SOCIAL RELATIONSHIPS AND HEALTH-RELATED BEHAVIOR IN ADOLESCENTS WITH CANCER

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NOMENCLATURE

CNS	Central Nervous System
CCSS	Childhood Cancer Survivor Study
US	United States
OK	Oklahoma
MS	Mississippi
TX	Texas
ICCC	International Classification of Childhood Cancers
ICD-O	International Classification of Diseases for Oncology
IR	Ionizing Radiation
UV	Ultraviolet
BMT	Bone Marrow Transplant
GVHD	Graft versus Host Disease
GH	Growth Hormone
Gy	Gray, unit of absorbed radiation
ALL	Acute Lymphoblastic Leukemia
IQ	Intelligence Quotient
CDC	Centers for Disease Control
USDHHS	United States Department of Health and Human Services
PE	Physical Education

DQ	Dating Questionnaire
NRI-R	Network of Relationships Inventory-Revised
DAS-A	Dating Anxiety Scale for Adolescents
FIS	Fear of Intimacy Scale
BSI	Brief Symptom Inventory
GSI	Global Severity Index
SCL-90-R	Symptom Checklist-90-Revised
YRBS	Youth Risk Behavior Survey
NIH	National Institutes of Health
BASC-2-PRS	Behavior Assessment System for Children-2-Parent Rating Scales
PedsQL	Pediatric Quality of Life Inventory
SOIS	Severity of Illness Scale
HIPAA	Health Insurance Portability and Accountability Act
N	Sample Size
M	Mean
SD	Standard Deviation
α	Cronbach's alpha
%	Percentage
p	Statistical Significance Level
r	Value of the test statistic for a bivariate correlation
λ	Value of the test statistic for a chi-square analysis

CHAPTER I

INTRODUCTION

Childhood cancer consists of a large and diverse group of diseases, with the common factor for all variations of cancer involving a change in normal cells that leads to (a) rapid proliferation of abnormal cells, (b) spread of abnormal cells to other organs (i.e., metastasis), and (c) diminished or loss of normal cell or organ function (Armstrong, 2006). As these abnormal cells proliferate, the natural course of the disease ultimately leads to death when untreated, although the speed of progression varies dramatically across the different types of childhood cancer (Armstrong & Briery, 2004). The most common childhood cancer is leukemia (30%), followed by brain and other central nervous system (CNS) cancers (22.3%), neuroblastoma (7.3%), Wilms tumor (5.6%), Non-Hodgkin lymphoma (4.5%), Hodgkin lymphoma (3.5%), rhabdomyosarcoma (3.1%), retinoblastoma (2.8%), osteosarcoma (2.4%), and Ewing sarcoma (1.4%) (American Cancer Society, 2007). Treatment of childhood cancer involves the use of chemotherapy, radiation therapy, or surgery (or any combination thereof) chosen based on the type and stage of cancer (Armstrong, 2006).

Cancer in childhood is rare, with only 1 or 2 children per 10,000, or 0.01% - 0.02% of all children, diagnosed with cancer each year (Moore, 2005). Nevertheless, cancer is the leading cause of death by disease in children (Brown, 2006). Approximately 8,000 children and 11,500 adolescents were diagnosed with cancer in the

United States in 1999 (Castellino & Hudson, 2002), suggesting that each year approximately 20,000 total youth are diagnosed with cancer. Over the past 30 years, however, 5-year survival rates have also improved markedly, from less than 50% before the 1970s to nearly 80% today (American Cancer Society, 2007). Rates do vary considerably depending on cancer type, though, such that for the most recent time period (1996 – 2002), 5-year survival for neuroblastoma was 69%, 72% for bone and joint cancers, 74% for brain and other CNS cancers, 81% for leukemia, 86% for non-Hodgkin lymphoma, 92% for Wilms tumor, and 95% for Hodgkin lymphoma (American Cancer Society, 2007). This improvement in survival rates is due to significant advances in treatment, resulting in cure or long-term remission for a substantial proportion of children with cancer.

Given such dramatically improved survival rates, cancer has come to be known as a *chronic* illness as opposed to a *terminal* illness. Nevertheless, a diagnosis of pediatric cancer remains one of the most stressful situations a child and family must face. Treatments remain lengthy and intensive and often involve fundamental changes in the child and family's lives (Kupst & Bingen, 2006). In particular, a diagnosis of cancer in adolescence occurs at a critical time of social and interpersonal development. Adolescents are encountering rapid physical growth, hormonal changes, and a shift away from dependence on parents with associated reliance upon peer relationships. These peer relationships often involve increased levels of intimacy and sexuality, and it is in the context of these relationships that adolescents are developing important competencies for later relationships in their adult years. Thus, it stands to reason that adolescents with

cancer may be considerably more vulnerable than younger children from the standpoint of impact of diagnosis on their close or intimate social relationships.

Notably, research examining peer relationships specifically among adolescents with cancer is scant; most research has focused solely on children or on mixed samples of children and adolescents. Such limited extant research suggests that adolescent cancer survivors experience significant discomfort in relationships with members of the opposite sex, as well as continue to harbor a negative body image related to their cancer experience (e.g., Fritz & Williams, 1988). Even among those adolescents who indicated that they had a dating partner currently or in the past, few adolescents indicate that they had discussed their cancer diagnosis with their partner (Fritz & Williams, 1988). Other research has also documented that many adolescent cancer survivors experience significant problems with self-image. Stern, Norman, and Zevon (1993) found that adolescents with cancer fell below standardized norms for sexual self-image, and were significantly less adjusted than healthy controls on dimensions of sexual self and social self. A majority of adolescents also reported that they experienced rejection from peers. Madan-Swain and colleagues (1994) have also documented significant body-image disturbance and adjustment difficulties in a sample of cancer survivors when compared to healthy controls, as has Shroff-Pendley and colleagues (1997). An exception to these findings is the work of Kazak and colleagues (1994), who found that on virtually all measures of social adjustment, including self-worth, adolescents with cancer fell within normal limits. Collectively, these results suggest that the cancer experience may indeed alter self-perception at a time of critical development in an adolescent's life.

A critical question is the *extent* to which a serious, life-threatening chronic illness in childhood potentially affects the process of relationship development. La Greca and Bearman (2000) have aptly pointed out that pediatric chronic illness research needs to move beyond studies of peer acceptance and instead focus on studies which facilitate our understanding of how different pediatric conditions exert their influence on the formation and maintenance of *close friendships and dating relationships.* Problems with the development or maintenance of such peer relationships have been linked to poor school performance, loneliness, depressive symptoms, externalizing behaviors, and mental health problems later in adult life (e.g., Parker & Asher, 1993). Successful peer relationships, on the other hand, provide adolescents with an avenue in which to learn empathy, trust, compassion and other such relationship-enhancing skills (Buhrmester & Furman, 1986). In essence, the acquisition of such skills sets the stage for the quality of intimate interpersonal relationships later in adulthood, which in turn influences directly and indirectly a given individual's overall quality of life.

Data from the Childhood Cancer Survivor Study (CCSS), a retrospective national cohort study initiated to explore the late effects of childhood cancer, provides an illustration of the nature of cancer survivors' relationships and overall quality of life and psychological distress outcomes. Notably, a preliminary description of marital status of cancer survivors found that, in general, the marriage rates of cohort members were lower than rates in the U.S. population (Rauck et al., 1999). In addition, two studies comparing the health status of adult cancer survivors to their siblings found that survivors were more likely to report adverse general health, mental health, activity limitations, and functional impairment; cancer survivors were also more likely to report symptoms of depression and

somatic distress (Hudson et al., 2003; Zebrack et al., 2002). Further, another CCSS study found that psychological distress among cancer survivors appears to be related to diminished social functioning (Zebrack et al., 2004). Thus, it would appear that the importance of examining specific dimensions of close peer relationships among adolescents with cancer, and their relationship to quality of life and distress outcomes cannot be understated.

Given the importance that close peer relationships hold in adolescents' lives, it also stands to reason that these relationships may have the potential to influence adolescents' decisions regarding health-related behavior. Indeed, adolescents may feel the need to engage in specific health-related behaviors in order to maintain that sense of closeness and intimacy with their peers. Unfortunately, this need to "fit in" may come at the high cost of engagement in risky health behavior (i.e., drug and alcohol use, unprotected sex). Given the increasingly high rates of risky health behavior in the medically healthy population of youth, it is imperative that we understand what is taking place in adolescents' close friendships and dating relationships and, in turn, how this may influence decisions to engage in risky behavior. This is particularly true when adolescent relationships are further complicated by a diagnosis such as cancer. Data from the CCSS suggests that approximately 28% of cancer survivors have smoked, with approximately 17% reporting being current smokers (Emmons et al., 2002). Thus, it appears that some cancer survivors are engaging in risky behavior despite the fact that this is likely to increase the occurrence of second malignancies. Consequently, it becomes important to examine aspects of health-related behavior (i.e., smoking, drinking) among adolescents currently on treatment for cancer. Indeed, it can be argued that the study of adolescents

who are on treatment for cancer provides an excellent heuristic for evaluating how adolescents in general face important transitions in their lives while faced with significant adversity.

The purpose of the current study was to address gaps in the extant literature by providing an examination of how dimensions of close peer and dating relationships (i.e., social support, negative interactions, dating anxiety, fear of intimacy) among adolescents with cancer correspond with ratings of quality of life, psychological distress, and health-related behaviors (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety). The current study was guided by two specific aims: a) to identify how dimensions of adolescents' close peer and dating relationships are related to both adolescent- and parent-rated quality of life and psychological distress; and b) to identify how dimensions of adolescents' close peer and dating relationships are associated with adolescent-report of their health-related behaviors. It was hypothesized that adolescents currently on treatment for cancer who endorsed a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, lower levels of dating anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend would be more likely to experience higher quality of life and lower levels of psychological distress, according to both adolescent- and parent-report. Similarly, it was hypothesized that adolescents currently on treatment for cancer who endorsed a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, lower levels of dating anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend would be more likely to engage in healthy

behaviors (e.g., good nutrition, physical activity) and less likely to engage in risky health behaviors (e.g., smoking, drinking, and other drug use; unprotected sex). Taking into account the relative lack of empirical data on prevalence rates of health-related behaviors among adolescents with cancer, an exploratory investigation of the prevalence rates of such health-related behaviors among adolescents currently on treatment for cancer, including a comparison to United States (US) healthy representative adolescent samples, as well as healthy adolescents in the states for which adolescents with cancer were recruited from (i.e., Oklahoma, Mississippi, and Texas), was also undertaken.

To accomplish the stated aims of our study, a comprehensive review of the relevant literature is first presented. This includes a review of the literature associated with the medical and clinical aspects (e.g., diagnosis, prognosis, course of treatment, survival) of childhood cancer, followed by a review of the literature base examining psychological adjustment to childhood cancer. In particular, the focus will be on providing a review of the nature of social relationships in children and how a diagnosis of cancer can impact peer friendships and relationships. Moreover, a review of the extant, yet brief, literature on health-related behaviors among adolescents with cancer is provided. Finally, the results of the current study will be presented.

CHAPTER II

REVIEW OF LITERATURE

The following is a review of extant literature relevant to the current project. The review is divided into four major sections. The first section focuses on the nature of cancer, including a discussion of illness characteristics, as well as prevalence and incidence rates, direct and indirect costs associated with morbidity and mortality, and overall trends in childhood cancer. This section also documents the hypothesized etiology, diagnosis, prognosis and course of treatment, and survival rates of childhood cancer. The second section provides a general overview of child/adolescent psychological adjustment to cancer, with distinctions made between children/adolescents currently on treatment for cancer versus those children/adolescents who are long-term cancer survivors. This is followed by a brief review of the rather voluminous amount of literature on social relationships of children/adolescents, including a specific discussion of the impact of cancer on peer relationships and friendships. Finally, a brief summary of the small body of literature on health-related behaviors (i.e., substance use, diet, sexual activity, physical activity) among adolescents with cancer is presented in order to provide the framework for the current study.

The Nature of Cancer

Illness Characteristics

Classification. Childhood cancer is not a single disease entity, but rather a spectrum of different malignancies that can vary by type of histology, site of disease origin, race, gender, and age (Ries, Percy, & Bunin, 1999). However, it is important to note that, for children, classification of malignancies is based on morphology rather than primary site of origin, as is the case in adults (Steliarova-Foucher, Stiller, Lacour, & Kaatsch, 2005). A standard classification of malignancies is essential for comparing incidence and survival rates across regions and time periods, thus prompting the development of the International Classification of Childhood Cancer, currently in its third edition (i.e., ICCC-3). The ICCC-3 is based on the International Classification of Diseases for Oncology (ICD-O-3) and stipulates three levels of hierarchical classification: a) Level 1, 12 main diagnostic groups, b) Level 2, 47 diagnostic subgroups, and c) Level 3 (optional), extended classification of selected diagnostic subgroups (Steliarova-Foucher et al., 2005). Please refer to Appendix A for an illustration of the current classification system.

Prevalence. Pediatric cancer is relatively rare, with most recent data indicating that approximately 8,000 children and 11,500 adolescents (ages 15 to 19 years) were diagnosed with cancer in the United States in 1999 (Castellino & Hudson, 2002). Despite the relative rarity of childhood cancer (1 or 2 children diagnosed out of 10,000, or 0.01% - 0.02% of all children), it is still the chief cause of death by illness in children (American Cancer Society, 2007). The most common childhood cancer is leukemia, which accounts for approximately 30% of all cancer cases in the aforementioned age group; leukemia is a cancer of the bone marrow and tissues which produce the circulating blood cells (American Cancer Society, 2007). Other prevalent childhood cancers are those involving

the central nervous system (22.3% of all cases), such as brain tumors or neuroblastomas (American Cancer Society, 2007). Given the important organs located within the central nervous system (i.e., brain, spinal cord), tumors in these areas have unique properties and symptoms, including nausea, dizziness, or difficulty walking (American Cancer Society, 2007). In addition, evidence suggests that tumors involving the central nervous system do not share quite as favorable prognoses and long-term outcomes as do other childhood cancers (Fuemmeler, Mullins, & Elkin, 2001; Ries et al., 1999). Cancers involving the kidneys (i.e., Wilms tumor), lymph nodes (i.e., Hodgkin's lymphoma and non-Hodgkin's lymphoma), soft tissues (i.e., rhabdomyosarcoma), eyes (i.e., retinoblastoma), and bones (i.e., osteosarcoma, Ewings sarcoma) can also occur, accounting for 1.4-5.6% of all childhood cancer cases (American Cancer Society, 2007). For adolescents ages 15-19 years, lymphomas are the most common diagnosis, followed by leukemia (Ries et al., 1999).

Current incidence. The American Cancer Society (2007) recently provided estimates of childhood cancer incidence for the current year. According to this data, an estimated 10,400 new cases of cancer among children ages 0 to 14 years are expected in 2007, as are 1,545 deaths, with approximately one-third of these deaths attributed to leukemia (American Cancer Society, 2007). Unfortunately, estimates of the anticipated incidence of cancer for adolescents ages 15 and older in the current year are not readily available, reflecting yet again the tendency for this important group to be overlooked. Nevertheless, it is noteworthy that in the United States, cancer remains responsible for more deaths from one year through adolescence than any other illness (American Cancer Society, 2007). The cancers of children, adolescents, and young adults to age 20

combined are also the sixth most common cancer in the United States (Ries et al., 1999). According to the American Cancer Society (2007), overall costs of cancer in 2006 were approximately $206.3 billion, with $78.2 billion for direct medical costs (total of all health expenditures), $17.9 billion for indirect morbidity costs (cost of lost productivity due to illness), and $110.2 billion for indirect mortality costs (cost of lost productivity due to premature death).

Overall trends. As alluded to earlier, age, gender, and race are factors in the development of childhood cancer. Children ages 5 and under are most typically affected by leukemia, neuroblastoma, Wilms tumor, retinoblastoma, and hepatoblastoma, while the incidence of osteosarcoma, Ewings tumor, and Hodgkin's lymphoma gradually increases with age (Ward, 2000). Research has also found that children under 5 years of age and adolescents ages 15 to 19 years have similar and much higher cancer rates, 199.9 per million and 202.2 per million, respectively, as compared to the two intermediary age groups of 5 to 9 year olds (110.2 per million) and 10-14 year olds (117.3 per million; Ries et al., 1999; Ward, 2000). In addition, the probability of developing childhood cancer varies slightly by gender when all cancer sites are combined. Specifically, newborn males have a 1 in 300 chance of developing cancer prior to age 20, while newborn females have a 1 in 333 chance of developing cancer prior to age 20 (Ries et al., 1999). However, it is important to note that for some sites/histologies, there may be other factors (i.e., age) where there are differences by gender. For example, among children under 15 years of age, males have somewhat higher rates of Hodgkin's lymphoma, but among adolescents ages 15-19 years, females have somewhat higher rates (Ries et al., 1999). Specific to race, the incidence of cancer among Caucasian children is

proportionally greater than that among African-American children, with the incidence of cancer among Hispanic and Asian/Pacific Islander children falling between that of Caucasian and African-American children (Ries et al., 1999). Native Americans appear to have the lowest incidence of childhood cancer (Ries et al., 1999).

Etiology of Childhood Cancer

Cancer is a general term used to describe uncontrolled, abnormal cell growth. Such growth occurs when a cell's genetic instructions allow proliferation of cells without normal control mechanisms (Li & Wendt, 1998). Many childhood cancers occur very early in life and, understandably, parents seek a specific etiology or etiologies. Unlike cancers among adults, however, childhood cancers are not significantly related to lifestyle choices such as tobacco or alcohol use, poor diet, or not enough physical activity (American Cancer Society, 2007). There is some evidence to suggest, though, that chemical and radiation exposure may contribute to certain types of childhood cancers. For example, specific chemicals such as benzene, asbestos, vinyl chloride, arsenic, and aflatoxin show definite evidence of causing cancer in humans, while others (i.e., chloroform, formaldehyde) are considered possible carcinogens based on evidence collected through animal experiments (American Cancer Society, 2007). Radiation exposure in the form of high-frequency ionizing radiation (IR) and ultraviolet (UV) radiation has also proven to cause cancer, based on evidence from studies of atomic bomb survivors, patients receiving radiotherapy, and certain occupational groups, such as uranium miners (American Cancer Society, 2007). Overall, though, it appears that the etiology of most childhood cancers in unknown, although it is theorized that the etiology is most likely attributable to a complex interaction between environmental factors and

genetic susceptibility that varies in specifics among the different forms of cancer (American Cancer Society, 2007; Li & Wendt, 1998). Clearly, continued research is necessary to formally document how environmental and genetic factors interact in the etiology of childhood cancer.

Diagnosis, Prognosis, and Course of Childhood Cancer

Cancers in children are often difficult to recognize. Consequently, parents are encouraged to have their children receive regular medical checkups and be alert for unusual symptoms, including: an unusual mass or swelling; unexplained paleness and loss of energy; a sudden tendency to bruise; a persistent, localized pain or limping; prolonged, unexplained fever or illness; frequent headaches, often with vomiting; sudden eye or vision changes; and excessive, rapid weight loss (American Cancer Society, 2007; Li & Wendt, 1998). A diagnosis of cancer typically involves a careful systematic assessment using diagnostic radiology (i.e., X rays), surgery, and/or biochemistry, in order to determine the stage of the disease and the presence/absence of favorable or unfavorable prognostic factors (Li & Wendt, 1998).

Childhood cancers are typically treated with chemotherapy, radiation therapy, surgery, or a combination of two or more of these therapies (American Cancer Society, 2007). Chemotherapy involves the use of chemical agents (i.e. drugs) to eradicate cancer cells; the chemical agents work by interfering with the ability of the cancer cells to divide and reproduce (Brown, 2006). Although there are exceptions, childhood cancers tend to respond well to chemotherapy because they are cancers that grow fast (American Cancer Society, 2007). As such, chemotherapy drugs are given for several reasons: 1) to decrease the size of tumors for easier and safer removal by surgery; 2) to enhance the

cancer-killing effectiveness of other treatments, such as radiation therapy; 3) in higher dosages, to overcome the resistance of cancer cells; and 4) to control the cancer and enhance the patient's quality of life (Brown, 2006). Chemotherapy is typically administered to children intravenously (through a vein) or orally (by mouth), although it may also be administered into the spinal canal, into muscle, into the abdominal cavity, into a body cavity, or subcutaneously (through the skin) (Brown, 2006). The duration of chemotherapy treatment and type of chemotherapy drugs used depends on the type of cancer being treated and how the child responds to the drugs. Notably, many of the chemotherapy drugs utilized in childhood cancer treatment carry significant short- and long-term problems. Short-term side effects may include hair loss, mouth and throat sores, nausea and vomiting, diarrhea, fatigue, anemia, abnormal bleeding, and increased risk of infection. Long-term side effects may include liver damage, and heart and skin problems (Brown, 2006).

Radiation therapy is another common form of treatment for childhood cancers. It involves the use of high energy X-rays to destroy or damage cancer cells, although it is notable that radiation can also damage healthy cells in the area where it is administered (Brown, 2006). Common side effects of radiation therapy may include: nausea, vomiting, mouth sores, and skin changes (i.e., skin may look and feel like a sunburn); other more long-term effects of radiation therapy may include: problems with growth, hormone production, learning problems, declines in IQ, slowed processing speed, and difficulties with sustained attention and memory (Marsland, Ewing, & Thompson, 2006).

Surgery is another treatment option for childhood cancers, although it often plays a minor role among children with leukemias or lymphomas (Brown, 2006). However, for

children with solid tumors, surgery can be an effective treatment option. Surgery can be classified into three main types: primary, second look, and supportive care surgery (Brown, 2006). Primary surgery is used to remove all or most of the tumor at the time of diagnosis. However, in some cases the tumor may be too large, or in any area of the body where it cannot be safely removed. In these instances, primary surgery is done after chemotherapy or radiation therapy, which is given to help reduce the size of the tumor. As the name implies, second look surgery is done after chemotherapy or radiation in order to take out what may be remaining of the tumor, while supportive care surgery is done to help with some aspect of the patient's care (i.e., inserting a catheter, gastrostomy tube).

Children with certain types of cancer may also be candidates for bone marrow transplantation (BMT). Bone marrow is a spongy tissue inside certain bones of the body that produces blood cells. In leukemias, the bone marrow itself is the source of the cancer and transplantation with healthy bone marrow may be needed to cure the cancer (Brown, 2006). BMT can also be utilized in the treatment of some solid tumors. Specifically, BMT may be utilized in order to administer more intensive doses of chemotherapy than would typically be tolerated (Brown, 2006). Transplantation of the bone marrow can either be autologous (i.e., from the patient's own body) or allogeneic (i.e., from another individual) (Brown, 2006). Unfortunately, BMT can leave children very susceptible to infections, including graft versus host disease (GVHD). GVHD is a reaction or rejection to the donor's marrow and can produce symptoms such as rash, diarrhea, liver disease, poor immune function, and even death in some instances (Brown, 2006).

Survival Rates Among Childhood Cancer

For all childhood cancers combined, 5-year survival rates have improved markedly over the past thirty years, from less than 50% before the 1970s to nearly 80% today (American Cancer Society, 2007). Rates do vary considerably depending on cancer type, though, such that for the most recent time period (1996 – 2002), 5-year survival for neuroblastoma was 69%, 72% for bone and joint cancers, 74% for brain and other CNS cancers, 81% for leukemia, 86% for non-Hodgkin lymphoma, 92% for Wilms tumor, and 95% for Hodgkin lymphoma (American Cancer Society, 2007). The 5-year survival rate refers to the percentage of patients who live *at least* five years after their cancer is diagnosed, and is used to produce a standard way of discussing prognosis. It is important to note that five-year survival rates are based on patients diagnosed and initially treated more than five years ago, thus improvements in treatment are likely to result in a more favorable outlook for recently diagnosed patients (American Cancer Society, 2007).

Summary

Although comparatively rare as a childhood condition, cancer remains responsible for more deaths from one year through adolescence than any other illness (American Cancer Society, 2007). Fortunately, childhood cancer has gradually changed from being an inevitably fatal illness to a life-threatening chronic condition due to advances in medical science and technology. Despite increases in survival rates, however, a concrete etiological basis remains to be found, with current evidence highlighting the complex interplay of environmental and genetic factors likely involved in the manifestation of the illness. This lack of concrete etiology understandably leads to distress among both

children with cancer and their parents. Further complicating matters is the fact that treatments for childhood cancer are often intense and invasive, as well as often result in deleterious short- and long-term effects. In the section that follows, we discuss how children and adolescents adjust to this highly unpredictable and invasive illness, both during treatment for cancer, as well as into stages of cancer survivorship.

Child and Adolescent Psychological Adjustment to Cancer

Children and Adolescents Currently on Treatment for Cancer

Empirical investigations of the psychological adjustment of childhood cancer patients utilizing standardized assessment measures have resulted in mixed findings. Some studies suggest that children and adolescents with cancer are at increased risk for adjustment problems (e.g., Erickson & Steiner, 2001; Greenberg, Kazak, & Meadows, 1989; Kazak et al., 2001; Meeske, Ruccione, Globe, & Stuber, 2001; Mulhern, Wasserman, Friedman, & Fairclough, 1989; Sawyer, Toogood, Rice, Haskell, & Baghurst, 1989), while other studies suggest that their adjustment is comparable to that of control samples and standardized norms (e.g., Brown et al., 1992; Eiser, Hill, & Vance, 2000; Kaplan, Busner, Weinhold, & Lenon, 1987; Noll, Bukowski, Davies, Koontz, & Kulkarni, 1993; Patenaude & Kupst, 2005; Phipps & Srivastava, 1997). Although it is evident that some null findings can indeed by attributed to a lack of statistical power given small sample sizes, a possible theory that may explain such diverse findings is the "often extreme heterogeneity of patients in terms of time since diagnosis" (Varni & Katz, 1997, p. 268). In other words, researchers often combine groups of children and adolescents who are newly diagnosed with cancer with children and adolescents on

treatment for several years and long-term survivors, thus reducing the precision of findings and possibly accounting for inconsistencies reported in the extant literature.

Overall, research conducted with children and adolescents diagnosed with cancer indicates that the vast majority cope well over time (Kupst & Bingen, 2006); however, small subsamples are at risk, primarily for internalizing (e.g., anxiety, depression) types of symptoms (Vanatta & Gerhardt, 2003). Children and adolescents with cancer who are experiencing adjustment problems (e.g., internalizing symptoms) may also have subsequent difficulties negotiating peer relationships and interacting with others. Indeed, the clinical child psychology literature has documented that children who are depressed perceive themselves to be less accepted by others, view their relationships with their best friends as being of lower friendship quality, or see others' neutral intentions as malevolent (Brendgen, Vitaro, Turgeon, & Poulin, 2002). Additionally, research has indicated that peers rate children who are depressed as being less likable and attractive, as well as more likely to need therapeutic services than nondepressed peers (e.g., Peterson, Mullins, & Ridley-Johnson, 1985). Taking these findings into account, it appears that the small subset of children and adolescents with cancer who experience internalizing problems may be at risk for experiencing difficulties with their peers, although this has yet to be investigated at length (Fuemmeler, Mullins, & Carpentier, 2006). Future research is needed to address how children and adolescents with cancer who experience adjustment difficulties may also experience subtle problems with peer relations and friendships.

Long-Term Childhood Cancer Survivors

As mentioned earlier, the survival rates of many childhood cancers have risen at a remarkable rate for several decades, with recent estimates suggesting that approximately one out of every 900 individuals in the United States between the age of 15 and 45 years is a survivor of childhood cancer (Robison et al., 2002). This increase in survivorship has created the need to assess the long-term morbidity and mortality associated with childhood cancer and its treatment, especially given that long-term survivors are at risk for a milieu of adverse outcomes. Such outcomes include second malignancies, organ dysfunction, disturbances in growth and development, decreased fertility, impaired intellectual function, difficulties in obtaining employment and insurance, and overall reduced quality of life (Robison et al., 2002). Many institutions and cooperative clinical trials groups have begun the process of conducting much needed research into long-term survivorship, although the majority of this research has been restricted to the first decade following diagnosis and treatment, and often includes small sample sizes, low participation rates, and incomplete or limited follow-up of participants (Robison et al., 2002).

In order to overcome many of the limitations faced by single institutions and cooperative clinical trials groups, the Childhood Cancer Survivor Study (CCSS) was initiated by the University of Minnesota Cancer Center in 1994 to follow a cohort of 14,054 five-year survivors of childhood and adolescent cancer (Robison et al., 2002). The CCSS consortium consists of 25 participating clinical centers across the United States and Canada and represents the largest cohort of childhood cancer survivors to ever be examined (Friedman, 1999). In the paragraphs that follow, a review of the currently available findings from the CCSS is presented.

Secondary malignancies. Secondary cancers are the second leading cause of death, following recurrence, among 5-year cancer survivors (Mertens et al., 2001). Unfortunately, childhood cancer survivors are at increased risk for the development of secondary sarcomas, with a 15-year cumulative incidence of 3% - 5% (de Vathaire et al., 1999; Neglia et al., 2001). Several investigations have attempted to examine factors associated with the risk of developing secondary sarcomas. An investigation by Henderson and colleagues (2007) revealed that the risk of a secondary sarcoma was more than ninefold among childhood cancer survivors than among the general population, with young age at diagnosis, primary sarcoma diagnosis, family history of cancer, history of other secondary neoplasms, and treatment with higher doses of anthracyclines or alkylating agents emerging as risks associated with such secondary cancers. In addition, Bassal and colleagues (2006) have documented that survivors of childhood cancer are also at increased risk of developing subsequent carcinomas typical of later adulthood (e.g., gastrointestinal, head and neck, renal cell, and genitourinary system carcinomas). Moreover, it appears that risk for secondary breast cancer is increased in survivors who were treated with chest radiation therapy, survivors of bone and soft-tissue sarcoma who were not treated with chest radiation therapy, survivors with a family history of breast cancer, and survivors with a history of thyroid disease (Kenney et al., 2004). Interestingly, growth-hormone (GH) treated survivors appear to have an increased risk of developing secondary neoplasms as compared to survivors not treated with GH, although the risk appears to diminish with increasing length of follow-up (Ergun-Longmire et al., 2006).

