its given dependent variable (Baron & Kenny, 1986). This conceptual framework illustrates the comorbid and temporal relationship between anxiety and MDE, whereby anxiety typically precedes a MDE. Figure 2 illustrates this conceptual framework.

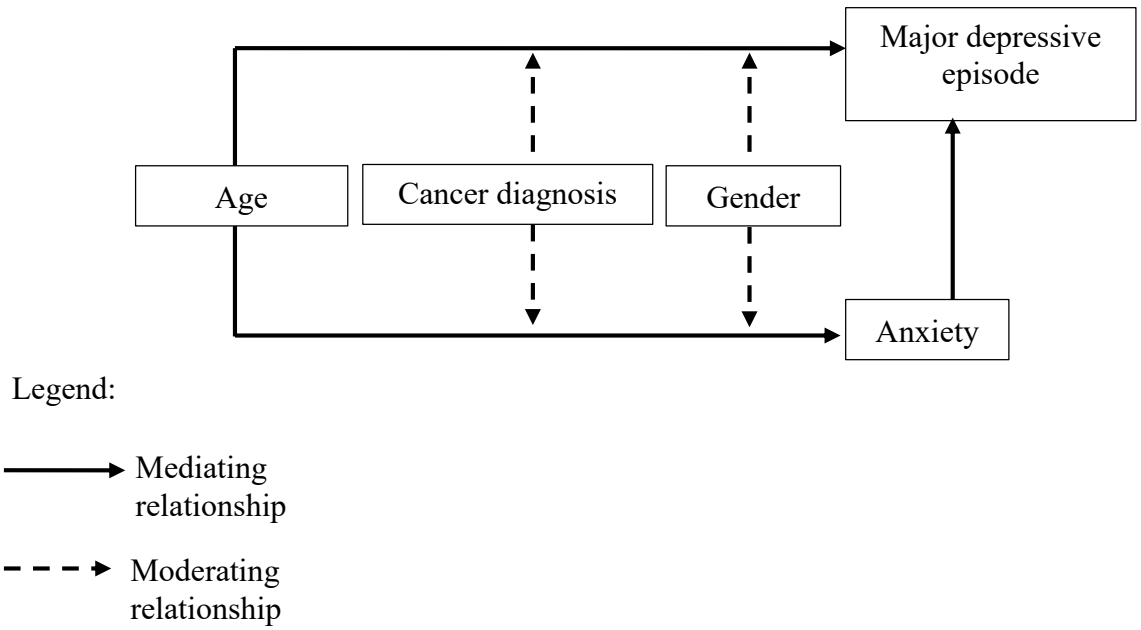

Figure 2. Conceptual framework for a major depressive episode in adolescents with cancer

Gaps in Knowledge

The literature suggests limited consensus regarding the prevalence of MDEs and anxiety disorders among adolescents with cancer, with minimal use of empirically supported screening and diagnostic measures. Cancer treatment is often physically and psychologically demanding, making MDEs difficult to identify and treat (Kersun & Kazak, 2006). In addition to a general

reticence among health care professionals in pediatric oncology to discuss depression and psychological distress, the challenges in diagnosing a MDE are considerable. Psychosocial assessments of adolescents with cancer lack empirical validation and have resulted in a trend toward reactive measures of treatment, such as the use of antidepressants, often in the absence of adjuvant psychosocial therapy and formal psychiatric consultation (Kersun & Kazak, 2006; Phipps et al., 2012; Portteus et al., 2006). Although there are a number of validated depression screening instruments available for use in pediatric populations, they lack diagnostic capacity and have yet to be validated for use in adolescents with cancer. This raises important concerns as poor psychological assessment with little certainty of whether these instruments have discriminative ability in assessing MDEs and depressive symptoms in this population, ultimately results in lack of or inappropriate psychosocial treatment.

These significant gaps in knowledge justify the importance of the evaluation of the psychometric properties of a screening instrument for MDEs and an initial exploration of some factors related to a MDE in adolescents with cancer. I plan to begin addressing these gaps by comparing scores on the Children's Depression Inventory (CDI) and the Diagnostic Interview for Children and Adolescents (DICA-IV), the gold standard for diagnosing a MDE. An exploration of the relationships between age, gender, MDEs and anxiety will provide pilot data for use in a larger study I plan to do to test the conceptual framework. Findings from this study may also inform future studies on the adaptive capacity of adolescents early in the cancer trajectory.

Chapter 3: Methodology

Research Design

Using a cross-sectional descriptive design, I conducted this study to examine and compare the feasibility of utilizing an existing depression screening tool and a standardized diagnostic interview to identify a MDE in adolescents with cancer. I also examined relationships among age, gender and anxiety and a MDE in adolescents with a cancer diagnosis. Since the sample size was small, the distribution of study variable scores were examined for skewness, kurtosis and homogeneity of variance. Many of the variables were positively skewed, with relatively normal kurtosis. As the findings were not normally distributed, I used non-parametric statistics in the analysis.

Sample and Setting

The study sample was comprised of adolescents receiving treatment within the Hematology/Oncology/Transplant Program at the Alberta Children's Hospital (ACH) in Calgary, Alberta, who met the following eligibility criteria: 1) diagnosis of any type of malignant cancer or tumor that required chemotherapy treatment, or a hematological disorder requiring a blood or bone marrow transplant (BMT), between January 2008 and May 2014; 2) between the ages of 13 and 18 at the time of recruitment; 3) received or receiving treatment at the ACH; and 4) physical, cognitive, and language abilities to complete self-report questionnaires and to be interviewed. Participants were excluded if they were not treated with chemotherapy, or if their medical histories indicated that they were unable to complete study instruments due to cognitive impairment or advanced disease. Based on the recruitment criteria for time of diagnosis, the sample included a variety of patients who ranged from active treatment, remission, post-BMT

follow-up, and palliative care. Treatment and transplant status were reported on the patient demographics forms.

Data Collection

Data collection took place between September 2013 and July 2014. Ethics approval was obtained by the University of Alberta Health Ethics Review Board and the University of Calgary Conjoint Health Research Ethics Board (see Appendix A for ethics approval letters). I identified potential participants by referring to databases of all adolescent patients at the respective oncology programs. During a clinic visit, I provided a letter to the parents of each eligible adolescent, describing the study and asking them to indicate their interest in hearing more about the study by signing a consent to contact letter form (see Appendix B). There were also recruitment posters located in the inpatient and outpatient units, describing the study and those who were eligible for the study, with a contact number that parents could call to reach me at, if they were interested (see Appendix C for recruitment poster). After parents provided consent to contact, I also obtained consent from the parents and assent (or consent if 18 years of age) from the adolescents who wished to participate (see Appendix D for parental consent form, adolescent assent/consent forms, and information letters). Data collection took place either at the time of their next clinic visit or a phone interview if the adolescent did not have an upcoming scheduled visit to the clinic.

Table 3 outlines the data that were collected and the data sources used.

Table 3
Measures and Data Sources

Measure	Data sources
Depression	▪ CDI scores ▪ DICA-IV scores
Anxiety	▪ MASC score
Demographic data ▪ Gender ▪ Age at time of recruitment ▪ Age at diagnosis ▪ Diagnosis ▪ Treatment status ▪ Transplant status ▪ Alcohol use ▪ Drug use ▪ Ethnicity ▪ Parental education/occupation ▪ Yearly family income ▪ Parental marital status ▪ Number of siblings and health status	▪ Participant demographics form ▪ Parental demographics form

I administered three instruments (the CDI, the DICA-IV, and the Multidimensional Anxiety Scale for Children (MASC)) and completed demographic data forms for both the adolescent and his/her parent. Data were collected either in a private consult room or a private phone interview to maintain confidentiality. Demographic data (Appendix E), including age, gender, diagnosis, date of diagnosis, transplant status, treatment phase, and presence of drug and alcohol use, were collected to characterize the sample. Parents of participants were asked to fill out a parent demographics sheet, which detailed yearly family income, family composition, and other health concerns within the family. This information was used to further describe the sample.

Instrumentation

Two instruments were used to operationally define a MDE in this study: The Children's Depression Inventory (CDI) and the Diagnostic Interview for Children and Adolescents (DICA-IV). See Appendix F for instruments.

The Children's Depression Inventory (CDI-2)

The CDI is one of the most widely used screening tools for assessing depression in pediatric populations, but its validity has not been established nor has its clinical utility in pediatric oncology been investigated (Lee, Krishnan, & Park, 2012). Originally established in 1985, the CDI is 27-item, self-rated, symptom-oriented scale suitable for individuals aged seven to 17 (Kovacs, 1992) and has recently been revised to its second edition (Kovacs, 2010). The scores on the Profile Forms are reported as T-scores, which are standardized scores, with high scores indicating the presence of depressive symptomatology, while low scores indicate an absence of depressive symptoms (Kovacs, 1992). T-scores have a mean of 50 and a standard deviation of 10, with scores of 65 and above indicating further follow-up for a possible MDE (Kovacs, 1992). The CDI-2 is used to screen for cognitive, affective, and behavioural depressive symptoms to provide an index of the severity of depression and can be used in both clinical and community samples in clinical applications (Friedberg & McClure, 2002; Kovacs, 1985). The original development of the CDI instrument included a five-factor structure that assesses negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-esteem (Kovacs, 1985, 1992). However, there has been inconsistent use of the CDI, due to variations in the scoring of the instrument (Lee et al.). Thus, despite the widespread use of the CDI and CDI-

2, there are currently criticisms related to its use, assumptions, and psychometric properties (Gomez, Vance, & Gomez, 2012; Lee et al.).

Validity and reliability of the CDI. The CDI and CDI-2 have demonstrated success in distinguishing clinical and nonclinical groups, with acceptable test-retest reliability, internal consistency estimates, and adequate convergent and discriminant validity (Carey, Faulstich, Gresham, Ruggiero, & Enyart, 1987; Cole, Martin, Peeke, Henderson, & Harwell, 1998; Craighead, Curry, & Ilardi, 1995; Hodges, 1990; Kovacs, 1985, 1992; Saylor, Finch, Spirito, & Bennett, 1984; Smucker, Craighead, Craighead, & Green, 1986). Reliability data for the CDI ranges between adequate to moderate with test-retest reliability coefficients ranging from .38 to .87 (Finch, Saylor, Edwards, & McIntosh, 1987; Saylor et al.). Internal consistency coefficients and item-total score correlations have been shown to be high, with a Cronbach's alpha >.80 (Oster & Caro, 1990). Concurrent validity of the CDI has been established in relation to numerous depression scales, including the Hopelessness Scale for Children and the Reynolds Adolescent Depression Scale, with the Pearson's correlation coefficient ranging from .49 to .79 (Eckert, Dunn, Guiney, & Codding, 2000). Construct validity has also been examined in several studies, with most suggesting that a one-factor structure that focuses on depression in general, as opposed to the original five-factor model, is most parsimonious (Saylor et al.; Weiss et al., 1991). The use of the CDI and CDI-2 have not been investigated in adolescent oncology.

The Diagnostic Interview for Children and Adolescents (DICA-IV)

The DICA was first developed by Barbara Herjanic, M.D. in the early 1970s, for the purposes of diagnosing psychiatric disorders (Herjanic & Reich, 1982). Early revisions of the DICA focused on the development of interviews designed for younger children, but has since

evolved into separate interviews for children (six to 12 years) and adolescents (13 to 18 years) (Reich, 2000). Originally conceived as a highly structured psychiatric interview, the latest revision, DICA-IV, can now be used in a semi-structured format to diagnose DSM-V axis I disorders, with 26 diagnostic categories, including major depressive disorder, and up to 1,600 possible questions (Reich; Sala, Granero, & Ezpeleta, 2006). In this study, I collected data using a structured interview. Although the interviewer does not diagnose individuals solely on the basis of the DICA-IV, researchers showed that the results of the DICA-IV had relatively high percentages of interrater agreement (85% to 89%) and within-interviewer agreement (80% to 95%) (Whitcomb & Merrell, 2013)

The latest version of the DICA-IV is available in computerized format, whereby the program automatically branches to appropriate questions and sections depending on the responses given (Reich, Welner, & Herjanic, 1997). I used the computerized format in this study. Administration of the DICA-IV requires two to four weeks of training, which I completed. Although administration of the full DICA-IV requires 60 to 90 minutes to complete, administration of individual sections, particularly the MDE section, requires between five and 30 minutes to complete (Sala et al., 2006). For this study, only the MDE section of the DICA-IV was administered.

Validity and reliability of the DICA-IV. The DICA-IV has been studied for reliability and validity and was found to have high test-retest results in the adolescent version of the interview (Welner, Reich, Herjanic, Jung, & Amado, 1987), with kappa coefficients ranging from .80 to .90—the highest among available diagnostic interviews (D'Angelo & Augenstein, 2012). Additionally, it has been found to have high interrater agreement (85% to 89%) and

within interviewer agreement (80% to 95%) at two to three month intervals (Merrell & Whitcomb, 2012). Among the diagnostic interviews available for use in children and adolescents, the DICA-IV has been one of the most studied and has demonstrated excellent psychometric properties (Merrell & Whitcomb).

The Multidimensional Anxiety Scale for Children (MASC-2)

The MASC-2 is a pediatric self-report anxiety scale designed to screen a wide spectrum of common anxiety symptoms in children and adolescents aged eight to 19 years (March et al., 1997). The MASC-2 contains 39 items and is comprised of two major indexes (Anxiety Disorders Index, Inconsistency Index) and a scale measuring total anxiety (Total Anxiety Scale), as well as subscales on physical or somatic symptoms, harm avoidance, and social anxiety (Eckert et al., 2000). The MASC-2 has been cross-validated in clinical and population samples and has been validated across gender and age (March, Sullivan, & Parker, 1999; Rynn et al., 2006). Similar to the CDI-2, raw scores on the MASC-2 are converted to T scores and are differentiated accordingly: 45 to 55 average, 56 to 60 slightly above average, 61 to 65 above average, 66 to 70 much above average, and scores above 70 are suggestive of a anxiety disorder (March et al., 1997).

Validity and reliability of the MASC-2. The MASC-2 has demonstrated acceptable convergent and divergent validity, and significantly correlates with other older anxiety measures, such as the Revised Children's Manifest Anxiety Scale (RCMAS) and the State-Trait Anxiety Scale for Children (STAIC) (Baldwin & Dadds, 2007). In clinical samples, the test-retest reliability is satisfactory, with average intraclass correlation coefficients ranging from .79 to .93 (March et al., 1997). Additionally, in a study with a large clinical sample of anxious and

depressed adolescents, the MASC-2 demonstrated excellent discriminative validity in being able to distinguish anxiety from depression, with high internal consistency and Cronbach alpha of .87 (Rynn et al., 2006).

