BIOPSYCHOSOCIAL IMPACT OF PARENTAL CANCER ON SCHOOL AGERS

DISSERTATION

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ABSTRACT

Cancer is the second leading cause of death in the United States. Approximately 128,089 children in 1998 had a parent diagnosed with cancer. Parental cancer may be a pervasive stressful event for children, but the impact on children is largely unrecognized. How children cope with parental cancer and the effectiveness of their coping strategies is unknown. Based on an integration of Lazarus’s cognitive appraisal theory of stress and coping, cognitive developmental theory, social/emotional developmental theory, and physiologic stress response theory, this study aims to characterize the stress-coping process of children ages 7-12 who have a parent with cancer. A descriptive, cross-sectional design was used with a convenience sample of 51 school-age children from a University support group, oncology outpatient clinics and inpatient units. Data were collected through questions related to children’s appraisal of their parents’ cancer, 3 saliva samples, a human figure drawing, four self-report instruments for children (concurrent stressors, coping, responses to parental cancer, relationships with parents) and two instruments for parents (relationship with the child and child behavior checklist). Children’s appraisal of having a parent with cancer was positively significantly correlated with the severity of their symptoms. Children identified “having your parents
argue in front of you,” “not having homework done on time,” and “not spending enough time with parents” as stressors that occurred most frequently and were perceived as most severe. “Pray” was the most frequently used and effective coping strategy. The average cortisol level of the children was within the normal range. Stress symptoms were predominantly cognitive/emotional symptoms such as worried, cry or feel sad, afraid, nervous, bad, mad, and confused. More than half of the children had 2 or more than 2 emotional indicators in their drawings. The better the child-mother relationship, the more the children believed that their parents’ treatment would work. Children’s perceptions of their relationships with their mothers were negatively associated with their CBCL total scores. This is the first study to measure variables related to the entire scope of the stress-coping process. Findings from this study can be used as research-based guidance for developing nursing interventions for parents and children.
Dedicated to the parents and their children who shared their experiences with me

To my parents and my son, Robert
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CHAPTER 1

INTRODUCTION

According to the American Cancer Society, cancer is the second leading cause of death in the United States (U.S.), exceeded only by heart disease. Approximately, one of every four deaths in the U.S. is from cancer. In addition, about 1,368,030 new cancer cases are expected in 2004. More than 18 million new cancer cases have been diagnosed since 1990 (American Cancer Society, 2004). Many of these are parents of children and adolescents. For example, according to the National Cancer Institute and U.S. Bureau of Census, approximately 128,089 children had a parent diagnosed with cancer in 1998 (as cited in Birenbaum, Yancey, Phillips, Chand, & Huster, 1999). Cancer has been identified as a family affair (Baider & Kaplan De-Nour, 1988; Germino & O’Rourke, 1996; Lewis, Ellison, & Woods, 1985). When a parent is diagnosed with cancer, all family members are influenced by the illness, including the children. Parental cancer represents a significant stressor for children due to changes in parent-child interaction from the parents’ illness and the potential threat of the death of their parents. However, most of existing data focuses on the parents and their spouses. Children have received relatively little attention
in research literature. This pervasive stressor may trigger a variety of physiological, psychological, and behavioral stress responses in the children. Most of research to date has focused on children’s adjustment to their parents’ cancer. No research has been conducted to examine the entire scope of the stress-coping process. More understanding about potential factors that would contribute to children’s adjustment is necessary to develop effective interventions that prevent potential emotional harm in these children and further promote their physical and psychological health. The purpose of this dissertation is to describe these children’s concurrent stressors, appraisal, parent-child relationship, coping strategies used by children and their effectiveness, and children’s biopsychosocial responses as well as to examine the interrelationships among these variables.