Fertility outcomes. As therapies for childhood cancers are enhanced and survival rates continue to improve, questions arise regarding fertility and the health of offspring of childhood cancer survivors. According to a preliminary report from the CCSS (e.g., Byrne, 1999), fertility appears to be retained among childhood cancer survivors, although a host of other negative outcomes can occur , including excess miscarriages, delayed conception, increased possibility of cancer and birth defects in offspring, poor pregnancy outcome, and the possibility of early menopause. However, it is important to note that some of these outcomes, namely delayed conception, miscarriages, and premature menopause have yet to be adequately studied (Byrne, 1999; Sklar, 2006). Preliminary reports from the CCSS looking at pregnancy outcomes among survivors of childhood cancer suggest an increased incidence of spontaneous abortions, low-birth-weight babies, and neonatal deaths among women with Wilms tumor who had received abdominal radiation (Blatt, 1999), as well as increased risks of pre-term, low-birth-weight, and small-for-gestational-age babies, with risks concentrated among women who received pelvic irradiation (Signorello et al., 2006). Hodgkin disease survivors who had received both radiation and chemotherapy also appeared to be at increased risk of spontaneous abortions (Blatt, 1999). Other research outside of the CCSS has indicated that female survivors of childhood cancer may experience primary ovarian failure from chemotherapy, radiation involving the abdominal or pelvic region, or surgical removal of the ovaries (Bottomley & Kassner, 2003). Female survivors may also experience delayed or arrested pubertal development, delayed menarche, amenorrhea in a postpubertal female, and early menopause (Chiarelli, Marrett, & Darlington, 1999). Less risk for infertility has also been documented among women treated prior to the onset of puberty

(Chiarelli et al., 1999). Research looking at fertility outcomes among men treated for childhood cancer is scant, although some research suggests that men who were treated with radiation to the pelvic area and/or received alkylating agents are susceptible to temporary or permanent loss of sperm production (Shusterman & Meadows, 2000).

Endocrine and cardiovascular late effects. Survivors of childhood brain tumors are at significantly higher risk for a variety of late adverse effects, including compromised neurologic and sensory outcomes (Gurney et al., 2003). In addition, childhood brain tumor survivors are also susceptible to endocrine and cardiovascular conditions, with one or more endocrine conditions being reported by 43% of childhood brain tumor survivors in a preliminary report of the CCSS (Gurney et al., 2003). Specifically, compared to healthy siblings, childhood brain tumor survivors had a significantly elevated risk of late-onset hypothyroidism, growth hormone deficiency, the need for medications to induce puberty, and osteoporosis (Gurney et al., 2003). Further, one or more cardiovascular conditions were reported by 18% of survivors, with an elevated late-onset risk for stroke, blood clots, and angina-like symptoms (Gurney et al., 2003). Notably, few late effects were found among those treated with surgery only, but risks were consistently elevated for those children treated with radiation and surgery, and higher still for those who also receive chemotherapy (Gurney et al., 2003). Results of a more recent investigation of the incidence of and risk factors for strokes in $\geq$ 5-year survivors of childhood leukemia and brain tumors revealed similar results to the Gurney and colleagues (2003) study; specifically, survivors, particularly those with brain tumors treated with cranial radiation therapy at doses greater than 30 Gy, are at increased risk for stroke (Bowers et al., 2006). Collectively, such investigations argue for lifetime

medical surveillance of childhood cancer survivors, as treatment-related complications may occur many years after therapy has ceased.

Health behaviors and long-term health outcomes. Given that adult survivors of childhood cancer are at risk for a number of medical sequelae, the CCSS has also recently focused its efforts on examining multiple aspects of health behavior among this population. For example, in a study spearheaded by Oeffinger and colleagues (2003), researchers sought to determine whether childhood cancer survivors of acute lymphoblastic leukemia (ALL) are at increased risk for obesity due to radiation therapy or chemotherapy used in the treatment of ALL. Results indicated that obesity indeed was greatest among females diagnosed at 0 to 4 years of age and treated with radiation doses $\geq$ 20 Gy; obesity was not associated with treatment consisting of chemotherapy only or with radiation doses of 10 to 19 Gy (Oeffinger et al., 2003). A more recent investigation of body mass index among adult survivors of childhood cancer revealed similar trends, with female survivors of leukemia being more likely to be obese while survivors more likely to be underweight included female and male survivors of Hodgkins disease and Wilms tumor, female survivors of bone carcinoma without amputation, and male survivors of leukemia, brain tumors, non-Hodgkins lymphoma, neuroblastoma, and soft tissue sarcoma (Meacham et al., 2005).

In another report from the CCSS, researchers sought to compare the health status of childhood cancer survivors to siblings, as well as identify factors associated with adverse outcomes (Hudson et al., 2003). Six health status domains were assessed: general health, mental health, functional status, activity limitations, cancer-related pain, and cancer-related anxiety/fears (only the first four domains were assessed in the control

group). Results indicated that childhood cancer survivors were more likely to report adverse general health, mental health, activity limitations, and functional impairment, as compared to siblings, with 44% of survivors reporting at least one adverse health status domain (Hudson et al., 2003). Sociodemographic factors associated with reporting at least one adverse health status domain included being female, having a lower level of educational attainment, and having an annual income less than $20,000 (Hudson et al., 2003). Assessing health behavior among childhood cancer survivors, researchers sought to determine the type of outpatient medical care reported by survivors and to examine factors associated with limited medical care (Oeffinger et al., 2004). Results indicated that 87% of childhood cancer survivors reported having a general medical contact, 71.4% a general physical examination, 41.9% a cancer-related visit, and 19.2% a visit at a cancer center over a two-year period (Oeffinger et al., 2004). Factors associated with not reporting any outpatient medical care included having no health insurance, being male, having a lack of concern for future health, and being 30 years or older (Oeffinger et al., 2004). Notably, results of a recent investigation regarding the influence of race/ethnicity on outcomes in the CCSS revealed that, although overall health status was similar, African-American survivors were less likely to report adverse mental health, risky behaviors (e.g., smoking, problem drinking), and better preventive practices, while Hispanic survivors demonstrated equitable access to cancer-related care (Castellino et al., 2005). Thus, it would appear that, adjusted for socioeconomic status, adverse outcomes in the CCSS are not associated with minority status (Castellino et al., 2005).

Most recently, researchers involved with the CCSS have sought to determine the long-term morbidity that follows treatment of childhood cancer. Specifically, Oeffinger

and colleagues (2006) evaluated the incidence and severity of chronic health conditions in 10,397 adult childhood cancer survivors as compared to 3,034 siblings. Their results indicated that, among survivors, the risk of chronic health conditions is high, particularly for second cancers, cardiovascular disease, renal dysfunction, severe musculoskeletal problems, and endocrinopathies, with increases in incidence appearing over time and not evidencing any signs of plateau. Specifically, 62.3% of survivors had at least one chronic condition and 27.5% had a severe or life-threatening condition (e.g., myocardial infarction, congestive heart failure, premature gonadal failure, second cancers, and severe cognitive dysfunction). In addition, the cumulative incidence of a chronic health condition reached 73.4% thirty years after the cancer diagnosis, with a cumulative incidence of 42.4% for severe, disabling, or life-threatening conditions, or death due to a chronic condition. Moreover, three groups were documented to be at highest risk, specifically survivors of bone tumors, CNS tumors, and Hodgkin's disease. Clearly, such results are remarkable and concerning, and suggest that childhood cancer survivors face increased physical morbidity following their diagnosis and course of childhood cancer.

Educational and vocational outcomes. A couple of reports from the CCSS have assessed educational and employment outcomes among childhood cancer survivors. In a select sample of cancer survivors, Nagarajan and colleagues (2003) assessed education, employment, and health insurance outcomes among survivors of pediatric lower extremity bone tumors, classified by amputation status (amputees and non-amputees), as compared to siblings. Results indicated that amputation status did not significantly influence education, employment, or health insurance outcomes; however, education was a significant positive predictor of employment and having health insurance (Nagarajan et

al., 2003). When compared to siblings, though, amputees experienced significant deficits in education, employment, and health insurance (Nagarajan et al., 2003), results similar to an investigation by Park and colleagues (2005) indicating that adult survivors of childhood cancer have significantly lower rates of health insurance coverage and more difficulties obtaining coverage.

Another report from the CCSS sought to compare the self-reported rates of special education and educational attainment among childhood cancer survivors and a random sample of sibling controls (Mitby et al., 2003). Results indicated that the use of special education services was reported in 23% of survivors and only 8% of siblings, with the greatest differences observed among survivors who were diagnosed before age 6, and survivors of central nervous system (CNS) tumors and Hodgkin disease (Mitby et al., 2003). In addition, the use of intrathecal methotrexate and cranial radiation, administered alone or in combination, significantly increased the likelihood that a survivor would utilize special education services (Mitby et al., 2003). Moreover, survivors of leukemia, CNS tumors, non-Hodgkin lymphoma, neuroblastoma, and rhabdomyosarcoma were significantly less likely to complete high school or ever worked a job as compared to siblings (Mitby et al., 2003; Punyko et al., 2007), although when survivors received special education services, estimates approached those of the sibling population (Mitby et al., 2003).

Marriage. In a preliminary report assessing marital status of a cohort of childhood cancer survivors, Rauck, Green, Yasui, Mertens, & Robison (1999) found that 32% of survivors (of both CNS and non-CNS cancers) reported being married or living as married, 6% reported being divorced or separated, and 62% reported having never been

married. In general, compared to the overall U.S. population, survivors were less likely to have ever married, particularly females and Caucasians, although once married, they were less likely to divorce/separate, again particularly among females and Caucasians (Rauck et al., 1999). African American survivors were generally found to be more likely to have married, with males and African Americans more likely to divorce/separate once married (Rauck et al., 1999). Overall, this preliminary evaluation provided evidence suggesting a decreased likelihood of marriage for childhood cancer survivors, which may be influenced by gender and/or race. Recently, similar results were found such that adult survivors of childhood and adolescent rhabdomyosarcoma were less likely than sibling controls to ever been married, although survivors who reported cancer-related pain had an increased likelihood of ever being married (Punyko et al., 2007).

Psychological outcomes. As highlighted earlier, psychological sequelae among childhood cancer survivors has been the subject of a number of investigations, although many of such investigations have been plagued by small sample sizes, data derived from a single institution, and a lack of a control group. Fortunately, the initiation of the CCSS has now afforded an opportunity to evaluate and compare psychological outcomes among long-term survivors of leukemia, Hodgkin's disease, and non-Hodgkin's lymphoma across the U.S. and Canada. In the first of such reports, Zebrack and colleagues (2002) provide evidence suggesting that childhood cancer survivors are 1.6 to 1.7 times more likely to report depressive symptomatology or somatic distress as compared to sibling controls, although it is important to note that, as a group, the majority of childhood cancer survivors appear psychologically healthy. Nevertheless, women were significantly more likely to indicate symptoms of depression and somatic distress than were men;

socioeconomic variables (e.g., low household income, low levels of educational attainment, recent history of unemployment) also predicted symptomatic levels of both depression and somatic distress (Zebrack et al., 2002). Further, exposure to intensive chemotherapy predicted both depressive symptomatology and somatic distress (Zebrack et al., 2002).

Summary

Intuitively, it can be argued that adjustment to a diagnosis of cancer in childhood or adolescence is likely faced with considerable challenge, although it is interesting to note that the extant literature indeed offers mixed findings, with some studies suggesting that children and adolescents may evidence some difficulty adjusting to the diagnosis and other studies finding no evidence of such difficulty. Although speculative, one reason for such inconsistent findings in the literature may be related to the tendency for researchers to group children and adolescents who have been newly diagnosed with cancer with children and adolescents who have been on treatment for several years and/or childhood cancer survivors. Another issue that may account for inconsistent findings is the tendency for researchers to utilize broad-band measures of adjustment that may not be appropriate for assessing the more subtle sequelae of the cancer experience. Clearly, the aforementioned reasons are indeed speculative and underscore the need for studies of homogenous groups of childhood cancer patients and survivors.

Taking into the account the inconsistencies in the extant literature on adjustment outcomes among children and adolescents with cancer, it stands to reason that the cancer experience indeed has the *potential* to impact children's social relationships, in addition to posing risks for a host of long-term difficulties (e.g., problems with conception,

endocrine and cardiovascular problems, marital difficulties, depressive symptomatology, somatic distress). Social relationships in childhood and adolescence play an important role in creating social competencies critical to future relationships, thus underscoring the importance of understanding how such relationships can be affected by a diagnosis such as cancer. Notably, the literature on social relationships in general is voluminous, and a full review is beyond the scope of the current paper. However, a brief review of the nature of social relationships in childhood/adolescence is presented to provide a framework for understanding the impact of cancer on peer relationships and friendships.

Social Relationships in Childhood/Adolescence

Psychologists have conceptualized and studied social relationships of children from a number of vantage points, with the notion that each perspective helps in understanding a child's social ecology. The constructs that are most commonly studied include social support, social networks, peer acceptance, and friendships. These perspectives are defined below.

Social Support

Social support reflects the quality of a relationship with other individuals; it is believed that social support may enhance health and well-being in a child or individual by promoting adaptation of health behavior and/or enhancing the immune responses activated by stress (House, Landis, & Umberson, 1988). Often, researchers studying social support distinguish between four main functional types, including emotional support, instrumental support, informational support, and appraisal support. Emotional support reflects support provided in the form of empathy, love, trust, or caring. Instrumental support involves support in the form of tangible aid or services.

Informational support is the support of advice and suggestions. Finally, appraisal support reflects what a person receives from others in the form of affirmations, constructive feedback, or social comparison (House, 1981).

Social Networks

Social networks reflect the intricate web of social relationships and the embedded structure of these relationships. Social network analysis attempts to assess the structural characteristics of social networks, how these networks are formed, and how such social networks influence important health and psychological outcomes (Gifford-Smith & Brownell, 2003). The structural characteristics of a child's social network are an important area of inquiry in network analysis. These characteristics include size, interconnectedness, and stability. Size reflects the number of peer clusters in a child's network. Interconnectedness (sometimes referred to as density) involves the level of cohesion and the extent to which members know and interact with one another. Stability of a network reflects the level of changes in the group membership over time.

Research on the social networks of children suggests that boys generally have larger peer groups than girls, and higher social status children have larger networks than do lower status children (Gifford-Smith & Brownell, 2003). A child's position in the network also has been studied as a potential factor related to socio-emotional development. For instance, perceived popularity, athletic ability (for boys), and leadership skills are characteristics associated with children who are highly central in a network (i.e., they know a great number of children and are known by a lot of other children), and these children are predicted to function well with others and have few social and emotional adjustment difficulties (Farmer & Farmer, 1996; Farmer & Rodkin,

1996; Gest, Graham-Bermann, & Hartup, 2001). Children who are peripheral in a network (i.e., isolates) are often characterized as being shy or withdrawn and are predicted to have more social and emotional problems than their peers who are central to a network (Farmer & Rodkin, 1996).

Peer Acceptance or S*ociometric Status*

Peer acceptance or *sociometric status* is another method of examining the social relationships of children. Common methods used to assess sociometric status involve the use of peer nominations or peer ratings (e.g., Coie & Dodge, 1983; Coie, Dodge, & Coppotelli, 1982). In this methodology, the constructs of social preference and social impact of children are assessed. Children are presented with a class roster and asked to indicate children in their class who they most like and children who they least like. Social preference reflects the number of like nominations minus the number of disliked nominations. Social impact reflects the degree to which a child is noticed by his or her peers, and is the sum of the particular child's "like" and "dislike" nominations. Scores are then categorized into five sociometric categories: popular, rejected, neglected, controversial, and average (Coie & Dodge, 1983, 1988; Newcomb, Bukowski, & Patte, 1993). These categories are described below.

Popular. Children categorized as popular receive numerous "like" nominations and few "dislike" nominations from their peers. These are children who also receive high social preference scores. Generally, *popular* children have many positive qualities. They are seen by their peers as being socially helpful, cooperative, considerate, and outgoing (Coie, Dodge, & Kupersmidt, 1990). They also are more likely to be children who are

socially competent, demonstrating prosocial problem-solving strategies and skills (Erdley & Asher, 1999; Nelson & Crick, 1999).

Rejected. Children in the rejected category receive few "like" nominations and numerous "dislike" nominations, and are rated lowest on social preference. In a 5-year longitudinal study of academic achievement and psychological adjustment, Ollendick et al. (1992) found that children in the rejected and controversial (mentioned below) categories had poorer psychosocial and psychological outcomes than children in other status groups. *Rejected* children also demonstrate more aggressive and hostile behavior (Coie, Dodge, Terry, & Wright, 1991; Newcomb et al., 1993). Higher levels of emotional reactivity and sensation seeking also have been observed among children in the rejected category (Hinshaw & Melnick, 1995). Non-aggressive rejected children tend to be those children who are more shy and withdrawn and more prone to display socially awkward and strange behaviors than their peers who are not rejected (Bierman, Smoot, & Aumiller, 1993).

Neglected. Children in the neglected category receive few "dislike" or "like" nominations. They are the children in the classroom who typically go unnoticed. Unlike children in the rejected category, children in the neglected category do not display a high frequency of externalizing or aggressive behavior; rather they are sometimes characterized as shy and withdrawn by other children (Ollendick et al., 1992). However, some studies have found that teachers typically do not characterize these children as problematic and tend to see them as functioning independently and appropriately (Wentzel & Asher, 1995).

Controversial. Children in the controversial category receive a high number of "like" and "dislike" nominations. These children share qualities of both rejected and popular children. They are viewed by their peers as leaders and sociable; however, they are also viewed as being aggressive and forcefully assertive (Bagwell, Coie, Terry, & Lochman, 2000; Newcomb et al., 1993). As these children become adolescents, their leadership skills and tendency toward more aggressive behavior increase the likelihood of having a negative rather than a pro-social influence on other children around them (Bagwell et al., 2000).

Average. In sociometric studies, nearly half of children do not fall into any of the aforementioned categories. These children do not appear to be at risk for poor adjustment outcomes. Rather, these children function well and display levels of externalizing and internalizing behavior that are not considered clinically significant.

Using this sociometric method provides researchers one strategy for gaining insight into the complex association between peer relationships and developmental outcomes, whether they exist in academic, psychological, behavioral, or social spheres. One consistent observation among investigators using this approach has been that there is considerable heterogeneity within these categories (Gifford-Smith & Brownell, 2003; LaGreca, 1997). That is, children in the rejected category are not always viewed as aggressive or children in the neglected category are not always seen as shy. However, these methods and the categories have been used with some success to predict development and psychological health in 5 to 10 year longitudinal studies (Bagwell, Schmidt, Newcomb, & Bukowski, 2001).

Friendships

The study of *friendships* and dyadic interactions reflects another dimension that overlaps but yet is distinct from the construct of peer acceptance. Children's level of acceptance or rejection may be independent from their close reciprocal friendships (Gest et al., 2001; Ladd, Kochenderfer, & Coleman, 1997). Indeed, a friendship represents a voluntary, evolving, positive reciprocal relationship between two children (Bukowski & Hoza, 1989), whereas sociometric status represents the level of a child's acceptance within the larger peer group (Gifford-Smith & Brownell, 2003). A friendship is typically operationalized as two classmates who give mutual positive nominations (Erdley, Nangle, Newman, & Carpenter, 2001). Additionally, the quality of a child's friendships is also important to assess, as this can be relevant to the child's emotional adjustment and development (Bukowski & Hoza, 1989). High quality friendships, such as those characterized by intimacy, loyalty, reciprocal encouragement and validation, have been shown to be associated with overall better social adjustment (Berndt, Hawkins, & Jiao 1999; Ladd et al., 1997). Friends also can serve as an important source of support during stressful times or transitions. Having positive friendships has been demonstrated to mitigate the stress related to family adversity and divorce (Criss, Pettit, Bates, Dodge, & Lapp, 2002; Hetherington, 1999). Not surprisingly, children who do not have close friends appear to be at risk for poor outcomes, such as loneliness, depressive symptoms, and social anxiety (La Greca & Lopez, 1998; Parker, Rubin, Price, & De Rosier, 1995). Children who form friendships with other children, who also engage in highly delinquent aggressive behaviors, also appear to be at risk for poor adaptation and engaging in delinquent and aggressive behavior themselves (Newcomb, Bukowski, & Bagwell, 1999).

Peer Relationships and Development

The distinct functions that peer relationships have during different phases of development have been a focus of ever increasing empirical investigation. Historically, theorists have suggested that age-related patterns of friendships emerge during early, middle, and late childhood (e.g., Selman, 1980; Sullivan, 1953; Youniss, 1980). Sullivan (1953) proposed that during early childhood, parents remain a strong source of socialization and support for children. However, around the age of two to six, children begin to form companionships with other children. Small dyads are formed and their play is characterized by sustained sessions of imaginative play (Parker & Gottman, 1989). Around the ages of 6 to 9 years, childrens' needs for acceptance begin to influence their social engagements. It is theorized that children at this age choose friends who are similar to them, and that they develop friendships that serve to validate their developing interpersonal awareness (Sullivan, 1953). During preadolescence (ages nine to twelve), Sullivan asserts that the need for greater intimacy begins to shape the friendships that children develop. At this age, youth begin to form relationships that are based upon mutual sharing of personal information. During adolescence, sexuality and identity begin to shape their friendship relationships. Through the course of development and in the context of these friendships, Sullivan (1953) asserts that social competencies emerge.

Subsequent to these early writings, others have suggested that making and keeping friends requires a number of competencies and skills, such as learning to take another's perspective, regulating emotion, effective interpersonal communication, processing social information cues, and problem-solving (e.g., Gifford-Smith &

Brownell, 2003). Although the focus of research has largely centered on differences between individuals rather than developmental change, there is some support for Sullivan's theories. For instance, research has demonstrated that as children develop and mature their descriptions of their friendship relationships are characterized by more comments reflecting intimacy, such as sharing personal thoughts and feelings (Bigelow & La Gaipa, 1980; Furman & Bierman, 1984).

Despite the fact that research has documented that adolescent social relationships are characterized by increased levels of intimacy, it is important to note that pediatric chronic illness research has failed to move beyond studies of peer acceptance and instead focus on understanding *how* pediatric conditions (e.g., cancer) exert their influence on the formation and maintenance of *close friendships and dating relationships.* Such paucity of research is unfortunate, given that problems with the development and maintenance of such peer relationships have been linked to poor school performance, loneliness, depressive symptoms, externalizing behaviors, and mental health problems later in adult life (e.g., Parker & Asher, 1993). Successful peer relationships, on the other hand, provide adolescents with an avenue in which to learn empathy, trust, compassion and other such relationship-enhancing skills (Buhrmester & Furman, 1986). Indeed, it can be argued that the acquisition of such skills sets the stage for the quality of intimate interpersonal relationships later in adulthood, which in turn influences directly and indirectly a given individual's overall quality of life. The next section documents how a diagnosis of cancer can impact peer relationships and friendships.

The Impact of Cancer on Peer Relationships and Friendships

Children and adolescents with cancer experience a number of acute and long-term consequences of their illness and its associated treatments that can potentially affect their social relationships, with extant research largely focusing on three overlapping domains: a) social adjustment with peers, b) the academic context and peer relations, including the role of neurocognitive impairments, and c) peer support and adjustment outcomes. Previous work has suggested that such domains are of high relevance to children undergoing cancer treatment, although it is notable that extant research has tended to overlook homogeneous adolescent populations (Eiser, 1998; Eiser & Vance, 2002; Vannatta & Gerhardt, 2003).

Social Adjustment with Peers

It is not uncommon for many children undergoing treatment for cancer to express concerns or worries about their relationships with peers. Such concerns may be especially salient among children with cancer (La Greca, Bearman, & Moore, 2002; Wolman, Resnick, Harris, & Blum, 1994). The question remains as to whether or not children with cancer experience significant social adjustment or peer relationship problems, and if so, of what type.

In a series of studies, Noll and colleagues utilized the sociometric method and asked both peers and teachers to provide information about the social relationships of children diagnosed with cancer (Noll et al., 1996; Noll et al., 1999; Noll, Bukowski, Davies, Koontz, & Kalkarni, 1993; Noll, Bukowski, Rogosch, LeRoy, & Kulkarni, 1990; Noll, LeRoy, Bukowski, Rogosch, & Kulkarni, 1991). The sociometric method involves the use of peer/teacher nominations or peer/teacher ratings (e.g., Coie & Dodge, 1983;

Coie, Dodge, & Coppotelli, 1982), in order to assess the constructs of social preference and social impact. In the first of these studies, Noll et al. (1990) compared teacher ratings of 24 children with cancer to a classroom comparison control group of children along three dimensions of interpersonal style: sociability-leadership, aggressive-disruptive, and sensitive-isolated. Results indicated that children with cancer were rated as being less sociable and less prone toward leadership, as well as more socially isolated and withdrawn than their healthy counterparts. Notably, only teacher ratings were obtained and no child or parent data were available.

In a subsequent study, Noll and colleagues (1991) compared children with cancer to classroom controls on indices of a) peer- and self- perceptions of sociability, aggression, and social isolation; b) overall popularity; c) mutual friendships; d) feelings of loneliness; and, e) self-concept. Peer report data indicated that the children with cancer were more likely to be perceived by their peers as socially isolated compared to healthy classmates. However, no significant differences between the children with cancer and the comparison control children were found in the areas of popularity, number of mutual friends, loneliness, self-worth, depression, and self-concept. Results of a longitudinal, multi-informant investigation of these variables (Noll et al., 1993) indicated that children with cancer continued to have a social reputation as being more socially isolated, although no significant differences were found on measures of social acceptance or self-reported psychological functioning.

In another investigation, Noll and colleagues (1992) evaluated the social reputations among children with a) brain tumors; b) a malignancy not primarily involving the CNS; and c) sickle cell disease. Analyses comparing the child with a chronic illness

to peers in each class indicated that children with cancer were nominated more often for sociability-leadership roles and less frequently for aggressive-disruptive roles by their teachers. Additionally, brain tumor survivors were nominated more often for sensitive-isolated roles, while children with sickle cell disease were not significantly different from peers.

To further describe psychosocial adjustment among children with cancer, Kullgren and colleagues (2003) conducted a longitudinal investigation of social and behavioral functioning among children with brain tumors at two points (1 to 2 years, and 3 to 4 years post-diagnosis). The authors used the Child Behavior Checklist (CBCL) social competence (Achenbach & Edelbrock, 1983) scale as the primary measure of social functioning; items that load on the social-competence scale include activity in organizations and friendships, and relationships with siblings, peers, and parents. Results indicated that parents rated their children lower than average across areas of social-competence at both time points. Additionally, those children who experienced difficulties with social competence at Time 1 were more likely to experience these same difficulties at Time 2. Thus, the results of this study suggest that initial social competence ratings are important in predicting long-term outcomes; consequently, it may be that early intervention among children having difficulties could be important in reducing long-term social-competence deficits.

Using different methodology, Spirito et al. (1990) evaluated the impact of cancer treatment on peer relations of children previously treated for cancer between the ages of 2-5 years by examining social adjustment, peer relations, and social skills development. Specifically, 56 survivors of childhood cancer between the ages of 5 and 12 years were

compared to a sample of healthy controls on measures assessing self-perception and social skills (i.e., Self-Perception Profile for Children; Harter, 1985; specific items from the Social Competence scale of the Child Behavior Checklist; Achenbach & Edelbrock, 1983). Teacher ratings were also obtained via the Taxonomy of Problem Situations scale (TOPS; Dodge, McClaskey, & Feldman, 1985) and the Deasy-Spinetta Behavioral Questionnaire (DSBQ; Deasy-Spinetta, 1981); parent ratings were obtained from the TOPS parent form, items from the Social Competence scale of the CBCL, and interview questions designed specifically for the study. Results yielded few differences between cancer survivors and healthy children on measures of perceptions of competency, although there was a trend for cancer survivors to report spending more time alone than they desired compared to others of their same age. Teacher reports indicated that cancer survivors were more interested in school and less likely to argue or get teased compared to healthy children. Parent reports were similar to the teachers, although, interestingly, parents did not report that their children spent more time alone than their children desired. Spirito and colleagues (1990) concluded that their findings are largely consistent with other follow-up studies of cancer survivors since successful adjustment is often found in the majority of survivors. However, Spirito et al. stressed the possibility of response bias among teachers and parents, warning against over interpreting the finding that cancer survivors were more likely to be isolated than their healthy counterparts, since significant differences were found on only 2 of 23 questions.

Collectively, these studies suggest that the cancer experience does not necessarily imply a course of negative social adjustment for children with cancer. Instead, it appears that considerable individual variability exists in the adjustment process, and that a small

subset of these children experience consistent difficulties. However, it is also important to emphasize that relatively little is known about the nature of close peer relationships in adolescents diagnosed with cancer. Indeed, existing literature is largely cross-sectional in nature and has relied upon small, combined samples of both children and adolescents. Many of the studies conducted on adolescent survivors are comprised of individuals actually diagnosed in childhood, as opposed to the critical teen years. Additionally, such research has focused almost exclusively on global assessments of social behavior. Although such global ratings by peers, teachers, and cancer survivors themselves have yielded important information, such data fails to capture the complexity of social relationships. It can be argued that research has failed to address the more salient and meaningful types of social relationships, those involving *close and intimate friendships and dating relationships*. Indeed, it may be further argued that it is just those types of relationships that ultimately bear on adjustment and quality of life in later years of survivorship. Thus, examination of adolescents' intimate friendships and romantic relationships, particularly when faced with a diagnosis of cancer, is extremely important.