Data Analysis

Statistical information was computed utilizing SPSS Version 20.0 for Windows. Descriptive statistics were computed for all variables. Given the small sample size, medians and ranges were calculated for the demographic variables obtained from the participants. Medians and ranges were also calculated for scores on all study instruments. Spearman's *rho* was used to examine the relationships between age, gender, anxiety and depression as indicted by scores on the DICA, MASC-2, and CDI-2, with the significance value set at $p = 0.1$. This statistical approach is appropriate when the sample size is small and the data are not normally distributed. Finally, descriptive comparisons were drawn between the feasibility of utilizing the CDI-2 compared to the DICA-IV, as defined by length of time required to administer, ease for participants to complete, and clinical usefulness of the results yielded by each instrument.

Ethical Considerations

This study was approved by the University of Alberta Research Ethics Board (REB) and the Conjoint Health Research Ethics Board (CHREB) of the University of Calgary, before beginning recruitment at the ACH, Calgary, Alberta. Upon initial contact, participants were informed of the purpose of the study, risks, benefits, voluntary participation, and confidentiality via an information letter. It was be emphasized that the participant was under no obligation to participate and could withdraw from the study at any time with no detriment to treatment.

Participants were advised that they could withdraw from the study by indicating their wish to do so to their parent or the primary researcher.

Since adolescents are underage, adolescent assent and proxy consent from parents or guardians were obtained. A parental consent form was signed by parents prior to approaching adolescents to sign the assent form and prior to the initiation of the study. All data collected were stored in a locked filing cabinet or password-protected electronic files only accessible to the primary researchers, with names and identifying information removed to maintain confidentiality. Although this study posed no direct risks or benefits, it was made clear to participants that the questionnaires or interview may uncover emotionally challenging and upsetting issues. In such cases, contact information for crisis lines would be provided or a participant's oncologist and/or primary nurse would be notified, upon participant request and permission from parents. Participants who were suspected of meeting criteria for a MDE based on study results, and who were currently not receiving intervention were referred to the psychosocial team at the ACH with participant and parental permission. Likewise, in cases were the participant and his or her parents refused a referral, a referral was not made. Participants who did not exhibit scores that were clinically diagnosable, but who selected responses indicative of having problems (such as trouble sleeping), were also asked for permission to notify the primary nurse for further follow-up. Participants were advised that if the responses during the study indicated the possibility of self-harm or suicide, the oncologist would be notified to ensure that required care was provided.

Chapter 4: Results

Participants

A total of twenty five patients met the study criteria, who were still accessing medical care at the ACH and were approached to take part in the study during one of their scheduled appointments at the outpatient oncology clinic at the ACH. Of these, five patients refused to take part in the study, two deceased shortly after providing consent, two dropped out of the study, and two could not be contacted after consenting. Therefore of the number of participants recruited was comprised of 14 individuals (five boys and nine girls), who attended the outpatient oncology clinic between September 2013 and July, 2014.

Participant Demographics

The median age of participants was 15 years with a range of 13 to 17. The median number of months from diagnosis to time of participation in the study was 14. The minimum time from diagnosis was two months and the maximum time was 67 months. Seven of the participants were still receiving active treatment, while two participants were post-BMT, three participants were off treatment, and two participants were in the palliative stage. There was only one participant with a hematological condition (Fanconi anemia), which required a BMT, while the remainder of participants had a range of oncological diagnoses: desmoid fibromatosis, Ewing's sarcoma, acute lymphoblastic leukemia (ALL), medulloblastoma, tectal glioma, intracranial rhabdomyosarcoma, ganglioneuroblastoma, acute myeloid leukemia (AML), pilocytic astrocytoma, and osteosarcoma. None of the participants cited current consumption of alcohol and only one participant stated she regularly consumed illicit drugs, which she began prior to her cancer diagnosis. Table 4 summarizes the demographic data on study participants.

Table 5 summarizes the demographic data on the 11 participants who met eligibility criteria during the study period, but did not participate due to attrition, death and/or refusal.

Table 4
Participant Demographics

Participant ID	Gender	Age	Diagnosis	Months since diagnosis	Treatment Phase
ACD03	M	16	Desmoid fibromatosis	55	Off
ACD05	F	13	Ewing's sarcoma	56	Palliative
ACD07	F	13	Fanconi anemia	18	Post-BMT
ACD08	F	16	Very high risk ALL	12	Active
ACD10	F	17	Ewing's sarcoma	11	Active
ACD11	M	15	High risk medulloblastoma	66	Off
ACD12	M	14	Tectal glioma	67	Active
ACD13	M	14	Intracranial rhabdomyosarcoma	30	Off
ACD14	F	14	ALL	11	Active
ACD15	F	17	High risk ALL	16	Post-BMT
ACD16	F	16	Ganglioneuroblastoma	9	Active
ACD21	M	13	AML	2	Active
ACD22	F	15	Pilocytic astrocytoma	8	Active
ACD23	F	17	Osteosarcoma	16	Palliative

Table 5
Demographics of Non-Participating Eligible Individuals

Participant ID	Gender	Age	Diagnosis	Months since diagnosis	Treatment Phase	Reason for exclusion
ACD01	F	16	Relapsed AML	24	Palliative	Deceased
ACD02	M	18	Osteosarcoma	20	Palliative	Deceased
ACD04	M	17	Hodgkin's lymphoma	8	Active	Unable to contact
ACD06	M	14	Diffuse large B-cell lymphoma	5	Active	Unable to contact
ACD09	M	14	Neurofibromatosis type I	80	Off	Dropped out
ACD17	M	16	Malignant peripheral nerve sheath tumour	9	Active	Refused
ACD18	F	13	Rhabdomyosarcoma	11	Active	Refused
ACD19	M	18	ALL	41	Off	Refused
ACD20	F	13	Very high risk ALL	14	Post-BMT	Refused
ACD24	M	18	Aplastic anemia	31	Post-BMT	Refused
ACD25	F	16	?	Unknown	Off	Dropped out

Family Demographics

The majority of the participants' parents were married (12), while one parent was single (never previously married) and one parent was recently widowed within the last year. The average yearly family income varied among the participants, but half of the families (7) made a yearly income of over $85,000. Familial ethnic backgrounds varied between Caucasian, African, Pakistani, Hispanic, Aboriginal, Sri Lankan and multiracial (mix of Filipino, Algerian, and Caucasian), with the majority of families being Caucasian. Finally, the level of parental education ranged from some high school education to University or college degrees. Table 6 summarizes the demographic data on the study participants' families. There was no available information on family demographic data on eligible individuals who did not participate in the study.

Table 6
Family Demographics

	Minimum	Maximum	Mean	Standard deviation
Parental age	36	59	47.31	5.14
				Count
Ethnic background	Caucasian			7
	African			1
	Pakistani			1
	Hispanic			1
	Aboriginal			1
	Sri Lankan			1
	Multiracial			2
Marital status	Married			12
	Separated			0
	Divorced			0
	Single			1
	Widowed			1
Yearly family income	Less than $25,000			0
	$26,000 to $35,000			1
	$36,000 to $45,000			2
	$46,000 to $65,000			1
	$66,000 to $85,000			3
	More than $85,000			7
Education	Other			0
	Less than high school education			0
	Some high school education			1
	High school graduate			2
	Some university or college			4
	University or college graduate			7

Feasibility

Time

The screening tool and diagnostic interview examined in this study were the CDI-2 and the DICA-IV, respectively, both of which were administered during one encounter with a participant in a busy outpatient clinic setting. As hypothesized, the CDI-2 took much less time to administer, with most participants completing the questionnaire within five minutes. The DICA-IV, on the other hand, ranged from five to 45 minutes to complete, as participant responses guided the types and number of questions asked. Participants with more potential for depressive symptoms typically required more time to complete the interview. Furthermore, as the CDI-2 was completed independently, participants could have completed the questionnaire on their own time in clinic, whereas the DICA-IV required the participants to relocate to a private room with the interviewer to maintain confidentiality.

Willingness to Disclose

I hypothesized that participants would be more willing to disclose their symptoms on the CDI-2 self-report questionnaire than in the interview format of the DICA-IV. However this was not clearly evident in the findings. Among all participants, the study instruments were administered in the same order to ensure consistency in data collection: participant demographics, the MASC-2, the CDI-2, and lastly, the DICA-IV. The rationale for administering the DICA-IV last was to allow participants time to reflect on their feelings while independently filling out the CDI-2 and MASC-2 questionnaires prior to being verbally interviewed. However, as the formats of the CDI-2 (multiple choice answers) and the DICA-IV

(yes/no answers) differed, it was difficult to assess whether their answers to both instruments were consistent and thus, inconclusive in terms of assessing willingness to disclose.

Recruitment

A total of twenty five patients met the study criteria, who were still accessing medical care at the ACH and were approached to take part in the study during one of their scheduled appointments at the outpatient oncology clinic at the ACH. Of these, five patients refused to take part in the study, two deceased shortly after providing consent, two dropped out of the study, and two could not be contacted after consenting. Therefore of the number of participants recruited was comprised of 14 individuals (five boys and nine girls), who attended the outpatient oncology clinic between September 2013 and July, 2014.

Recruitment in this particular population proved to be rather challenging, as demonstrated by the low participation rate of 56% of the twenty five potential candidates for this study. Although it was difficult to ascertain reasons for those who chose not to participate, there was an observable pattern that many of those who declined participation also had known present issues with anxiety and depressive symptoms as indicated on their medical charts. Furthermore, as the ACH is a central site in Western Canada for blood and marrow transplantations, there were a number of potential participants that could not be approached for recruitment as they had returned to their home sites and were no longer receiving treatment at the ACH. Finally, there were more males who declined participation in this study compared to females, which resulted in disproportionate gender representation. Although this is an interesting finding on its own, due to the small sample size, statistical differences and conclusions based on gender could not be drawn.

Variables

The Children's Depression Inventory (CDI-2)

The CDI-2 measured a total T-score and T-scores for two subscales, emotional problems and functional problems. The emotional problems subscale was further divided into two subscales, which were also measured with T-scores: negative mood/physical symptoms and negative self-esteem. The functional problems subscale was also further divided into two subscales, with corresponding T-scores: ineffectiveness and interpersonal problems. The emotional problems subscale refers to feelings of sadness or irritability and/or low self-esteem, self-dislike, and feelings of being unloved, all of which may also manifest as physical symptoms related to sleep, appetite, fatigue and aches or pains (Kovacs, 1992). The functional problems subscale refers to poor self-evaluation of own abilities and school performance, impaired capacity to enjoy school and other activities, feelings of loneliness, and difficulty interacting with peers and/or family (Kovacs).

T-scores above 65 are considered clinically significant for depression and scores between 45 and 55 are considered average. Table 7 summarizes the means, medians, and ranges of the total CDI-2 T-scores and the subscale T-scores. Table 8 summarizes medians and ranges of total CDI-2 T-scores stratified across age and gender. Table 9 summarizes medians and ranges of T-scores for all the subscales stratified across gender. Although the low number of participants limits the ability to analyze these data statistically, this information provides some insight into possible differences in MDEs by age and gender.

Table 7
Means, Medians and Ranges of Total CDI-2 T-Scores and CDI-2 Subscale T-Scores

	Mean	Median	Range
Total CDI-2	53.36 (SD 11.76)	49.50	40 to 81
Emotional problems	52.57 (SD 11.57)	49.50	41 to 82
Negative mood/ Physical symptoms	53.93 (SD 12.12)	50.50	41 to 83
Negative self-esteem	50.29 (SD 8.64)	48.00	42 to 74
Functional problems	53.21 (SD 11.98)	51.00	40 to 77
Ineffectiveness	53.21 (SD 11.55)	50.50	40 to 74
Interpersonal problems	50.21 (SD 12.12)	42.00	41 to 74

Table 8
Medians and Ranges of CDI-2 T-Scores across Age and Gender

		Median CDI-2 T-Score	Range	Number
Patient age in years	13	47.00	45 to 66	3
	14	42.00	20 to 62	3
	15	62.50	44 to 81	2
	16	52.00	47 to 63	3
	17	52.00	45 to 64	3
Gender	Male	44.00	40 to 47	5
	Female	62.00	45 to 81	9

Table 9
Medians and Ranges of CDI-2 Subscale T-Scores across Gender

		Median CDI-2 T-Score	Range
Emotional problems	Male	44.00	41 to 47
	Female	52.00	45 to 82
Negative mood/ Physical symptoms	Male	46.00	41 to 50
	Female	57.00	44 to 83
Negative self-esteem	Male	44.00	44 to 50
	Female	53.00	42 to 74
Functional problems	Male	44.00	40 to 50
	Female	55.00	44 to 77
Ineffectiveness	Male	44.00	40 to 52
	Female	56.00	45 to 74
Interpersonal problems	Male	42.00	All scored 42
	Female	49.00	41 to 74

N=14

The Multidimensional Anxiety Scale for Children (MASC-2)

The MASC-2 provided a total T-score and T-scores for ten subscales: separation anxiety/phobias, general anxiety disorder (GAD) index, social anxiety, humiliation/rejection, performance fears, obsessions and compulsions, physical symptoms, panic, tense/restlessness, and harm avoidance. T-scores above 55 are considered above average and scores above 70 are suggestive of an anxiety disorder. The mean total MASC-2 T-score was 55.93 (SD 12.73), with a range of 34 to 78 and a median of 54.00. Table 10 summarizes medians and ranges of total MASC-2 T-scores stratified across age and gender. Table 11 summarizes medians and ranges of T-scores for all the subscales stratified across age gender. Once again, the low number of participants makes it difficult to analyze these data statistically, but this information offers some insight into possible differences in anxiety by age and gender.

Table 10
Medians and Ranges of MASC-2 T-Scores across Age and Gender

		Median MASC-2 T-Score	Range	Number
Patient age in years	13	47.00	46 to 69	3
	14	38.00	34 to 64	3
	15	61.00	52 to 70	2
	16	58.00	51 to 78	3
	17	56.00	52 to 68	3
Gender	Male	46.00	34 to 58	5
	Female	64.00	47 to 78	9

Table 11
Medians and Ranges of MASC-2 Subscale T-Scores across Gender

		Median MASC-2 T-Score	Range
Separation anxiety/phobias	Male	45.00	40 to 55
	Female	62.00	47 to 79
	Total	54.50	40 to 79
GAD Index	Male	46.00	32 to 64
	Female	67.00	54 to 70
	Total	57.00	32 to 70
Social anxiety	Male	43.00	34 to 48
	Female	56.00	37 to 72
	Total	47.50	34 to 72
Humiliation/rejection	Male	41.00	36 to 49
	Female	54.00	36 to 65
	Total	51.00	36 to 65
Performance	Male	47.00	37 to 53
	Female	57.00	36 to 76
	Total	51.00	36 to 76
Obsessions and compulsions	Male	48.00	39 to 49
	Female	64.00	47 to 70
	Total	53.50	39 to 70
Physical symptoms	Male	51.00	39 to 63
	Female	55.00	45 to 79
	Total	51.50	39 to 79
Panic	Male	51.00	40 to 67
	Female	55.00	41 to 78
	Total	51.50	40 to 78
Tense/restlessness	Male	50.00	39 to 57
	Female	54.00	40 to 73
	Total	53.50	39 to 73
Harm avoidance	Male	52.00	41 to 58
	Female	54.00	37 to 62
	Total	53.50	37 to 62

N=14

The Diagnostic Interview for Children and Adolescents (DICA-IV)

The DICA-IV identified individuals who met the diagnostic criteria for both a present MDE and a past MDE. Of the 14 participants interviewed, only one participant met the criteria for a present MDE. This same individual also met the diagnostic criteria for a past MDE. Additionally there were two other participants who met the criteria for a past MDE, but no longer met the diagnostic criteria for a present MDE. The interview elicited descriptive responses, which indicated that these participants have actively been receiving psychosocial intervention either through adolescent mental health programs or through counselling from a clinical psychologist. Although causation cannot be determined, it could be inferred that psychosocial intervention may have been a contributing factor to the resolution of a past MDE. Of the three participants who met the diagnostic criteria for a MDE, either past or present, all were female.

Correlations: Age, Gender, and Anxiety

Given the small sample size, Spearman's *rho* was used to examine correlations among key variables noted in the research questions in chapter 3.

The CDI-2 and Gender

As hypothesized, there was a significant positive relationship between elevated CDI-2 scores and being female, with a correlation coefficient of 0.642 (p=0.013), suggesting that females are at higher risk for developing depressive disorders and/or depression symptoms than their male counterparts.

The CDI-2 and Age

As hypothesized, there was a significant positive relationship between elevated CDI-2 scores and increasing age, with a correlation coefficient of 0.103 (p=0.727), suggesting there is no significant relationship between age and risk for developing a MDE.

The MASC-2 and Gender

Likewise, there was a significant positive relationship between elevated MASC-2 scores and being female, with a correlation coefficient of 0.628 (p=0.016), suggesting that females are at higher risk for developing anxiety disorders and/or anxiety symptoms than their male counterparts.

The MASC-2 and Age

There was no significant relationship between elevated MASC-2 scores and increasing age, with a correlation coefficient of 0.274 (p=0.314), suggesting that age and the risk for developing anxiety disorders and/or anxiety symptoms are unrelated.

The CDI-2 and the MASC-2

The correlation between the total CDI-2 T-scores and total MASC-2 T-scores was examined to investigate the relationship between depression and anxiety symptom severity, so that study findings could be compared to findings from the literature that suggest anxiety and depressive disorders are highly comorbid conditions. As hypothesized, there was a significant positive relationship between elevated CDI-2 scores and elevated MASC-2 scores, with a correlation coefficient of 0.727 (p=0.003), suggesting that depressive symptoms and anxiety symptoms were highly correlated in this sample.

The CDI-2, the MASC-2, and the DICA-IV

Of the 14 participants in this study, the CDI-2 identified two individuals with scores suggestive of a MDE (T-score > 65), one of who did not meet the diagnostic criteria for a MDE on the DICA-IV. The other individual with a clinically significant CDI-2 score met the diagnostic criteria for a past MDE, but not present. Additionally, the CDI-2 identified three individuals who scored above average scores (T-score 56 to 65). All five of the above individuals with elevated CDI-2 scores were female. The DICA-IV identified three individuals who met the criteria for either a past or present MDE, but two of those scored just below the cut-off for clinically significant depression on the CDI-2. The MASC-2 identified two participants with scores clinically significant for an anxiety disorder (T-score ≥ 70), both of whom also met the diagnostic criteria for a past or present MDE. The MASC-2 also identified five individuals who scored above average scores (T-score 55 to 69). Of the above individuals with elevated MASC-2 scores, six were female and one was male. Table 12 summarizes the above data on individuals with elevated CDI-2 and MASC-2 scores compared to the DICA-IV results.

Table 12
Participants with Elevated CDI-2 and MASC-2 Scores and Associated DICA-IV Results

ID	Gender	Age	CDI-2 T-Score > 65	CDI-2 T-Score 56 - 65	MASC-2 T-Score ≥ 70	MASC-2 T-Score 55 - 69	Past MDE (DICA-IV)	Present MDE (DICA-IV)
ACD03	M	16				✓		
ACD05	F	13	✓			✓		
ACD08	F	16		✓	✓		✓	✓
ACD10	F	17				✓		
ACD14	F	14		✓		✓		
ACD15	F	17		✓			✓	
ACD22	F	15	✓		✓		✓	
ACD23	F	17				✓		

N=8

Table 13 summarizes the CDI-2 and MASC-2 T-scores of the three individuals who met the diagnostic criteria for either a past or present MDE on the DICA-IV.

Table 13
CDI-2 and MASC-2 T-Scores for Participants with a Past or Present MDE

ID	Gender	Age	CDI-2 T-Score	MASC-2 T-Score	Past MDE (DICA-IV)	Present MDE (DICA-IV)
ACD08	F	16	63	78	✓	✓
ACD15	F	17	64	52	✓	
ACD22	F	15	81	70	✓	

N=3

This data suggests the CDI-2 screening test was sensitive to identifying individuals who met the diagnostic criteria for a MDE. However, as two of the above individuals missed the CDI-2 cut-off for MDE, it suggests that individuals who do not have a clinically significant CDI-2 score could still be at risk for MDE. The sample is too small to provide information about the utility of the CDI-2, but future studies with larger samples should explore the ability of the CDI-2 to detect the relationships between elevated CDI-2 scores and past or present MDE and potential MDE over time. These data also suggests that individuals with depressive symptoms or a MDE are likely to have co-morbid anxiety symptoms or disorders, as illustrated by the elevated MASC-2 T-scores in two out of the three above individuals.

Chapter 5: Discussion

Feasibility

Although the purposes of a screening tool versus a diagnostic interview are distinct, there are steep measurement challenges when identifying MDEs in adolescent cancer patients, thus warranting further examination of these types of measures. Some of the measurement challenges include, but are not limited to, differences in individual report or exhibition of symptoms, similarities in symptoms of cancer treatment and MDEs, and minimal routine psychosocial screening measures in Canadian pediatric centres (Hopko et al., 2008; Kendall & Drabick, 2010; Public Health Agency of Canada, 2012). As the consequences of poor identification of MDEs and depressive symptoms are severe, ranging from inconsistent consults to psychiatry to missed diagnoses, this pilot study's examination of the feasibility of a screening tool instead of a diagnostic interview offers preliminary insight into potential methods that could be employed by Canadian pediatric centres to increase early identification of depressive symptoms in this population.

Time

As the CDI-2 required considerably less time to administer than the DICA-IV, it can be concluded that the CDI-2 has higher clinical utility in busy clinical settings. Since the CDI-2 can be completed independently, it also allows patients to complete the questionnaire on their own time as opposed to setting apart designated time for a psychosocial assessment with a clinician. This prevents unanticipated medical issues that often arise in the clinical setting (emergency reactions to chemotherapy, medications or blood products, sudden bouts of nausea and vomiting, etc.) from interfering with psychosocial assessments, as the CDI-2 does not require a clinician to

physically be present to administer the tool. Since the CDI-2 requires little time commitment, it is reasonable to administer it serially across the treatment trajectory, which allows clinicians to follow patients' psychosocial well-being over time while providing intervention, if needed, along the way.

Willingness to Disclose

It was evident that adolescents were willing to disclose on both the self-report questionnaires and in the interview as there were no missing items on the questionnaires and all questions were answered on the DICA-IV. In terms of disclosure, participants cited difficulty and at times, frustration with both the questionnaire and the interview as they were limited to only two or three answers that may not have adequately described their feelings. For example, with the exception of a few short answer questions in the beginning of the interview to help establish rapport, all of the questions on the DICA-IV were a yes/no format. As depressive thoughts and emotions exist along a continuum, many of the participants expressed that neither yes or no was an accurate response to many of the questions. Although the DICA-IV has demonstrated excellent psychometric properties (D'Angelo & Augenstein, 2012; Merrell & Whitcomb, 2012), the common sentiment among participants was that the provided answers were not accurate representations of their true feelings, which highlights limitations in the DICA-IV, particularly its validity.

Participants expressed similar issues when completing the CDI-2 questionnaire. All questions provided only three choices, such as "all the time", "many times", or "once in a while". Some participants stated that there was a big difference between "many times" and "once in a while" and thus for many questions, they had difficulty choosing the right response as they felt

their answers landed more in the middle of the two choices. As with the DICA-IV, these issues illustrate similar limitations to the CDI-2. However, as the CDI-2 is a screening instrument that is not meant for diagnostic purposes and has a range in the interpretation of the T-scores (average, above average, clinically significant, etc.), the limitations in answers may potentially have less impact on the results, compared to the DICA-IV. This is because the range in answers on the CDI-2 allows the clinician to interpret level of severity or potential for a *possible* MDE based on the presence of depressive symptoms. By contrast, the yes/no nature of the DICA-IV can potentially lead to false positives or negatives for a MDE with no spectrum in between for those individuals that fall in between the criteria of a definitive MDE and subclinical symptoms.

Finally, the CDI-2 offered more clinically useful information, compared to the DICA-IV as it included multiple sub-scales that could indicate areas where a participant may potentially be struggling, even if he or she did not have a clinically significant total score. For example, a participant could have had an average total score, but an elevated score for the ineffectiveness subscale, which suggests that he or she could benefit from professional assistance in personal abilities and school performance. Thus, the CDI-2 results could be used to guide a practitioner's practice in determining specific areas that may be causing an individual distress. Furthermore, the range of scores provides insight not only into the actual presence of a depressive disorder, but the potential and risk of an individual for developing a depressive disorder. The DICA-IV could only provide information on who met the diagnostic criteria for a MDE, with little insight on those with subclinical symptoms. Thus the ability for the CDI-2 to provide a severity index in depressive symptoms may serve greater clinical benefit than merely identifying the presence or absence of a MDE diagnosis, as it identifies those that may benefit from early intervention. This

helps to promote proactive psychosocial management to prevent the development of a MDE, as opposed to the traditional reactive treatment of existing MDEs.

Recruitment

There was a significantly higher proportion of females who were willing to enroll in the study, compared to males with a ratio of nine to five, respectively. By contrast, of the 11 individuals who were eligible to participate in the study, but did not enroll due to refusal, attrition and/or death, seven of those were male, suggesting that males were less willing to participate in the study compared to females. A number of factors could have contributed to the disproportionate representation of the genders. According to the National Institute of Mental Health (2015), males are less likely to admit to depressive symptoms and to seek help, and thus they may also be less likely to participate in research studies regarding depression. As the traditional male role often restricts emotional expression, males have a greater resistance to seeking treatment and also recognizing symptoms of depression (Addis & Mahalik, 2003), thus suggesting limitations in the inclusion of males in research studies and understanding MDEs in this population. This may have been a contributing factor to the low number of male participants in this study. Furthermore, there were no male researchers on the team to interview the male participants, which potentially could have limited male participants' comfort level with expressing potentially distressing issues.

Moreover, of the small number of eligible participants, the low participation rate as demonstrated by this study is consistent with literature findings in adolescent research, which has suggested that adolescent recruitment and retention is particularly challenging compared to other age groups (Ferrari & Bleyer, 2007; Spigarelli, 2008; Steinbeck, Baur, Cowell, & Pietrobelli,

2008). Although there is no one specific underlying reason for this phenomenon, there are a number of speculations on recruitment challenges in this age group. One particular study that explored barriers to recruitment from vulnerable populations, including adolescents, suggested that common reasons for low participation rates in studies is due to mistrust of research and the medical system, direct and indirect costs of participation, transportation, time commitment, fear, family considerations, and dynamics of the patient-provider relationship (Ford et al., 2008). These findings were corroborated by other studies specific to adolescents, which again cited mistrust in the medical establishment, as well as the prevailing notion of invincibility and independence that deter adolescents from participation in research (Bleyer, Budd, & Montello, 2006; Ferrari & Bleyer, 2007; Steinbeck et al., 2008). Adolescents are also typically less able to perceive long term consequences of their actions, likely partially attributed to having an incompletely developed prefrontal cortex—an area of the brain that is responsible for higher order cognitive processes (Johnson, Blum, & Giedd). Thus, there is less incentive to participate in research studies, as adolescents have difficulty perceiving immediate personal benefit from participation in research and its subsequent translation into clinical practice. Attrition in adolescent research, as was also seen in this study, can be attributed to dynamics between adolescent-parent dynamics, where the need for autonomy may drive an adolescent to decline participation, particularly if a parent is supportive of their participation (Steinbeck et al., 2008). It can also be attributed to similar reasons for attrition of adult research participants, such as failure of research to meet their expectations, time and travel constraints and other interfering events in life (Steinbeck et al.).

Age, Gender, and Anxiety

Due to the small sample size of this study, statistical significance of the results cannot be inferred. However, results from this study offer preliminary observations in the identification of MDEs in adolescents with cancer as well as variations in age, gender and anxiety. Of the 14 participants in this study, although only three met the diagnostic criteria for a past or present MDE, a total of eight participants exhibited high scores for depression symptoms, anxiety symptoms, or both. In the literature, the combination of anxiety and depression symptoms have been conceptualized as psychological distress (Croyle & Rowland, 2003; Hopko et al., 2008). Thus based on this definition, these study findings are consistent with other studies within the oncologic context including both pediatric and adult populations, which suggest that the prevalence of psychological distress can range from 20 to 47%, (Croyle & Rowland, 2003; Hopko et al., 2008; Zabora et al., 2001).