The Academic Context and Peer Relationships

As indicated earlier, peers play an important role in the social adjustment of children and adolescents with cancer. Indeed, children and adolescents who have undergone treatment for cancer experience a number of acute and long-term consequences related to treatment that may potentially have an impact on relationships with peers. Consequently, returning to the classroom after the diagnosis of cancer is a challenging situation for the child/adolescent, his/her parents, friends, and teachers (Vance & Eiser, 2002), particularly when the child/adolescent is still on treatment.

School absence is a salient issue among children and adolescents with cancer, as a majority of them attend school less regularly than do healthy children or children with other chronic conditions (Adamoli et al., 1997; Deasy-Spinetta & Spinetta, 1980; Mancini et al., 1989). Investigators have reported a significant association between the number of days missed from school and academic skills (Williams, Ochs, Williams, & Mulhern, 1991). Further, academic functioning has been associated with social skills among child and adolescent cancer survivors (Newby, Brown, Pawletko, Gold, & Whitt, 2000). Thus, it seems reasonable to conclude that successful re-integration into school is important in facilitating children and adolescents' academic skills and subsequent educational progress and is also crucial to the establishment of close interpersonal relationships (Vance & Eiser, 2002).

There are a number of factors that are important as children and adolescents re-integrate into the school setting having been diagnosed and undergoing treatment. Notably, the physical sequelae associated with cancer treatment sets some of these children apart from their peers. For example, loosing their hair, puffiness or swelling, using braces or a wheelchair may each contribute to a sense of feeling "different" or not fitting in to a peer group. Such stigmata may also result in classmates pestering or teasing the child who has been ill. Fatigue and pain may also limit the child's ability to successfully engage with peers. Moreover, the child/adolescent with cancer may experience limited opportunities for interaction with peers due to school absences or medical limitations. Another important factor that may make it challenging for children/adolescents, especially those with central nervous system (CNS) involvement, to re-integrate successfully is the degree of cognitive impairment that may be associated

with their illness or associated treatment. Additionally, the child may also be limited or even thwarted from spending much time with peers due to overprotection from parents. Certainly, it appears that factors related to medical sequelae could be important in understanding how children and adolescents with cancer re-integrate into their academic setting.

Although there are relatively few investigations of children's socio-emotional functioning in the school context, a handful of studies have provided evidence that children with cancer are able to successfully manage social relationships as they return to school. Such studies have primarily examined differences in classroom behavior among children with cancer versus healthy comparison control children. In almost every case, no differences emerge between the two groups based on either parent or teacher report for children either on or off treatment (Gartstein, Short, Vannatta, & Noll, 1999; Madan-Swain et al., 1994; Noll et al., 1999). Further, Deasy-Spinetta and Spinetta (1980) found that the children with cancer were not significantly different from their healthy peers in their willingness to attend school, teasing, or the extent to which they demonstrated age-inappropriate behaviors. Two other studies provide largely similar results. Mancini and colleagues (1989) obtained teacher ratings of the school behavior of 91 children with cancer and healthy comparison control children chosen by the teacher to best represent class characteristics. Ratings were made through use of a forced-choice questionnaire that assessed teachers' perceptions of the child's interest in school, degree of learning abilities, and level of social interactions. Results revealed that children with cancer missed school more regularly and had average school behavior scores that were significantly lower than controls. Item analysis indicated that children with cancer had

lower (i.e., less typical) behavior scores on only 12 of 29 items. The investigators concluded that lower attendance on the part of the children with cancer was the biggest obstacle to school performance and they suggested that this may be due to overprotection on the part of physicians and parents. Nonetheless, it is important to note that these conclusions were speculative and these hypotheses deserve further empirical validation.

In another study using the same methodology with a sample of 291 children, Adamoli and colleagues (1997) found that children with cancer differed from healthy classmates in overall school functioning, including areas of learning, socialization (i.e., degree of social participation versus social isolation), and emotionality. However, results also indicated that only a small number of children with cancer were actually demonstrating school-related difficulties. Thus, it appears that both the Mancini (1989) and Adamoli (1997) studies provide further evidence to suggest that children with cancer fare well overall compared to healthy controls, and only a subset of this sample may indeed exhibit school-related difficulties.

Neurocognitive impairments and social adjustment. As mentioned previously, children and adolescents with certain forms of cancer are certainly at increased risk to experience neurocognitive impairments secondary to surgical procedures and treatment for cancer (e.g., CNS therapies for leukemia including radiation chemotherapy). Frequently, these neurocognitive impairments are manifested many years after cessation of treatment.

Cognition can potentially impact skills necessary for social interaction (e.g., recognition of social cues, flexibility in thinking, etc.) and affect the way in which children and adolescents learn and perform in school. For instance, declines in measures

of global intellectual functioning (e.g., IQ scores) have been demonstrated among children treated with radiation therapy, largely due to changes in the frontal cortex of the brain (Armstrong, Blumber, & Toledano, 1999). Other common adverse effects may include slowed processing speed, difficulties with sustained attention, difficulties with visual-motor integration, memory difficulties, as well as some academic problems in math and/or reading (Armstrong & Briery, 2004). Recent evidence also suggests that children treated with radiation therapy to the CNS have reduced volumes of normal white matter and that these deficits can at least partially explain deficits in children's intellectual performance (Mulhern et al., 1999). These findings suggest that the extent to which radiation has destroyed normal white matter plays a role in determining the severity of cognitive deficits among children with cancer.

Certainly, such cognitive impairments may create challenges for these children in their social environment. In a review of 31 studies on the social-emotional adjustment of children with brain tumors, Fuemmeler, Elkin, and Mullins (2002) conclude that cognitive impairments are a primary factor related to poor social adjustment. Such deficits may result in a diminished ability to recognize subtle social cues necessary for successful interactions with peers. In addition, difficulties in attention, problem-solving, and decision-making, along with impulsivity, may lead to ineffective or inappropriate social behavior. Placement in special education classrooms secondary to cognitive deficits (e.g., reading lab, self-contained classrooms) may inadvertently lead to social stigmatization and social isolation.

Taken together, it appears that the combined influence of visible stigmata, time away from the school setting, and neurocognitive impairments result in children and

adolescents with cancer being at heightened risk for difficulties in social adjustment. Currently, it is difficult to determine whether the aforementioned factors directly lead to difficulties in social adjustment, as extant research has only recently begun to evaluate the effects of cancer treatment among children and adolescents re-integrating into the academic setting. Further research is needed to examine how medical sequelae can play a role in successful social re-integration among children, and particularly adolescents, with cancer.

Peer Support and Adjustment Outcomes

Although the cancer experience can negatively affect the child and his/her peer relationships, the potential also exists for peers and friends to provide positive social support, ultimately influencing a variety of adjustment outcomes. Social support is believed to be important in children's adjustment to their illness, functioning as a buffer for stress (Burroughs, Harris, Pontious, & Santiago, 1997; La Greca et al., 1995; La Greca et al., 2002). Notably, few investigators have examined issues of social support in the context of childhood cancer. An early investigation by Kazak and Meadows (1989) examined the role of social support to adjustment outcomes among survivors of childhood cancer. The investigators compared young adolescent (10-15 years old) survivors of cancer to a healthy comparison control group on measures of social support, perceived self-competence, and family adaptability and cohesion at two time points (i.e., September and March of the academic year). Results revealed that scores were generally within normative limits and did not differ significantly between the survivor and comparison groups. However, survivors reported lower levels of perceived social support from family, friends, and teachers at the second assessment compared to earlier

in the year. The investigators speculate that this perception of lower social support may be due to subtle effects of having had cancer, combined with possible parental overprotectiveness and time away from peers.

Varni, Katz, Colegrove, and Dolgin (1994) further studied the role of perceived social support on adjustment among school-aged children who were newly diagnosed with cancer (i.e., 9 months post-diagnosis). Children completed standardized measures of depression, state and trait anxiety, social anxiety, general self-esteem, and perceived social support from classmates, parents, teachers, and friends. Parental reports of internalizing and externalizing behavior problems were also assessed on the Child Behavior Checklist (CBCL-Parent Report Form) (Achenbach & Edelbrock, 1983). Results revealed that perceived classmate social support significantly predicted each of the criterion variables (i.e., depressive symptoms, anxiety) with the exception of general self-esteem. Perceived social support from teachers predicted externalizing behavior problems. Neither perceived social support from parents or friends predicted any criterion variables. Collectively, the results indicate that perceived classmate, parent, and teacher social support were associated with the adjustment criterion variables in the direction of greater support predicting less psychological distress and higher self-esteem. Additionally, perceived classmate social support was identified as the most consistent predictor of adjustment. These data provide evidence for the potential positive effects of the school social environment and suggest that children diagnosed with cancer need continuation of their social and academic activities in order to normalize as much as possible an ongoing stressful experience.

In a later study, Varni and Katz (1997) prospectively examined the effects of perceived stress and social support on negative affectivity in a sample of newly-diagnosed, school-aged children with cancer within one month of diagnosis, 6 months postdiagnosis, and 9 months postdiagnosis. Negative affectivity was calculated by symptoms of depression and anxiety as measured by the Children's Depression Inventory (CDI; Kovacs, 1992) and State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973), respectively. Results revealed that higher perceived social support was predictive of lower negative affectivity at each of the assessment points. The investigators concluded that the pattern of relationships between perceived stress, perceived social support, and negative affectivity changes during the transition from an initial diagnosis of cancer through the subsequent nine months and that it is necessary to evaluate children's adjustment throughout this transitional period.

Consistent with research on other chronic illnesses (La Greca, Bearman, & Moore, 2002; La Greca et al., 1995) it appears that perceived social support is associated with psychological adjustment among children with cancer. Unfortunately, only a small number of investigations in the pediatric psychosocial oncology literature have sought to examine the role of social support to adjustment outcomes. Further, longitudinal research is necessary to specifically examine the social support-adjustment linkage among this population.

Summary

The extant literature suggests that the impact of cancer on a child's social adjustment varies significantly depending upon informant. In other words, depending on who is asked, child, parent, and/or teacher, one may obtain relatively different

perspectives on social adjustment. However, the current literature would suggest that, overall, the cancer experience does not necessarily imply a course of negative social adjustment for all children and/or adolescents with cancer. Instead, it appears that considerable individual variability exists in the adjustment process, and that only a small subset of these children experience consistent difficulties. Currently, it is difficult to determine whether the possibility of visible stigmata, time away from the school setting, and neurocognitive impairments directly lead to difficulties in social adjustment, as extant research has only recently begun to evaluate the effects of cancer treatment among children and adolescents re-integrating into the academic setting. Further research is needed to examine how medical sequelae and social support can play a role in successful social re-integration among children with cancer.

As is also evident from the literature, adolescents, in particular, are often overlooked and grouped together with children, despite the fact that they are at very different stages of the developmental continuum. Adolescents have much more invested in peer relationships and friendships, with increasing levels of intimacy that may set the stage for future adult relationships. Certainly, close peer relationships have the potential to influence adolescents' decisions regarding health-related behavior. Adolescents may feel the need to engage in specific health-related behaviors in order to maintain that sense of closeness and intimacy with their peers. Unfortunately, this need to "fit in" may come at the high cost of engagement in risky health behavior (i.e., drug and alcohol use, unprotected sex). Given the high rates of risky health behavior in the medically healthy population of youth, it is imperative that we understand what is taking place in adolescents' close friendships and dating relationships. This is particularly true when

adolescent relationships are further complicated by a diagnosis such as cancer. Indeed, it can be argued that the study of adolescents who are on treatment for cancer provides an excellent heuristic for evaluating how teens face important transitions in their lives while faced with significant adversity. In the section that follows we will discuss the role that close peer and dating relationships play in adolescents' lives, including a discussion of how such relationships lend themselves to health-related behavior (i.e., alcohol/tobacco use, other drug use, sexual activity, diet, physical inactivity).

Health Related Behavior Among Adolescents with Cancer

Peer relationships and close friendships play extremely important roles in children and adolescents' emotional development, particularly given that children and adolescents spend most of their daytime hours engaged in academic and leisure activities with peers and close friends (La Greca, Bearman, & Moore, 2002). Notably, peer relationships take on special significance when a child or adolescent has a chronic illness, with support from friends often buffering the impact of illness-related stressors. Indeed, youth with chronic medical conditions often express concerns about the social impact of their condition and the possible disruption of friendships (La Greca et al., 2002). Perhaps most concerning, though, is the fact that some children and adolescents may feel the need to forgo treatment recommendations in order to "fit in" with peers. This pressure to "fit in" may be particularly salient among children and adolescents with a chronic illness, who may already feel different and isolated from their peers. Thus, health-related behaviors such as smoking, alcohol and drug use, improper diet, lack of exercise, and risky sexual behavior may be viewed as "easy ways to project desired peer images" (La Greca et al., 2002, p. 274).

A major concern with such health-related behaviors in adolescence is that they represent key risk factors for a multitude of diseases that ultimately contribute to adult mortality, including heart disease, cancer, cerebrovascular disease, and HIV infection (La Greca, Prinstein, & Fetter, 2001). For childhood cancer survivors, health behaviors are even more crucial, given the likelihood of second malignancies associated with their cancer history (Ford & Ostroff, 2006). For example, we know that irradiation, in combination with cytotoxic therapy, has been associated with liver damage; therefore, survivors are urged to limit alcohol consumption (Hollen & Hobbie, 1993). Similarly, survivors treated with cardiopulmonary toxic agents, thoracic radiation therapy, or anthracyclines should abstain from tobacco use, as it may lead to restrictive lung disease and serious pulmonary complications (Shaw, Tweeddale, & Eden, 1989), as well as congestive heart failure and related cardiac problems (Lipshultz et al., 1991). Moreover, survivors are also at increased risk for endocrinologic toxicity, which is known to contribute to an increased incidence of obesity; thus, survivors should engage in regular exercise and good nutritional habits (Odame, Reilly, Gibson, & Donaldson, 1994). Consequently, it stands to reason that adopting a healthy lifestyle by avoiding tobacco use, limiting alcohol use, regularly exercising, and having good nutritional habits is quite imperative for childhood cancer survivors (Ford & Ostroff, 2006).

Research has only recently begun to examine the nature of health-related behaviors among childhood cancer survivors, with most research focusing on health-damaging behaviors (e.g., largely tobacco, but also alcohol and illicit drug use), as opposed to health-protective behaviors (e.g., good dietary practice, regular exercise, and sun protection; Ford & Ostroff, 2006). With regard to tobacco and alcohol use, research

has historically found that cancer survivors often use tobacco and alcohol just as frequently as their healthy peers and siblings (Haupt et al., 1992; Hollen & Hobbie, 1996). However, several recent studies have documented the opposite trend, that is, fewer childhood cancer survivors smoke cigarettes as compared to their healthy peers (Emmons et al., 2002; Larcombe, Mott, & Hunt, 2002; Tercyak, Donze, Prahlad, Mosher, & Shad, 2005) and siblings (Tao et al., 1998). In fact, in an exploratory study designed to assess the current health perceptions and health behaviors of preadolescent and adolescent survivors of childhood cancer, Tyc, Hadley, and Crockett (2001a) found that the prevalence of risky health behaviors, as indicated by alcohol and tobacco use, was less frequent than that in the general population. While cancer survivors are less likely to experiment with smoking, once they start smoking they are at similar risk for becoming persistent smokers as are sibling controls (Tao et al., 1998). Such results are similar to those obtained by Emmons and colleagues (2003) suggesting that over one-half of young adult survivors of childhood cancer who smoke are addicted to nicotine. Collectively, these studies suggest a trend toward increased tobacco use as adolescent cancer survivors reach late adolescence or young adulthood (Ford & Ostroff, 2006; Tao et al., 1998).

Extant data related to alcohol and illicit drug use among childhood cancer survivors is much more limited in comparison to data on tobacco use (Ford & Ostroff, 2006). Nevertheless, investigations have revealed prevalence rates ranging from 8.2% - 84%, with no significant differences between survivors and siblings or matched controls (Larcombe et al., 2002; Verrill, Schafer, Vannatta, & Noll, 2000). Illicit drug use by survivors of childhood cancer also appears to be a low incidence behavior, although only three known studies have examined such use. In the first of such studies, Hollen &

Hobbie (1993) found that 17% of survivors had ever tried marijuana, although none reported being current users. Verrill and colleagues (2000) found that survivors engaged in significantly less drug use over the prior year as compared to controls, with use consisting of one to two times in the preceding year (as opposed to six to nine time for controls). Moreover, Larcombe and colleagues (2002) found that survivors used drugs less than siblings and population controls, with 15% of male survivors and 8% of female survivors engaging in such recreational drug use.

In contrast to the number of investigations conducted on health-damaging behaviors among childhood cancer survivors, there have been even more limited examinations of health-protective behaviors among this cohort. Extant research has documented that childhood cancer survivors engage in healthy habits at low to moderate rates and as frequently as healthy peers (Ford & Ostroff, 2006). Specifically, 40% - 70% of survivors have good dietary habits always or most times (Hudson et al., 2002; Mulhern et al., 1995; Tyc et al., 2001a, 2001b). In addition, 29% - 41% of survivors engage in six hours or more of exercise per week (Mulhern et al., 1995; Tyc et al., 2001a, 2001b), and 52% engage in regular aerobic exercise (Hudson et al., 2002). Such results are in contrast to those of Tercyak and colleagues' (2005), who found that 80% of their sample engaged in adequate physical activity as recommended by the CDC. Notably, a majority (63% - 64%) of survivors engage in recommended sun protection (Hudson et al., 2002; Tercyak et al., 2005).

In the sole known study to evaluate multiple health-related behaviors among childhood cancer survivors, Butterfield and colleagues (2004) sought to describe the prevalence of five behavioral risk factors (i.e., red meat consumption, multivitamin use,

alcohol use, physical activity, health care utilization) among 541 childhood cancer survivors who were identified as smokers and enrolled in a randomized clinical trial of a smoking cessation intervention. Results indicated that 31% of the sample engaged in zero or one health-risk behavior in addition to smoking; 63% engaged in 2 or 3, and 6% engaged in 4 or 5 (Butterfield et al., 2004). The study demonstrated that childhood cancer survivors who smoke have a number of other risk factors for the development of preventable disease, and the presence of these risks was associated with factors that decrease the likelihood of smoking cessation (Butterfield et al., 2004).

Health Behavior Interventions

Similar to the extant research on the prevalence of health-related behaviors among childhood cancer survivors, relatively little is known regarding the efficacy of interventions focused on decreasing health-damaging behaviors and increasing health-protective behaviors among this population (Ford & Ostroff, 2006). Most interventions appear to be based largely on research with the general population (Blalock, DeVellis, & Afifi, 1990) and adult cancer patients (Harari, O'Connor, Fiore, & Kinsella, 1995), which documents that informing individuals about their personal susceptibility to negative health can reduce health-damaging behaviors. Thus, investigations have primarily targeted perceived vulnerability and decision-making in order to effect health behavior change among childhood cancer survivors. A brief review of available research to date in this area is presented below.

In the first of such investigations, Tyc and colleagues (1999) compared the utility of a patient-centered educational and risk-counseling intervention for tobacco-related health hazards with a standard smoking ask-advise approach for 27 preadolescent and

adolescent cancer survivors. The outcome of the study focused on reducing future intentions to use tobacco, and the intervention was delivered in a single session with periodic reinforcement of goals by telephone. A 12-month follow-up indicated that survivors in the intervention group demonstrated an increase in their tobacco knowledge and perceived vulnerability, and a decrease in their future intentions for tobacco use. Unfortunately, results from this study failed to provide useful information regarding health-damaging behavior in survivors, as the investigation focused on future *intentions* to smoke and not *actual tobacco use*.

Extending into line of research into randomized clinical trials, Hudson and colleagues (2002) conducted a longitudinal, controlled trial of a multi-behavioral, risk counseling educational intervention versus standard care for 272 childhood cancer survivors. Standard care was defined as: 1) teaching of breast or testicular self-examination, 2) clinical assessment by physician/nurse practitioner, 3) and late effects screening and counseling. In contrast, the intervention group received standard care, in addition to a single-session intervention with telephone follow-up at 3- and 6-months. All participants were assessed on a number of variables, including health knowledge, perceived susceptibility, perceived benefits and barriers of the health behavior, and several health practices (e.g., tobacco use, sun protection). Results failed to find significant differences pre- to post-intervention on any of the knowledge or psychosocial variables for the intervention group, although female survivors evidenced greater improvement in health knowledge than did their male counterparts. Interestingly, only patients who received training in self-examination demonstrated significant improvement with regard to health behavior change. The investigators speculated that the limited

impact of the intervention may reflect its' short duration and focus and argue for future investigations that are greater in scope and duration.

Recently, Tyc and colleagues (2003) extended their previous research by conducting a randomized controlled trial of tobacco risk counseling for 103 childhood/adolescent cancer survivors. Specifically, they compared standard ask-advise care with a single-session intervention that included an educational video, a physician feedback letter, tobacco-related literature, and 1- and 3-month post-intervention telephone counseling. Results indicated that the intervention was in fact successful at increasing knowledge and perceived vulnerability while decreasing future intentions to use tobacco, with effects strongest at 12-months post-intervention. Despite its success, however, it is notable that the intervention had less of an impact for survivors whose parents smoke, illustrating the importance of the family context in health behavior interventions for this particular age group.

In comparison to research targeting perceived vulnerability for health behavior change, less work has focused on decision-making processes among childhood/adolescent cancer survivors. Based on Katz and Varni's (1993) work with healthy adolescents, it has been demonstrated that although knowledge is a basis for behavioral change, other variables (e.g., decision-making skills) are quite essential. Thus, in the sole known intervention to date incorporating such findings, Hollen and colleagues' (1999) tested a health-promotional program focused on tobacco, alcohol, and illicit drug use on 64 childhood cancer survivors ages 13-21 years old and disease-free for at least five years. The one-day workshop-type intervention consisted of four components, survivorship, decision-making skills, adolescent risk behaviors, and social

support from peers and healthcare professionals. Results revealed a significant effect of the intervention on decision-making at 1- and 12-month follow-up, although not at 6-months. Although results provide support for the utility of decision-making processes in promoting behavior change among cancer survivors, it remains true that the limited duration of the intervention and the lack of a randomized design raise concerns regarding the validity of the findings and warrant further replication and extension.

Summary

Despite the fact that childhood cancer survivors have the potential to live a normal lifespan due to improved medical technology, they continue to be at increased risk for second cancers and other health problems (Boulad, Sands, & Sklar, 1998; de Vathaire et al., 1999; Mertens et al., 2001; Neglia et al., 2001; Schwartz, 1995). Lifestyle factors such as tobacco use, physical inactivity, poor diet, and alcohol use increase the risk of these long-term effects (Butterfield et al., 2004). In fact, an estimated 60-70% of all deaths in the United States are related to lifestyle choices (McGinnis & Foege, 1993). Smoking, in particular, is linked to early mortality and is regarded as the most important risk factor for all of the leading chronic illnesses (USDHHS, 2000). Research also suggests that smokers are more likely than nonsmokers to engage in other risky behaviors (Dallongeville et al., 1998).

It is evident from reviewing the literature on health-related behaviors among childhood cancer survivors that there is considerable need to enhance health behaviors in a number of domains. Although it is true that health-promoting behaviors such as dietary habits are similar between survivors and healthy peers, the level of risk for late effects for surviviors make such percentages suboptimal at best (Ford & Ostroff,

2006). Given that decisions to engage in health-related behaviors are often established during adolescence and persist well into adulthood (La Greca et al., 2002), it becomes imperative to understand what is taking place during the critical time period that is adolescence. We know that adolescence is a developmental period characterized by a desire to "fit in," often at the expense of poor decision-making. Such decisions in adolescence typically involve health-related behaviors such as smoking, drinking, improper diet, lack of exercise, and risky sexual behavior. A critical question then, is the extent to which a diagnosis of cancer affects adolescents' propensity to engage in health-related behavior, as well as their *close friendships and dating relationships.* Examination of adolescents' close friendships and dating relationships is particularly important and unfortunately neglected in extant literature, although it can be argued that it is precisely those types of relationships that ultimately bear on adjustment and quality of life into later stages of survivorship. The current study represents an attempt to fill gaps in the extant literature, and is described in greater detail in the chapter that follows.

CHAPTER III

THE PRESENT STUDY

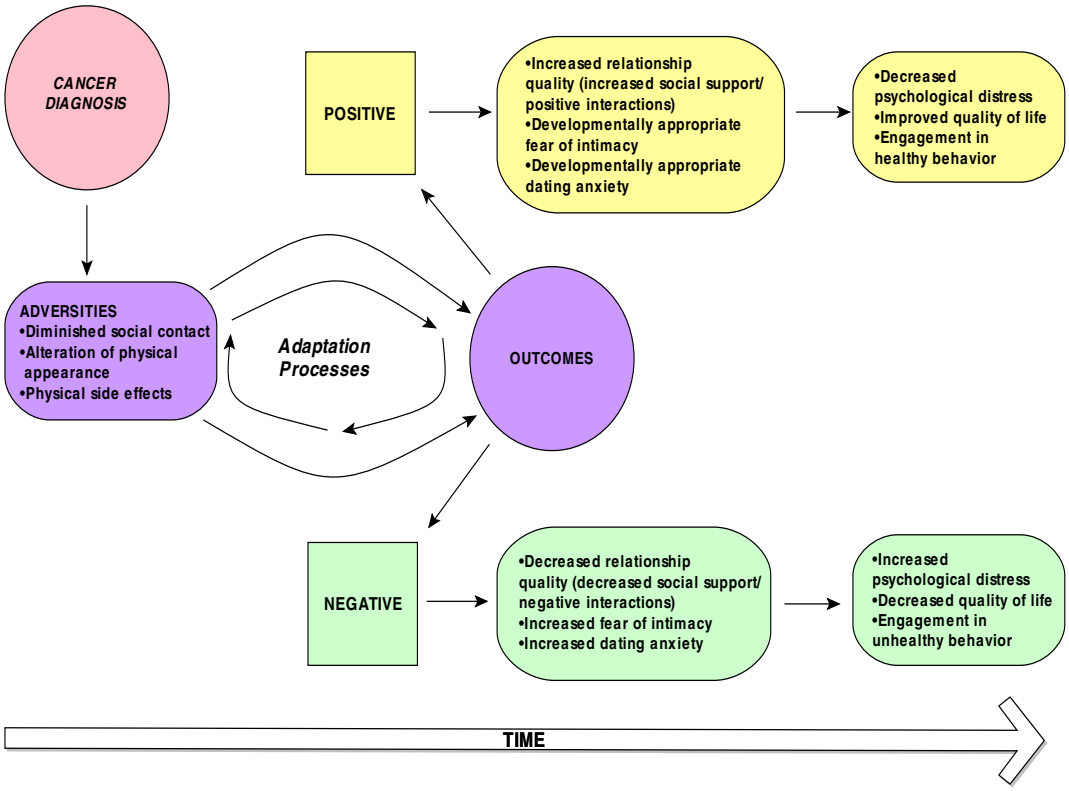
As is evident from the preceding review of the literature, relatively little is currently known about the nature of close peer and dating relationships in adolescents diagnosed with cancer. Many of the studies conducted on adolescent survivors are comprised of individuals actually diagnosed in childhood, as opposed to diagnosis during the critical teen years. In addition, research has focused almost exclusively on *global* assessments of social behavior. It can be argued that research has failed to address the more salient and meaningful types of social relationships, those involving *close* and *intimate* peer and dating relationships. Indeed, it stands to reason that it is just those types of relationships that ultimately bear on adjustment and quality of life in later years of survivorship.

Figure 1 represents our hypothesized model of adolescent adaptation to a diagnosis of cancer (Mullins, Carpentier, & Wolfe-Christensen, 2005). Our model is based, in part, on previous models of children's adaptations to stressful events by Wyman and colleagues (2000) and adaptation to chronic illness by Thompson and Gustafson (1996). Essentially, this model posits that a diagnosis of cancer in adolescence leads to significant adversities, such as diminished opportunities for social contact, altered physical appearance, and physical side effects. These adversities are particularly stressful for adolescents, as they must couple the diagnosis of cancer with the normal

developmental tasks of shaping their own identity and developing intimacy with others, particularly peers (Erikson, 1968). Consequently, the nature of adolescents' adaptation processes determine both short- and long-term outcomes. Successful adaptation leads to positive short-term outcomes in the form of increased relationship quality, including increased social support, positive interactions, and developmentally appropriate levels of dating anxiety and fear of intimacy. These short-term positive outcomes are thought to influence future outcomes, leading to decreased psychological distress, improved quality of life, and engagement in healthy behaviors over time (i.e., good nutrition, appropriate levels of exercise, and abstaining from high-risk behaviors such as smoking and drinking). On the other hand, unsuccessful adaptation leads to negative short-term outcomes in the form of decreased relationship quality, including decreased social support, negative interactions, and increased levels of dating anxiety and fears of intimacy. These short-term negative outcomes are also thought to influence future outcomes, leading to increased psychological distress, decreased quality of life, and engagement in unhealthy behaviors over time (e.g., tobacco, alcohol, and other drug use;

sexual risk-taking; poor nutrition/physical activity).

Figure 1. Model of Adolescent Adaptation to Cancer



Adapted from: 1) Resilience as Cumulative Competence Promotion and Stress Protection: Theory and Intervention. Wyman, Peter A.; Sandler, Irwin; Wolchik, Sharlene; In: Promotion of wellness in children and adolescents. Cicchetti, Dante; Rappaport, Julian; Washington, DC, US: Child Welfare League of America, Inc, 2000. pp. 133-184. 2) Adaptation to Chronic Illness. Thompson, Robert J.; Gustafson, Kathryn E.; Washington, DC, American Psychological Association, 1996.