It has been well documented in the literature that age and gender are important mediators of MDEs and depressive symptoms, as the prevalence of major depression increases significantly across adolescence, with females being disproportionately affected (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Bhatia & Bhatia, 2007; Malcarne & Hansdottir, 2001). As MDEs and anxiety disorders have also been demonstrated as highly co-morbid conditions, similarly, there is a much higher prevalence of females developing anxiety symptoms compared to their male counterparts (Altemus, 2006; Bitsika et al., 2010; Kelly et al., 2008; Leach et al., 2008). Findings from this study are consistent with current literature, with significant positive relationships found between females and an MDE or depressive symptoms, females and anxiety symptoms, and MDEs or depressive symptoms and anxiety symptoms. By contrast, this study

did not find any positive correlations between age and anxiety symptoms and age and a MDE. Possible explanations for this are that the small sample size did not provide adequate statistical power to demonstrate a relationship, anxiety disorders and age may not be related in the adolescent oncological context, or there was in fact no relationship between the variables.

In the context of MDEs, anxiety symptoms, and gender, as was explored in this study, it is important to note the conceptual distinction between 'sex' and 'gender', whereby sex refers to the genotypic, phenotypic and anatomical characteristics of an individual, and 'gender' is a socio-cultural identity that is adopted through time, based on environmental factors (Gahagan, Gray, & Whynacht, 2015; World Health Organization, 2013). These study findings highlight the increased vulnerability of females to MDEs and anxiety symptoms, which multiple lines of literature has attributed to sociological factors that define gender (Hopcroft & McLaughlin, 2012; Li, DiGiuseppe, & Froh, 2006; Zhang, Gao, Fokkema, Alterman, & Liu, 2015). Such factors include differences in coping styles and interpersonal relationships between females and males, as mediated by sociologically established gender norms (Li et al., 2006). Thus, these findings support future research to further explore the role of gender and MDEs in adolescents within the oncological context.

Limitations of the Study

Due to the small sample size, there was a lack of statistical power, thus limiting the ability to draw statistical conclusions from the results. Furthermore, recruitment from a single site and the non-probability sampling strategy in this study may have led to selection bias, and limits the generalizability of the results. However, as adolescents with cancer in Canada represents a very small population (approximately 10 adolescents between the ages of 13 and 18

are diagnosed with cancer each year at the ACH), a large sample size would be impossible to recruit from this one site alone. As this study was conducted as a Master's Thesis, there were limitations in resources and time, which prevented recruitment from multiple Canadian sites. This study also employed a cross-sectional design, only capturing patients' symptoms at one time point, with no ability to establish trends of depressive symptoms and anxiety symptoms throughout the illness and treatment trajectory. The small number of participants also precluded the planned regression and the addition of other important variables that may potentially mediate depression symptoms or incidence rates of MDEs, including, but not limited to ethnicity, Aboriginal status, family income, and other co-morbidities.

Chapter 6: Implications for Practice, Education and Research

Nursing Practice

Nurses play a critical role in the recognition, assessment and management of MDEs in adolescents with cancer as they are typically front-line members of the health care team who provide the most direct day-to-day care for patients with cancer (Engvall et al., 2011). Although adolescent survivors of cancer are at increased risk for developing depressive symptoms compared to their healthy counterparts (Reuben, 2004; Seitz et al., 2009), few pediatric oncology sites have implemented defined protocols for routine psychosocial assessments, leading to lack of timely and appropriate treatment and follow-up (Barr, 2011; Barr et al., 2011; Public Health Agency of Canada, 2012). Thus, identification of adolescent cancer patients who may potentially be suffering from MDEs is dependent on individual referrals to the psychology team, rendering the risk of missing individuals who could benefit from treatment.

Feasibility of the CDI-2

Although results from this study only offer preliminary insight into screening and assessment of adolescents with cancer for MDEs, its findings are supportive of the use the CDI-2 in identifying individuals who potentially meet the criteria for a MDE. The CDI-2 requires little time to complete and could thus, easily be integrated into care for nurses to administer to their patients. The CDI-2 also has potential for identifying individuals who do not meet the cut-off for clinically significant depressive symptoms, which could be beneficial in earlier identification of adolescents who may benefit from psychosocial intervention, particularly in specific domains such as self-esteem, ineffectiveness and negative mood (Friedberg & Sinderman, 2011; Kovacs, 1992). These findings can be translated into clinical practice in a number of ways. For example,

the oncology program could implement routine administration of the CDI-2 at each phase of a patient's treatment regimen with associated tracking of each time it is administered, such as on a "psychosocial roadmap" that is attached to each patient's medical chart. This would be similar to roadmaps currently used for chemotherapy administration, as outlined by the Children's Oncology Group (Hunger et al., 2013). This would allow practitioners to monitor trends in an adolescent's psychosocial status, which would allow for early identification of potential signs of a MDE. Monitoring trends also help track changes within an individual and thus, although one may not score high enough to meet clinical significance for a MDE, drastic changes in one's CDI-2 score may signal the need for early intervention. Routine administration of the CDI-2 would also identify those who meet cut-off scores for clinically significant depressive symptoms and thus screen those who may need further assessment with diagnostic interviews such as the DICA-IV.

Additionally, subscales on the CDI-2 for negative mood, negative self-esteem, ineffectiveness and interpersonal problems serve the benefit of identifying specific issues that an individual may be struggling with, even if he or she does not meet the criteria for major depression (Kovacs, 1985, 1992). For example, if an individual scores high on the negative self-esteem scale, interventions can be tailored more specifically to self-esteem issues. Thus, when making referrals to other members of the health care team, such as the clinical psychologist, nurses and the medical team can be more specific in the needs that an individual requires.

Age, Gender, and Anxiety

Results from this study also indicated correlations between MDEs and gender, whereby females more frequently experienced depressive symptoms; and MDEs and anxiety symptoms,

whereby MDEs and anxiety disorders were typically co-morbid conditions. This data is consistent with literature on MDEs, suggesting that anxiety disorders and major depression exhibit high comorbidity (Barlow, 2002; Olson, Hayduk, et al., 2008; Zahn-Waxler et al., 2000). Although this study did not find correlations between age and a MDE, current literature suggests high correlations between females and depressive symptoms (Altemus, 2006; Bitsika et al., 2010; Kelly et al., 2008). With this knowledge, nurses can be more cognizant of signs and symptoms of MDEs particularly in females and older adolescents, rather than simply dismissing them as adverse effects of cancer and cancer treatment. Likewise, nurses can also identify patients who exhibit symptoms consistent with anxiety as also potentially having major depression, thus tailoring interventions to address both anxiety and depressive symptoms.

Nursing Education

The risks for developing MDEs and the associated detrimental effects of psychosocial distress on the overall wellbeing of an adolescent with cancer highlights the importance of educating nurses and members of the allied health care team about early assessment and management of depression symptoms. The findings in this study suggest that health care professionals must implement proactive means of identification of MDEs and depressive symptoms and/or signs and symptoms of maladaptive responses in other areas of psychosocial functioning, such as anxiety and the other subscales represented on the CDI-2. Creating a forum of open dialoguing about psychosocial issues such as MDEs in a cancer setting endorses a clinical culture conducive to a safe space for individuals to confide emotionally challenging issues without the fear of stigma (Cho et al., 2013).

In addition to nursing education, there is also immense opportunity for patient education regarding self-management of depressive and anxiety symptoms. Research has shown that patients are often hesitant to admit to symptoms of depression for fear of judgement as well as the need for social acceptance (Canning et al., 1992; Logan et al., 2008; van de Mortel, 2008). Thus, as discussed above, creating an open forum for discussion of emotional concerns could help encourage patients to report feelings of sadness, despair and hopelessness to members of the health care team. Teaching the importance of open communication to patients is paramount as treatment for MDEs and depressive symptoms depends on their honesty in reporting their symptoms. Furthermore, patients may potentially dismiss depressive symptoms as an expected outcome of their diagnosis and treatment and thus, find little importance in reporting their concerns. This highlights the importance of teaching patients that although emotional distress is understandable when given a life-threatening diagnosis, they don't have to suffer in silence and there are options available to them for support.

Nursing Research

Further research on screening and assessing adolescents with cancer for MDEs is clearly warranted. A significant limitation to this study, as well as many studies on depressive symptoms in adolescents with cancer, is the small sample size that precludes the ability to make strong statistical conclusions. Future research in this area would benefit from recruiting from multiple pediatric oncology sites across the nation and even across North America to generate data that is statistically significant and generalizable. One method that can be employed is to establish an online forum with other pediatric oncology researchers across Canada to explore this issue further and to seek solutions to recruitment challenges. As recruitment of adolescent

participants posed a significant challenge, there needs to be more innovative approaches to attracting adolescents to participate in research. An example of a strategy that can be employed is to utilize social media as a platform for recruitment and data collection, given how pervasive this has become in adolescent pop culture (Amon, Campbell, Hawke, & Steinbeck, 2014; L. Jones, Saksvig, Frieser, & Young, 2012; Moreno, Fost, & Christakis, 2008). Employing male researchers may also be an effective strategy to recruit young male participants, who may be less likely to engage in emotional expression (Addis & Mahalik, 2003).

Future research in this area should also employ a longitudinal design that allows for exploration of major depression across the treatment trajectory of adolescent patients with cancer, including times of remission and long-term survivorship. As pertinent issues evolve from the time of diagnosis to active treatment and are also drastically different in the palliative stage versus remission, it is important to study differences of depressive symptoms depending on the phase of cancer treatment as the interventions that can be offered would vary (Reuben, 2004). Within longitudinal studies, researchers could also implement intervention studies, which would be a step beyond screening and assessment of MDEs. Intervention studies would provide a significant contribution to our current management of adolescents with cancer and MDEs, which could help steer treatment away from current reactive measures, such as the use of solely antidepressants to treat MDEs and depressive symptoms (Kersun & Kazak, 2006; Phipps et al., 2012).

Although it was an initial goal of this study to examine multiple variables in the development of MDEs in adolescents with cancer since depressive symptoms are highly mediated by social factors, the small sample size of this study did not allow for analysis of

multiple variables. Future research should examine socially salient variables, such as ethnicity, Aboriginal status, family income, and religion as potential mediators of MDEs. This would lend insight into subgroups of adolescent populations that are at higher risk for major depressive disorders and thus indicate those that might need earlier screening. Examining multiple variables would also help researchers and clinicians gain a more in-depth and multidimensional understanding of major depressive disorders in the context of adolescent cancer patients and survivors.

Conclusion

A review of the literature on MDEs and depressive symptomatology in adolescents diagnosed with cancer revealed limited evidence in screening and diagnosing MDEs, thus supporting the importance of this study. As current practice does not include routine psychosocial assessments of adolescents with cancer, results from this pilot study provides preliminary evidence to support routine use of screening measures for MDEs. As existing instruments used to screen for MDEs and depressive symptoms have not previously been tested for clinical utility in pediatric oncology patients, this study's results in the use of the CDI-2 in this population provides an important step in learning more about screening for MDEs in adolescents with cancer.

Although current evidence suggests the role that age, gender, and anxiety have in predicting MDEs and depressive symptoms, this study is the first to examine this phenomenon among Canadian adolescent cancer patients. Findings from this study confirm conclusions from current literature in the role that age, gender and anxiety play in depressive disorders. Although findings remain preliminary, these results will help inform future studies as well as the

development of a larger research program on studying behavioural and psychosocial markers of adaptive capacity in adolescents with cancer.

References

Abrams, A. N., Hazen, E. P., & Penson, R. T. (2007). Psychosocial issues in adolescents with cancer. *Cancer Treatment Reviews, 33*(7), 622-630. doi: 10.1016/j.ctrv.2006.12.006

Addis, M.E., & Mahalik, J.R. (2003). Men, masculinity, and the contexts of help seeking. *American Psychologist, 58*(1), 5-14.

Altemus, M. (2006). Sex differences in depression and anxiety disorders: Potential biological determinants. *Hormones & Behavior, 50*(4), 534-538.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (5th ed.). Washington, DC: American Psychiatric Association.

Amon, K.L., Campbell, A.J., Hawke, C., & Steinbeck, K. (2014). Facebook as a recruitment tool for adolescent health research: A systematic review. *Academic Pediatrics, 14*(5), 439-447.e434. doi: 10.1016/j.acap.2014.05.049

Angold, A., Costello, E.J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology, Psychiatry, and Allied Disciplines, 40*, 57-87.

Arabiat, D.H., Al Jabery, M., & Wardam, L. (2013). Screening for anxiety symptoms and social desirability in children and adolescents living with chronic illnesses in Jordan. *Journal of Child Health Care, 17*(1), 62-71. doi: 10.1177/1367493512450623

Avenevoli, S., Swendsen, J., He, J., Burstein, M., & Merikangas, K.R. (2015). Major depression in the national comorbidity survey–adolescent supplement: Prevalence, correlates, and treatment. *Journal of the American Academy of Child & Adolescent Psychiatry, 54*(1), 37-44.e32. doi: 10.1016/j.jaac.2014.10.010

Axelson, D.A., & Birmaher, B. (2001). Relation between anxiety and depressive disorders in childhood and adolescence. *Depression and Anxiety, 14*, 67-78.

Baldwin, J.S., & Dadds, M.R. (2007). Reliability and validity of parent and child versions of the Multidimensional Anxiety Scale for Children in community samples. *Journal of the American Academy of Child & Adolescent Psychiatry, 46*(2), 252-260.

Barlow, D.H. (2002). *Anxiety and its disorders: The Nature and treatnent of anxiety and panic* (2nd ed.). New York, NY: Guilford Press.

Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in socialpsychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Barr, R.D. (2011). Adolescents, young adults, and cancer?the international challenge. *Cancer, 117*(S10), 2245-2249. doi: 10.1002/cncr.26052

Barr, R.D., Rogers, P., & Schacter, B. (2011). Preamble. *Cancer, 117*, 2239-2240. doi: 10.1002/cncr.26054

Beesdo, Katja, Knappe, Susanne, & Pine, Daniel S. (2009). Anxiety and Anxiety Disorders in Children and Adolescents: Developmental Issues and Implications for DSM-V. *Psychiatric Clinics of North America, 32*(3), 483-524. doi: http://dx.doi.org/10.1016/j.psc.2009.06.002

Bernstein, G.A., & Borchardt, C.M. (1991). Anxiety disorders of childhoo and adolescence: A critical review. *Journal of the American Academy of Child & Adolescent Psychiatry, 30*, 519-530.

Bhatia, S.K., & Bhatia, S.C. (2007). Childhood and adolescent depression. *American Family Physician, 75*(1), 73-80.

Bhatia, S.K., & Meadows, A.T. (2006). Long-term follow-up of childhood cancer survivors: Future directions for clinical care and research. *Pediatric Blood Cancer, 46*(2), 143-148.

Bitsika, V., Sharpley, C.F., & Melhem, T.C. (2010). Gender differences in factor scores of anxiety and depression among Australian university students: Implications for counselling interventions. *Canadian Journal of Counselling, 44*(1), 51-64.

Bleyer, A., Budd, T., & Montello, M. (2006). Adolescents and young adults with cancer. *Cancer, 107*(S7), 1645-1655. doi: 10.1002/cncr.22102

Bottomley, S.J., & Kassner, E. (2003). Late effects of childhood cancer therapy. *Journal of Pediatric Nursing, 18*(2), 126-133.

British Columbia Medical Association. (2010). Anxiety and Depression in Children and Youth: Diagnosis and Treatment. In G. P. A. Committee (Ed.).

Bryant, R. (2003). Managing side effects of childhood cancer treatment. *Journal of Pediatric Nursing, 18*(2), 113-125. doi: 10.1053/jpdn.2003.11

Campbell, M.A., Rapee, R.M., & Spence, S.H. (2000). Developmental changes in the interpretation of rating format on a questionnaire measure of worry. *Clinical Psychologist, 5*(2), 49-59.

Canadian Cancer Society. (2009). Cancer statistics in adolescents and young adults (15-29 years)*Canadian cancer statistics 2009*. Retrieved from http://www.cancer.ca/canadawide/about%20cancer/cancer%20statistics/~/media/CCS/Ca

nada%20wide/Files%20List/English%20files%20heading/pdf%20not%20in%20publications%20section/Stats%202009E%20Special%20Topics.ashx.

Canadian Partnership Against Cancer. (2012). *Sustaining action toward a shared vision: 2012-2017 Strategic plan* Retrieved from http://www.partnershipagainstcancer.ca/wp-content/uploads/Sustaining-Action-Toward-A-Shared-Vision_web.pdf

Canning, E., Canning, R., & Boyce, W. (1992). Depressive symptoms and adaptive style in children with cancer. *Journal of the American Academy of Child & Adolescent Psychiatry, 31*, 1120-1124.

Carey, M.P., Faulstich, M.E., Gresham, F.M., Ruggiero, L., & Enyart, P. (1987). Children's Depression Inventory: Construct and discriminant validity across clinical and nonreferred (control) populations. *Journal of Consulting and Clinical Psychology, 55*(5), 755-761. doi: 10.1037/0022-006X.55.5.755

Carlson, L.E., & Bultz, B.D. (2003). Benefits of psychosocial oncology care: Improved quality of life and medical cost offset. *Health and Quality of Life Outcomes, 1*(8). doi: 10.1186/1477-7525-1-8

Chaplin, T.M., Gillham, J.B., & Seligman, M.E.P. (2009). Gender, anxiety, and depressive symptoms: A longitudinal study of early adolescents. *Journal of Early Adolescence, 29*, 307-327.

Cheung, A.H., & Dewa, C.S. (2006). Canadian Community Health Survey: Major depressive disorder and suicidality in adolescents. *Healthcare Policy, 2*(2), 76-89.

Chiles, J.A., Lambert, M.J., & Hatch, A.L. (1999). The impact of psychological interventions on medical cost offset: A meta-analytic review. *Clinical Psychology: Science and Practice, 6*(2), 204-220.

Cho, J., Choi, E.K., Kim, S.Y., Shin, D.W., Cho, B.L., Kim, C.H., . . . Park, J.H. (2013). Association between cancer stigma and depression among cancer survivors: A nationwide survey in Korea. *Psychooncology, 22*(10), 2372-2378. doi: 10.1002/pon.3302

Clark, Lee Anna, & Watson, David. (1991). Tripartite Model of Anxiety and Depression: Psychometric Evidence and Taxonomic Implications. *Journal of Abnormal Psychology Special Issue on Diagnoses, Dimensions, and DSM-IV: The Science of Classification, 100*(3), 316-336.

Cole, D.A., Martin, J.M., Peeke, L., Henderson, A., & Harwell, J. (1998). Validation of depression and anxiety measures in white and black youths: Multitrait-multimethod analyses. *Psychological Assessment, 10*(3), 261-276. doi: 10.1037/1040-3590.10.3.261

Costello, E.J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry, 60*, 837-844.

Craighead, W.E., Curry, J.F., & Ilardi, S.S. (1995). Relationship of Children's Depression Inventory factors to major depression among adolescents. *Psychological Assessment, 7*, 171-176.

Croyle, R.T., & Rowland, J.H. (2003). Mood disorders and cancer: A National Cancer Institute perspective. *Biological Psychiatry, 54*(3), 191-194.

Cunningham, S., Gunn, T., Alladin, A., & Cawthorpe, D. (2008). Anxiety, depression and hopelessness in adolescents: A structural equation model. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 17*(3), 137-144.

D'Angelo, E.J., & Augenstein, T.M. (2012). Developmentally informed evaluation of depression: Evidence-based instruments. *Child and Adolescent Psychiatric Clinics of North America, 21*(2), 279-298.

Dyson, G. J., Thompson, K., Palmer, S., Thomas, D. M., & Schofield, P. (2012). The relationship between unmet needs and distress amongst young people with cancer. *Supportive Care in Cancer, 20*(1), 75-85. doi: 10.1007/s00520-010-1059-7

Eckert, T.L., Dunn, E.K., Guiney, K.M., & Codding, R.S. (2000). Self-reports: Theory and research in using rating scale measures. In E. S. Shapiro & T. R. Kratochwill (Eds.), *Behavioural Assessment in Schools: Theory, Research, and Clinical Foundations* (2nd ed.). New York, NY: The Guilford Press.

Engvall, G., Skolin, I., Mattsson, E., Hedstrom, M., & von Essen, L. (2011). Are nurses and physicians able to assess which strategies adolescents recently diagnosed with cancer use to cope with disease- and treatment-related distress? *Supportive Care in Cancer, 19*(5), 605-611. doi: 10.1007/s00520-010-0859-0

Enskar, K., & von Essen, L. (2007). Prevalence of aspects of distress, coping, support and care among adolescents and young adults undergoing and being off cancer treatment. *European Journal of Oncology Nursing, 11*(5), 400-408.

Erikson, E.H. (1968). *Identity, Youth and Crisis*. New York, NY: Norton.

Essau, C.A. (2003). Comorbidity of anxiety disorders in adolescents. *Depression and Anxiety, 18*, 1-6.

Essau, C.A., & Chang, W.C. (2009). Epidemiology, comorbidity, and course of adolescent depression. In C. A. Essau (Ed.), *Treatments for Adolescent Depression: Theory and Practice*. New York, NY: Oxford University Press.

Essau, C.A., Conradt, J., & Petermann, F. (2000). Frequency, comorbidity, and psychosocial impairment of anxiety disorders in German adolescents. *Journal of Anxiety Disorders, 14*(3), 263-279.

Ferrari, A., & Bleyer, A. (2007). Participation of adolescents with cancer in clinical trials. *Cancer Treatment Reviews, 33*(7), 603-608. doi: http://dx.doi.org/10.1016/j.ctrv.2006.11.005

Ferrari, A., Montello, M., Budd, T., & Bleyer, A. (2008). The challenges of clinical trials for adolescents and young adults with cancer. *Pediatric Blood Cancer, 50*(1), 1101-1104.

Finch, A.J., Saylor, C.F., Edwards, G.L., & McIntosh, J.A. (1987). Children's Depression Inventory: Reliability over repeated administrations. *Journal of Clinical Child Psychology, 16*(4), 339-341.

Fisch, M. (2004). Treatment of Depression in Cancer. *JNCI Monographs, 2004*(32), 105-111. doi: 10.1093/jncimonographs/lgh011

Ford, J.G., Howerton, M.W., Lai, G.Y., Gary, T.L., Bolen, S., Gibbons, M.C., . . . Bass, E.B. (2008). Barriers to recruiting underrepresented populations to cancer clinical trials: A systematic review. *Cancer, 112*(2), 228-242. doi: 10.1002/cncr.23157

Friedberg, R.D., & McClure, J.M. (2002). *Clinical practice of cognitive therapy with children and adolescents: The nuts and bolts*. New York, NY: Guilford.

Friedberg, R.D., & Sinderman, S.A. (2011). CDI scores in pediatric psychiatric inpatients: A brief retrospective static group comparison. *Depression Research and Treatment, 2011*. doi: 10.1155/2011/134179

Gahagan, J., Gray, K., & Whynacht, A. (2015). Sex and gender matter in health research: Addressing health inequities in health research reporting. *International Journal for Equity in Health, 14*(12), 1-4. doi: 10.1186/s12939-015-0144-4

Garber, J., & Weersing, V.R. (2010). Comorbidity of anxiety and depression in youth: Implications for treatment and prevention. *Clinical Psychology: Science & Practice, 17*(4), 293-306. doi: 10.1111/j.1468-2850.2010.01221.x

Gomez, R., Vance, A., & Gomez, A. (2012). Children's Depression Inventory: Invariance across children and adolescents with and without depressive disorders. *Psychological Assessment, 24*(1), 1-10. doi: 10.1037/a0024966

Government of Canada. (2006). The Human Face of Mental Health an Mental Illness in Canada 2006. Ottawa, ON.

Hedström, M., Haglund, K., Skolin, I., & von Essen, L. (2003). Distressing events for children and adolescents with cancer: Child, parent, and nurse perceptions. *Journal of Pediatric Oncology Nursing, 20*(3), 120-132. doi: 10.1053/jpon.2003.76

Hedström, M., Kreuger, A., Ljungman, G., Nygren, P., & von Essen, L. (2006). Accuracy of assessment of distress, anxiety, and depression by physicians and nurses in adolescents

recently diagnosed with cancer. *Pediatric Blood & Cancer, 46*(7), 773-779. doi: 10.1002/pbc.20693

Hem, E., Loge, J.H., Haldorsen, T., & Ekeberg, O. (2004). Suicide risk in cancer patients from 1960 to 1999. *Journal of Clinical Oncology, 22*(20), 4209-4216.

Herjanic, B., & Reich, W. (1982). Development of a structured psychiatric interview for children: Agreement between child and parent on individual symptoms. *Journal of Abnormal Child Psychology, 10*(3), 307-324.

Hodges, K. (1990). Depression and anxiety in children: A comparison of self-report questionnaires to clinical interview. *Psychological Assessment, 2*(4), 376-381. doi: 10.1037/1040-3590.2.4.376

Hollen, P.J., & Hobbie, W.L. (1996). Decision making and risk behaviours of cancer-surviving adolescents and their peers. *Journal of Pediatric Oncology Nursing, 13*(3), 121-134.

Hopcroft, R.L., & McLaughlin, J. (2012). Why is the sex gap in feelings of depression wider in high gender equity countries? The effect of children on the psychological well-being of men and women. *Social Science Research, 41*(3), 501-513. doi: 10.1016/j.ssresearch.2011.12.006

Hopko, D. R., Bell, J. L., Armento, M. E., Robertson, S. M., Hunt, M. K., Wolf, N. J., & Mullane, C. (2008). The phenomenology and screening of clinical depression in cancer patients. *Journal of Psychosocial Oncology, 26*(1), 31-51.

Hunger, S.P., Loh, M.L., Whitlock, J.A., Winick, N.J., Carroll, W.L., Devidas, M., & Raetz, E.A. (2013). Children's Oncology Group's 2013 blueprint for research: Acute

lymphoblastic leukemia. *Pediatric Blood & Cancer, 60*(6), 957-963. doi: 10.1002/pbc.24420

Johnson, S.B., Blum, R.W., & Giedd, J.N. Adolescent maturity and the brain: The promise and pitfalls of neuroscience research in adolescent health policy. *Journal of Adolescent Health, 45*(3), 216-221. doi: 10.1016/j.jadohealth.2009.05.016

Jones, B. (2008). Promoting health development among survivors of adolescent cancer. *Family Community Health, 31*(1S), S61-S70.

Jones, L., Saksvig, B.I., Frieser, M., & Young, D.R. (2012). Recruiting adolescent girls into a follow-up study: Benefits of using a social networking website. *Contemporary Clinical Trials, 33*(2), 268-272.

Jörngården, A., Mattsson, E., & von Essen, L. (2007). Health-related quality of life, anxiety and depression among adolescents and young adults with cancer: a prospective longitudinal study. *European Journal of Cancer, 43*(13), 1952-1958. doi: 10.1016/j.ejca.2007.05.031

Kazak, A. E., Simms, S., Alderfer, M.A., Rourke, M. T., Crump, T., McClure, K., . . . Reilly, A. (2005). Feasibility and preliminary outcomes from a pilot study of a brief psychological intervention for families newly diagnosed with cancer. *Journal of Pediatric Psychology, 30*(8), 644-655.

Kazak, A. E., Simms, S., & Rourke, M. T. (2002). Family systems practice in pediatric psychology. *Journal of Pediatric Psychology, 27*(2), 133-143.

Kelly, M.M., Tyrka, A.R., Price, L.H., & Carpenter, L.L. (2008). Sex differences in the use of coping strategies: Predictors of anxiety and depressive symptoms. *Depression and Anxiety, 25*(10), 839-846.

Kendall, P.C., & Drabick, D.A.G. (2010). Problems for the book of problems? Diagnosing mental health disorders among youth. *Clinical Psychology: Science & Practice, 17*, 265-271.

Kersun, L. S., & Kazak, A. E. (2006). Prescribing practices of selective serotonin reuptake inhibitors (SSRIs) among pediatric oncologists: a single institution experience. *Pediatric Blood & Cancer, 47*(3), 339-342. doi: 10.1002/pbc.20484

Kersun, L. S., Rourke, M. T., Mickley, M., & Kazak, A. E. (2009). Screening for depression and anxiety in adolescent cancer patients. *Journal of Pediatric Hematology/Oncology, 31*(11), 835-839. doi: 10.1097/MPH.0b013e3181b8704c

Kessler, R.C., Chiu, W.T., Demler, O., Merikangas, K.R., & Walters, E.E. (2005). Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry, 62*(6), 617-627.