An equally important question is whether these close peer and dating relationships are related to adolescents' decisions regarding health-related behavior. We know that the majority of adolescents spend considerable time with peers and/or romantic partners, thus it would appear that they are making decisions regarding tobacco, alcohol, and other drug use; sexual risk-taking; nutrition and physical activity; overweight and dietary behavior; and sun safety within the context of such peer and dating relationships. Research has only recently begun to examine prevalence rates of such health-related behaviors among adolescents diagnosed with cancer. Unfortunately, available research has tended to focus almost exclusively on smoking behavior. Thus, a need clearly exists for examination of other health behaviors in addition to smoking (i.e., alcohol and other drug use; sexual

risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety). The purpose of the current study was to address these gaps in the literature by providing an examination of how dimensions of close peer and dating relationships (i.e., social support, negative interactions, dating anxiety, fear of intimacy) among adolescents with cancer correspond with ratings of quality of life, psychological distress, and health-related behaviors. Toward this end, the specific aims of the current study were twofold, and as follows:

Aim 1: Identify how dimensions of adolescents' close peer and dating relationships are related to both adolescent- and parent-rated quality of life and psychological distress.

Hypothesis: Adolescents currently on treatment for cancer who endorse a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, lower levels of dating anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend will be more likely to experience higher quality of life and lower levels of psychological distress, according to both adolescent- and parent-report.

Aim 2: Identify how dimensions of adolescents' close peer and dating relationships are associated with health-related behaviors (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety).

Hypothesis: Adolescents currently on treatment for cancer who endorse a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, lower levels of dating anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend will be more likely to engage in healthy behaviors (e.g., good nutrition, physical activity) and less likely to

engage in risky health behaviors (e.g., tobacco, alcohol, and other drug use; sexual risk-taking).

Taking into account the relative lack of sound empirical data on prevalence rates of health-related behaviors among adolescents with cancer, we also sought to provide an exploratory investigation of the prevalence rates of such health-related behaviors (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety) among adolescents currently on treatment for cancer, including a comparison to United States (US), Oklahoma (OK), Mississippi (MS), and Texas (TX) healthy representative samples. In order to test these hypotheses, adolescents currently on treatment for cancer, along with their parents, were recruited from a total of four pediatric cancer centers in the Southwestern United States. All adolescent participants completed a battery of questionnaires assessing dimensions of their close peer and dating relationships, quality of life, psychological distress, and health-related behaviors. Parents of adolescent participants also completed a separate battery of questionnaires assessing demographic information and adolescent behavior, quality of life, and psychological distress. Each of these instruments and the study's procedure is described in greater detail in the chapter that follows.

CHAPTER IV

METHODOLOGY

Participants

Participants were 39 adolescents with cancer (13 males, 26 females) between the ages of 12 and 19 (M = 15.92, SD = 1.81) and their parents. The majority of adolescents identified themselves as Caucasian (61.5%), followed by African American (17.9%), Native American (7.7%), Biracial (5.1%), Hispanic (2.6%), Asian (2.6%), and Other (2.6%). The modal cancer diagnosis was Acute Lymphoblastic Leukemia (ALL; n = 15 or 38.5%), followed by Ewings sarcoma (n = 5 or 12.8%). Please refer to Table 1 for more detailed descriptive participant information.

Participants were recruited primarily from the Jimmy Everest Cancer Center (JEC), located in the Children's Hospital of Oklahoma at the University of Oklahoma Health Sciences Center in Oklahoma City, Oklahoma. Approximately 41 families were approached regarding participation and 31 families agreed to participate, yielding a 75.6% participation rate. Of these families, 22 completed the study, yielding a 70.9% completion rate. In light of the difficulty encountered in recruiting a viable sample size within a single pediatric oncology center, participants were additionally recruited from the Children's Cancer Clinic of the Blair E. Batson Hospital for Children at the University of Mississippi Medical Center (UMC) in Jackson, Mississippi; the Hematology/Oncology Center at Cook Children's Medical Center in Fort Worth, Texas;

and the Pediatric Hematology/Oncology Clinic of the Children's Hospital at St. Francis, in Tulsa, Oklahoma, in order to maximize rates of participation and as part of efforts to establish a multi-site consortium. Respective participation and completion rates for the additional recruitment sites were 93.8% and 66.7% for the Jackson site, 100.0% and 83.3% for the Fort Worth site, and 100.0% and 100.0% for the Tulsa site.

Inclusion criteria for participation in the study included the following: a) a diagnosis of cancer between the ages of 12 and 19, and b) adolescents did not exhibit any comorbid psychiatric disorders or cognitive deficits (e.g., mental retardation). Exclusion criteria were as follows: a) the adolescent was experiencing an imminent medical crisis necessitating significant medical intervention, or b) the adolescent was determined to be in the terminal phase of cancer and/or was receiving palliative care. The study coordinator, in conjunction with nursing staff, at the pediatric cancer clinics verified the inclusion criteria before eligible participants were contacted. Participants were compensated with a $20.00 gift card to a local department store for their participation in the study.

Instruments

Adolescent-Report Measures

For all adolescent questionnaires, a friend was defined as "a person who you like, to whom you feel close, and with whom you spend time." A romantic partner was defined as "someone you are physically attracted to, have had intimate contact with (e.g., hand holding, kissing, etc.), you consider to be more than a friend, and go out on 'dates' with." Dating was defined as "spending time with someone who you are romantically

interested in and who is also romantically interested in you. It can occur in a small group (e.g., double-date), or with just the two of you."

Dating Questionnaire (DQ; Kuttler & La Greca, 2004). The DQ was developed based on previous dating questionnaires (i.e., Furman, 1994; Kuttler, La Greca, & Prinstein, 1999) and extensive pilot testing (see Appendix B). It was utilized in the current study to gather useful information regarding adolescents dating relationships. Adolescents were asked to describe their *current* level of dating involvement using the following categories: a) not dating now, b) dating or seeing one person casually, c) dating or seeing more than one person casually, d) mostly going out with one person and dating a few others, e) have an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together), f) have a very serious relationship with one person (planning to get engaged, married, or live together), g) engaged or living with someone, or h) married. Adolescents were subsequently categorized based on their level of dating involvement: *not dating* (category a), *casually dating* (categories b-d), or *seriously dating* (categories e-h). Adolescents also indicated which category *usually* describes their dating involvement: a) have never dated, b) rarely date, c) date casually, without an exclusive commitment, or d) involved in an exclusive relationship with someone. Due to the recent development of this measure, psychometric information is virtually nonexistent. However, based on extensive pilot testing by the test developers, it appears that the DQ is a valid and viable categorical measure of dating relationships. For purposes of the current study, the DQ was utilized as a descriptive measure of dating information on adolescents with cancer.

Network of Relationships Inventory—Revised (NRI-R; Furman & Buhrmester, 1985). The NRI-R is an instrument designed to assess 10 factors of relationship quality (see Appendix C). Specifically, the NRI-R measures seven positive aspects of relationship quality (i.e., companionship, instrumental aid, intimacy, nurturance, affection, admiration, and reliable alliance), two negative aspects of relationship quality (i.e., conflict, antagonism), and relative power. Each factor is assessed by responses to three separate items, each rated on a five-point Likert scale where 1 = "little or none" and 5 = "the most." The NRI-R yields a total social support score and a negative interaction score. Adolescents rated the presence of each factor in their relationships with a boy/girlfriend (if applicable), same-sex best friend, and/or opposite-sex friend. If adolescents were dating more than one individual, they were asked to answer the questions in regard to the person they like the best or whom they feel closest to. Previous research has indicated that internal consistencies are high for the positive variables (alpha range = .89 - .92) and adequate for the negative variables (alpha range = .72 - .75). For purposes of the current study, the total social support and negative interaction summary scores were utilized in all analyses. Cronbach's alpha for the positive and negative variables of the NRI-R were .99 and .94, respectively.

Dating Anxiety Scale for Adolescents (DAS-A; Glickman & La Greca, 2004). The DAS-A is a 21-item instrument that assesses concerns about negative evaluations or social avoidance and distress, with a specific focus on adolescent social and dating situations (see Appendix D). Items are rated on a 5-point Likert scale ranging from 1 ("not at all characteristic of me") to 5 ("extremely characteristic of me"). The items load on three subscales, the Fear of Negative Evaluation—Dating subscale, the Social

Distress—Dating subscale, and the Social Distress—Group subscale. Subscales are subsequently summed to create a total score for dating anxiety (DAS-A Total) that can range from 21 to 105, with higher scores indicative of greater dating anxiety. For the purposes of the current study, the DAS-A Total score was utilized in all analyses. Given the fact that the DAS-A is still relatively new, little psychometric information is currently available. However, Glickman and La Greca (2004) offer evidence indicating that the scale as a whole, including its subscales, has high internal consistency (Cronbach's α = .81-.94). Evidence for construct and discriminant validity is also presented. Cronbach's alpha for the DAS-A in the current study was .95.

Fear of Intimacy Scale (FIS; Descutner & Thelen, 1991). The FIS is a 35-item, conceptually-based instrument aimed at assessing intimacy (or fear of intimacy) in a close relationship or at the prospect of a close relationship (see Appendix E). Items for the FIS were based on the definition that the fear of intimacy is the inhibited capacity of an individual to exchange thoughts and feelings of personal significance with another individual who is highly valued (Descutner & Thelen, 1991). The fear-of-intimacy construct takes into account three defining features: (a) content, the actual expression of personal information; (b) emotional valence, strong feelings about the personal material articulated; and (c) vulnerability, high esteem for the intimate other. Items are rated on a 5-point Likert scale ranging from 1 ("not at all characteristic of me") to 5 ("extremely characteristic of me"), and summed to create an overall fear of intimacy summary score. Higher scores on the FIS suggest an increased fear of intimacy. For purposes of the current study, the overall summary score was utilized in all analyses.

Extant research indicates that the FIS is a valid and reliable measure, with high internal consistency (Cronbach's $\alpha = .93$) and test-retest reliability (Cronbach's $\alpha = .89$) estimates. Construct validity has been established by factor analysis and significant correlations. The FIS has been validated for use with adolescents, with one version retaining the original target of a dating partner and another version asking about a close, same-gender friend (Sherman & Thelen, 1996). Results suggest high internal consistency estimates for both modified versions of the FIS, thus suggesting its applicability to adolescents. Cronbach's alpha for the FIS for the current study was .87.

Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI is a 53-item self-report symptom inventory which asks respondents to rate their level of psychological distress during the past seven days on a four-point Likert scale (see Appendix F). The Likert-style ratings range from 0 ("not at all distressed") to 4 ("extremely distressed"). The BSI takes approximately 8 to 10 minutes to complete. It is scored in terms of nine clinical dimensions of psychological distress (e.g., somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism), with t-scores ranging from 30 to 80. The BSI yields three global indices, the Global Severity Index (GSI), the Positive Symptom Total (PST), and the Positive Symptom Distress Index (PSDI). For the purposes of the current study, only the Global Severity Index, or GSI, was utilized as a global index of psychological distress. Caseness criteria was also assessed as a means of characterizing individuals' level of distress. Caseness on the BSI is defined as a GSI score greater than or equal to a T score of 63, or two or more primary clinical scales with a T score $\geq$ 63 (Derogatis, 1993).

Previous research has demonstrated that the BSI correlates highly with the SCL-90-R, as well as possesses high reliability and validity (Derogatis, 1993). Specifically, the BSI has high internal consistency, ranging from .71 to .85, and high test-retest reliability, ranging from .68 to .91. The BSI Global Severity Index, or GSI, has a test-retest reliability coefficient of .90, thereby providing strong evidence that the BSI represents consistent measurement across time (Derogatis, 1993). Cronbach's alpha for the BSI for the current study was .96.

Youth Risk Behavior Survey (YRBS; Centers for Disease Control and Prevention [CDC], 2004). The YRBS is an integral part of a larger, ongoing effort of the CDC's Youth Risk Behavior Surveillance System (YRBSS; see Appendix G). The YRBSS was developed in the late 1980s to: 1) monitor priority health-risk behaviors that contribute substantially to the leading causes of death, disability, and social problems among youth and young adults in the United States; 2) assess whether these behaviors increase, decrease, or stay the same over time; and 3) examine the co-occurrence of health-risk behaviors. The YRBSS includes biennial national, state, and local school-bases surveys of select behaviors of representative samples of students in grades 9-12. The priority health-risk target behaviors include the following: behaviors that contribute to unintentional injuries and violence; tobacco use, alcohol and other drug use; sexual behaviors that contribute to unintended pregnancies and STDs; unhealthy dietary behaviors, and physical inactivity. Given the sensitive nature of some questions posed by the YRBS, a federal Certificate of Confidentiality was obtained through the National Institutes of Health (NIH) in order to further protect participants' confidentiality through the prevention of mandated reporting of illicit behavior (e.g., illicit drug use). For

purposes of the current study, the 2005 National YRBS was utilized. Specific questions of interest in the current study were related to: 1) lifetime and current tobacco, alcohol, and other drug use; 2) sexual risk-taking (e.g., intercourse with four or more partners, using alcohol/drugs or not using a condom or birth control pills prior to last sexual intercourse; 3) nutrition (e.g., fruit/vegetable and milk consumption), physical activity (e.g., meeting currently recommended guidelines, time spent engaged in sedentary behavior), and dietary behavior (e.g., exercising, food restriction, fasting); and 4) sun safety. Notably, the aforementioned questions of interest were chosen based in part to address gaps in the literature related to health-risk behaviors among adolescents with cancer.

The CDC has conducted two test-retest reliability studies of the YRBS questionnaire, one in 1992 and another in 2000. In the former study, the YRBS was administered on two occasions, 2 weeks apart. Results indicated that approximately three-fourths of the items were rated as having a substantial or higher reliability, and no statistically significant differences were observed between prevalence estimates for the first and second YRBS administrations. In the latter study, approximately 1 of 5 items had significantly different prevalence estimates for the first and second administrations, thus suggesting questionable reliability. Such items have been consequently revised or deleted from later versions of the YRBS. Importantly, biennial data from the national, state, and local YRBS is routinely made available through CDC, allowing for comparison of data obtained through the current study with national, normative samples.

Parent-Report Measures

Demographic Questionnaire. Parents were asked to complete a brief demographic questionnaire developed specifically for use in the current study (see Appendix H). The questionnaire assessed such areas as their (parent's) age, their adolescent's age, parental marital status, number of siblings in the home, employment status, annual level of income, distance they are living from their respective cancer treatment center, and whether they are currently seeking counseling or psychotherapy for their teen.

Behavior Assessment System for Children-Parent Rating Scales—2nd edition (BASC-2-PRS; Reynolds & Kamphaus, 2004). The BASC-2 is a multi-method, multi-dimensional approach to evaluating the behavior and self-perceptions of children. It has five components that can be used individually or in any combination. The three core components are Teacher Rating Scales (TRS), Parent Rating Scales (PRS), and Self-Report of Personality (SRP). Additional components include Structured Developmental History (SDH) and Student Observation System (SOS). For purposes of the current study, only the Parent Rating Scale (for rating children ages 12-18) was utilized (see Appendix I).

The BASC-2-PRS measures positive (adaptive) as well as negative (clinical) dimensions of children's behavior and personality. Respondents rate the specified behavior on a scale from 0 ("never") to 3 ("almost always"). Clinical scales include: Aggression, Hyperactivity, Conduct Problems, Anxiety, Depression, Somatization, Attention Problems, Learning Problems, Atypicality, and Withdrawal. Adaptive scales include: Adaptability, Leadership, Social Skills, and Study Skills. The BASC-2-PRS also provides composites, including: Externalizing Problems, Internalizing Problems, School

Problems, Adaptive Skills, and a Behavioral Symptoms Index. The BASC has received extensive attention and use since its introduction and is one of the most widely used approaches to measuring behavior. It has excellent psychometric properties, with internal consistency estimates for the PRS subscales ranging from .70s to .80s, and composite reliability estimates ranging from high .80s to low .90s. Test-retest reliability estimates are also good, ranging from .70 to .90 across both subscale and composite scores. For purposes of the current study, the BASC-2-PRS Behavioral Symptoms Index was utilized as an overall composite of child behavior. Cronbach's alpha for the BASC-2-PRS BSI was .89.

Adolescent- and Parent- Report Measures

Pediatric Quality of Life Inventory (PedsQL 4.0; Varni, Seid, & Kurtin, 2001). The PedsQL 4.0 Measurement Model is a modular approach to measuring health-related quality of life in children and adolescents. The PedsQL 4.0 consists of brief, practical, generic core scales suitable for use with healthy school and community populations, as well as condition-specific modules which complement the generic core scales for use in designated clinical populations. Developmentally appropriate self-report forms are available for children ages 2-4, 5-7, 8-12, and 13-18 years, as are parent proxy-reports of child quality of life. For purposes of the current study, complementary cancer-specific modules (i.e., PedsQL 3.0 Cancer Module, both adolescent self-report and parent proxy-report) were utilized in order to provide greater measurement sensitivity (see Appendices J and K).

The 27-item Cancer Module encompasses 8 scales: Pain and Hurt (2 items), Nausea (5 items), Procedural Anxiety (3 items), Treatment Anxiety (3 items), Worry (3

items), Cognitive Problems (5 items), Perceived Physical Appearance (3 items), and Communication (3 items). Respondents rate how much the given item has been a problem over the past month on a 5-point Likert scale, where 0 = "never" and 4 = "almost always." Items are reverse-scored and linearly transformed to a 0-100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0) such that higher PedsQL scores indicate better health-related quality of life (i.e., fewer problems and/or symptoms). Research on the PedsQL 3.0 Cancer Module has yielded excellent internal consistency estimates, with alphas for self-report ranging from .70 to .89 and alphas for parent proxy-report ranging from .79 to .92. Additionally, the PedsQL measurement system, as a whole, has demonstrated an excellent ability to differentiate health related quality of life outcomes between healthy children versus children with cancer. Cronbach's alpha for the PedsQL Teen and Parent Report was .90 and .94, respectively.

Physician-Report Measure

Severity of Illness Scale (SOIS; Worchel & Rae, 1990). The SOIS is a six-item Likert-format scale that focuses on the medical severity of illness of children with cancer, from the point of view of medical personnel (see Appendix L). It utilizes a 7-point Likert scale in assessing the following areas related to severity of illness: (a) degree of impairment, (b) future outlook, (c) quantity of medical procedures required, (d) number of hospitalizations, (e) ability to participate in activities, and (f) prognosis. Items include: "Describe the degree of impairment for this child," where 1 = independent functioning, requires no assistance, and 7 = requires complete assistance; and "Is it likely that there will be an improvement or worsening of this child's impairment within the next year?,"

where 1 = likely to improve and 7 = likely to worsen. Items are summed to create a single total score, with higher scores indicative of greater impairment.

The SOIS demonstrates good psychometric properties, with acceptable internal consistency, test-retest, and interrater reliability estimates (Young-Saleme & Prevatt, 2001). Cronbach's alpha has been utilized to calculate internal consistency, yielding total alpha scores of .79 for physicians and .80 for nurses. Test-retest reliability coefficients range from .96 and .92 over 2-week and 3-month time periods. Interrater reliability comparing physician ratings to nurse ratings is approximately .89. Importantly, physicians and nurses have rated the SOIS positively for brevity, ease of completion, and utility in depicting medical severity of disease (Young-Saleme & Prevatt, 2001). Cronbach's alpha for the SOIS in the current study was .60.

Other Measures

Once parental consent and adolescent assent were obtained, the following information was gathered through consultation with medical staff: date of diagnosis, length of time since diagnosis, nature and type(s) of treatment modalities employed (i.e., chemotherapy, radiation, surgical procedures), complications secondary to diagnosis and/or treatment, number of outpatient clinic visits in the past year, number of relapses in the past year, number of emergency room visits in the past year, and number of hospitalizations in the past year (see Appendix M).

Procedure

Following initial examination of the patient databases at each respective cancer center, eligible adolescent participants were first identified by the study coordinator. Consultation with the adolescents' attending physicians and nurses was then held in order

to assess adolescents' medical eligibility for the study. During the adolescents' next scheduled visit, eligible adolescent participants and their parents were approached in the clinic by a trained graduate research assistant. The research assistant followed a script (see Appendix N) that provided the eligible adolescent participant and his/her parent(s) with a short description regarding the nature of the study and the nature of their involvement should they choose to participate. Adolescents were explained the nature of the study in developmentally appropriate language. The research assistant also emphasized the fact that their decision to take part in the study would in no way influence their subsequent medical treatment. Eligible adolescent participants and their parents were given the opportunity to review the consent forms and HIPAA guidelines for research participation; they were also encouraged to ask questions regarding the study. Both parental consent and adolescent assent were obtained in conformity with standards of the Institutional Review Boards of each participating institution (see Appendix P), as well as in keeping with ethical standards established by the American Psychological Association.

Once adolescent assent/parent consent was obtained, paper-and-pencil psychological measures were administered to the adolescents and their parents during that same clinic visit in a private location away from the general clinic area. Adolescent participants completed the Dating Questionnaire (DQ; Kuttler & La Greca, 2004), the Network of Relationships Inventory (NRI-R; Furman & Buhrmester, 1985), the Dating Anxiety Scale for Adolescents (DAS-A; Glickman & La Greca, 2004), the Fear of Intimacy Scale (FIS; Sherman & Thelen, 1996), the Brief Symptom Inventory (BSI; Derogatis, 1996), the Youth Risk Behavior Survey (CDC, 2004), and the Pediatric

Quality of Life Questionnaire, Cancer Module, Adolescent Form (PedsQL; Varni, Seid, & Kurtin, 2001), while parent participants completed a Demographic Questionnaire, the Behavior Assessment Scales for Children-Parent Rating Scale-2 (BASC-2-PRS; Reynolds & Kamphaus, 2004), and the Pediatric Quality of Life Questionnaire, Cancer Module, Parent Form (PedsQL; Varni, Seid, & Kurtin, 2001). All questionnaires were presented to adolescent and parent participants in paper-and-pencil format with total time for completion of these measures ranging from 45 minutes to one hour for the adolescents, and 20-30 minutes for their parents. The research assistant was available to answer any questions during this time period. Upon completion of the questionnaires, the family was provided with a $20.00 gift card to a local department store.

CHAPTER V

RESULTS

Overview of Data Analyses

In order to characterize the nature of this sample, descriptive data regarding caseness criteria on the Brief Symptom Inventory (BSI; Derogatis, 1993) and adolescent dating categories on the Dating Questionnaire (DQ; Kuttler & La Greca, 2004) were first computed. Second, bivariate correlations were conducted to identify potential relationships between demographic (i.e., age, gender) and illness variables (i.e., illness duration, illness severity) to the primary variables of interest (i.e., quality of life, psychological distress). Third, a series of bivariate correlations was conducted in order to examine the nature of the relationships between social dimensions of close peer and dating relationships to quality of life, psychological distress, and health-related behavior (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behavior; sun safety behavior) in adolescents with cancer. Notably, one-tailed tests of significance were utilized given that our hypotheses state the anticipated direction of such relationships. Results of post-hoc power analyses revealed that we had approximately 95% power to detect a medium-sized effect (Cohen, 1988), thereby indicating that our sample size was indeed sufficient to accurately assess the variables of interest.

Exploratory analyses were also conducted examining the prevalence rates of health-related behavior, based on adolescent self-report on the 2005 Youth Risk Behavior Survey (YRBS; Centers for Disease Control, 2004), as compared to United States (US), Oklahoma (OK), and Texas (TX) healthy samples (data for the state of Mississippi was unavailable, as it does not currently participate in YRBS data collection efforts). Although it was true that the aggregate US sample consisted of OK and TX subsamples, among other states, it was determined that it would be valuable to glean information on how the current sample compares not only to healthy adolescents in the nation, but also healthy adolescents in the region where they were recruited from. Indeed, it was believed that important regional differences could emerge over the course of this comparison and the gathering of such data was believed to outweigh this confound and subsequent limitation of our results. Notably, although we will be conducting a number of tests, given the preliminary nature of the current work, further adjustment to alpha level is not advisable at this point (Bender & Lange, 1999; Cohen, Cohen, West, & Aiken, 2003). Although it is true that not adjusting alpha may result in a spurious relationship being significant, this is preferable to overlooking an important relationship as the former will be identified in subsequent work, but the latter cannot as it would be forever left out of any further applications.

Preliminary Analyses

Based on their self-report, 13 (33.3%) adolescents with cancer met caseness criteria on the BSI (Derogatis, 1993), which is defined as obtaining a T score greater than or equal to 63 on two or more clinical subscales, or on the Global Severity Index (Derogatis, 1993). With regard to *current* dating status as assessed by the DQ (Kuttler &

La Greca, 2004), the majority of adolescents (n = 23, 59%) reported that they are "not currently dating," followed by 5 adolescents (12.8%) who reported that they are "dating or seeing one person casually," 4 adolescents (10.3%) who reported they have an "exclusive relationship with someone," 4 adolescents (10.3%) who reported that they have a "very serious relationship with one person," 2 adolescents (5.1%) who reported that they are "dating or seeing more than one person casually," and 1 adolescent (2.6%) who reported that they are "mostly going out with one person and dating a few others." Adolescent-report of their *usual* dating status was fairly evenly distributed, with 10 adolescents (25.6%) reporting that they "have never dated," 10 adolescents (25.6%) reporting that they usually "rarely date," 9 adolescents (23.1%) reporting that they usually "date casually, without an exclusive commitment," and 9 adolescents (23.1%) reporting that they usually are "involved in an exclusive relationship with someone." One adolescent failed to report a usual dating status. In terms of their *preferred* dating status, 12 adolescents (30.8%) reported that they would prefer to "not be dating," 12 adolescents (30.8%) reported that they would prefer to "date or see one person casually," 9 adolescents (23.1%) reported that they would prefer to "have an exclusive relationship with someone," 4 adolescents (10.3%) reported that they would prefer to "have a very serious relationship with one person," 1 adolescent (2.6%) reported that they would prefer to "date or see more than one person casually," and 1 adolescent (2.6%) reported that they would prefer to "be engaged or living with someone." Notably, age was not significantly related to current ($r(37) = 0.13$, $p = .45$), usual ($r(36) = 0.30$, $p = .07$), or preferred ($r(37) = 0.19$, $p = .25$) dating status in our sample. Similarly, gender was also not significantly related to current ($\lambda(5, N = 39) = 3.52$, $p = .62$), usual ($\lambda(3, N = 39) =$

2.80, p = .42), or preferred ($\lambda(5, N = 39) = 6.88$, p = .23) dating status in our sample. However, results of a one-way multivariate analysis of variance (MANOVA) revealed a significant difference between Oklahoma City, OK (M = 1718.2, SD = 435.2), Jackson, MS (M = 2062.5, SD = 368.6), Tulsa, OK (M = 2287.5, SD = 229.8), and Fort Worth, TX (M = 1955.0, SD = 393.9) sites on adolescent-report of quality of life ($F(2,30) = 3.91$, p = .03), but not on parent-report of adolescent quality of life ($F(2,30) = 2.82$, p = .08), parent-report of adolescent psychological distress ($F(2,30) = 2.40$, p = .11), or adolescent-report of psychological distress ($F(2,30) = 0.97$, p = .39). Thus, adolescents in Tulsa reported the highest quality of life, followed by adolescents in Jackson, Fort Worth, and Oklahoma City.

With regard to adolescents' best friends' current dating status, a majority of adolescents with cancer (n = 15, 38.5%) reported that their best friend is currently "not dating," followed by 10 adolescents (25.6%) whose best friend currently has "an exclusive relationship with someone," 7 adolescents (17.9%) whose best friend currently is "dating or seeing one person casually," 3 adolescents (7.7%) whose best friend currently is "dating or seeing more than one person casually," 2 adolescents (5.1%) whose best friend is currently "married," 1 adolescent (2.6%) whose best friend is currently "mostly going out with one person and dating a few others," and 1 adolescent (2.6%) whose best friend is currently "engaged or living with someone."

Bivariate correlations were then conducted to identify potential relationships between demographic (i.e., age) and illness variables (i.e., illness duration, illness severity) to the primary dependent variables of interest (i.e., quality of life, psychological

distress). Results revealed that none of the demographic or illness variables were significantly related to the primary variables of interest, all *p*'s > .05 (see Table 2).

Primary Analyses

Hypothesis 1. It was anticipated that adolescents currently on treatment for cancer who endorsed a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, lower levels of dating anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend would be more likely to experience higher quality of life and lower levels of psychological distress, according to both adolescent- and parent-report. To examine this hypothesis, bivariate correlations between the variables of interest were conducted (see Table 3). Results indicated that adolescents' perceived social support from boy/girlfriends was significantly associated with their self-report of quality of life ($r(30) = .35$, $p = .03$), adolescents' negative interactions with same-sex friends were significantly associated with their self-report of psychological distress ($r(33) = .33$, $p = .03$), and adolescents' dating anxiety was significantly related to their self-report of psychological distress ($r(34) = .51$, $p = .001$). No other significant relationships emerged among the variables of interest, all *p*'s > .05. Thus, the current results indicate that close peer and dating relationships are, in fact, positively related to adolescent quality of life and psychological distress outcomes. These same relationships were not found, however, for parent-report of adolescent outcomes.