Kibby, M.Y., Tyc, V.L., & Mulhern, R.K. (1998). Effectiveness of psychological intervention for children and adolescents with chronic medical illness: A meta-analysis. *Clinical Psychology Review, 18*(1), 103-117. doi: 10.1016/S0272-7358(97)00049-4

Klein-Geltink, J., Shaw, A., Morrison, H., Barr, R.D., & Greenberg, M. (2005). Use of pediatric versus adult oncology treatment centres by adolescents 15-19 years old: The Canadian Childhood Cancer Surveillance and Control Program. *European Journal of Cancer, 41*(1), 404-410.

Kovacs, M. (1985). The Children's Depression Inventory. *Psychopharmacology Bulletin, 21*(4), 995-998.

Kovacs, M. (1992). *Children's Depression Inventory, manual*. New York, NY: Multi-Health Systems.

Kovacs, M. (2010). *Children's Depression Inventory 2, manual*. New York, NY: Multi-Health Systems.

Kovacs, M., Gatsonis, C., Paulauskas, S.L., & Richards, C. (1989). Depressive disorders in childhood: IV. A longitudinal study of comorbidity with and risk for anxiety disorders. *Archives of General Psychiatry, 46*, 776-782.

Kunin, H.M., Patenaude, A.F., & Grier, H.E. (1995). Suicide risk in pediatric cancer patients: An exploratory study. *Psycho-Oncology, 4*(2), 149-155.

Leach, L.S., Christensen, H., Mackinnon, A.J., Windsor, T.D., & Butterworth, P. (2008). Gender differences in depression and anxiety across the adult lifespan: The role of psychosocial mediators. *Social Psychiatry and Psychiatric Epidemiology, 43*(12), 983-998.

Lee, Y.S, Krishnan, A., & Park, Y.S. (2012). Psychometric properties of the Children's Depression Inventory: An item response theory analysis across age in a nonclinical, longitudinal, adolescent sample. *Measurement and Evaluation in Counseling and Development, 45*(2), 84-100. doi: 10.1177/0748175611428329

Li, C.E., DiGiuseppe, R., & Froh, J. (2006). The roles of sex, gender and coping in adolescent depression. *Adolescence, 41*(163), 409-415.

Logan, D. E., Claar, R. L., & Scharff, L. (2008). Social desirability response bias and self-report of psychological distress in pediatric chronic pain patients. *Pain, 136*(3), 366-372. doi: 10.1016/j.pain.2007.07.015

Maddage, N. C., Senaratne, R., Low, L. S., Lech, M., & Allen, N. (2009). Video-based detection of the clinical depression in adolescents. *31st Annual International Conference of the IEEE Engineering in Medicine & Biology Society, 2009*, 3723-3726.

Malcarne, V.L., & Hansdottir, I. (2001). Vulnerability to anxiety disorders in childhood and adolescence. In J. Price & R. Ingram (Eds.), *Vulnerability to Psychopathology: Risk Across the Lifespan* (pp. 271-303). New York, NY: Guilford Press.

March, J.S., Parker, J.D.A., Sullivan, K., Stallings, P., & Conners, K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and validity. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*(4), 554-565. doi: 10.1097/00004583-1997040000-00019

March, J.S., Sullivan, K., & Parker, J.D.A. (1999). Test-retest reliability of the Multidimensional Scale for Children. *Journal of Anxiety Disorders, 13*(4), 349-358.

Mattsson, E., El-Khouri, B., Ljungman, G., & von Essen, L. (2009). Empirically derived psychosocial states among adolescents diagnosed with cancer during the acute and extended phase of survival. *Annals of Oncology, 20*(10), 1722-1727. doi: 10.1093/annonc/mdp066

McGoldrick, D., Gordon, P., Whiteson, M., Adams, H., Rogers, P., & Sutcliffe, S. (2011). Awareness and advocacy for adolescents and young adults with cancer. *Cancer, 117*(10 Suppl), 2311-2315.

Merrell, K.W., & Whitcomb, S. (2012). *Behavioral, Social, and Emotional Assessment of Children and Adolescents*. New York, NY: Routledge.

Moreno, M.A., Fost, N.C., & Christakis, D.A. (2008). Research ethics in the MySpace era. *Pediatrics, 121*(1), 157-161. doi: 10.1542/peds.2007-3015

National Institute of Mental Health. (2015). Real men. Real depression. Retrieved May 7, 2015, from http://menanddepression.nimh.nih.gov

Olson, K., Hayduk, L., Cree, M., Cui, Y., Quan, H., Hanson, J., . . . Strasser, F. (2008). The changing causal foundations of cancer-related symptom clustering during the final month of palliative care: A longitudinal study. *BMC Medical Research Methodology, 8*(36). doi: 10.1186/1471-2288-8-36

Olson, K., Turner, R., Courneya, K.S., Field, C., Man, G., Cree, M., & Hanson, J. (2008). Possible links between behavioural and physiological indices of tiredness, fatigue, and exhaustion in advanced cancer. *Support Care Cancer, 16*, 241-249. doi: 10.1007/s00520-007-0298-8

Oster, G.D., & Caro, J.E. (1990). *Understanding and treating depressed adolescents and their families*. New York, NY: Wiley.

Pai, A. L., Drotar, D., Zebracki, K., Moore, M., & Youngstrom, E. (2006). A meta-analysis of the effects of psychological interventions in pediatric oncology on outcomes of psychological distress and adjustment. *Journal of Pediatric Psychology, 31*(9), 978-988. doi: 10.1093/jpepsy/jsj109

Parker, G. (2011). Classifying clinical depression: an operational proposal. *Acta Psychiatrica Scandinavica, 123*(4), 314-316. doi: 10.1111/j.1600-0447.2011.01681.x

Patten, S.B., Jian Li, W., Williams, J.V.A., Currie, S., Beck, C.A., Maxwell, C.J., & El-Guebaly, N. (2006). Descriptive Epidemiology of Major Depression in Canada. *Canadian Journal of Psychiatry, 51*(2), 84-90.

Phipps, S., Buckholdt, K. E., Fernandez, L., Wiener, L., Kupst, M. J., Madan-Swain, A., . . . Noll, R. B. (2012). Pediatric oncologists' practices of prescribing selective serotonin reuptake inhibitors (SSRIs) for children and adolescents with cancer:A multi-site study. *Pediatric Blood & Cancer, 58*(2), 210-215. doi: 10.1002/pbc.22788

Portteus, A., Ahmad, N., Tobey, D., & Leavey, P. (2006). The prevalence and use of antidepressant medication in pediatric cancer patients. *Journal of Child & Adolescent Psychopharmacology, 16*(4), 467-473. doi: 10.1089/cap.2006.16.467

Prithwish, D., Ellison, L.F., Barr, R.D., Semenciw, R., Marrett, L.D., Weir, H.K., . . . Grunfeld, E. (2011). Canadian adolescents and young adults with cancer: Opportunity to improve coordination and level of care. *Canadian Medical Association Journal, 183*(3), 187-194.

Public Health Agency of Canada. (2012). *Cancer in adolescents in Canada (15-19 years)* Retrieved from http://www.phac-aspc.gc.ca/cd-mc/cancer/fs-fi/cancer-adol/assets/pdf/cancer-adol-eng.pdf

Regier, D.A., Rae, D.S., Narrow, W.E., Kaelber, C.T., & Schatzberg, A.F. (1998). Prevalence of anxiety disorders and their comorbidity with mood and addictive disorders. *British Journal of Psychiatryy, 173*, 24-28.

Reich, W. (2000). Diagnostic Interview for Children and Adolescents (DICA). *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(1), 59-66.

Reich, W., Welner, Z., & Herjanic, B. (1997). Diagnostic Interview for Children and Adolescents-IV (DICA IV): Software manual for the Child/Adolescent and Parent Versions. Toronto, ON: Multi-Health Systems Inc.

Reinherz, H.Z., Stewart-Berghauer, B., Pakiz, B., Frost, A.K., Moeykens, B.A., & Holmes, W.M. (1989). The relationship of early risk and current mediators to depressive symptomatology in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry, 28*, 942-947.

Reuben, S.H. (2004). Living beyond cancer: Finding a new balance. *President's Cancer Panel: 2003-2004 Annual Report*. Bethesda, Maryland: National Cancer Institute.

Rohde, P., Lewinsohn, P.M, & Seeley, J.R. (1991). Comorbidity of unipolar depression: II. Comorbidity with other mental disorders in adolescents and adults. *Journal of Abnormal Psychology, 100*, 214-222.

Rynn, M.A., Barber, J.P., Khalid-Khan, S., Siquelan, L., Dembiski, M., McCarthy, K.S., & Gallop, R. (2006). The psychometric properties of the MASC in a pediatric psychiatric sample. *Journal of Anxiety Disorders, 20*(2), 139-157.

Sala, R., Granero, R., & Ezpeleta, L. (2006). Dimensional analysis of a categorical diagnostic interview: the DICA-IV. *Psicothema, 18*(1), 123-129.

Santacroce, S. J., Asmus, K., Kadan-Lottick, N., & Grey, M. (2010). Feasibility and preliminary outcomes from a pilot study of coping skills training for adolescent--young adult survivors of childhood cancer and their parents. *Journal of Pediatric Oncology Nursing, 27*(1), 10-20. doi: 10.1177/1043454209340325

Saylor, C.F., Finch, A.J., Spirito, A., & Bennett, B. (1984). The Children's Depression Inventory: A systematic evaluation of psychometric properties. *Journal of Consulting and Clinical Psychology, 52*(6), 955-967.

Schniering, C.A., Hudson, J.L., & Rapee, R.M. (2000). Issues in the diagnosis and assessment of anxiety disorders in children and adolescents. *Clinical Psychology Review, 20*(4), 453-478.

Seitz, D. C., Besier, T., & Goldbeck, L. (2009). Psychosocial interventions for adolescent cancer patients: A systematic review of the literature. *Psycho-oncology, 18*(7), 683-690. doi: 10.1002/pon.1473

Smucker, M.R., Craighead, W.E., Craighead, L.W., & Green, B.J. (1986). Normative and reliability data for the Children's Depression Inventory. *Journal of Abnormal Child Psychology, 14*(1), 25-39.

Spigarelli, M. (2008). Adolescent participation in research. *Journal of Adolescent Health, 43*(1), 1-2. doi: http://dx.doi.org/10.1016/j.jadohealth.2008.04.004

Statistics Canada. (2008). *Canadian Cancer Registry, 2007 Edition* Retrieved from http://www.statcan.gc.ca/pub/82-225-x/2007010/article/10508-eng.pdf

Statistics Canada. (2012). *Canadian Vital Statistics Death Database* Retrieved from http://www.statcan.gc.ca/pub/84f0211x/84f0211x200900-eng.pdf

Steinbeck, K., Baur, L., Cowell, C., & Pietrobelli, A. (2008). Clinical research in adolescents: Challenges and opportunities using obesity as a model. *International Journal of Obesity, 33*(1), 2-7.

Sutcliffe, Simon B. (2011). A review of Canadian health care and cancer care systems. *Cancer, 117*, 2241-2244. doi: 10.1002/cncr.26053

Turner-Sack, A. M., Menna, R., & Setchell, S. R. (2012). Posttraumatic growth, coping strategies, and psychological distress in adolescent survivors of cancer. *Journal of Pediatric Oncology Nursing, 29*(2), 70-79. doi: 10.1177/1043454212439472

van de Mortel, T.F. (2008). Faking it: social desirability response bias in self-report research. *Australian Journal of Advanced Nursing, 25*(4), 40-48.

Verhulst, F.C., van der Ende, J., Ferninand, R.F., & Kasius, M.C. (1997). The prevalence of DSM-III-R diagnoses in a national sample of Dutch adolescents. *Archives of General Psychiatry, 54*(4), 329-336.

Warner, J. (2004). Clinicians' guide to evaluating diagnostic and screening tests in psychiatry. *Advances in Psychiatric Treatment, 10*, 446-454.

Weiss, B., Weisz, J.R., Politano, M., Carey, M., Nelson, W.M., & Finch, A.J. (1991). Developmental differences in the factor structure of the Children's Depression Inventory. *Psychological Assessment, 3*(1), 38-45. doi: 10.1037/1040-3590.3.1.38

Welner, Z., Reich, W., Herjanic, B., Jung, K.G., & Amado, H. (1987). Reliability, validity, and Parent-Child Agreement Studies of the Diagnostic Interview for Children and Adolescents (DICA). *Journal of the American Academy of Child & Adolescent Psychiatry, 26*(5), 649-653.

Whitcomb, S., & Merrell, K.W. (2013). *Behavioural, Social, and Emotional Assessment of Children and Adolescents* (4th ed.). New York, NY: Routledge.

Woodgate, R.L. (1999a). Conceptual understanding of resilience in the adolescent with cancer: Part I. *Journal of Pediatric Oncology Nursing, 16*(1), 35-43.

Woodgate, R.L. (1999b). A review of the literature on resilience in the adolescent with cancer: Part II. *Journal of Pediatric Oncology Nursing, 16*(2), 78-89.

Woodgate, R.L., Degner, L.F., & Yanofsky, R. (2003). A different perspective to approaching cancer symptoms in children. *Journal of Pain and Symptom Management, 26*(3), 800-817.

Woodward, L.J., & Fergusson, D.M. (2001). Life course outcomes of young people with anxiety disorders in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(9), 1086-1093.

World Health Organization. (2012). Health topics. *Adolescent health.* Retrieved November 4, 2012, from http://www.who.int/topics/adolescent_health/en/

World Health Organization. (2013). What do we mean by "sex" and "gender"? *Gender, women and health.* Retrieved June 24, 2013, from http://www.who.int/gender/whatisgender/en/

Zabora, J., Brintzenhofeszoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology, 10*(1), 19-28.

Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M.J. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology, 12*(3), 443-466. doi: doi:null

Zebrack, B.J. (2001). Health-related worries, self-image, and life outlooks of long-term cancer survivors of childhood cancer. *Health and Social Work, 26*(4), 245-256.

Zebrack, B.J. (2011). Psychological, social, and behavioral issues for young adults with cancer. *Cancer, 117*(S10), 2289-2294. doi: 10.1002/cncr.26056

Zebrack, B.J., Zeltzer, L.K., Whitton, J., Mertens, A.C., Odom, L., & Berkow, R. (2002). Psychological outcomes in long-term survivors of childhood leukemia, Hodgkin's disease, and non-Hodgkin's lymphoma: A report from the Childhood Cancer Survivor study. *Pediatrics, 110*(1), 42-52.