Hypothesis 2. It was anticipated that adolescents currently on treatment for cancer who endorsed a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, lower levels of dating

anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend would be more likely to engage in healthy behaviors (e.g., good nutrition, physical activity) and less likely to engage in risky health behaviors (e.g., tobacco, alcohol, and other drug use; sexual risk-taking). To examine this hypothesis, bivariate correlations between the variables of interest were conducted (see Tables 4 – 8). Results indicated that adolescents' negative interactions with their boy/girlfriends were significantly associated with their self-report of current cigarette use ($r(30) = .40$, $p = .01$) and using condoms at their last sexual experience ($r(30) = -.42$, $p = .008$). Such results suggest that, when faced with conflict in dating relationships, adolescents with cancer may potentially engage in risky behavior such as tobacco, alcohol, and other drug use, as well as unprotected sexual intercourse. Adolescents' dating anxiety was also significantly related to their self-report of current cigarette use ($r(36) = -.29$, $p = .04$), which suggests that, when anxious regarding dating, adolescents with cancer may not necessarily utilize risky behaviors. Finally, adolescents' fear of intimacy was significantly related to both condom use ($r(37) = -.40$, $p = .006$) and birth control use ($r(37) = -.39$, $p = .007$) prior to their last sexual experience. Such results suggest that with increasing levels of fear of intimacy, the likelihood of engaging in risky sexual behavior (i.e., unprotected sexual intercourse) also increases. Importantly, this result is based on a small subset of adolescents (given that the majority of them have yet to engage in lifetime sexual intercourse).

Specific to nutrition/physical activity and overweight/dietary behavior domains, results indicated that adolescents' fear of intimacy was significantly related to meeting currently recommended levels of physical activity ($r(37) = -.27$, $p = .048$) and watching

television three or more hours per day ($r(36) = -.50$, $p = .001$). Thus, it appears that, once again, with increasing fear of intimacy, rates of engagement in recommended physical activities are reduced. Social support from boy/girlfriends and other-sex friends was significantly associated with adolescents describing themselves as slightly or very overweight ($r(30) = -.49$, $p = .002$; $r(34) = -.38$, $p = .011$), respectively. In other words, the more supported that adolescents with cancer feel in their close peer and dating relationships, the more likely that they are to express satisfaction with other aspects of their lives, including their looks. Adolescents' negative interactions with other-sex friends were significantly associated with watching television ($r(33) = .30$, $p = .04$) and playing video/computer games ($r(33) = .36$, $p = .02$) three or more hours per day. Similarly, negative interactions with both same-sex and other-sex friends was significantly associated with adolescents describing themselves as slightly or very overweight ($r(35) = -.32$, $p = .03$; $r(34) = -.45$, $p = .003$), respectively. Such results suggest that when adolescents with cancer are involved in conflict with their peers, they demonstrate an increased tendency to internalize such conflict or retreat from such situations and instead focus on more sedentary behaviors such as watching television or playing games. Moreover, dating anxiety was significantly related to adolescents describing themselves of slightly or very overweight ($r(36) = .45$, $p = .002$). Thus, it appears that anxiety about dating situations has the potential to lead into more generalized anxiety, such as anxiety regarding one's looks or weight. No significant relationships emerged among the social and sun safety variables of interest, all p's $> .05$, suggesting that, among the current sample, social dimensions of close peer and dating

relationships are not significantly associated with sun safety behavior among adolescents with cancer.

Exploratory Analyses

Taking into account the relative lack of empirical data on prevalence rates of health-related behaviors among adolescents with cancer, we also sought to provide an exploratory investigation of the prevalence rates of such health-related behaviors (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety) among adolescents currently on treatment for cancer, including a comparison to United States (US), Oklahoma (OK), and Texas (TX) healthy samples (see Table 9). As mentioned earlier, data for the state of Mississippi is unavailable, as it does not currently participate in YRBS data collection efforts.

Results of frequency analyses indicated that 35.9% (n = 14) of adolescents with cancer have ever tried cigarette smoking, even one or two puffs (as compared to 54.3% of US adolescents, 62.3% of OK adolescents, and 58.5% of TX adolescents), with significant differences observed between adolescents with cancer and healthy US (χ = 5.31, $p < .05$), OK (χ = 11.23, $p < .01$), and TX (χ = 8.12, $p < .01$) adolescents on lifetime cigarette use. In addition, 15.4% (n = 6) of adolescents with cancer have ever smoked cigarettes daily (as compared 13.4% of US adolescents, 17.8% of OK adolescents, and 11.5% of TX adolescents), although no significant differences emerged between groups (all p's > .05). Currently, 5.2% (n = 2) of adolescents with cancer reported smoking at least one cigarette (as compared to 23% of US adolescents, 28.6% of OK adolescents, and 24.2% of TX adolescents), with significant differences observed

between adolescents with cancer and healthy US ($\chi = 7.03$, $p < .01$), OK ($\chi = 10.38$, $p < .01$), and TX ($\chi = 7.69$, $p < .01$) adolescents. No adolescents with cancer (n = 0) reported smoking at least one cigar (as compared to 14% of US adolescents, 16.2% of OK adolescents, and 7.6% of TX adolescents), which yielded significant differences between the adolescents with cancer and healthy US ($\chi = 6.34$, $p < .05$), OK ($\chi = 7.51$, $p < .05$), and TX adolescents ($\chi = 8.03$, $p < .01$). Approximately 2.6% (n = 1) of adolescents with cancer reported using chewing tobacco, snuff, or dip (as compared to 8% of US adolescents, 11% of OK adolescents, and 17.1% of TX adolescents) at least once over the past 30 days, with no significant differences emerging between groups (all p's > .05). Specific to alcohol use, 48.7% (n = 19) of adolescents with cancer have ever had at least one drink of alcohol, which was significantly different than lifetime alcohol use among healthy US (74.3%; $\chi = 13.30$, $p < .001$), OK (76.5%; $\chi = 16.08$, $p < .001$), and TX (80.2%; $\chi = 23.83$, $p < .001$) adolescents. Currently, 5.2% (n = 2) of adolescents with cancer report having had at least one drink of alcohol at least once over the past 30 days (as compared to 43.3% of US adolescents, 40.5% of OK adolescents, and 47.3% of TX adolescents), with significant differences observed between adolescents with cancer and healthy US ($\chi = 23.09$, $p < .001$), OK ($\chi = 19.95$, $p < .001$), and TX ($\chi = 27.58$, $p < .001$) adolescents. Moreover, 2.6% (n = 1) of adolescents with cancer reported having 5 or more drinks of alcohol in a row at least once over the past 30 days, which differed significantly from episodic heavy drinking rates among US (25.5%; $\chi = 10.79$, $p < .01$), OK (26.6%; $\chi = 11.42$, $p < .001$), and TX (29.6%; $\chi = 13.61$, $p < .001$) adolescents. Overall, adolescents with cancer demonstrate lower rates of tobacco and alcohol use, both

lifetime and currently, as compared to their healthy counterparts, with a number of these differences emerging within the statistically significant range.

Related to other drug use, 17.9% (n = 7) of adolescents with cancer reported ever using marijuana (as compared to 38.4% of US adolescents, 39.3% of OK adolescents, and 42.2% of TX adolescents), with significant differences observed between adolescents with cancer and healthy US ($\chi = 6.88$, $p < .01$), OK ($\chi = 7.32$, $p < .01$), and TX ($\chi = 9.33$, $p < .01$) adolescents on lifetime marijuana use. Approximately 2.6% (n = 1) of adolescents with cancer reported currently using marijuana at least once over the past 30 days, which was significantly different than current marijuana use among healthy US (20.2%; $\chi = 7.52$, $p < .01$), OK (18.7%; $\chi = 6.64$, $p < .01$), and TX (21.7%; $\chi = 8.37$, $p < .01$) adolescents. Similarly, 0% (n = 0) of adolescents with cancer reported ever using any form of cocaine, including powder, crack, or freebase, which differed significantly from lifetime cocaine use among healthy TX (11.9%; $\chi = 5.26$, $p < .05$), but not US (7.6%) and OK (8.7%) adolescents (both p's > .05). In terms of current cocaine use, 0% (n = 0) of adolescents with cancer reported using any form of cocaine at least once over the past 30 days (as compared to 3.4% of US adolescents, 2.6% of OK adolescents, and 5.5% of TX adolescents), with no significant differences observed between groups (all p's > .05). Regarding lifetime use of other drugs, 2.6% (n = 1) of adolescents with cancer reported ever using inhalants (as compared to 12.4% of US adolescents, 12% of OK adolescents, and 13.2% of TX adolescents), 0% (n = 0) reported ever using heroin (as compared to 2.4% of US adolescents, 2.1% of OK adolescents, 3.0% of TX adolescents), 2.6% (n = 1) reported ever using methamphetamines (as compared to 6.2% of US adolescents, 7.1% of OK adolescents, 7.3% of TX adolescents), 2.6% (n = 1) reported

ever using ecstasy (as compared to 6.3% of US adolescents, 6.7% of OK adolescents, and 8.2% of TX adolescents), and 2.6% (n = 1) reported ever using hallucinogenic drugs (as compared to 8.5% of US adolescents—no OK or TX state data available). No significant differences were observed between adolescents with cancer and healthy US, OK, and TX adolescents on lifetime inhalant, heroin, methamphetamine, ecstasy, and hallucinogenic drug use, all *p*'s > .05. Collectively, adolescents with cancer demonstrate lower rates of lifetime and current drug use as compared to their healthy peers, although most of these differences do not differ statistically, as is the case with tobacco and alcohol use.

Among adolescents with cancer, 30.8% (n = 12) have had sexual intercourse, which differed significantly from 46.8% of US healthy adolescents ($\chi = 4.01$, $p < .05$), 49.3% of OK healthy adolescents ($\chi = 5.22$, $p < .05$), and 52.5% of TX healthy adolescents ($\chi = 7.31$, $p < .01$). Such results indicate that a majority of adolescents with cancer have refrained from sexual intercourse to date. Even when adolescents have chosen to engage in sexual intercourse, none (n = 0) reported having had sexual intercourse prior to the age of 13 (as compared to 6.2% of US adolescents, 6.5% of OK adolescents, and 7.4% of TX adolescents), with no significant differences observed between groups (all *p*'s > .05). Approximately 7.7% (n = 3) of adolescents with cancer have had sexual intercourse with 4 or more partners, which was not significantly different than 14.3% of US healthy adolescents, 17.8% of OK healthy adolescents, and 16.3% of TX healthy adolescents (all *p*'s > .05). Thus, it appears that only a small subset of adolescents with cancer are engaging in risky sexual behavior (e.g., multiple partners). Nevertheless, 15.4% (n = 6) of adolescents with cancer reported being currently sexually active, which was significantly different than 33.9% of US healthy adolescents ($\chi = 5.95$,

$p < .05$), 36.3% of OK healthy adolescents ($\chi = 7.27$, $p < .01$), and 37.6% of TX healthy adolescents ($\chi = 8.15$, $p < .01$).

None (n = 0) of the adolescents with cancer used alcohol or drugs prior to having sexual intercourse the last time, which was also significantly different than prevalence rates for healthy US (23.3%; $\chi = 11.84$, $p < .001$), OK (22.4%; $\chi = 11.18$, $p < .001$), and TX (22.7%; $\chi = 11.43$, $p < .001$) adolescents. These results indicate that adolescents with cancer are making good decisions regarding alcohol and drug use in the context of their sexual experiences. Approximately 33.3% (n = 4) of adolescents with cancer (or their partners) used birth control pills the last time they had sexual intercourse, which was not significantly different than 17.6% of US healthy adolescents and 16.4% of OK healthy adolescents (both p's > .05). However, such results did differ significantly from 13.0% of TX healthy adolescents ($\chi = 4.36$, $p < .05$). Such results highlight that adolescents with cancer (or their partners) appear to utilize birth control at a greater frequency than that documented in their healthy peers, although a majority (approximately 66.6%) are still not utilizing birth control pills to reduce their risk for unintended pregnancies. Similarly, 41.7% (n = 5) of adolescents with cancer (or their partners) used a condom the last time they had sexual intercourse, which did not differ significantly from 62.8% of US healthy adolescents ($\chi = 2.29$, $p > .05$), 61.7% of OK healthy adolescents ($\chi = 2.02$, $p > .05$), and 60.7% of TX healthy adolescents ($\chi = 1.82$, $p > .05$). Although not statistically different from condom behavior among healthy peers, such results remain concerning nonetheless and suggest that adolescents with cancer are not engaging in appropriate planned behaviors and are placing themselves at heightened risk for the transmission of sexually transmitted diseases (STDs) and/or pregnancy.

Specific to nutrition and physical activity, 10.3% (n = 4) of adolescents with cancer currently eat at least five servings of fruits and vegetables a day, which was not significantly different than 20.1% of US healthy adolescents, 15.9% of OK healthy adolescents, and 19.4% of TX healthy adolescents (all p's > .05). Although not significantly different than their healthy counterparts, such results suggest that adolescents with cancer are engaging in suboptimal levels of fruit and vegetable consumption. However, 43.6% (n = 17) of adolescents with cancer reported drinking at least three glasses of milk a day, which did differ significantly than milk consumption among healthy US (16.2%; $\chi = 21.40$, $p < .001$), OK (14.5%; $\chi = 25.05$, $p < .001$), and TX (12.2%; $\chi = 34.80$, $p < .001$) adolescents, and in the preferred direction. Approximately 17.9% (n = 7) of adolescents with cancer meet currently recommended levels of physical activity (i.e., at least 60 minutes a day for at least 5 days a week), which is in contrast to 35.8% of US healthy adolescents ($\chi = 5.39$, $p < .05$), 38.2% of OK healthy adolescents ($\chi = 6.65$, $p < .01$), and 36.0% of TX healthy adolescents ($\chi = 5.48$, $p < .05$). Thus, once again it appears that adolescents with cancer are engaging in suboptimal levels of physical activity and even lag behind the levels of physical activity reported by their healthy peers. Approximately 30.8% (n = 12) of adolescents with cancer play video or computer games, which did not differ significantly from 21.1% of healthy US adolescents ($p > .05$)—no state data available for OK and TX. Approximately 53.8% (n = 21) of adolescents with cancer reported watching television at least 3 hours a day, which differed significantly from 37.2% of US healthy adolescents ($\chi = 4.61$, $p < .05$), but not healthy OK (38.8%) or TX (40.5%) adolescents (both p's > .05). Moreover, 15.4% (n = 6) of adolescents with cancer reported attending physical

education (PE) classes daily, which did differ significantly than PE attendance among healthy US (33%; $\chi = 5.46$, $p < .05$), OK (31.3%; $\chi = 4.53$, $p < .05$), and TX (35.7%; $\chi = 6.96$, $p < .01$) adolescents. Similarly, 20.5% (n = 8) of adolescents with cancer reported exercising or playing sports for at least 20 minutes of their PE class, which was in contrast to 84% of US healthy adolescents ($\chi = 115.58$, $p < .001$), 91.6% of OK healthy adolescents ($\chi = 214.57$, $p < .001$), and 84.6% of TX healthy adolescents ($\chi = 118.07$, $p < .001$). Thus, these results suggest that roughly a third to a half of adolescents with cancer are engaging in sedentary behavior and to an extent that is greater than that of healthy peers in the general US population.

Concerning weight and dietary behavior, 28.2% (n = 11) of adolescents with cancer described themselves as "slightly" or "very" overweight, which did not differ significantly than 31.5% of US adolescents, 30.9% of OK adolescents, and 29.1% of TX adolescents (all p's > .05). Although not significantly different than perceptions of their healthy peers, the current results suggest that more than a quarter of adolescents with cancer are truly overweight (and should be engaging in less sedentary behavior), or perceive themselves as being overweight due to a negative body image. In order to lose weight or keep from gaining weight, 25.6% (n = 10) reported exercising, which was significantly different than 60% of US healthy adolescents ($\chi = 19.11$, $p < .001$), 58.8% of OK healthy adolescents ($\chi = 17.19$, $p < .001$), and 61.9% of TX healthy adolescents ($\chi = 21.45$, $p < .001$). Similarly, to lose weight, 23.1% (n = 9) of adolescents with cancer reported eating less food, fewer calories, or foods low in fat, which differed significantly from caloric/fat restriction among healthy US (40.7%; $\chi = 5.01$, $p < .05$), OK (41.2%; $\chi = 5.20$, $p < .05$), and TX (37.3%; $\chi = 3.34$, $p < .05$) adolescents. No adolescents with

cancer (n = 0) reported going without eating for 24 hours or more, or fasting, which also was significantly different than 12.3% of US healthy adolescents ($\chi = 5.47$, $p < .05$), 11.8% of OK healthy adolescents ($\chi = 5.19$, $p < .05$), and 11.6% of TX healthy adolescents ($\chi = 5.11$, $p < .05$). No adolescents with cancer (n = 0) reported taking diet pills, powders, or liquids without a doctor's advice (as compared to 6.3% of US adolescents, 7.2% of OK adolescents, and 8.2% of TX adolescents), and 0% (n = 0) reported vomiting or taking laxatives (as compared to 4.5% of US adolescents, 4% of OK adolescents, and 5.4% of TX adolescents). No significant differences emerged between groups on use of pills/powders/liquids or vomiting/laxative use to lose weight, all p's > .05. Collectively, the current results suggest that adolescents with cancer tend to engage in more appropriate methods to lose weight (e.g., exercise, caloric/fat restriction), as opposed to health-damaging behaviors (e.g., fasting, taking diet pills/powders/liquids, vomiting, laxative abuse).

Finally, regarding sun safety, 10.3% (n = 4) of adolescents with cancer reported that, when outside for more than one hour on a sunny day, they wear sunscreen with an SPF of 15 or higher at least most of the time (as compared to 9% of US adolescents—no OK and TX state data available). Similarly, when outside for more than one hour on a sunny day, 28.2% (n = 11) of adolescents with cancer reported that they stay in the shade, wear long pants, wear a long-sleeved shirt, or wear a hat that shades their face, ears, and neck (as compared to 18.2% of US adolescents—no OK and TX state data available). No significant differences emerged between groups on use of sunscreen or shade/cover-ups, all p's > .05. Thus, the current results suggest that adolescents with cancer engage in

greater use of sunscreen and shade/cover-ups when outside, although clearly still at suboptimal levels given their risk of second malignancies.

CHAPTER VI

DISCUSSION

The current study was designed to address gaps in the extant literature by providing an examination of how dimensions of close peer and dating relationships (i.e., social support, negative interactions, dating anxiety, fear of intimacy) among adolescents with cancer correspond with ratings of quality of life, psychological distress, and health-related behaviors (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety). It was hypothesized that adolescents currently on treatment for cancer who endorsed a higher quality of close peer and dating relationships (i.e., higher levels of social support, lower levels of negative interactions, age-appropriate levels of dating anxiety and fear of intimacy) with their boy/girlfriend, same-sex friend, and/or other-sex friend would be more likely to: 1) experience higher quality of life and lower levels of psychological distress, according to both adolescent- and parent-report; and 2) engage in healthy behaviors (e.g., good nutrition, physical activity) and less likely to engage in risky health behaviors (e.g., smoking, drinking, and other drug use; unprotected sex).

Consistent with the first hypothesis, result revealed that adolescents' perceived social support from their boy/girlfriends was significantly associated with their self-report of quality of life. Specifically, higher levels of social support from romantic partners was significantly associated with adolescent-report of higher quality of life (but not parent-

report). Similarly, it was found that lower levels of negative interactions with same-sex friends was significantly associated with adolescent-report of lower levels of psychological distress (but not parent-report). Moreover, lower levels of dating anxiety were significantly related to adolescent-report of lower levels of psychological distress (but not parent-report).

Interestingly, dimensions of close peer and dating relationships were not significantly related to parent-report of adolescent quality of life and psychological distress. Although somewhat unexpected, the results are indeed consistent with a number of studies illustrating discrepancies between child/adolescent- and parent-report of child/adolescent functioning across a number of domains, including psychological functioning (Parsons, Barlow, Levy, Supran, & Kaplan, 1999; Vance, Morse, Jenney, & Eiser, 2001), school functioning (Sawyer, Antoniou, Toogood, & Rice, 1999), and health-related quality of life (Parsons et al., 1999; Vance et al., 2001). However, it may simply be the case that quality of life outcomes among adolescents with cancer do vary based upon reporter, as has been previously documented in the literature (Fuemmeler, Mullins, & Carpentier, 2006), thus accounting for some of the discrepancy in findings across studies.

The findings based on our first hypothesis support the relatively small body of literature which indicates that social support from peers is indeed important in children/adolescent's adjustment to chronic illness, often functioning as a buffer for stress (Burroughs et al., 1997; La Greca et al., 1995, 2002). In this regard, early work by Wallander and Varni (1989) found that children with a number of chronic conditions who reported high levels of both family and friend support exhibited lower levels of behavior

problems than children with support from only one source. Subsequent work by Varni and colleagues (1994) found that, among children with cancer, higher perceived classmate support predicted fewer symptoms of depression and anxiety and lower levels of internalizing and externalizing behavior problems. Moreover, La Greca and colleagues (1995) documented differences in the type of support provided by friends versus family members and found that friends tend to provide companionship and emotional support for adolescents' management of diabetes whereas family members tend to provide instrumental support.

Our findings that negative interactions with same-sex friends and dating anxiety were significantly associated with adolescent-report of psychological distress are also consistent with an emerging body of literature examining the influence of discrete aspects of social functioning (e.g., positive and negative interactions, dating anxiety) on adolescent adjustment outcomes. For example, research with healthy adolescents has found that dating anxiety is significantly associated with peer-related anxiety and depressive symptoms and is a significant predictor of adolescents' current and usual dating status, even when controlling for peer-related social anxiety (Glickman & La Greca, 2004). Similarly, research by Kuttler and La Greca (2004) has demonstrated that: 1) dating among healthy adolescents is associated with more positive and less negative interactions with best friends, and 2) romantic relationships have more negative interactions than best friendships. However, it is important to note that the scarce research in this area is currently limited to work with healthy adolescents. Thus, our results extend this small body of literature by extrapolating such work on discrete aspects of social dimensions in peer and dating relationships to adolescents faced with a life-

threatening chronic illness such as cancer. Indeed, our results should be considered exploratory in nature and future studies would benefit from further investigation of the role of such social dimensions in predicting quality of life and distress outcomes among adolescents with cancer.

Results provided mixed support for the second hypothesis. For example, support was found for the fact that lower levels of negative interactions with romantic partners was significantly associated with adolescent-report of less risky health-behaviors, including decreased current cigarette use and increased use of condoms prior to sexual intercourse. In addition, results indicated that higher levels of social support from romantic partners, same-sex friends, and other sex-friends was significantly related to adolescents' not describing themselves as slightly or very overweight. Lower levels of negative interactions with other-sex friends were also significantly associated with decreased television-watching and playing of video/computer games. Increased dating anxiety was significantly related to adolescents' increased tendency to describe themselves as slightly or very overweight, while increased fear of intimacy among adolescents with cancer was significantly associated with adolescents' decreased use of condoms and birth control pills prior to their last sexual experience and adolescents' not meeting currently recommended levels of physical activity. Thus, such results suggest that positive aspects of peer and dating relationships among adolescents with cancer, as defined by increased social support and decreased negative interactions, are associated with a decrease in health-damaging behaviors such as smoking and unprotected sexual intercourse. In contrast, greater anxiety and fear of intimacy is related to a tendency for adolescents with cancer to engage in risky behavior, such as decreased use of condoms

and birth controls pills prior to intercourse or increased engagement in sedentary behavior.

Understanding how peers and romantic partners influence the health-related behaviors of adolescents with chronic illnesses is extremely important; unfortunately, investigations in this area are also scarce and tend to focus largely on nonchronically ill populations (La Greca et al., 2002). Based on available research, however, we know that adolescents' health-risk behaviors are influenced by the behaviors of their close friends and the larger peer group (La Greca et al., 2001; Prinstein, Boergers, & Spirito, 2001; Tolson & Urberg, 1993), although this similarity in health-risk behaviors may result from bidirectional influences. Based on the concept of homophily (Kandel, 1978), adolescents choose to associate with similar peers via mutual selection (selection process) and these peers encourage and reinforce similar attitudes and behaviors (socialization process). Such literature is consistent with our results suggesting that increased social support and decreased negative interactions with peers and romantic partners are related to a decrease in health-risk behaviors such as cigarette use, unprotected sexual intercourse, and sedentary behavior (e.g., watching television or playing video/computer games for three or more hours a day). Moreover, the finding that dating anxiety and fear of intimacy were significantly related to adolescents' tendency to describe themselves as slightly or very overweight and not meeting currently recommended levels of physical activity was as expected, and highlights a fruitful area of future investigation into such discrete constructs of social relationships and their relationship to health-related behaviors in adolescents currently on treatment for cancer.

Certain unexpected findings also emerged within the context of our second hypothesis. For instance, results indicated that lower levels of negative interactions with both same-sex and other-sex friends were significantly related to adolescents increasingly describing themselves as slightly or very overweight. Although counterintuitive, such results possibly make sense in light of peer socialization processes. Specifically, adolescents with cancer may be more likely to describe themselves as overweight if they perceive their friends as engaging in or supporting this behavior (Romer et al., 1994). On some level, then, adolescents with cancer are faced with covert coercion (particularly when involved in relationships that are quite supportive and devoid of negativity) to perceive themselves in a specific manner (i.e., overweight), ultimately to meet the goal of fitting in with the respective peer group.

Taking into account the relative lack of empirical data on prevalence rates of health-related behaviors among adolescents with cancer (available research tends to focus only on cancer *survivors*), the current study also sought to provide an exploratory investigation of the prevalence rates of such health-related behaviors among a single cohort of *adolescents currently on treatment for cancer*, including a comparison to United States (US) healthy representative adolescent samples, as well as healthy adolescents in the states for which adolescents with cancer were recruited from (i.e., Oklahoma, Mississippi, and Texas), although it is notable that state data from Mississippi was unavailable given its nonparticipation in YRBS data collection efforts.

Interpreting our findings within the context of existing literature on tobacco use among childhood cancer survivors is difficult due to limited research in the area, as well as discrepant findings. For example, early research suggested that childhood cancer

survivors engaged in tobacco use at similar rates to siblings or to the general population (Corkery, et al., 1979; Hollen & Hobbie, 1996; Troyer & Holmes, 1988). More recently, research has documented that childhood cancer survivors smoke less than their siblings (Tao et al., 1998) and the general population (Emmons et al., 2002; Tercyak et al., 2004, 2005; Tyc et al., 2001a, 2001b), with prevalence rates of tobacco use in this group ranging from 8.2% - 28.5%. Thus, our current prevalence rates of tobacco use (5.2% for cigarette use and 2.6% for smokeless tobacco) among adolescents currently on treatment for cancer are consistent with more recent literature, albeit on the lower end of the range.

Related to current alcohol use among childhood cancer survivors, extant research has revealed prevalence rates ranging from 8.2% - 84%, with no significant differences between survivors and siblings or matched controls (Larcombe et al., 2002; Verrill, Schafer, Vannatta, & Noll, 2000). Clearly, the demonstration of such a large range is problematic and likely reflects varying methods of assessment. In fact, when specifically looking at *self-report* of alcohol use among childhood cancer survivors, 72.5% of survivors report drinking and 12.5% report engaging in binge drinking (Mulhern et al., 1995), in contrast to parent report of 8.2% prevalence rate of alcohol use. Again, such prevalence rates are in stark contrast to our obtained prevalence rates of 5.2% for alcohol use and 2.6% for binge drinking.

Illicit drug use by survivors of childhood cancer is even more rare, although only three known studies have examined such outcomes. In the first of such studies, Hollen & Hobbie (1993) found that 17% of survivors had ever tried marijuana, although none reported being current users. Verrill and colleagues (2000) found that survivors engaged in significantly less drug use over the prior year as compared to controls, with use

consisting of one to two times in the preceding year (as opposed to six to nine time for controls). Moreover, Larcombe and colleagues (2002) found that survivors used drugs less than siblings and population controls, with 15% of male survivors and 8% of female survivors engaging in such recreational drug use. Among our sample of adolescents currently on treatment for cancer, we found similar rates of lifetime marijuana use, 17.9%, with 2.6% (or one individual) of our sample currently engaging in marijuana use. Moreover, we were fortunate to also include questions regarding other illicit drug use and found that 2.6% of our sample (the same individual engaging in current marijuana use) has ever used inhalants, methamphetamines, ecstasy, and hallucinogenic drugs.

Collectively, it appears that adolescents currently undergoing treatment for cancer engage in lower levels of risky health-related behavior such as tobacco, alcohol, and other drug use, as compared to that of healthy adolescents in the general US, OK, and TX. Such results are consistent with those of most recent investigations with childhood cancer survivors. However, it is important to note that extant research with childhood cancer survivors is problematic in that it has yielded rather large ranges in the prevalence rates of such health-damaging behaviors. Clearly, varying methods of assessment of tobacco, alcohol, and other drug use may be accounting for such large differences across studies. For instance, tobacco use may be defined as any use in the past month, any lifetime use, any use in the past week, or at least one cigarette a week (Ford & Ostroff, 2006). Thus, it is difficult to accurately compare prevalence rates across studies and with published normative data. Future research is needed that assesses such health behaviors with consistent indices and at specific developmental time periods (e.g., adolescence).

Specific to sexual-risk taking, our results indicated that 30.8% of adolescents with cancer have had sexual intercourse, although none reported having had sexual intercourse prior to the age of 13. Approximately 7.7% of adolescents have had sexual intercourse with 4 or more partners and 15.4% were currently sexually active, but notably none reported having used alcohol or drugs prior to their last sexual experience. Nevertheless, 33.3% of adolescents with cancer reported using birth control pills and only 41.7% of adolescents with cancer used a condom the last time they had sexual intercourse. As was the case for tobacco, alcohol, and other drug use, prevalence rates for sexual risk-taking were lower for the current sample, with the exception of condom use, than those of healthy adolescents in the general US, OK, and TX population. However, it certainly remains true that a suboptimal level of adolescents with cancer are engaging in some sort of protective behavior prior to engaging in sexual intercourse (e.g., birth control, condom use).

Related to birth control use, it may be that adolescents with cancer are engaging in higher levels of birth control use, as compared to their healthy peers, due to the mere availability of birth control as an artifact of frequent cancer clinic visits. Given that adolescents are frequently advised not to become pregnant while undergoing treatment, they may be readily provided with birth control pills by their providers in order to prevent unintended pregnancies. This is in stark contrast to healthy peers in the general population who may or may not have access to a health care provider with which to discuss birth control use. Conversely, it may be that adolescents with cancer are not engaging in condom use at higher levels that are consistent with those of their healthy counterparts due to anger and frustration regarding their illness and the belief that it "does

not matter what I do, I am going to die anyway." Indeed, anecdotal evidence suggests that a subset of adolescents with cancer do in fact harbor a sense of resentment and anger at the impact that their illness has had in their life. Clearly, such explanations for prevalence rates of birth control and condom use among adolescents with cancer are quite speculative, as the current study is the only known study to date to examine sexual behavior among adolescents with cancer or childhood cancer survivors. Thus, these results should be considered exploratory in nature and warrant replication.

In terms of nutrition and physical activity, and weight and dietary behavior, adolescents with cancer are engaging in healthy habits (e.g., at least five servings of fruits and vegetables a day, at least three glasses of milk a day) at low to moderate rates and not as frequently as reported by their healthy peers in the US, OK, and TX. In addition, adolescents with cancer are engaging in a variety of unhealthy habits, such as not meeting currently recommended levels of physical activity (i.e., at least 60 minutes a day for at least 5 days a week) and watching television or playing video/computer games more than three hours a day. Moreover, approximately a quarter of adolescents with cancer describe themselves as being "slightly" or "very" overweight, although it is notable that a large majority are not engaging in appropriate behaviors to modify their weight (e.g., exercising, restricting caloric/fat intake). Although concerning, it stands to reason that such increased prevalence rates in sedentary behavior may be due to actually being on treatment for cancer. Specifically, it may be that the effects of treatment agents (e.g., chemotherapy), general fatigue, and increased time spent waiting in the cancer clinic may be related to increased television and video/computer game use. In fact, when evaluating literature on physical activity and nutrition among childhood cancer survivors, prevalence

rates of sedentary behavior do indeed decrease to those evidenced by healthy peers (Mulhern et al., 1995). Regardless, it is important to note that the suboptimal prevalence of healthy habits such as good nutrition and physical activity is concerning, especially in light of the fact that adolescents with cancer will also have the influence of late effects to contend with well into survivorship.

Finally, regarding sun safety, only 10.3% of adolescents with cancer reported that, when outside for more than one hour on a sunny day, they wear sunscreen with an SPF of 15 or higher at least most of the time. Similarly, when outside for more than one hour on a sunny day, only 28.2% of adolescents reported that they stay in the shade, wear long pants, wear a long-sleeved shirt, or wear a hat that shades their face, ears, and neck. Such prevalence rates for sun protective behavior, although not preferable, were actually slightly better than those reported by healthy adolescents in the US general population (state data was unavailable for this specific outcome). However, in comparison to extant data on childhood cancer survivors, which suggests that a majority (63% - 64%) of survivors engage in recommended sun protection (Hudson et al., 2002; Tercyak et al., 2005), our prevalence rates were quite low. Although speculative, it may be that adolescents currently undergoing treatment for cancer may not yet fully realize the extent of their future disease risk, including how their risk for second malignancies is heightened, and focus instead on simply working towards a cure. Thus, it may be that until they approach survivorship and are more specifically informed of the late effects to potentially be prepared for (e.g., second malignancy), adolescents may not take the steps to engage in good sun protective behavior.

Strengths and Limitations

The current study possesses several strengths. First and foremost, the aim of this study was to expand upon extant literature by providing an examination of *discrete* aspects of social adjustment among adolescents currently on treatment for cancer. Specifically, the current study succeeded in providing a relevant examination of how dimensions of close peer and dating relationships impact quality of life, psychological distress, and health-related behaviors among youth who are faced with a diagnosis of cancer in adolescence. These results highlight the need for continued examination of discrete aspects of social adjustment among this presumably vulnerable population.

Another strength of the current study involves its exploratory focus on identifying prevalence rates of a spectrum of health-related behaviors among adolescents currently on treatment for cancer. Indeed, this is the only study, to our knowledge, that has examined such health behavior among adolescents who are still undergoing treatment, as opposed to survivors of childhood or adolescent cancer. Such work will allow for a more careful assessment of the trajectory and natural history of such behaviors. Moreover, the current study has expanded upon existing literature by choosing to examine a multitude of important health behaviors, including alcohol and other drug use, sexual risk-taking, nutrition/physical activity, overweight and dietary behavior, and sun safety, as opposed to sole examination of smoking behavior.

The utilization of both adolescent- and parent-report measures is another strength of the current study. It is noteworthy that previous research has almost exclusively examined child/adolescent adjustment via mother-report, thus creating a potential confound of parent adjustment influencing parent-reported child/adolescent adjustment. Consequently, the current study provides a more accurate assessment of quality of life

and psychological distress among adolescents with cancer by utilizing independent raters of adolescent behavior. Nevertheless, it remains true that future research could also benefit from inclusion of peer-report data evaluating the impact of an adolescent's diagnosis of cancer on their peers. Indeed, to our knowledge, no research to date has examined peer outcomes in relation to an friend's diagnosis of cancer in adolescence. It stands to reason that such data could shed light on an important piece of adjustment to the adolescent cancer diagnosis.

Despite its strengths, the current study is not without its limitations. For one, the cross-sectional nature of this study precludes determination of the causal direction of relationships between the variables of interest. It may be that social dimensions of close peer and dating relationships impact quality of life, psychological distress, and health-related behavior among adolescents with cancer, but the converse may also be true. Clearly, longitudinal investigations of the nature of such relationships are necessary, as such relationships may indeed change as adolescents transition off treatment and into survivorship, where a new set of potential physical, cognitive, and emotional challenges await (Ford & Ostroff, 2006).

Another limitation of the study is related to the fact that our sample consisted of a heterogeneous group of adolescents with a number of different cancer diagnoses. Although the breakdown of cancer diagnoses was as would be expected, with Acute Lymphoblastic Leukemia (ALL) emerging as the predominant diagnosis, it is true that the amount of variability introduced into the study simply by type of cancer could indeed impact adolescent quality of life, psychological distress, and health-related behavior. Nevertheless, it is important to note that it is typically the case that a number of cancer

diagnoses are represented in psychosocial research with children and adolescents (e.g., Fuemmeler, Brown, Williams, & Barredo, 2003; Hancock & Phipps, 2006; Hendricks-Ferguson, 2006). This is particularly the case given the difficulty in recruiting ample sample sizes. In the current study, sample size was also a limitation, although it should be noted that the final sample size is consistent with those generally found in extant literature looking at similar variables and outcomes among adolescents with cancer (e.g., Dowling, Hockenberry, & George, 2003; Kazak et al., 2005; Kullgren et al., 2003). Moreover, results of post-hoc power analyses revealed that we had approximately 95% power to detect a medium-sized effect (Cohen, 1988), thereby indicating that our sample size was indeed sufficient to accurately assess our variables of interest.

The self-selected nature of our sample is also a limitation of the current study. It is quite possible that the current sample of adolescents with cancer and their parents felt significantly distressed and thus chose to participate in the study. Conversely, it is also possible that adolescents with cancer and their parents were experiencing good outcomes despite the nature of their circumstances and wanted to participate because they were doing so well. This self-selection bias may have resulted in the observed relationships among the variables of interest. Nevertheless, it remains true that the observed participation rates would indeed suggest that the participants comprised a representative and generalizable sample. Unfortunately, our data collection procedure did not allow for examination of potential differences between adolescents with cancer who chose to participate and those who did not. Thus, this self-selection bias remains a limitation, albeit one which is often encountered in research by other pediatric psychologists (Riekart & Drotar, 1999).

The exclusive reliance on self-report measures is also of concern, as this may have resulted in the observed significant correlations due to shared method variance and not to the true nature of the relationships between the variables of interest. Similarly, the fact that reliability estimates for the medical personnel report of adolescent illness severity were relatively low (Cronbach's alpha = .60) and in contrast to those ranging from the low .70s to high .80s, as typically reported by other researchers (Young-Saleme & Prevatt, 20001), is also a limitation of the current study. In this regard, it would appear that the measure of illness severity utilized in our study may not have accurately captured the construct of interest, at least in our current sample. Future research may benefit from developing a more psychometrically sound measure of illness severity specific to the unique issues faced by adolescents with cancer.

Moreover, although an attempt was made to compare the health-related behaviors of the current sample of adolescents with cancer to healthy adolescents in the US, OK, and TX, it is notable that a confound emerged in that the aggregate US sample did in fact consist of OK and TX subsamples, among other states. Therefore, clear comparisons between the current sample and US-specific data was difficult to ascertain, as it was influenced by the inclusion of the states for which the current sample was also independently compared to (i.e., OK, TX). Nevertheless, the fact that the current sample was able to be compared to healthy adolescents in the region and nation was believed to outweigh this confound and subsequent limitation of our results.

Finally, the fact that our study did not include a healthy control group is another limitation to consider, albeit one which can be argued not to be quite as significant. The current study allowed us to examine discrete aspects of social relationships, quality of

life, psychological distress, and health-related behavior among adolescents with cancer. Unfortunately, based on the design of our study, we were unable to compare such variables of interest to functioning of healthy adolescents. However, it can also be argued that the absence of a healthy control group is not particularly problematic because we simply are not interested in the healthy adolescent population. Rather, it is our intention to examine the nature of adjustment *within* a sample of adolescents with cancer in order to ultimately inform interventions tailored to improving adjustment outcomes in this population.

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APPENDICES

Appendix A

INTERNATIONAL CLASSIFICATION OF CHILDHOOD CANCER, THIRD EDITION

International Classification of Childhood Cancer, Third Edition

I. Leukemias, myeloproliferative diseases, and myelodysplastic diseases

   a. Lymphoid leukemias
   b. Acute myeloid leukemias
   c. Chronic myeloproliferative dieases
   d. Myelodysplastic syndrome and other myeloproliferative diseases
   e. Unspecified and other specified leukemias

II. Lymphomas and reticuloendothelial neoplasms

   a. Hodgkin lymphomas
   b. Non-Hodgkin lymphomas (except Burkitt lymphoma)
   c. Burkitt lymphoma
   d. Miscellaneous lymphoreticular neoplasms
   e. Unspecified lymphomas

III. CNS and miscellaneous intracranial and intraspinal neoplasms

   a. Ependymomas and choroids plexus tumor
   b. Astrocytomas
   c. Intracranial and intraspinal embryonal tumors
   d. Other gliomas
   e. Other specified intracranial and intraspinal neoplasms
   f. Unspecified intracranial and intraspinal neoplasms

IV. Neuroblastoma and other peripheral nervous cell tumors

   a. Neuroblastoma and ganglioneuroblastoma
   b. Other peripheral nervous cell tumors

V. Retinoblastoma

VI. Renal tumors

   a. Nephroblastoma and other nonepithelial renal tumors
   b. Renal carcinomas
   c. Unspecified malignant renal tumors

VII. Hepatic tumors

   a. Hepatoblastoma
   b. Hepatic carcinomas
   c. Unspecified malignant hepatic tumors

VIII. Malignant bone tumors

a. Osteosarcomas
b. Chondrosarcomas
c. Ewing tumor and related sarcomas of bone
d. Other specified malignant bone tumors
e. Unspecified malignant bone tumors

IX. Soft tissue and other extraosseous sarcomas

a. Rhabdomyosarcomas
b. Fibrosarcomas, peripheral nerve sheath tumors, and other fibrous neoplasms
c. Kaposi sarcoma
d. Other specified soft tissue sarcomas
e. Unspecified soft tissue sarcomas

X. Germ cell tumors, trophoblastic tumors, and neoplasms of gonads

a. Intracranial and intraspinal germ cell tumors
b. Malignant extracranial and extragonadal germ cell tumors
c. Malignant gonadal germ cell tumors
d. Gonadal carcinomas
e. Other and unspecified malignant gonadal tumors

XI. Other malignant epithelial neoplasms and malignant melanomas

a. Adrenocortical carcinomas
b. Thyroid carcinomas
c. Nasopharyngeal carcinomas
d. Malignant melanomas
e. Skin carcinomas
f. Other and unspecified carcinomas

XII. Other and unspecified malignant neoplasms

a. Other specified malignant tumors
b. Other unspecified malignant tumors

Note. CNS = Central Nervous System.

Appendix B

RELEVANT RESULTS

Table 1

Demographic, Illness, and Psychosocial Variables of Interest

Variables	*N*	*M*	%	*SD*
Gender				
Male	13		33.3	
Female	26		66.7	
Ethnicity				
Caucasian	24		61.5	
African American	7		17.9	
Native American	3		7.7	
Hispanic	1		2.6	
Asian	1		2.6	
Biracial	2		5.2	
Other	1		2.6	
Diagnosis				
ALL	15		38.5	
AML	3		7.7	
Anaplastic oligodendroglioma	1		2.6	
Burkitt's lymphoma	1		2.6	
Ewings sarcoma	5		12.8	
Hepatoblastoma	1		2.6	
Hodgkin's disease	2		5.2	
Medulloblastoma	1		2.6	
Osteosarcoma	3		7.7	
Synovial cell sarcoma	1		2.6	
Undifferentiated sarcoma	1		2.6	
Unavailable	5		12.8	
Age		15.9		1.8
Illness Duration (months)		23.9		57.4
Illness Severity		21.9		6.4
NRI SS, BGF		2.6		1.3
NRI NI, BGF		1.9		1.1
NRI SS, SSF		3.1		0.9

NRI NI, SSF	1.8	0.9
NRI SS, OSF	2.9	1.0
NRI NI, OSF	1.5	0.6
DAS-A	49.8	19.4
FIS	89.3	30.0
PedsQL-T	1866.0	433.3
PedsQL-P	1707.6	467.6
BASC-2-BSI	48.7	10.2
BSI	49.1	12.0

Note. ALL = Acute Lymphoblastic Leukemia; NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend; DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; PedsQL-T = Pediatric Quality of Life Inventory, Teen Report; PedsQL-P = Pediatric Quality of Life Inventory, Parent Report of Teen; BASC-2 BSI = Behavioral Assessment System of Children-2 Behavioral Symptoms Inventory; BSI = Brief Symptom Inventory Global Severity Index.

Table 2

Zero-Order Correlations for Selected Study Variables

Variables	1	2	3	4	5	6	7
1. Age	--	.19	-.07	.10	-.29	.18	.03
2. Duration		--	-.11	-.18	-.11	.09	.24
3. SOIS			--	-.04	-.03	-.09	.01
4. PedsQL-P				--	.70**	-.20	-.70**
5. PedsQL-T					--	-.35*	-.45**
6. BSI						--	.33
7. BASC-2-BSI							--

Note. Duration = Illness Duration (Date of Diagnosis subtracted from Participation Date); SOIS = Severity of Illness Scale Summary Score; PedsQL-P = Pediatric Quality of Life Inventory, Parent Report of Teen; PedsQL-T = Pediatric Quality of Life Inventory, Teen Report; BSI = Brief Symptom Inventory; BASC-2 BSI = Behavioral Assessment System for Children-2 Behavioral Symptoms Index; *$p < .05$, **$p < .01$.

Table 3

Zero-Order Correlations for the Relationship of Close Peer & Dating Relationships to Quality of Life & Psychological Distress

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. NRI SS, BGF	--	.32*	.35*	.48**	.38*	.42**	-.48**	-.04	.03	.35*	-.13	.06
2. NRI NI, BGF		--	.54**	.37*	.43**	.29	-.34*	-.14	-.29	-.08	.15	.18
3. NRI SS, SSF			--	.29*	.87**	.29*	-.17	-.27	-.17	-.07	-.07	-.00
4. NRI NI, SSF				--	.35*	.80**	-.15	.00	-.11	-.14	.33*	.26
5. NRI SS, OSF					--	.32*	-.27	-.16	-.15	-.13	-.10	.12
6. NRI NI, OSF						--	-.37*	-.28	-.02	.05	.12	.00
7. DAS-A							--	.38**	.10	-.21	.51**	.03
8. FIS								--	-.04	-.13	.23	.06
9. PedsQL-P									--	.70**	-.20	-.70**
10. PedsQL-T										--	-.35*	-.45**
11. BSI											--	.33*
12. BASC-2-BSI												--

Note. NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend; DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; PedsQL-P =

Pediatric Quality of Life Inventory, Parent Report of Teen; PedsQL-T = Pediatric Quality of Life Inventory, Teen Report; BSI = Brief Symptom Inventory; BASC-2-BSI = Behavioral Assessment System for Children-2 Behavioral Symptoms Index; *$p < .05$, **$p < .01$.

Table 4

Zero-Order Correlations for the Relationship of Close Peer & Dating Relationships to Tobacco, Alcohol, & Other Drug Use

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. NRI SS, BGF	--	.32*	.35*	.48**	.38*	.42**	-.48**	-.04	.22	.04	.12	.04	.14
2. NRI NI, BGF		--	.54**	.37*	.43**	.29	-.34*	-.14	.40*	-.07	.02	.01	.01
3. NRI SS, SSF			--	.29*	.87**	.29*	-.17	-.27	.09	-.20	-.27	-.16	-.21
4. NRI NI, SSF				--	.35*	.80**	-.15	.00	.17	-.15	-.06	.06	-.15
5. NRI SS, OSF					--	.32*	-.27	-.16	.03	-.18	-.21	-.09	-.21
6. NRI NI, OSF						--	-.37*	-.28	-.02	-.15	.02	.18	-.15
7. DAS-A							--	.38**	-.29*	-.19	-.03	.07	-.12
8. FIS								--	.02	.12	.11	.15	.01
9. Cig Use									--	.54**	-.05	-.04	-.04
10. ST Use										--	-.04	-.03	-.03
11. Alcohol Use											--	.70**	.70**
12. Hvy Drinking												--	-.03
13. MJ Use													--

Note. NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend;

DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; Cig Use = Current Cigarette Use (more than once in past 30 days); ST Use = Current Smokeless Tobacco Use (more than once in past 30 days); Alcohol Use = Current Alcohol Use (more than once in past 30 days); Hvy Drinking = Current Episodic Heavy Drinking (at least 5 or more drinks in a row at least once in past 30 days); MJ Use = Current Marijuana Use (more than once in past 30 days); $*p < .05$, $**p < .01$.

Table 5

Zero-Order Correlations for the Relationship of Close Peer & Dating Relationships to Sexual Risk-Taking

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. NRI SS, BGF	--	.32*	.35*	.48**	.38*	.42**	-.48**	-.04	.04	.28	-.25	-.27
2. NRI NI, BGF		--	.54**	.37*	.43**	.29	-.34*	-.14	.17	.16	-.42**	-.25
3. NRI SS, SSF			--	.29*	.87**	.29*	-.17	-.27	-.02	-.02	-.09	.04
4. NRI NI, SSF				--	.35*	.80**	-.15	.00	.11	.13	-.17	-.22
5. NRI SS, OSF					--	.32*	-.27	-.16	-.04	.05	-.15	-.01
6. NRI NI, OSF						--	-.37*	-.28	-.05	-.12	.06	-.10
7. DAS-A							--	.38**	-.06	-.17	.14	.18
8. FIS								--	.09	.29*	-.40**	-.39**
9. Partners									--	.14	-.31*	-.41**
10. Sex Active										--	-.83**	-.52**
11. Condom Use											--	.82**
12. BC Use												--

Note. NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend; DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; Partners = Sexual Intercourse with 4 or More Partners; Sex Active = Currently Sexually Active; Condom Use = Used a Condom at Last Sexual Intercourse; BC Use = Used Birth Control Pills at Last Sexual Intercourse; *$p < .05$, **$p < .01$.

Table 6

Zero-Order Correlations for the Relationship of Close Peer & Dating Relationships to Nutrition/Physical Activity

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. NRI SS, BGF	--	.32*	.35*	.48**	.38*	.42**	-.48**	-.04	.24	.14	.19	-.03	.15
2. NRI NI, BGF		--	.54**	.37*	.43**	.29	-.34*	-.14	-.14	.20	-.14	.02	.14
3. NRI SS, SSF			--	.29*	.87**	.29*	-.17	-.27	.12	.18	-.05	.08	.15
4. NRI NI, SSF				--	.35*	.80**	-.15	.00	-.04	-.05	-.11	.28	.10
5. NRI SS, OSF					--	.32*	-.27	-.16	.14	.26	-.09	.17	.10
6. NRI NI, OSF						--	-.37*	-.28	-.02	.02	-.16	.36*	.30*
7. DAS-A							--	.38**	.04	-.01	-.18	-.18	-.26
8. FIS								--	.06	-.00	-.27	-.15	-.50**
9. Fruits/veg									--	.04	-.16	-.05	-.04
10. Milk										--	-.01	-.01	-.09
11. PA											--	-.18	.02
12. Games												--	.27
13. TV													--

Note. NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend; DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; Fruits/veg = Eats Fruits & Vegetables at Least 5 Time Per Day; Milk = Drinks at Least 3 Glasses of Milk Per Day; PA = Meets Currently Recommended Levels of Physical Activity (i.e., at least 60 minutes per day, $\geq$ 5 days per week); Games = Plays Video or Computer Games $\geq$ 3 Hours Per Day; TV = Watches Television $\geq$ 3 Hours Per Day; $^{*}p < .05$, $^{**}p < .01$.

Table 7

Zero-Order Correlations for the Relationship of Close Peer & Dating Relationships to Overweight & Dietary Behavior

Variables	1	2	3	4	5	6	7	8	9	10	11
1. NRI SS, BGF	--	.32*	.35*	.48**	.38*	.42**	-.48**	-.04	-.50**	-.07	-.08
2. NRI NI, BGF		--	.54**	.37*	.43**	.29	-.34*	-.14	-.24	-.10	.15
3. NRI SS, SSF			--	.29*	.87**	.29*	-.17	-.27	-.24	-.14	.11
4. NRI NI, SSF				--	.35*	.80**	-.15	.00	-.32*	.02	.01
5. NRI SS, OSF					--	.32*	-.27	-.16	-.38*	-.15	.08
6. NRI NI, OSF						--	-.37*	-.28	-.45**	-.06	-.08
7. DAS-A							--	.38**	.45**	.26	.11
8. FIS								--	.06	.09	-.00
9. Self Desc									--	.42**	.33*
10. Exercises										--	.51**
11. Eats Less											--

Note. NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend; DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; Self Desc = Describes Him/Herself as Slightly or Very Overweight; Exercises = Exercises to Lose Weight or Keep from Gaining Weight; Eats Less = Eats Less Food, Fewer Calories, or Foods Low in Fat to Lose Weight or Keep from Gaining Weight; *$p < .05$, **$p < .01$.

Table 8

Zero-Order Correlations for the Relationship of Close Peer & Dating Relationships to Sun Safety

Variables	1	2	3	4	5	6	7	8	9	10
1. NRI SS, BGF	--	.32*	.35*	.48**	.38*	.42**	-.48**	-.04	-.03	.01
2. NRI NI, BGF		--	.54**	.37*	.43**	.29	-.34*	-.14	-.08	.15
3. NRI SS, SSF			--	.29*	.87**	.29*	-.17	-.27	.18	.12
4. NRI NI, SSF				--	.35*	.80**	-.15	.00	-.20	.01
5. NRI SS, OSF					--	.32*	-.27	-.16	.16	.23
6. NRI NI, OSF						--	-.37*	-.28	-.14	-.06
7. DAS-A							--	.38**	-.20	-.13
8. FIS								--	-.07	-.18
9. Sunscreen									--	.16
10. Seeks Cover										--

Note. NRI SS = Network of Relationships Inventory Social Support Summary Score; NRI NI = Network of Relationships Inventory Negative Interactions Summary Score; BGF = Boy/girlfriend; SSF = Same-Sex Friend; OSF = Other-Sex Friend; DAS-A = Dating Anxiety Scale for Adolescents Total Score; FIS = Fear of Intimacy Scale Total Score; Sunscreen = Wears sunscreen with SPF 15 or greater when outside $\geq$ 1 hour, at least most of the time; Seeks Cover = Stays in shade, wears long pants/long-sleeved shirts/hat when outside $\geq$ 1 hour, at least most of the time; *$p < .05$, **$p < .01$.

Table 9

Prevalence of Health-Related Behaviors

Behavior	US	OK	TX	Current Sample
Tobacco, Alcohol, & Other Drug Use				
Lifetime cigarette use	54.3*	62.3**	58.5**	35.9
Lifetime daily cigarette use	13.4	17.8	11.5	15.4
Current cigarette use	23.0**	28.6**	24.2**	5.2
Current smokeless tobacco use	8.0	11.0	7.6	2.6
Current cigar use	14.0*	16.2*	17.1**	0.0
Lifetime alcohol use	74.3**	76.5**	80.2**	48.7
Current alcohol use	43.3**	40.5**	47.3**	5.2
Current episodic heavy drinking	25.5**	26.6**	29.6**	2.6
Lifetime marijuana use	38.4**	39.3**	42.2**	17.9
Current marijuana use	20.2**	18.7**	21.7**	2.6
Lifetime cocaine use	7.6	8.7	11.9*	0.0
Current cocaine use	3.4	2.6	5.5	0.0
Lifetime inhalant use	12.4	12.0	13.2	2.6
Lifetime heroine use	2.4	2.1	3.0	0.0
Lifetime methamphetamine use	6.2	7.1	7.3	2.6
Lifetime ecstasy use	6.3	6.7	8.2	2.6
Lifetime hallucinogenic drug use	8.5	N/A	N/A	2.6
Sexual Risk-Taking				
Lifetime sexual intercourse	46.8*	49.3*	52.5**	30.8
Sexual intercourse prior to age 13	6.2	6.5	7.4	0.0
Sexual intercourse with 4 or more partners	14.3	17.8	16.3	7.7
Currently sexually active	33.9*	36.3**	37.6**	15.4
Used alcohol or drugs prior to last sexual intercourse	23.3**	22.4**	22.7**	0.0
Used a condom at last sexual intercourse	62.8	61.7	60.7	41.7
Used birth control pills at last sexual intercourse	17.6	16.4	13.0*	33.3
Nutrition/Physical Activity				
Eats fruits and vegetables at least five times per day	20.1	15.9	19.4	10.3
Drinks at least 3 glasses of milk per day	16.2**	14.5**	12.2**	43.6
Meets currently recommended levels of physical activity	35.8*	38.2**	36.0*	17.9
Plays video or computer games $\geq$ 3 hours per day	21.1	N/A	N/A	30.8
Watches television $\geq$ 3 hours per day	37.2*	38.8	40.5	53.8
Attends physical education (PE) classes daily	33.0*	31.3*	35.7**	15.4
During PE, exercises or plays sports $\geq$ 20 minutes	84.0**	91.6**	84.6**	20.5
Overweight & Dietary Behavior				
Describes him/herself as slightly or very overweight	31.5	30.9	29.1	28.2
To lose weight or keep from gaining weight:				
Exercises	60.0**	58.8**	61.9**	25.6
Eats less food, fewer calories, or foods low in fat	40.7*	41.2*	37.3	23.1
Starves or fasts	12.3*	11.8*	11.6*	0.0
Takes diet pills, powders, or liquids	6.3	7.2	8.2	0.0

Vomits or takes laxatives	4.5	4.0	5.4	0.0
Sun Safety				
When outside ≥ 1 hour, at least most of the time:				
Wears sunscreen with an SPF ≥ 15	9.0	N/A	N/A	10.3
Stays in shade, wears long pants/shirts/hat	18.2	N/A	N/A	28.2

Note. No state data available for Mississippi; US = United States representative sample; OK = Oklahoma representative sample; N/A = Not available; Lifetime use = Ever tried or had; Lifetime daily use = At least once every day for 30 days; Current use = More than once in past 30 days; Episodic heavy = At least 5 or more drinks in a row at least once in past 30 days; Previously recommended levels of physical activity = at least 20 minutes per day, ≥ 3 days per week or at least 30 minutes per day, ≥ 5 days per week; Currently recommended levels of physical activity = at least 60 minutes per day, ≥ 5 days per week; * $p < .05$; ** $p < .01$.

Appendix C

DATING QUESTIONNAIRE (DQ)

For the questionnaires that follow, use the following definitions:

Friend – A person who you like, who you feel close to, and who you spend time with.

Boyfriend/Girlfriend – Someone you are physically attracted to, have strong feelings for, have had intimate contact with (e.g., hand holding, kissing, etc.), who you consider to be more than a friend and go out on "dates" with.

Dating – Spending time with someone of the opposite sex who you are romantically interested in and who is also romantically interested in you. It can occur in a small group (e.g., double-date) or alone with just the two of you.

DQ

1. Have you ever had a boy/girlfriend before? NO YES

2. Have you ever gone out on a date before? NO YES

(If you answered "NO," please skip to question 9)

3. How old were you when you had your first date? _____ years old

4. How many different boy/girlfriends have you ever had? _____ *(please write a number)*

5. How many people have you dated in the last 12 months? _____ *(please write a number)*

6. Have you broken up with anyone you were dating in the past 6 months? NO YES

7. If yes, how long ago did this happen? _____ months _____ weeks

8. How long do your romantic relationships typically last? ____ years ____months ____weeks

9. Which best describes you *now*? *(circle one)*

1) Not dating
2) Dating or seeing one person casually
3) Dating or seeing more than one person casually
4) Mostly going out with one person and dating a few others
5) Have an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together)
6) Have a very serious relationship with one person (planning to get engaged, married, or live together)
7) Engaged or living with someone
8) Married

10. Which *usually* describes you? *(circle one)*

1) Have never dated
2) Rarely date
3) Dating casually, without an exclusive commitment
4) Involved in an exclusive relationship with someone

11. Which describes what you would *like* to be doing now? *(circle one)*

1) Not dating
2) Dating or seeing one person casually
3) Dating or seeing more than one person casually
4) Mostly going out with one person and dating a few others
5) Have an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together)
6) Have a very serious relationship with one person (planning to get engaged, married, or live together)
7) Engaged or living with someone
8) Married

12. How happy are you with your current dating status?

Not at all Happy	A Little Happy	Somewhat Happy	Very Happy
1	2	3	4

13. How interested are you in dating someone of the opposite sex?
(You may be interested in dating someone of the opposite sex, but may not currently have a boy/girlfriend or may not have a particular person in mind that you would like to date).