Zhang, B., Gao, Q., Fokkema, M., Alterman, V., & Liu, Q. (2015). Adolescent interpersonal relationships, social support and loneliness in high schools: Mediation effect and gender differences. *Social Science Research, 53*, 104-117. doi: 10.1016/j.ssresearch.2015.05.003

Zoellner, T., & Maercker, A. (2006). Posttraumatic growth in clinical psychology — A critical review and introduction of a two component model. *Clinical Psychology Review, 26*(5), 626-653. doi: 10.1016/j.cpr.2006.01.008

Appendix A

Ethics Approval Letters

Health Research Ethics Board

308 Campus Tower
University of Alberta, Edmonton, AB T6G 1K8
p. 780.492.9724 (Biomedical Panel)
p. 780.492.0302 (Health Panel)
p. 780.492.0459
p. 780.492.0839
f. 780.492.9429

Approval

Date: October 22, 2013

Study ID: Pro00040750

Principal Investigator: Karin Olson

Study Title: Screening and Assessing Adolescents with Cancer for a Major Depressive Episode

Approval Expiry Date: October 21, 2014

Thank you for submitting the above study to the Health Research Ethics Board - Health Panel. Your application, including revisions received today, has been reviewed and approved on behalf of the committee.

A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

Approval by the Health Research Ethics Board does not encompass authorization to access the patients, staff or resources of Alberta Health Services or other local health care institutions for

the purposes of the research. Enquiries regarding Alberta Health Services approvals should be directed to (780) 407-6041. Enquiries regarding Covenant Health should be directed to (780) 735-2274.

Sincerely,

Carol Boliek, Ph.D.

Associate Chair, Health Research Ethics Board - Health Panel

Note: This correspondence includes an electronic signature (validation and approval via an online system).

Conjoint Health Research Ethics Board
Research Services Office
3rd Floor Mackimmie Library Tower (MLT 300)
2500 University Drive, NW
Calgary AB T2N 1N4
Telephone: (403) 220-7990
Fax: (403) 289-0693
chreb@ucalgary.ca

February 12, 2014

Ethics ID: REB13-1302

Fiona Schulte

Oncology

Dear Fiona Schulte :

RE: Screening and Assessing Adolescents with Cancer for a Major Depressive Episode

The above-named research, including:

- Recruitment Poster
- Consent to Contact Form, 2.0, February 11, 2014
- Information Letter for Parents, 2.0, February 11, 2014
- Parental Consent Form, 2.0, February 11, 2014
- Adolescent Information Letter and Assent Form, 2.0, February 11, 2014
- Depression measure DICA
- Anxiety measure MASC
- Comparison depression measure CDI
- Patient Demographics Form
- Parent Demographics Form
- SAACMDE Protocol, 4.0, January 9, 2014

has been granted ethical approval by the Conjoint Health Research Ethics Board of the University of Calgary. The Board conforms to the Tri-Council Guidelines, ICH Guidelines and amendments to regulations of the Food and Drugs Act re clinical trials, including membership and requirements for a quorum.

Please note that this approval is subject to the following conditions:

1. A renewal must be submitted by **February 12, 2015** , containing the following information:
    i. The number of participants recruited;
    ii. A description of any protocol modification;
    iii. Any unusual and/or severe complications, adverse events or unanticipated problems involving risks to participants or others, withdrawal of participants from the research, or complaints about the research;
    iv. A summary of any recent literature, finding, or other relevant information, especially information about risks associated with the research;
    v. A copy of the current informed consent form;
    vi. The expected date of termination of this project.
2. A Final Report must be submitted at the termination of the project.

Please accept the Board's best wishes for success in your research.

Sincerely,

Stacey A. Page, PhD, Chair , CHREB

Appendix B

Consent to Contact Letter and Form

You are being asked for permission to be contacted for your child's participation in a research study. The purpose of this study is to help nurses and health care professionals to assess and diagnose major depressive episodes in adolescents with cancer. As a participant in this study, your adolescent child would be asked to complete two questionnaires and an interview that will take no longer than 30 minutes. In appreciation for his or her time, your child will receive $10 iTunes gift card.

If you agree to be contacted about this research study, a member of the research team will contact you with the information that you provide. Confidentiality of your information will be maintained. Only members of the research team will have access to your personal information.

Your decision to provide your contact information is completely voluntary.

If you have any questions about this study, please contact Anra Lee at 403-714-3524 or Karin Olson at 780-492-6403

If you have questions about your child's rights as a research participant, you may contact The University of Alberta, Research Ethics Board Office at 780-492-0459.

Statement of Consent

I have read this consent form. I have had the opportunity to ask questions and discuss what is involved. I understand that my personal information will be kept confidential. By signing this consent form, I am agreeing to be contacted with further information about the study.

Parent/legal guardian's signature_____ Date _____

Parent/legal guardian's printed name: _____

Home Phone: _____

Work Phone: _____

Cellphone: _____

Email: _____

Best time to be contacted: _____

Appendix C

Recruitment Poster

UNIVERSITY OF CALGARY

SCREENING AND ASSESSING ADOLESCENTS WITH CANCER FOR A MAJOR DEPRESSIVE EPISODE

PARTICIPANTS NEEDED

We are looking for volunteers to take part in a study on screening for and assessing depression in adolescents who have been diagnosed with cancer. Participants must currently be between 13 to 18 years old.

As a participant in this study, your teen child would be asked to complete two questionnaires and an interview that will take no longer than 30 minutes.

In appreciation for his or her time, your child will receive a $15 iTunes gift card.

For more information about this study, or to volunteer for this study, please contact:

Anra Lee, RN BScN MN student
Faculty of Nursing, University of Alberta
at
403-714-3524 or
Email: *anra@ualberta.ca*

Or

Fiona Schulte, MA PhD, Psychologist
Alberta Children's Hospital
at
403-955-2879 or
Email: *Fiona.Schulte@albertahealthservices.ca*

This study has been reviewed by, and received ethics clearance through the University of Calgary Conjoint Health Research Ethics Board.

Appendix D

Information Letters and Consent Forms

Information Letter for Parents

Title: Screening and Assessing a Major Depressive Episode in Adolescent Cancer Patients

Principal investigator: Anra Lee, BScN, MN candidate, University of Alberta, (403) 714-3524

Co-investigator: Dr. Karin Olson, RN PhD, Professor, University of Alberta, Faculty of Nursing

Purpose of this study:

The purpose of this study is to help nurses and health care professionals to assess and diagnose major depressive episodes in adolescents with cancer. Improved survival for childhood cancer is only one measure of success. Current research suggests that teen survivors of cancer may be at risk for depression during and after cancer treatment. However, there is little known on how to diagnose depression, since symptoms often overlap with side effects of cancer treatment. Learning about your child's experiences and feelings is an important step in screening and treating depression in adolescents with cancer. For this research, I would like to talk to as many adolescents as possible.

What will happen:

I would like to speak to your adolescent child once during one of his/her scheduled clinic visits. Your adolescent son or daughter will be given two questionnaires to fill out. One of them will be assess his or her on anxiety and the other will assess depression. Each questionnaire should take no longer than 10 minutes each to complete. We will then complete an interview together, which will take between 5 and 30 minutes to complete. The interview will be about your adolescent child's experiences and feelings. Your adolescent son or daughter will also be asked to complete a personal information sheet.

Adolescents will not be contacted until you give consent for them to be in the study. Once you have agreed they can be in the study, I will contact them to tell them about the study and to ask if they want to be in the study.

Benefits:

If your child takes part in this study, he or she may receive indirect benefit in being able to share his or her feelings. Results of this study may help health care providers to diagnose depression in teens with cancer. This study may also lead to future studies about how to improve screening and treatment of depression. It is our hope that other adolescents with cancer will benefit from what we learn from your adolescent child.

Risks:

There are no direct risks to your child by taking part in this study. Questions about your child's feelings and experiences after the cancer diagnosis may be upsetting. If this happens, I can contact the primary nurse and/or oncologist, at your child's request. If specific concern/issues arise that indicate your child is experiencing distress, I can make a referral to the

psychosocial team, with your permission. If your child is suspected to be a risk for suicide, I will notify the medical team and help your child get the support they need.

Confidentiality:

Everything your adolescent says will be kept confidential except when professional codes of ethics or the law require reporting and his or her right to confidentiality cannot be upheld. For example, the law requires use to give information about your child if a child has been abused, if your child has an illness that could spread to others, if you, your child, or someone else talks about suicide (killing themselves), or if the court orders us to give them the study papers. Your child's questionnaire and interview data will not be shared with you or anyone outside of the research team. However, if your child indicates high scores for possible depression, you will be notified and a referral to the psychosocial team will be made at your request.

Your names and other identifying information will not be printed or published from the interview and questionnaire data. Doctors and nurses involved in your child's care do not have access to any of the data. Only members of the research team will discuss study data. Study data will be as password-protected electronic files, separate from consent forms. The information your adolescent child provides will be kept for at least five years after the study is finished. No names will be used in any presentations or publications of the study results. The information gathered for this study might be looked at again in the future to help answer other study questions. If so, the ethics board will review the study to ensure the information is used ethically.

It's your choice:

You also have the right to decide if your adolescent child will take part in the study. You can remove your child from the study at any time. Your child will be informed about the study after you give consent. They can choose whether or not to take part in the study. They can also choose on their own to withdraw from the study at any time. The only risk to your child is being uncomfortable about what he or she says. Your adolescent has the right to refuse to answer any questions. He or she can stop completing the questionnaires and tell you or Anra Lee that they do not want to participate. He or she can also stop the interview at any time.

If you would like, I will give you a report of the findings when the study is finished. If you have any questions or concerns about any aspect of this study, you may contact Anra Lee at 403-714-3524 or Dr. Karin Olson, Professor, Faculty of Nursing at 780-492-6403.

Parental Consent Form

Title: Screening and Assessing a Major Depressive Episode in Adolescent Cancer Patients

Principal Investigator: Anra Lee, BScN, MN candidate, University of Alberta, (403) 714-3524

Co-Investigator: Dr. Karin Olson, RN PhD, Professor, University of Alberta, Faculty of Nursing

Do you understand that your child has been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached information sheet?	Yes	No
Do you understand the benefits and risks involved in your child taking part in this research study?	Yes	No
Have you had the opportunity to ask questions and discuss the study?	Yes	No
Do you understand that you are free to refuse your child or your child is free to refuse to participate or withdraw from the study at any time? He/she does not have to give a reason, and it will not affect his/her care or treatment.	Yes	No
Has the issue of confidentiality been explained to you?	Yes	No
Do you understand who will have access to your child's information?	Yes	No
Do you understand that the data your child provides in this study may be analyzed in future studies?	Yes	No
Would you be willing to be contacted about participating in related studies in the future?	Yes	No

This study was explained to me by: _____

I agree to allow my child to take part in this study.

_____	_____	_____
Signature of parent/guardian	Printed name	Date
_____	_____	_____
Signature of witness	Printed name	Date

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____

Date

_

Signature of witness

Adolescent Information Letter and Assent Form

Title: Screening and Assessing a Major Depressive Episode in Adolescent Cancer Patients

Principal Investigator: Anra Lee, BScN, MN candidate, University of Alberta, (403) 714-3524

Co-Investigator: Dr. Karin Olson, RN PhD, Professor, University of Alberta, Faculty of Nursing

I would like to interview you about your thoughts and feelings after finding out you have cancer.
What will you have to do? If you and your parents agree to take part, Anra will meet with you once during a scheduled clinic visit. You will be asked to fill out 2 surveys, which will take no more than 10 minutes each to complete. I will ask you questions about your feelings and if you have ever felt sad or hopeless during your treatment. These questions will take between 5 and 30 minutes to complete. I will also have you complete an information form about yourself (age, gender, types of medication you are currently taking, etc.)

Will it help? You may feel better having a chance to think about your life and tell me about your experiences and feelings.

Will it hurt? You may feel uncomfortable or upset telling someone else about your feelings. If you are still upset after the interview and you want someone else you can talk to about your feelings, I can contact someone for you.

Can you quit? You don't have to take part in the study at all, and you can quit at any time. No one will be mad at you if you decide you don't want to do this, or if you decide to stop part way through. You should tell a person from the study that you want to quit.
Who will know? No one except your parents and the research team members will know you're taking part in the study unless you want to tell them. Your name and the things you tell me during the interview won't be seen by anyone except the research team. Your parents will not know what you tell me during the interview or in the surveys. If your answers show that you are feeling more sad than normal, we can talk to your parents together and if you would like, find someone for you to talk to.
The only time I will tell others about what you say is if you share information with me about illegal activities like child abuse or neglect or ideas of hurting yourself or others. I have to tell the police or other legal authorities about those activities.
Your signature: I would like you to sign this form to show that you agree to take part. Your mom or dad will be asked to sign another form agreeing for you to take part in the study.

Do you have more questions? You can ask Anra about anything you don't understand. You can also talk to Dr. Karin Olson. Her phone number is 780-492-6403. You can also ask your parents any questions you have.

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of research participant	Printed name	Date

Witness (if available)

_____	_____	_____
Signature of witness	Printed name	Date

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____	_____
Signature of researcher	Printed name	Date

Information Letter for Young Adults

Title: Screening and Assessing Adolescents with Cancer for a Major Depressive Episode

Principal investigator: Anra Lee, BScN, MN Student, University of Alberta, (403) 714-3524

Co-investigators: Dr. Fiona Schulte, MA PhD, Psychologist, Hematology, Oncology & Transplant Program, Alberta Children's Hospital; Dr. Karin Olson, RN PhD, Professor, University of Alberta, Faculty of Nursing

Purpose of this study:

The purpose of this study is to help nurses and health care professionals to assess and diagnose major depressive episodes in adolescents with cancer. Improved survival for childhood cancer is only one measure of success. Current research suggests that teen survivors of cancer may be at risk for depression during and after cancer treatment. However, there is little known on how to diagnose depression, since symptoms often overlap with side effects of cancer treatment. Learning about your experiences and feelings is an important step in screening and treating depression in adolescents with cancer. For this research, I would like to talk to as many adolescents as possible.