Not at all	A little	Somewhat	Very Much
1	2	3	4

14. If you are not interested in dating someone of the opposite sex, why not? *(circle one)*

1) I am more interested in dating someone of the same sex
2) Just not ready to date
3) I am not interested in dating anyone, male or female
4) Other _____
5) N/A

Please answer questions 15-35 with regard to the person you are currently dating. If you are dating more than one person, pick the person who you like best or feel closest to. If you are not currently dating someone, please skip to question 36.

15. If you are dating someone now, how long have you been in this relationship?
(if not, skip to question 36)

_____yrs. _____mths. _____wks.

16. How much time do you spend together each week? _____hours

17. How many dates do you go on per week? _____

18. How old is the person you are dating? _____

19. Does the person you're dating currently attend the same school as you? NO YES

20. What grade in high school or year in college is s/he in? _____
(specify whether high school or college)

21. How did you meet this person? *(circle one)*

At school	Through friends	Through family	At a party	Other _____
1	2	3	4	5

22. How often do you and this person talk on the telephone?

Everyday	Several times/week	Once/week	Couple times/month	Once/month or less
1	2	3	4	5

23. How often do you and this person e-mail?

Everyday	Several times/week	Once/week	Couple times/month	Once/month or less
1	2	3	4	5

24. Are you involved in a long distance relationship? No Yes

25. If yes, how often do you see each other?

Several times/week	Once/week	Couple times/month	Once/month	Every couple mths
1	2	3	4	5

26. How physically attracted are you to the person you're dating?

Not at all	A little	Somewhat	Very	Extremely
1	2	3	4	5

27. Are you "in love" with the person you're dating? No Yes Not sure

28. Do you think you will eventually marry this person?

Definitely Yes	Probably yes	Maybe	Probably Not	Definitely Not
1	2	3	4	5

29. Have you ever engaged in sexual intercourse with this person? No Yes

30. Do your parents know the person you're dating? No Yes

31. If so, how much do your parents like this person?

Don't know	A little	Somewhat Well	A Lot
1	2	3	4

32. Do your close friends know the person you're dating? No Yes

33. If so, how well do your best same-sex friend and the person you're dating know each other?

Not at all	A little	Somewhat Well	Very Well
1	2	3	4

34. How well do your best same-sex friend and the person you're dating get along?

Not at all	A little	Somewhat Well	Very Well	N/A
1	2	3	4	5

35. How often do you and this person go out with your friends?

Never	At least 1 time/month	Every other week	1 time/week	Several times/week
1	2	3	4	5

36. How often do you and this person go out with his/her friends?

Never	At least 1 time/month	Every other week	1 time/week	Several times/week
1	2	3	4	5

37. How would you describe your best same-sex friend's current dating status? *(circle one)*

1) Not dating
2) Dating or seeing one person casually
3) Dating or seeing more than one person casually
4) Mostly going out with one person and dating a few others
5) Have an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together)
6) Have a very serious relationship with one person (planning to get engaged, married, or live together)
7) Engaged or living with someone
8) Married

38. Which *usually* describes your best same-sex friend's dating status? *(circle one)*

1) Has never dated
2) Rarely dates
3) Dating casually, without an exclusive commitment

4) Involved in an exclusive relationship with someone

39. How many of your close friends are dating someone? 0 1-2 3-4 5+

40. How often do you go out in groups of couples (e.g., double dating)?

Never	At least 1 time/month	Every other week	1 time/week	Several times/week
1	2	3	4	5

41. What things are important to your parents with regard to dating? *(Circle as many as apply)*

1) Curfew
2) An escort must accompany me
3) My boy/girlfriend should be close in age to me
4) They do not allow me to date
5) My boy/girlfriend should be of the same religion
6) My boy/girlfriend should be the same ethnicity
7) I must be a certain age before I am allowed to date
8) Other (Specify) _____

Appendix D

NETWORK OF RELATIONSHIPS INVENTORY—REVISED (NRI-R)

NRI

Everyone has a number of people who are important in his or her life. These questions ask about your relationships with each of the following people: your mother, your father, a sibling, a relative, a grand-parent, a same-sex friend, and an opposite-sex friend.

The first questions ask you to identify your mother figure, your father figure, a sibling, a relative, a grandparent, and two friends about whom you will be answering the questions.

1. Circle the **mother figure** you will be describing. (If you have both, choose the one you think of as your primary mother figure.)

   A. Biological/Adopted Mother

   B. Step-Mother (or Father's Significant Other)

   C. Other _____

2. Circle the **father figure** you will be describing. (If you have both, choose the one you think of as your primary father figure.)

   A. Biological/Adopted Father

   B. Step-Father (or Mother's Significant Other)

   C. Other _____

3. If one of your **brothers or sisters** is participating in this study also, please choose him or her. If you do not have a sibling taking part in this study, please describe your relationship with the sibling you consider to be most important/closest to you. (If several are equally important/close, just select one.) **If you do not have a sibling, leave these questions blank**.

   Your Sibling's First Name _____

   How old is s/he? _____ years old.

4. Now we would like you to choose a **relative** who is/was most important to you. Is this person a: a) **grandmother**, b) **grandfather**, c) **aunt**, or d) **uncle**? (Please circle one.) The relative's first name is _____.

5. Now we would like you to choose a boy/girl friend whom you are dating or dated. You may choose someone you are seeing now, or someone you went out with earlier in high school. If you choose a past boy/girl friend, please answer the questions as you would have when you were in the relationship.

   Boy/Girl Friend's First Name _____

   How long is/was the relationship? ____ years _____ months *(please fill in numbers)*

   Are you seeing this person now? **A.** Yes **B.** No

6. Please choose the most important **same-sex friend** you have had in high school. You may select someone who is your most important same-sex friend now, or who was your most important same-sex friend earlier in high school. **Do not choose a sibling.** If you select a person with whom you are no longer friends, please answer the questions as you would have when you were in the relationship.

Same-Sex Friend's First Name _____

How long is/was the friendship? ____ years _____ months *(please fill in numbers)*

Are you close friends now?

A. Yes **B.** Friends, but not as close as before **C.** No

7. Please choose the most important **other-sex friend** you have had in high school. You may select someone who is your most important other-sex friend now, or who was your most important other-sex friend earlier in high school. **Do not choose a sibling, relative, or boy/girl friend—even if she or he is or was your best friend.** If you select a person with whom you are no longer friends, just answer the questions as you would have when you were in the relationship.

Other-Sex Friend's First Name _____

How long is/was the friendship? ____ years _____ months *(please fill in numbers)*

Are you close friends now?

A. Yes **B.** Friends, but not as close as before **C.** No

8. Sometimes we would also like you to answer the following questions about some **extra person**. If there is a name written in the space below, please answer about this person also.

Extra Person _____

Relationship _____

****

Now we would like you to answer the following questions about the people you have selected above. Sometimes the answers for different people may be the same but sometimes they may be different.

9. How much free time do you spend with this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

10. How much do you and this person get upset with or mad at each other?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

11. How much does this person teach you how to do things that you don't know?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

12. How much do you and this person get on each other's nerves?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

13. How much do you talk about everything with this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

14. How much do you help this person with things she/he can't do by her/himself?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

15. How much does this person like or love you?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

16. How much does this person treat you like you're admired and respected?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

17. Who tells the other person what to do more often, you or this person?

	S/he always does	S/he often does	About the same	I often do	I always do	S/he always does	S/he often does	About the same	I often do	I always do	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

18. How sure are you that this relationship will last no matter what?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

19. How much do you play around and have fun with this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

20. How much do you and this person disagree and quarrel?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

21. How much does this person help you figure out or fix things?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

22. How much do you and this person get annoyed with each other's behavior?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

23. How much do you share your secrets and private feelings with this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

24. How much do you protect and look out for this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

25. How much does this person really care about you?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

26. How much does this person treat you like you're good at many things?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

27. Between you and this person, who tends to be the BOSS in this relationship?

	S/he always does	S/he often does	About the same	I often do	I always do	S/he always does	S/he often does	About the same	I often do	I always do	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

28. How sure are you that your relationship will last in spite of fights?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

29. How often do you go places and do enjoyable things with this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

30. How much do you and this person argue with each other?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

31. How often does this person help you when you need to get something done?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

32. How much do you and this person hassle or nag one another?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

33. How much do you talk to this person about things that you don't want others to know?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

34. How much do you take care of this person?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

35. How much does this person have a strong feeling of affection (loving or liking) toward you?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

36. How much does this person like or approve of the things you do?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

37. In your relationship with this person, who tends to take charge and decide what should be done?

	S/he always does	S/he often does	About the same	I often do	I always do	S/he always does	S/he often does	About the same	I often do	I always do	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

38. How sure are you that your relationship will continue in the years to come?

	Little or None	Some-what	Very Much	Extre-mely Much	The Most	Little or None	Some-what	Very Much	Extre-mely Much	The Most	
Mother	1	2	3	4	5	1	2	3	4	5	Boy/Girl Friend
Father	1	2	3	4	5	1	2	3	4	5	Same-Sex Friend
Sibling	1	2	3	4	5	1	2	3	4	5	Other-Sex Friend
Relative	1	2	3	4	5	1	2	3	4	5	Extra Person

39. Earlier, when we asked you to choose your most important same- and other-sex friends, we said that they could not be a sibling or a relative. Now please tell us who, of all these people, is your best friend?

A. My same-sex friend.

B. My opposite-sex friend.

C. My sibling. Name _____

D. My relative. Name _____

Appendix E

DATING ANXIETY SCALE FOR ADOLESCENTS (DAS-A)

DAS-A

This is not a test; there is no right or wrong answer. Please answer each item as honestly as you can.

Read each item carefully, and decide how much of the statement is characteristic or true of you. Show HOW MUCH something is true of you, by using the following scale:

1=Not at all characteristic of me
2=Slightly characteristic of me
3=Moderately characteristic of me
4=Very characteristic of me
5=Extremely characteristic of me

1. I am usually nervous going on a date with someone for the first time.....

   1 2 3 4 5

2. I am often afraid that I may look silly or foolish while on a date.....

   1 2 3 4 5

3. I worry that I may not be attractive to people of the opposite sex…….

   1 2 3 4 5

4. It takes me a long time to feel comfortable when I am in a group of both males and females.....

   1 2 3 4 5

5. I am usually worried about what kind of impression I make while on a date……..

   1 2 3 4 5

6. It is difficult for me to relax when I am with a member of the opposite sex who I do not know very well…….

   1 2 3 4 5

7. I think I am too concerned with what members of the opposite sex think of me…….

   1 2 3 4 5

8. I feel nervous in dating situations…….

   1 2 3 4 5

9. I often feel nervous when talking to an attractive member of the opposite sex……

1 2 3 4 5

10. I tend to be quieter than usual when I am with a group of both males and females…

1 2 3 4 5

11. I feel tense when I am on a date with someone I don't know very well…….

1 2 3 4 5

12. I often worry that the person I have a crush on won't think very much of me……

1 2 3 4 5

13. I often feel nervous or tense in casual get-togethers in which both guys and girls are present……..….

1 2 3 4 5

14. I am concerned when I think that a date is forming a negative impression of me……

1 2 3 4 5

15. I become tense & jittery when I feel that someone of the opposite sex is checking me out……

1 2 3 4 5

16. I am frequently afraid that the person I have a crush on will notice my flaws…….

1 2 3 4 5

17. Parties often make me anxious and uncomfortable…….

1 2 3 4 5

18. I often worry about what kind of impression I am making on members of the opposite sex……..…..

1 2 3 4 5

19. I am afraid that the person I am dating will find fault with me…….

1 2 3 4 5

20. I am more shy with someone of the opposite sex……..

1 2 3 4 5

21. I worry what my date will think of me even when I know it doesn't make any difference…...

1 2 3 4 5

Appendix F

FEAR OF INTIMACY SCALE (FIS)

FIS

Part A Instructions: Consider your committed relationship/marriage. Please answer the following statements about that relationship. Rate how characteristic or true each statement is of you according to the scale below.

(a)	(b)	(c)	(d)	(e)
Not at all Characteristic Of Me	Slightly Characteristic Of Me	Moderately Characteristic Of Me	Very Characteristic Of Me	Extremely Characteristic Of Me

NOTE: In each statement, "O" means the person with whom you are in the committed relationship.

_____ 1. I would feel uncomfortable telling O about things in the past that I have felt ashamed of.

_____ 2. I would feel uneasy talking with O about something that has hurt me deeply.

_____ 3. I would feel comfortable expressing my true feelings to O.

_____ 4. If O were upset I would sometimes be afraid of showing that I care.

_____ 5. I might be afraid to confide my innermost feelings to O.

_____ 6. I would feel at ease telling O that I care about him/her.

_____ 7. I would have a feeling of complete togetherness with O.

_____ 8. I would be comfortable discussing significant problems with O.

_____ 9. A part of me would be afraid to make a long-term commitment to O.

_____ 10. I would feel comfortable telling my experiences, even sad ones, to O.

_____ 11. I would probably feel nervous showing O strong feelings of affection.

_____ 12. I would find it difficult being open with O about my personal thoughts.

_____ 13. I would feel uneasy with O depending on me for emotional support.

_____ 14. I would not be afraid to share with O what I dislike about myself.

_____ 15. I would be afraid to take the risk of being hurt in order to establish a closer relationship with O.

(a) Not at all Characteristic Of Me	(b) Slightly Characteristic Of Me	(c) Moderately Characteristic Of Me	(d) Very Characteristic Of Me	(e) Extremely Characteristic Of Me

_____ 16. I would feel comfortable keeping very personal information to myself.

_____ 17. I would not be nervous about being spontaneous with O.

_____ 18. I would feel comfortable telling O things that I do not tell other people.

_____ 19. I would feel comfortable trusting O with my deepest thoughts and feelings.

_____ 20. I would sometimes feel uneasy if O told me about very personal matters.

_____ 21. I would be comfortable revealing to O what I feel are my shortcomings & handicaps.

_____ 22. I would be comfortable with having a close emotional tie between us.

_____ 23. I would be afraid of sharing my private thoughts with O.

_____ 24. I would be afraid that I might not always feel close to O.

_____ 25. I would be comfortable telling O what my needs are.

_____ 26. I would be afraid that O would be more invested in the relationship that I would be.

_____ 27. I would feel comfortable about having open and honest communication with O.

_____ 28. I would sometimes feel uncomfortable listening to O's personal problems.

_____ 29. I would feel at ease to completely be myself around O.

_____ 30. I would feel relaxed being together and talking about our personal goals.

Part B Instructions: Please answer the following statements about **past dating relationships or marriages.** Rate how characteristic or true each statement is of you on a scale from 1 to 5 as described in the instructions for part A.

_____ 31. I have shied away from opportunities to be close to someone.

_____ 32. I have held back my feelings in previous relationships.

_____ 33. There are people who think that I am afraid to get close to them.

_____ 34. There are people who think that I am not an easy person to get to know.

_____ 35. I have done things in previous relationships to keep me from developing closeness.

Appendix G

BRIEF SYMPTOM INVENTORY (BSI)

BSI

INSTRUCTIONS:
On the next page is a list of problems people sometimes have. Please read each one carefully, and blacken the circle that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Blacken the circle for only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example before beginning, and if you have any questions please ask them now.

EXAMPLE

Not at All	A Little Bit	Moder-ately	Quite a Bit	Extremely	HOW MUCH WERE YOU DISTRESSED BY:
0	1	2	3	4	Bodyaches

	Not At All	A Little Bit	Moder -ately	Quite A Bit	Extreme -ly	HOW MUCH WERE YOU DISTRESSED BY:
1)	0	1	2	3	4	Nervousness or shakiness inside
2)	0	1	2	3	4	Faintness or dizziness
3)	0	1	2	3	4	The idea that someone else can control your thoughts
4)	0	1	2	3	4	Feeling others are to blame for most of your troubles
5)	0	1	2	3	4	Trouble remembering things
6)	0	1	2	3	4	Feeling easily annoyed or irritated
7)	0	1	2	3	4	Pains in heart or chest
8)	0	1	2	3	4	Feeling afraid in open spaces or on the streets
9)	0	1	2	3	4	Thoughts of ending your life
10)	0	1	2	3	4	Feeling that most people cannot be trusted
11)	0	1	2	3	4	Poor appetite
12)	0	1	2	3	4	Suddenly scared for no reason
13)	0	1	2	3	4	Temper outbursts that you could not control
14)	0	1	2	3	4	Feeling lonely even when you are with people
15)	0	1	2	3	4	Feeling blocked in getting things done
16)	0	1	2	3	4	Feeling lonely
17)	0	1	2	3	4	Feeling blue
18)	0	1	2	3	4	Feeling no interest in things
19)	0	1	2	3	4	Feeling fearful
20)	0	1	2	3	4	Your feelings being easily hurt
21)	0	1	2	3	4	Feeling that people are unfriendly or dislike you
22)	0	1	2	3	4	Feeling inferior to others
23)	0	1	2	3	4	Nausea or upset stomach
24)	0	1	2	3	4	Feeling that you were watched or talked about by others
25)	0	1	2	3	4	Trouble falling asleep
26)	0	1	2	3	4	Having to check and double-check what you do
27)	0	1	2	3	4	Difficulty making decisions
28)	0	1	2	3	4	Feeling afraid to travel on buses, subways, or trains
29)	0	1	2	3	4	Trouble getting your breath
30)	0	1	2	3	4	Hot or cold spells
31)	0	1	2	3	4	Having to avoid certain things, places, or activities because they frighten you
32)	0	1	2	3	4	Your mind going blank
33)	0	1	2	3	4	Numbness or tingling in parts of your body
34)	0	1	2	3	4	The idea that you should be punished for your sins
35)	0	1	2	3	4	Feeling hopeless about the future
36)	0	1	2	3	4	Trouble concentrating
37)	0	1	2	3	4	Feeling weak in parts of your body
38)	0	1	2	3	4	Feeling tense or keyed up
39)	0	1	2	3	4	Thoughts of death or dying
40)	0	1	2	3	4	Having urges to beat, injure, or harm someone
41)	0	1	2	3	4	Having urges to break or smash things
42)	0	1	2	3	4	Feeling very self-conscious with others
43)	0	1	2	3	4	Feeling uneasy in crowds, such as shopping or at a movie
44)	0	1	2	3	4	Never feeling close to another person
45)	0	1	2	3	4	Spells of terror or panic
46)	0	1	2	3	4	Getting into frequent arguments
47)	0	1	2	3	4	Feeling nervous when you are left alone
48)	0	1	2	3	4	Others not giving you proper credit for your achievements
49)	0	1	2	3	4	Feeling so restless you couldn't sit still
50)	0	1	2	3	4	Feelings of worthlessness
51)	0	1	2	3	4	Feeling that people will take advantage of you if you let them
52)	0	1	2	3	4	Feelings of guilt
53)	0	1	2	3	4	The idea that something is wrong with your mind

Appendix H

2005 NATIONAL YOUTH RISK BEHAVIOR SURVEY (YRBS)

YRBS

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to develop better health education for young people like yourself. Make sure to read every question. Circle the answer that best applies to you.

1. How old are you?

A. 12 years old or younger
B. 13 years old
C. 14 years old
D. 15 years old
E. 16 years old
F. 17 years old
G. 18 years old or older

2. What is your sex?

A. Female
B. Male

3. In what grade are you?

A. 9th grade
B. 10th grade
C. 11th grade
D. 12th grade
E. Ungraded or other grade

4. How do you describe yourself? **(Select one or more responses.)**

A. American Indian or Alaska Native
B. Asian
C. Black or African American
D. Hispanic or Latino
E. Native Hawaiian or Other Pacific Islander
F. White

5. How do you describe your health in general?

A. Excellent
B. Very good
C. Good
D. Fair
E. Poor

6. How tall are you without your shoes on? Directions: Write your height in the shaded blank boxes. Fill in the matching oval below each number.

Example

Height	
Feet	**Inches**
5	7
3	0
4	1
5	2
6	3
7	4
	5
	6
	7
	8
	9
	10
	11

Height	
Feet	**Inches**
3	0
4	1
5	2
6	3
7	4
	5
	6
	7
	8
	9
	10
	11

7. How much do you weigh without your shoes on? Directions: Write your weight in the shaded blank boxes. Fill in the matching oval below each number.

Example

Weight		
Pounds		
1	5	2
0	0	0
1	1	1
2	2	2
3	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9

Weight		
Pounds		
0	0	0
1	1	1
2	2	2
3	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9

2005 National YRBS

The next 5 questions ask about personal safety.

8. **When you rode a motorcycle** during the past 12 months, how often did you wear a helmet?

   A. I did not ride a motorcycle during the past 12 months
   B. Never wore a helmet
   C. Rarely wore a helmet
   D. Sometimes wore helmet
   E. Most of the time wore a helmet
   F. Always wore a helmet

9. **When you rode a bicycle** during the past 12 months, how often did you wear a helmet?

   A. I did not ride a bicycle during the past 12 months
   B. Never wore a helmet
   C. Rarely wore a helmet
   D. Sometimes wore a helmet
   E. Most of the time wore a helmet
   F. Always wore a helmet

10. How often do you wear a seat belt when **riding in** a car driven by someone else?

   A. Never
   B. Rarely
   C. Sometimes
   D. Most of the time
   E. Always

11. During the past 30 days, how many times did you **drive** a car or other vehicle **when you had been drinking alcohol?**

   A. 0 times
   B. 1 time
   C. 2 or 3 times
   D. 4 or 5 times
   E. 6 or more times

12. During the past 30 days, how many times did you **ride** in a car or other vehicle **driven by someone who had been drinking alcohol?**

   A. 0 times
   B. 1 time
   C. 2 or 3 times
   D. 4 or 5 times

E. 6 or more times

The next 5 questions ask about sad feelings and attempted suicide. Sometimes people feel so depressed about the future that they may consider attempting suicide, that is, taking some action to end their own life.

24. During the past 12 months, did you ever feel so sad or hopeless almost every day for **two weeks or more in a row** that you stopped doing some usual activities?

A. Yes
B. No

25. During the past 12 months, did you ever **seriously** consider attempting suicide?

A. Yes
B. No

26. During the past 12 months, did you make a plan about how you would attempt suicide?

A. Yes
B. No

27. During the past 12 months, how many times did you actually attempt suicide?

A. 0 times
B. 1 time
C. 2 or 3 times
D. 4 or 5 times
E. 6 or more times

28. **If you attempted suicide** during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?

A. **I did not attempt suicide** during the past 12 months
B. Yes
C. No

The next 12 questions ask about tobacco use.

29. Have you ever tried cigarette smoking, even one or two puffs?

A. Yes
B. No

30. How old were you when you smoked a whole cigarette for the first time?

A. I have never smoked a whole cigarette
B. 8 years old or younger
C. 9 or 10 years old
D. 11 or 12 years old
E. 13 or 14 years old
F. 15 or 16 years old
G. 17 years old or older

31. During the past 30 days, on how many days did you smoke cigarettes?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

32. During the past 30 days, on the days you smoked, how many cigarettes did you smoke **per day**?

A. I did not smoke cigarettes during the past 30 days
B. Less than 1 cigarette per day
C. 1 cigarette per day
D. 2 to 5 cigarettes per day
E. 6 to 10 cigarettes per day
F. 11 to 20 cigarettes per day
G. More than 20 cigarettes per day

33. During the past 30 days, how did you **usually** get your own cigarettes? (Select only **one** response.)

A. I did not smoke cigarettes during the past 30 days
B. I bought them in a store such as a convenience store, supermarket, discount store, or gas station
C. I bought them from a vending machine
D. I gave someone else money to buy them for me
E. I borrowed (or bummed) them from someone else
F. A person 18 years old or older gave them to me
G. I took them from a store or family member
H. I got them some other way

34. **When you bought or tried to buy cigarettes** in a store during the past 30 days, were you ever asked to show proof of age?

A. I did not try to buy cigarettes in a store during the past 30 days
B. Yes, I was asked to show proof of age
C. No, I was **not** asked to show proof of age

35. During the past 30 days, on how many days did you smoke cigarettes **on school property**?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

36. Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?

A. Yes
B. No

37. During the past 12 months, did you ever try **to quit** smoking cigarettes?

A. I did not smoke during the past 12 months
B. Yes
C. No

38. During the past 30 days, on how many days did you use **chewing tobacco, snuff, or dip**, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

39. During the past 30 days, on how many days did you use **chewing tobacco, snuff, or dip on school property**?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days

F. 20 to 29 days
G. All 30 days

40. During the past 30 days, on how many days did you smoke **cigars, cigarillos, or little cigars**?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

The next 5 questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

41. During your life, on how many days have you had at least one drink of alcohol?

A. 0 days
B. 1 or 2 days
C. 3 to 9 days
D. 10 to 19 days
E. 20 to 39 days
F. 40 to 99 days
G. 100 or more days

42. How old were you when you had your first drink of alcohol other than a few sips?

A. I have never had a drink of alcohol other than a few sips
B. 8 years old or younger
C. 9 or 10 years old
D. 11 or 12 years old
E. 13 or 14 years old
F. 15 or 16 years old
G. 17 years old or older

43. During the past 30 days, on how many days did you have at least one drink of alcohol?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days

E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

44. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

A. 0 days
B. 1 day
C. 2 days
D. 3 to 5 days
E. 6 to 9 days
F. 10 to 19 days
G. 20 or more days

45. During the past 30 days, on how many days did you have at least one drink of alcohol **on school property**?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 to 19 days
F. 20 to 29 days
G. All 30 days

The next 4 questions ask about marijuana use. Marijuana also is called grass or pot.

46. During your life, how many times have you used marijuana?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 to 99 times
G. 100 or more times

47. How old were you when you tried marijuana for the first time?

A. I have never tried marijuana
B. 8 years old or younger
C. 9 or 10 years old
D. 11 or 12 years old
E. 13 or 14 years old
F. 15 or 16 years old

G. 17 years old or older

48. During the past 30 days, how many times did you use marijuana?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

49. During the past 30 days, how many times did you use marijuana **on school property**?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

The next 10 questions ask about cocaine and other drugs.

50. During your life, how many times have you used **any** form of cocaine, including powder, crack, or freebase?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

51. During the past 30 days, how many times did you use **any** form of cocaine, including powder, crack, or freebase?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

52. During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

53. During your life, how many times have you used **heroin** (also called smack, junk, or China White)?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

54. During your life, how many times have you used **methamphetamines** (also called speed, crystal, crank, or ice)?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

55. During your life, how many times have you used **ecstasy** (also called MDMA)?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

56. During your life, how many times have you used **hallucinogenic drugs**, such as LSD, acid, PCP, angel dust, mescaline, or mushrooms?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

57. During your life, how many times have you taken **steroid pills or shots** without a doctor's prescription?

A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

58. During your life, how many times have you used a needle to inject any **illegal** drug into your body?

A. 0 times
B. 1 time
C. 2 or more times

59. During the past 12 months, has anyone offered, sold, or given you an illegal drug **on school property**?

A. Yes
B. No

The next 7 questions ask about sexual behavior.

60. Have you ever had sexual intercourse?

A. Yes
B. No

61. How old were you when you had sexual intercourse for the first time?

A. I have never had sexual intercourse
B. 11 years old or younger
C. 12 years old
D. 13 years old
E. 14 years old
F. 15 years old
G. 16 years old
H. 17 years old or older

62. During your life, with how many people have you had sexual intercourse?

A. I have never had sexual intercourse
B. 1 person
C. 2 people

D. 3 people
E. 4 people
F. 5 people
G. 6 or more people

63. During the past 3 months, with how many people did you have sexual intercourse?

A. I have never had sexual intercourse
B. I have had sexual intercourse, but not during the past 3 months
C. 1 person
D. 2 people
E. 3 people
F. 4 people
G. 5 people
H. 6 or more people

64. Did you drink alcohol or use drugs before you had sexual intercourse the **last time**?

A. I have never had sexual intercourse
B. Yes
C. No

65. The **last time** you had sexual intercourse, did you or your partner use a condom?

A. I have never had sexual intercourse
B. Yes
C. No

66. The **last time** you had sexual intercourse, what **one** method did you or your partner use to **prevent pregnancy**? (Select only **one** response.)

A. I have never had sexual intercourse
B. No method was used to prevent pregnancy
C. Birth control pills
D. Condoms
E. Depo-Provera (injectable birth control)
F. Withdrawal
G. Some other method
H. Not sure

The next 7 questions ask about body weight.

67. How do **you** describe your weight?

A. Very underweight
B. Slightly underweight
C. About the right weight
D. Slightly overweight
E. Very overweight

68. Which of the following are you trying to do about your weight?

A. **Lose** weight
B. **Gain** weight
C. **Stay** the same weight
D. I am **not trying to do anything** about my weight

69. During the past 30 days, did you **exercise** to lose weight or to keep from gaining weight?

A. Yes
B. No

70. During the past 30 days, did you **eat less food, fewer calories, or foods low in fat** to lose weight or to keep from gaining weight?

A. Yes
B. No

71. During the past 30 days, did you **go without eating for 24 hours or more** (also called fasting) to lose weight or to keep from gaining weight?

A. Yes
B. No

72. During the past 30 days, did you **take any diet pills, powders, or liquids** without a doctor's advice to lose weight or to keep from gaining weight? (Do **not** include meal replacement products such as Slim Fast.)

A. Yes
B. No

73. During the past 30 days, did you **vomit or take laxatives** to lose weight or to keep from gaining weight?

A. Yes
B. No

The next 7 questions ask about food you ate or drank during the past 7 days. Think about all the meals and snacks you had from the time you got up until you

went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

74. During the past 7 days, how many times did you drink **100% fruit juices** such as orange juice, apple juice, or grape juice? (Do **not** count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
    A. I did not drink 100% fruit juice during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

75. During the past 7 days, how many times did you eat **fruit**? (Do **not** count fruit juice.)

    A. I did not eat fruit during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

76. During the past 7 days, how many times did you eat **green salad**?

    A. I did not eat green salad during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

77. During the past 7 days, how many times did you eat **potatoes**? (Do **not** count french fries, fried potatoes, or potato chips.)

    A. I did not eat potatoes during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

78. During the past 7 days, how many times did you eat **carrots**?

A. I did not eat carrots during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

79. During the past 7 days, how many times did you eat **other vegetables**? (Do **not** count green salad, potatoes, or carrots.)

A. I did not eat other vegetables during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

80. During the past 7 days, how many **glasses of milk** did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)

A. I did not drink milk during the past 7 days
B. 1 to 3 glasses during the past 7 days
C. 4 to 6 glasses during the past 7 days
D. 1 glass per day
E. 2 glasses per day
F. 3 glasses per day
G. 4 or more glasses per day

The next 9 questions ask about physical activity.

81. On how many of the past 7 days did you exercise or participate in physical activity for **at least 20 minutes that made you sweat and breathe hard**, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?

A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days

G. 6 days
H. 7 days

82. On how many of the past 7 days did you participate in physical activity for **at least 30 minutes** that did **not** make you sweat or breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors?

A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days

83. During the past 7 days, on how many days were you physically active for a total of **at least 60 minutes per day**? (Add up all the time you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.)

A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days

84. On an average school day, how many hours do you watch TV?

A. I do not watch TV on an average school day
B. Less than 1 hour per day
C. 1 hour per day
D. 2 hours per day
E. 3 hours per day
F. 4 hours per day
G. 5 or more hours per day

85. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Include activities such as Nintendo, Game Boy, Play Station, computer games, and the Internet.)

A. I do not play video or computer games or use a computer for something

that is not school work
B. Less than 1 hour per day
C. 1 hour per day
D. 2 hours per day
E. 3 hours per day
F. 4 hours per day
G. 5 or more hours per day

86. In an average week when you are in school, on how many days do you go to physical education (PE) classes?

A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days

87. During an average physical education (PE) class, how many minutes do you spend actually exercising or playing sports?

A. I do not take PE
B. Less than 10 minutes
C. 10 to 20 minutes
D. 21 to 30 minutes
E. 31 to 40 minutes
F. 41 to 50 minutes
G. 51 to 60 minutes
H. More than 60 minutes

88. During the past 12 months, on how many sports teams did you play? (Include any teams run by your school or community groups.)

A. 0 teams
B. 1 team
C. 2 teams
D. 3 or more teams

89. During the past 30 days, did you see a doctor or nurse for an injury that happened while exercising or playing sports?

A. I did not exercise or play sports during the past 30 days
B. Yes
C. No

The next 7 questions ask about other health-related topics.

90. Have you ever been taught about AIDS or HIV infection in school?

A. Yes
B. No
C. Not sure

91. Have you ever been tested for HIV, the virus that causes AIDS? (Do not count tests done if you donated blood.)

A. Yes
B. No
C. Not sure

92. When you are outside for more than one hour on a sunny day, how often do you wear sunscreen with an SPF of 15 or higher?

A. Never
B. Rarely
C. Sometimes
D. Most of the time
E. Always

93. When you are outside for more than one hour on a sunny day, how often do you do **one or more** of the following: stay in the shade, wear long pants, wear a long-sleeved shirt, or wear a hat that shades your face, ears, and neck?

A. Never
B. Rarely
C. Sometimes
D. Most of the time
E. Always

94. Has a doctor or nurse ever told you that you have asthma?

A. Yes
B. No
C. Not sure

95. During the past 12 months, have you had an episode of asthma or an asthma attack?

A. I do not have asthma
B. No, I have asthma, but I have not had an episode of asthma or an asthma attack during the past 12 months

C. Yes, I have had an episode of asthma or an asthma attack during the past 12 months
D. Not sure

96. Do you have any physical disabilities or long-term health problems? (Long-term means 6 months or more.)

A. Yes
B. No
C. Not sure

The next question asks about missing school.

97. During the past 30 days, on how many days did you miss classes or school without permission?

A. 0 days
B. 1 or 2 days
C. 3 to 5 days
D. 6 to 9 days
E. 10 or more days

Appendix I

DEMOGRAPHIC QUESTIONNAIRE

DEMOGRAPHIC INFORMATION

Subject Number: _____ Today's Date: _____
Child's Name: _____
Child's Gender: _____
Mother's Name: _____
Father's Name: _____

Name of person filling out this form and relationship to child (e.g., mother):
_____

Who currently lives in the household with you and your child? Please note their relationship to the child and age (e.g., brother- 15 months, stepparent-36 years old).

Name	Relation to child	Age
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

What is your age? _____ What was *your age* when your child was diagnosed? _____

What is your spouse's age? _____ What was *your spouse's age* when your child was diagnosed? _____

What is your child's age? _____ What was *your child's age* when he/she was diagnosed? _ _____

What grade is your child in? _____

What is your race?

Caucasian	African American	Hispanic	Native American	Asian	Other
1	2	3	4	5	6

Parent's Marital Status:

Married	Single Parent	Remarried	Never Married	Other
1	2	3	4	5

Parent's Highest Level of Education: Mother _____ Father _____

Parents' Occupations: Mother _____ Father _____

Please indicate your annual total family income: *This information will be kept strictly confidential.*

_____ 0-4,999
_____ 5,000-9,999
_____ 10,000-14,999
_____ 15,000-19,999
_____ 20,000-29,999
_____ 30,000-39,999
_____ 40,000-49,999
_____ 50,000-59,999
_____ 60,000 or greater

How many ER visits has your child had in the last 12 months?

_____

How many hospitalizations for medical problems has your child had in the last 12 months?

_____

What is the distance to your family's cancer treatment center?

_____

Are you currently seeking counseling/psychotherapy for your teen due his/her diagnosis?

_____

Appendix J

BEHAVIOR ASSESSMENT SYSTEM FOR CHILDREN—PARENT RATING SCALES—ADOLESCENT REPORT (BASC-PRS-A)

BASC-PRS-A

INSTRUCTIONS:
On the pages that follow are phrases that describe how children may act. Please read each phrase, and mark the response that describes how this child has behaved recently (in the last several months).

Circle **N** if the behavior **never** occurs.
Circle **S** if the behavior **sometimes** occurs.
Circle **O** if the behavior **often** occurs.
Circle **A** if the behavior **almost always** occurs.

Please mark every item. If you don't know or are unsure of your response to an item, give your best estimate.

	Never	Some-times	Often	Almost Always	Remember: N – Never; S – Sometimes; O – Often; A – Almost Always
1)	N	S	O	A	Adjusts well to new teachers.
2)	N	S	O	A	Accurately takes down messages.
3)	N	S	O	A	Volunteers to help clean up around the house.
4)	N	S	O	A	Calls other adolescents names.
5)	N	S	O	A	Pays attention.
6)	N	S	O	A	Compliments others.
7)	N	S	O	A	Is creative.
8)	N	S	O	A	Cries easily.
9)	N	S	O	A	Complains of being sick when nothing is wrong.
10)	N	S	O	A	Annoys others on purpose.
11)	N	S	O	A	Has eye problems.
12)	N	S	O	A	Worries about making mistakes.
13)	N	S	O	A	Uses foul language.
14)	N	S	O	A	Makes friends easily.
15)	N	S	O	A	Cannot wait to take turn.
16)	N	S	O	A	Has stomach problems.
17)	N	S	O	A	Joins clubs or social groups.
18)	N	S	O	A	Adjusts well to changes in plans.
19)	N	S	O	A	Steals.
20)	N	S	O	A	Acts without thinking.
21)	N	S	O	A	Seems unaware of others.
22)	N	S	O	A	Complains about being teased.
23)	N	S	O	A	Is nervous.
24)	N	S	O	A	Encourages others to do their best.
25)	N	S	O	A	Is cruel to animals.
26)	N	S	O	A	Is unclear when presenting ideas.
27)	N	S	O	A	Sees things that are not there.
28)	N	S	O	A	Says, “I’m not very good at this.”
29)	N	S	O	A	Drinks alcoholic beverages.
30)	N	S	O	A	Says, “Nobody understands me.”
31)	N	S	O	A	Adjusts well to changes in routine.
32)	N	S	O	A	Communicates clearly.
33)	N	S	O	A	Acts in a safe manner.
34)	N	S	O	A	Teases others.
35)	N	S	O	A	Has a short attention span.
36)	N	S	O	A	Congratulates others when good things happen to them.
37)	N	S	O	A	Is good at getting people to work together.
38)	N	S	O	A	Is negative about things.
39)	N	S	O	A	Complains of shortness of breath.
40)	N	S	O	A	Threatens to hurt others.
41)	N	S	O	A	Has a hearing problem.
42)	N	S	O	A	Worries about what teachers think.
43)	N	S	O	A	Sneaks around.
44)	N	S	O	A	Refuses to join group activities.
45)	N	S	O	A	Has poor self-control.
46)	N	S	O	A	Says, “I think I’m sick.”
47)	N	S	O	A	Will speak up if the situation calls for it.
48)	N	S	O	A	Is a “good sport.”
49)	N	S	O	A	Smokes or chews tobacco.
50)	N	S	O	A	Interrupts parents when they are on the phone.
51)	N	S	O	A	Stares blankly.
52)	N	S	O	A	Says, “I hate myself.”
53)	N	S	O	A	Tries too hard to please others.
54)	N	S	O	A	Says, “please” and “thank you.”
55)	N	S	O	A	Has headaches.

56)	N	S	O	A	Tracks down information when needed.
57)	N	S	O	A	Has strange ideas.
58)	N	S	O	A	Says, “I get nervous during tests” or “Tests make me nervous.”
59)	N	S	O	A	Is in trouble with the police.
60)	N	S	O	A	Says, “I want to kill myself.”
61)	N	S	O	A	Recovers quickly after a setback.
62)	N	S	O	A	Is effective when presenting information to a group.
63)	N	S	O	A	Needs help from others to get up on time.
64)	N	S	O	A	Argues when denied own way.
65)	N	S	O	A	Listens to directions.
66)	N	S	O	A	Tries to bring out the best in other people.
67)	N	S	O	A	Works well under pressure.
68)	N	S	O	A	Changes moods quickly.
69)	N	S	O	A	Complains about health.
70)	N	S	O	A	Hits other adolescents.
71)	N	S	O	A	Repeats one activity over and over.
72)	N	S	O	A	Worries about things that cannot be changed.
73)	N	S	O	A	Breaks the rules.
74)	N	S	O	A	Is shy with other adolescents.
75)	N	S	O	A	Acts out of control.
76)	N	S	O	A	Pays attention when being spoken to.
77)	N	S	O	A	Makes decisions easily.
78)	N	S	O	A	Adjusts well to changes in family plans.
79)	N	S	O	A	Lies.
80)	N	S	O	A	Interrupts others when they are speaking.
81)	N	S	O	A	Needs to be reminded to brush teeth.
82)	N	S	O	A	Is easily upset.
83)	N	S	O	A	Worries about what other adolescents think.
84)	N	S	O	A	Shows interest in others’ ideas.
85)	N	S	O	A	Complains of chest pain.
86)	N	S	O	A	Is able to describe feelings accurately.
87)	N	S	O	A	Says things that make no sense.
88)	N	S	O	A	Prefers to be alone.
89)	N	S	O	A	Gets into trouble.
90)	N	S	O	A	Says, “I want to die” or “I wish I were dead.”
91)	N	S	O	A	Complains when asked to do things differently.
92)	N	S	O	A	Is clear when telling about personal experiences.
93)	N	S	O	A	Organizes chores or other tasks well.
94)	N	S	O	A	Bullies others.
95)	N	S	O	A	Eats things that are not food.
96)	N	S	O	A	Volunteers to help with things.
97)	N	S	O	A	Is a “self-starter.”
98)	N	S	O	A	Seems lonely.
99)	N	S	O	A	Complains of pain.
100)	N	S	O	A	Loses temper too easily.
101)	N	S	O	A	Hears sounds that are not there.
102)	N	S	O	A	Is fearful.
103)	N	S	O	A	Uses illegal drugs.
104)	N	S	O	A	Quickly joins group activities.
105)	N	S	O	A	Fiddles with things while at meals.
106)	N	S	O	A	Listens carefully.
107)	N	S	O	A	Has difficulty explaining rules of games to others.
108)	N	S	O	A	Is stubborn.
109)	N	S	O	A	Breaks the rules just to see what will happen.
110)	N	S	O	A	Falls down.
111)	N	S	O	A	Sets realistic goals.
112)	N	S	O	A	Says, “Nobody likes me.”
113)	N	S	O	A	Worries.

114)	N	S	O	A	Sleeps with parents.
115)	N	S	O	A	Gets sick.
116)	N	S	O	A	Responds appropriately when asked a question.
117)	N	S	O	A	Babbles to self.
118)	N	S	O	A	Is chosen last by other adolescents for games.
119)	N	S	O	A	Deceives others.
120)	N	S	O	A	Attends after-school activities.
121)	N	S	O	A	Sets fires.
122)	N	S	O	A	Writes messages that are unclear or incorrect.
123)	N	S	O	A	Attends to issues of personal safety.
124)	N	S	O	A	Seeks revenge on others.
125)	N	S	O	A	Throws up after eating.
126)	N	S	O	A	Offers help to other adolescents.
127)	N	S	O	A	Gives good suggestions for solving problems.
128)	N	S	O	A	Says, “I don’t have any friends.”
129)	N	S	O	A	Is afraid of getting sick.
130)	N	S	O	A	Is cruel to others.
131)	N	S	O	A	Seems out of touch with reality.
132)	N	S	O	A	Eats too little.
133)	N	S	O	A	Disobeys.
134)	N	S	O	A	Has trouble making new friends.
135)	N	S	O	A	Disrupts other adolescents’ activities.
136)	N	S	O	A	Is easily distracted.
137)	N	S	O	A	Answers telephone properly.
138)	N	S	O	A	Eats too much.
139)	N	S	O	A	Lies to get out of trouble.
140)	N	S	O	A	Runs away from home overnight.
141)	N	S	O	A	Picks out clothes that match the weather.
142)	N	S	O	A	Is sad.
143)	N	S	O	A	Says, “I’m afraid I will make a mistake.”
144)	N	S	O	A	Is easily annoyed by others.
145)	N	S	O	A	Expresses fear of getting sick.
146)	N	S	O	A	Has trouble getting information when needed.
147)	N	S	O	A	Acts strangely.
148)	N	S	O	A	Avoids other adolescents.
149)	N	S	O	A	Has seizures.
150)	N	S	O	A	Is usually chosen as a leader.

Appendix K

PEDIATRIC QUALITY OF LIFE SCALE, CANCER MODULE, TEEN REPORT (PEDSQL, TEEN)

PedsQL-Teen

DIRECTIONS:
Teens with cancer sometimes have special problems, Please tell us **how much of a problem** each one has been for you during the **past one month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers. If you do not understand a question, please ask for help.

*In the past **one month**, how much of a **problem** has this been for you….*

	Pain and Hurt (PROBLEMS WITH….)	Never	Almost Never	Some-times	Often	Almost Always
1)	I ache or hurt in my joints and/or muscles.	0	1	2	3	4
2)	I hurt a lot.	0	1	2	3	4
	Nausea (PROBLEMS WITH….)	0	1	2	3	4
1)	I become sick to my stomach when I have medical treatments.	0	1	2	3	4
2)	Food does not taste very good to me.	0	1	2	3	4
3)	I become sick to my stomach when I think about medical treatments.	0	1	2	3	4
4)	I feel too sick to my stomach to eat.	0	1	2	3	4
5)	Some foods and smells make me sick to my stomach.	0	1	2	3	4
	Procedural Anxiety (PROBLEMS WITH…)	0	1	2	3	4
1)	Needle sticks (i.e., injections, blood tests, IV's) hurt.	0	1	2	3	4
2)	I get scared when I have to have blood tests.	0	1	2	3	4
3)	I get scared about having needle sticks (i.e., injections, blood tests, IV's).	0	1	2	3	4
	Treatment Anxiety (PROBLEMS WITH….)	0	1	2	3	4
1)	I get scared when I am waiting to see the doctor.	0	1	2	3	4
2)	I get scared when I have to go to the doctor.	0	1	2	3	4
3)	I get scared when I have to go to the hospital.	0	1	2	3	4
	Worry (PROBLEMS WITH….)	0	1	2	3	4
1)	I worry about side effects from medical treatments.	0	1	2	3	4
2)	I worry about whether or not my medical treatments are working.	0	1	2	3	4
3)	I worry that my cancer will come back or relapse.	0	1	2	3	4
	Cognitive Problems (PROBLEMS WITH….)	0	1	2	3	4
1)	It is hard for me to figure out what to do when something bothers me.	0	1	2	3	4
2)	I have trouble solving math problems.	0	1	2	3	4
3)	I have trouble writing school papers or reports.	0	1	2	3	4
4)	It is hard for me to pay attention to things.	0	1	2	3	4
5)	It is hard for me to remember what I read.	0	1	2	3	4
	Perceived Physical Appearance (PROBLEMS WITH…)	0	1	2	3	4
1)	I feel I am not good looking.	0	1	2	3	4
2)	I don't like other people to see my scars.	0	1	2	3	4
3)	I am embarrassed when others see my body.	0	1	2	3	4
	Communication (PROBLEMS WITH….)	0	1	2	3	4
1)	It is hard for me to tell the doctors and nurses how I feel.	0	1	2	3	4
2)	It is hard for me to ask the doctors and nurses questions.	0	1	2	3	4
3)	It is hard for me to explain my illness to other people.	0	1	2	3	4

Appendix L

PEDIATRIC QUALITY OF LIFE SCALE, CANCER MODULE, PARENT REPORT (PEDSQL, PARENT)

PedsQL-Parent

DIRECTIONS:
Teens with cancer sometimes have special problems. On the following page is a list of things that might be a problem for **your teen**. Please tell us **how much of a problem** each one has been for **your teen** during the **past one month** by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers. If you do not understand a question, please ask for help.

*In the past **one month**, how much of a **problem** has your teen had with….*

	Pain and Hurt (PROBLEMS WITH….)	Never	Almost Never	Some-times	Often	Almost Always
1)	Aches in joints and/or muscles.	0	1	2	3	4
2)	Having a lot of pain.	0	1	2	3	4
	Nausea (PROBLEMS WITH….)	0	1	2	3	4
1)	Becoming nauseated during medical treatments.	0	1	2	3	4
2)	Food not tasting very good to him/her.	0	1	2	3	4
3)	Becoming nauseated while thinking about medical treatments.	0	1	2	3	4
4)	Feeling too nauseous to eat.	0	1	2	3	4
5)	Some foods and smells making him/her nauseous.	0	1	2	3	4
	Procedural Anxiety (PROBLEMS WITH…)	0	1	2	3	4
1)	Needle sticks (i.e., injections, blood tests, IV's) causing him/her pain.	0	1	2	3	4
2)	Getting anxious about having blood drawn.	0	1	2	3	4
3)	Getting anxious about having needle sticks (i.e., injections, blood tests, IV's).	0	1	2	3	4
	Treatment Anxiety (PROBLEMS WITH….)	0	1	2	3	4
1)	Getting anxious when waiting to see the doctor.	0	1	2	3	4
2)	Getting anxious about going to the doctor.	0	1	2	3	4
3)	Getting anxious about going to the hospital.	0	1	2	3	4
	Worry (PROBLEMS WITH….)	0	1	2	3	4
1)	Worrying about side effects from medical treatments.	0	1	2	3	4
2)	Worrying about whether or not his/her medical treatments are working.	0	1	2	3	4
3)	Worrying that the cancer will reoccur or relapse.	0	1	2	3	4
	Cognitive Problems (PROBLEMS WITH….)	0	1	2	3	4
1)	Difficulty figuring out what to do when something bothers him/her.	0	1	2	3	4
2)	Trouble solving math problems.	0	1	2	3	4
3)	Trouble writing school papers or reports.	0	1	2	3	4
4)	Difficulty paying attention to things.	0	1	2	3	4
5)	Difficulty remembering what he/she reads.	0	1	2	3	4
	Perceived Physical Appearance (PROBLEMS WITH…)	0	1	2	3	4
1)	Feeling that he/she is not good looking.	0	1	2	3	4
2)	Not liking other people to see his/her scars.	0	1	2	3	4
3)	Being embarrassed about others seeing his/her body.	0	1	2	3	4
	Communication (PROBLEMS WITH….)	0	1	2	3	4
1)	Difficulty telling the doctors and nurses how he/she feels.	0	1	2	3	4
2)	Difficulty asking the doctors and nurses questions.	0	1	2	3	4
3)	Difficulty explaining his/her illness to other people.	0	1	2	3	4

Appendix M

SEVERITY OF ILLNESS SCALE (SOIS)

SEVERITY OF ILLNESS SCALE

Patient ID#: _____

Physician: _____

Nurse: _____

Primary Diagnosis: _____ Secondary Diagnosis: _____

1. Describe the degree of impairment for this child.

1	2	3	4	5	6	7
INDEPENDENT FUNCTIONING, REQUIRES NO ASSISTANCE			REQUIRES SOME ASSISTANCE (e.g., crutches)			REQUIRES COMPLETE ASSISTANCE

2. Is it likely that there will be an improvement or worsening of this child's impairment within the next year?

1	2	3	4	5	6	7
LIKELY TO IMPROVE			NO CHANGE LIKELY			LIKELY TO WORSEN

3. How often does this child require medical procedures?

1	2	3	4	5	6	7
NEVER		MONTHLY		WEEKLY		DAILY

4. Is it likely that there will be a change in this child's need for medical procedures within the next year?

1	2	3	4	5	6	7
DECREASE LIKELY			NO CHANGE		INCREASE LIKELY	

5. How many times a year does this child require hospitalization?

1	2	3	4	5	6	7
ZERO			ONE OR TWO		MANY TIMES	

6. How much does this child participate in age appropriate activities (e.g., attends school, involved in church, scouts, sports, social activities)?

1	2	3	4	5	6	7
PARTICIPATION SIMILAR TO THAT OF A NON-ILL CHILD			SOME ABSTINENCE		FREQUENTLY FAILS TO ATTEND SCHOOL OR OTHER ACTIVITIES	

Appendix N

MEDICAL PERSONNEL FORM

MEDICAL CHART FORM

Subject Number: _____

Child's Diagnosis: _____

Date of Diagnosis: _____

Current Date: _____

Date off Treatment: _____

Medical Interventions Currently Being Received or Previously Received:
(Please check whether received and indicate number of times received)

Procedure	**Currently or Previously Received (check to indicate)**	**Approx. Number of Times**
Surgery		
Biopsy		
Shunts		
Radiation		
Chemotherapy		
Bone Marrow Transplant		
Spinal Tap		
Bone Marrow Aspiration		
Other (describe)		
Other (describe)		
Other (describe)		

Complications Secondary to Diagnosis and/or Treatment:
_____
_____

Medications Currently Prescribed:
_____ _____
_____ _____
_____ _____
_____ _____

Number of Outpatient Clinic Visits in the Past Year: _____

Number of Relapses in the Past Year: _____

Number of Emergency Room Visits in the Past Year: _____

Appendix O

SUBJECT SOLICITATION SCRIPT

SUBJECT SOLICITATION SCRIPT

"Hello, Mr. and/or Mrs. _____. My name is _____ and I am a research assistant who works with Dr. _____ here at _____. I would like to take a couple of minutes of you and your teen's time to describe a research study that we are currently conducting, in the hopes that we may interest you in participating.

The purpose of our research study is to find out how having cancer affects the social relationships of adolescents, as well as to examine adolescents' health behaviors. This type of research has not been done with adolescents who have cancer in the past and we think it is important information to have.

Your child's participation in this research study involves answering a series of questions on a lap top computer. He/she will answer these questions today during your clinic visit. The questions will be about how he/she feels about friendships and dating relationships, as well as about he/she's health behaviors, such as personal safety, physical safety, suicidal thoughts, sexual behavior, and drug and/or alcohol use. You, as parents, will also complete a few questionnaires today. Your questions will focus on your child's behavior, emotional functioning, and quality of life.

Taking part in this research study is completely voluntary. You may choose not to take part, and you may withdraw (quit) at any time. There are no medical or health risks associated with this study. Some of the questions may ask your child personal or sensitive information. People sometimes get upset when they are asked to answer questions about this kind of personal information.

To thank you for your time, your family will receive $20.00. Your participation may help us to better understand what it is like to be an adolescent with cancer and how we can effectively help adolescents with cancer have satisfying interpersonal relationships.

Efforts will be made to keep you and your child's personal information confidential. You and your child will not be identifiable by name or descriptions in any reports or publications about this study. To further help us to protect your privacy, we have obtained a Certificate of Confidentiality from the National Institutes of Health. With this Certificate, we researchers cannot be forced to disclose information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. We will use the Certificate to resist any demands for information that would identify you.

Now that I have explained the purpose of our study, as well as other important information for you and your teen to have, I would like to have you read over our consent/assent form. Please let me know if you have any questions or concerns. If not, all I need is your respective signatures on the consent/assent form and we may enroll you into our research study."

Appendix P

OKLAHOMA STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD (IRB)

APPROVAL PAGE

Oklahoma State University Institutional Review Board

Date	Tuesday, October 31, 2006	**Protocol Expires:**	**10/30/2007**
IRB Application No:	AS0634		
Proposal Title:	Social Relationship and Health -Related Behavior in Adolescents with Cancer		
Reviewed and Processed as:	Exempt **Continuation**		

Status Recommended by Reviewer(s): **Approved**

Principal Investigator(s) :

Melissa Carpentier
215 N. Murray
Stillwater, OK 74078

Larry L. Mullins
OUHSC 940 NE 13th St.
Okla. City, OK 73104

John M. Chaney
215 N. Murray
Stillwater, OK 74078

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Signature :

Sue C. Jacobs, Chair, Institutional Review Board

Tuesday, October 31, 2006
Date

VITA

Melissa Yvonne Carpentier

Candidate for the Degree of

Doctor of Philosophy

Dissertation: SOCIAL RELATIONSHIPS AND HEALTH-RELATED BEHAVIOR IN ADOLESCENTS WITH CANCER

Major Field: Clinical Psychology

Biographical:

Personal Data: Born in Laredo, Texas, on July 4, 1980, the daughter of Demetrio and Araceli Carpentier.

Education: Graduated from Hebbronville High School (Valedictorian), Hebbronville, Texas, in May 1998; received a Bachelor of Arts degree (Magna Cum Laude) in Psychology in May 2001 from Our Lady of the Lake University, San Antonio, Texas; received a Master of Science degree in Psychology in August 2003 from Oklahoma State University, Stillwater, Oklahoma. Completed the requirements for the Doctor of Philosophy degree in Clinical Psychology at Oklahoma State University in July 2007.

Experience: Employed by Oklahoma State University as a graduate assistant from 2001 - 2003. Worked as a psychological associate from 2003 - 2005 at the Center and Child Abuse and Neglect and Child Study Center, and as a graduate research assistant from 2004 - 2006 in Pediatric Hematology/Oncology at the University of Oklahoma Health Sciences Center. Completed pre-doctoral internship at the University of Mississippi Medical Center from July 2006 - June 2007.

Professional Memberships: American Psychological Association
Association for Behavioral and Cognitive Therapies
Society for Research in Adolescence
International Neuropsychological Society

Name: Melissa Yvonne Carpentier Date of Degree: July, 2007

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: SOCIAL RELATIONSHIPS AND HEALTH-RELATED BEHAVIOR IN ADOLESCENTS WITH CANCER

Pages in Study: 225 Candidate for the Degree of Doctor of Philosophy

Major Field: Clinical Psychology

Scope and Method of Study: The purpose of the current study was to provide an examination of how dimensions of close peer and dating relationships (i.e., social support, negative interactions, dating anxiety, fear of intimacy) among adolescents with cancer correspond with ratings of quality of life, psychological distress, and health-related behaviors (i.e., tobacco, alcohol, and other drug use; sexual risk-taking; nutrition/physical activity; overweight and dietary behaviors; sun safety). Participants were 39 adolescents currently on treatment for cancer and their parents. Adolescent participants completed self-report measures of social relationships, dating anxiety, fear of intimacy, psychological distress, quality of life, and health-related behaviors, whereas parent participants completed parent-report measures of adolescent psychological distress and quality of life.

Findings and Conclusions: Results indicated that dimensions of adolescents' close peer and dating relationships were significantly related to adolescent-, but not parent-report, of quality of life and psychological distress outcomes. Significant relationships also emerged between the variables of interest and adolescent-report of engagement in current cigarette use, use of alcohol/drugs and/or birth control prior to their last sexual experience, and sedentary behavior (e.g., excessive television/computer time). With regard to prevalence rates of health-related behavior, results indicated that adolescents with cancer demonstrate lower lifetime and current rates of tobacco, alcohol, and other drug use as compared to healthy peers. In addition, only a small subset reported engaging in risky sexual behavior (e.g., multiple partners, unprotected sex, using alcohol/drugs prior to intercourse). However, a significant majority of adolescents with cancer reported engaging in sedentary behavior and suboptimal levels of fruit and vegetable consumption and sun safety. Collectively, such health behaviors are concerning given adolescents' risk for second malignancies and emphasize the need for interventions targeting health behaviors while adolescents are currently undergoing treatment.

ADVISER'S APPROVAL: John M. Chaney, Ph.D.