What will happen:

I would like to speak to you once during one of your scheduled clinic visits or by telephone. You will be given two questionnaires to fill out. One of them will assess anxiety and the other will assess depression. Each questionnaire should take no longer than 10 minutes each to complete. We will then complete an interview together, which will take between 5 and 30 minutes to complete. The interview will be about your experiences and feelings. You will also be asked to complete a personal information sheet. In appreciation for your time, you will receive $15 iTunes gift card. Should you choose to withdraw from the study at any time after providing consent for participation, you would still be entitled to the gift card.

Benefits:

If you take part in this study, you may receive indirect benefit in being able to share your feelings. Results of this study may help health care providers to diagnose depression in teens with cancer. This study may also lead to future studies about how to improve screening and treatment of depression. It is our hope that other adolescents with cancer will benefit from what we learn from what you share.

Risks:

There are no direct risks to you by taking part in this study. Questions about your feelings and experiences after the cancer diagnosis may be upsetting. If this happens, I can contact the primary nurse and/or oncologist, at your request. If specific concerns/issues arise that indicate you are experiencing distress, I can make a referral to the psychosocial team, with your permission. If you are suspected to be at risk for suicide, I will notify the medical team and help you get the support you need.

Confidentiality:

Everything you say will be kept confidential except when professional codes of ethics or the law require reporting and your right to confidentiality cannot be upheld. For example, the law requires us to give information about you if you have been abused, if you have an illness that could spread to others, if you or someone else talks about suicide (killing themselves), or if the

court orders us to give them the study papers. Your questionnaire and interview data will not be shared with your parents or anyone outside of the research team. However, if you score high for depression and/or anxiety, a referral to the psychosocial team can be made at your request.

Your name and other identifying information will not be printed or published from the study data. Doctors and nurses involved in your care do not have access to any of the data. Only members of the research team will discuss study data. Study data will be password-protected electronically and kept separate from consent forms. The information you provide will be kept for at least five years after the study is finished. No names will be used in any presentations or publication. The information gathered for this study might be looked at again in the future to help answer other questions. If so, the ethics board will review the study to ensure the information is used ethically.

It's your choice:

You have the right to decide if you will take part in the study. You may withdraw from the study at any time. You have the right to refuse to answer any questions. You can stop completing the questionnaires and tell Anra Lee that you do not want to participate. You may also stop the interview at any time.

If you would like, I will give you a report of the findings when the study is finished. If you have any questions or concerns about any aspect of this study, you may contact Anra Lee at 403-714-3524 or Dr. Fiona Schulte, Psychologist, Alberta Children's Hospital at 403-955-2879.

This study has been approved by the University of Calgary Conjoint Health Research Ethics Board. If you have any questions concerning your rights as a possible participant in this research, or research in general, please contact the Chair of the Conjoint Health Research Ethics Board, University of Calgary at (403) 220-7990.

Young Adult Consent Form

Title: Screening and Assessing Adolescents with Cancer for a Major Depressive Episode

Principal Investigator: Anra Lee, BScN, MN candidate, University of Alberta, (403) 714-3524

Co-Investigator: Dr. Fiona Schulte, MA PhD, Psychologist, Alberta Children's Hospital (403) 955-2879

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached information sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had the opportunity to ask questions and discuss the study?	Yes	No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason, and it will not affect your care or treatment.	Yes	No
Has the issue of confidentiality been explained to you?	Yes	No
Do you understand who will have access to your information?	Yes	No
Do you understand that the data you provide in this study may be analyzed in future studies?	Yes	No
Would you be willing to be contacted about participating in related studies in the future?	Yes	No

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of parent/guardian	Printed name	Date
_____	_____	_____
Signature of witness	Printed name	Date

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of witness	Date

Appendix E

Patient and Parent Demographics Sheets

Patient Demographics Sheet

Sex: Male ☐ Female ☐

Date of birth: _____/_____/_____
[yyyy] [mmm] [dd]

Diagnosis: _____

Date of diagnosis: _____/_____/_____
[yyyy] [mmm] [dd]

Currently on treatment (circle yes or no): Yes No

If yes, what is your current phase of treatment? _____

Are you a BMT (blood and marrow transplant) patient? Circle yes or no: Yes No

If yes, please state date of transplant (day "0"): _____/_____/_____
[yyyy] [mmm] [dd]

Do you currently consume alcohol on a social basis? Circle yes or no: Yes No

If yes, state how many drinks per week: 0 to 4 ☐ 5 to 10 ☐ over 10 ☐

If yes, did you begin consuming alcohol: Before cancer diagnosis ☐
After cancer diagnosis ☐

Do you currently, or have you ever consumed illicit drugs? Circle yes or no: Yes No

If yes, did you begin consuming drugs: Before cancer diagnosis ☐
After cancer diagnosis ☐

Parent Demographics Sheet

Age: _____

Relationship to child with cancer: Biological mother ☐
Biological father ☐
Other ☐

If other, state: _____

Ethnic background: _____

Any health issues: _____

Education: University or college graduate ☐
Some university or college ☐
High school graduate ☐
Some high school education ☐
Less than high school education ☐
Other ☐

Occupation: _____

Yearly family income: Less than $25,000 ☐
$26,000 to $35,000 ☐
$36,000 to $45,000 ☐
$46,000 to $65,000 ☐
$66,000 to $85,000 ☐
More than $85,000 ☐

Marital status: Married ☐ Separated ☐ Divorced ☐ Single ☐ Widowed ☐

List other siblings of child with cancer. Include age, sex, and any health issues:

_____

_____

_____

_____

Appendix F

Study Instruments

Children's Depression Inventory 2

This form lists the feelings and ideas in groups. From each group of three sentences, pick one sentence that describes you best for the past two weeks. After you pick a sentence from the first group, go on to the next group. There is no right or wrong answer. Just pick the sentence that best describes the way you have been recently. Put a mark like this ☑ next to your answer. Put the mark in the box next to the sentence that you pick. Remember, for each group, pick out the sentence that describes you best in the PAST TWO WEEKS.

Item 1 ☐ I am sad once in a while. ☐ I am sad many times. ☐ I am sad all the time.	*Item 7* ☐ All bad things are my fault. ☐ Many bad things are my fault. ☐ Bad things are not usually my fault.
Item 2 ☐ Nothing will ever work out for me. ☐ I am not sure if things will work out for me. ☐ Things will work out for me OK.	*Item 8* ☐ I do not think about killing myself. ☐ I think about killing myself but I would not do it. ☐ I want to kill myself.
Item 3 ☐ I do most things OK. ☐ I do many things wrong. ☐ I do everything wrong.	*Item 9* ☐ I feel like crying every day. ☐ I feel like crying many days. ☐ I feel like crying once in a while.
Item 4 ☐ I have fun in many things. ☐ I have fun in some things. ☐ Things will work out for me okay.	*Item 10* ☐ I feel cranky all the time. ☐ I feel cranky many times. ☐ I am almost never cranky.
Item 5 ☐ I am important to my family. ☐ I am not sure if I am important to my family. ☐ My family is better off without me.	*Item 11* ☐ I like being with people. ☐ I do not like being with people many times. ☐ I do not want to be with people at all.
Item 6 ☐ I hate myself. ☐ I do not like myself. ☐ I like myself.	*Item 12* ☐ I cannot make up my mind about things. ☐ It is hard to make up my mind about things. ☐ I make up my mind about things easily.

Item 13 ☐ I look OK. ☐ There are some bad things about my looks. ☐ I look ugly.	*Item 20* ☐ I never have fun at school. ☐ I have fun at school only once in a while. ☐ I have fun at school many times.
Item 14 ☐ I have to push myself all the time to do my school work. ☐ I have to push myself many times to do my schoolwork ☐ Doing school work is not a big problem.	*Item 21* ☐ I have plenty of friends. ☐ I have some friends but I wish I had more. ☐ I do not have any friends.
Item 15 ☐ I have trouble sleeping every night. ☐ I have trouble sleeping many nights. ☐ I sleep pretty well.	*Item 22* ☐ My schoolwork is alright. ☐ My schoolwork is not as good as before. ☐ I do very badly in subjects I used to be good in.
Item 16 ☐ I am tired once in a while. ☐ I am tired many days. ☐ I am tired all the time.	*Item 23* ☐ I can never be as good as other kids. ☐ I can be as good as other kids if I want to. ☐ I am just as good as other kids.
Item 17 ☐ Most days I do not feel like eating. ☐ Many days I do not feel like eating. ☐ I eat pretty well.	*Item 24* ☐ Nobody really loves me. ☐ I am not sure if anybody loves me. ☐ I am sure that somebody loves me.
Item 18 ☐ I do not worry about aches and pains. ☐ I worry about aches and pains many times. ☐ I worry about aches and pains all the time.	*Item 25* ☐ It is easy for me to get along with friends. ☐ I get into arguments with friends many times. ☐ I get into arguments with friends all the time.
Item 19 ☐ I do not feel alone. ☐ I feel alone many times ☐ I feel alone all the time.	*Item 26* ☐ I fall asleep during the day all the time. ☐ I fall asleep during the day many times. ☐ I almost never fall asleep during the day.

Item 27	*Item 28*
☐ Most days I feel like I can't stop eating.	☐ It is easy for me to remember things.
☐ Many days I feel like I can't stop eating.	☐ It is a little hard to remember things.
☐ My eating is O.K.	☐ It is very hard to remember things.

Kovacs, M. (2011). *Children's Depression Inventory (CDI) 2 Self-Report.* New York, NY: Multi-Health Systems.

Diagnostic Interview for Children and Adolescents IV (Sample Questions)

Conduct Disorder:
Child Version (Ages 6 to 12)

No 0
Yes 1

C5a. Have you ever stolen anything from someone when that person wasn't looking or wasn't around? 0 1

PROBE: Have you ever "swiped" ("taken," "kind of borrowed," "found") something in someone else's desk, locker?

INTERVIEWER: "BORROWED" AND "FOUND" ARE WORDS THAT CHILDREN, ESPECIALLY THE YOUNGER ONES, OFTEN USE AS EUPHEMISMS FOR STEALING.

SPECIFY: _____

_____

C5b. Have you ever stolen, swiped, "kind of borrowed," "found" anything else? 0 1

SPECIFY: _____

_____

C5c. What about shoplifting (taking) things from stores? Magazines, lipstick, soda, clothes, jewelry, CDs, a TV? 0 1

If NO, skip to C5c.
If YES, continue

SPECIFY: _____

_____

Record what was taken and amount worth

Note: From "Diagnostic Interview for Children and Adolescents (DICA)" by Reich, *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(1), p. 59-66.

Multidimensional Anxiety Scale for Children 2

Instructions: These sentences ask how you might have been thinking, feeling, or acting in the last while. For each item, please circle the number that describes **how often the sentence is true about you.**

Circle 0 if a sentence is Never true about you.
Circle 1 if a sentence is Rarely true about you.
Circle 2 if a sentence is Sometimes true about you.
Circle 3 if a sentence is Often true about you.

Remember, there are no right or wrong answers, just answer how you might have been feeling in the last while.

Here is an example to show you how to mark your answer. In the example, if you are hardly ever scared of dogs, you would circle the 1, meaning that the sentence is "Rarely" true about you.

	Never	Rarely	Some-times	Often
Example: I'm scared of dogs ……..	0	(1)	2	3
1. I feel tense or uptight……	0	1	2	3
2. I usually ask permission to do things…….	0	1	2	3
3. I worry about other people laughing at me……	0	1	2	3
4. I get scared when my parents go away……..	0	1	2	3
5. I keep my eyes open for danger ……	0	1	2	3
6. I have trouble getting my breath ..…….	0	1	2	3
7. The idea of going away to camp scares me……...	0	1	2	3
8. I get shaky or jittery……...	0	1	2	3
9. I try to stay near my mom or dad ……..……	0	1	2	3
10. I'm afraid that other kids will make fun of me……..	0	1	2	3
11. I try hard to obey my parents and teachers ……...	0	1	2	3
12. I get dizzy or faint feelings……	0	1	2	3
13. I check things out first……...	0	1	2	3

14.	I worry about getting called on in class…….	0	1	2	3
15.	I'm jumpy……..	0	1	2	3
16.	I'm afraid other people will think I'm stupid……	0	1	2	3
17.	I keep the light on at night…….	0	1	2	3
18.	I have pains in my chest…….	0	1	2	3
19.	I avoid going to places without my family……	0	1	2	3
20.	I feel strange, weird, or unreal……...	0	1	2	3
21.	I try to do things other people will like……..	0	1	2	3
22.	I worry what other people think of me……..	0	1	2	3
23.	I avoid watching scary movies and TV shows……..	0	1	2	3
24.	My heart races or skips beats…….	0	1	2	3
25.	I stay away from things that upset me……...	0	1	2	3
26.	I sleep next to someone from my family……...	0	1	2	3
27.	I feel restless and on edge……..	0	1	2	3
28.	I try to do everything exactly right……	0	1	2	3
29.	I worry about doing something stupid or embarrassing	0	1	2	3
30.	I get scared riding in the car or on the bus…….	0	1	2	3
31.	I feel sick to my stomach……...	0	1	2	3
32.	I get nervous if I have to perform in public……...	0	1	2	3
33.	Bad weather, the dark, heights, animals, or bugs scare me……...	0	1	2	3
34.	My hands shake…….	0	1	2	3
35.	I check to make sure things are safe……..	0	1	2	3
36.	I have trouble asking other kids to play with me……..	0	1	2	3
37.	My hands feel sweaty or cold……	0	1	2	3
38.	I feel shy…….	0	1	2	3
39.	I have trouble making up my mind about simple things	0	1	2	3
40.	I get upset over the thought that I might get sick……...	0	1	2	3

41. I have bad or silly thoughts that I can't stop……..	0	1	2	3
42. I have to do things over and over again for no reason...	0	1	2	3
43. I get really upset about dirt, germs, chemicals, radiation, or sticky things……...	0	1	2	3
44. I feel that I have to wash or clean more than I really need to……	0	1	2	3
45. I fear I'll be responsible for something bad happening	0	1	2	3
46. I have to check that nothing terrible has happened……	0	1	2	3
47. I have to check things several times or more…….	0	1	2	3
48. I count things for no reason……...	0	1	2	3
49. I get too concerned with sin or wrongdoing……..	0	1	2	3
50. I have to repeat things until it feels just right……	0	1	2	3

March, J.S. (2013). *Multidimensional Anxiety Scale for Children (MASC) 2 Self-Report.* New York, NY: Multi-Health Systems.