This dissertation will be presented in four chapters. Chapter 2 entitled “Children’s Adjustment to Parental Cancer: State of the Science” introduces a new model for examining the whole stress-coping process of children’s adjustment to their parents’ cancer by integrating moderating and mediating approach, the previous research findings and Lazarus’s Stress and Coping Theory. Chapter 3 “Evidence for Reliability & Validity of Human Figure Drawings (HFD) as a Measure of Children’s emotional Status” discusses the normative development of Human Figure drawings, the evidence for the reliability and validity of using HFD in assessing children’s emotional status, and the implications for applying HFD in practice. Chapter 4 “Biopsychosocial Impact of Parental Cancer on Schoolagers” describes the study completed for
this dissertation and the results. Finally, future research directions in the area of the impact of parental cancer on school-age children are provided.
CHAPTER 2

CHILDREN’S ADJUSTMENT TO PARENTAL CANCER: STATE OF THE SCIENCE

Children’s Adjustment to Having a Parent Diagnosed with Cancer

Clinical and research literature focuses mostly on children’s adjustment to having a parent with breast cancer. It is not known if the type of cancer is a relevant factor in children’s responses. A lack of comparison groups in most studies prevents conclusions that children’s adjustment problems were caused by the diagnosis of cancer in the family. Among the very few studies with comparison groups (e.g., Armeden & Lewis, 1994; Hoke, 2001; Siegel et al., 1992), findings were inconsistent among the groups, perhaps relevant contributing variables might not have been examined concurrently in the studies. Two studies found that most children of parents with cancer did well or did not demonstrate unusual problems (Armsden & Lewis, 1994; Compas et al., 1994).

Four types of children’s negative reactions to a parent’s cancer include: (1) mood and self-esteem changes such as crying, anger, fearfulness, anxiety, and low self-esteem, (2) academic changes such as poor concentration and
declining academic performances, (3) somatic symptoms such as stomach aches, appetite disturbance, and difficulty sleeping, and (4) social and interpersonal changes such as acting out, denial, withdrawal from social relationships, and loss of interest in extracurricular activities (Hoke, 1996).

Although no research has identified true psychiatric disorders in these children, a wide range of biopsychosocial and behavioral adjustment problems in children is evident. What are the factors that influence this process, and which factors are amenable to change? The literature provides some answers. In the face of this stress, children need to adapt to many changes in their lives. But what influences the children’s ability to deal with these changes caused by parental cancer? In order to help these children adjust themselves to their parents’ illness, a comprehensive knowledge of the whole process of children’s adjustment to parental cancer is required.

**Factors Influencing Children’s Adjustment:**

**Moderating and Mediating Variables**

Factors that contribute to a child’s adjustment to his or her parent’s cancer can be classified as moderators and mediators. Pre-existing variables such as age and gender of the child or gender of the ill parent are moderators that will influence the situation that causes stress. The second category mediators, includes factors that exert their influence after the occurrence of parental illness. For example, the quality of the parent-child relationship, or the child’s coping behavior. According to the cognitive theory of stress and coping (Lazarus & Folkman, 1984), moderators are directly related to how an individual
appraises an encounter (primary appraisal) and indirectly influence subsequent choices of coping (secondary appraisal). Mediators have direct effect on the choices of coping made because the coping strategies used by an individual are based on the individual’s primary appraisal. Both primary and secondary appraisals are mediators.

**Moderating Variables**

*Child Characteristics.* Research findings suggest that the child’s age, cognitive maturity, gender, socio-emotional development and previous experience with parental illness are significantly associated with the child’s adjustment to having a parent with cancer.

(1) *Child age and cognitive maturity.* According to Piaget’s cognitive-developmental theory (Piaget & Inhelder, 1969), preschool children are in preoperational stage of cognitive development. Their reasoning is characterized by fantasy and magical thinking. They are developing the moral sense and they often feel responsible for events in their lives and think that their thoughts, feelings, or wishes result in illness and death (Koocher, 1974). School-age children, in Piaget’s stage of concrete operation, are able to think more logically and flexibly when dealing with concrete information than preschoolers, while their abstract thinking ability is still limited (Piaget & Inhelder, 1969). Their ability for cause and effect reasoning is better with concrete concepts than with abstract concepts. In other words, school-age children who have a parent with cancer are able to understand the changes related to parental cancer such as hair loss, weight loss, and illness behavior because these are concrete
observations. However, school-age children may have difficulty understanding more abstract concepts like “cancer”, “chemo”, or “side effects.” The ability to think and reason about abstract concepts improves during the formal operational stage that begins around age 11 (Piaget & Inhelder, 1969). Despite their ability to understand the situation, adolescents often feel torn between their own needs to meet developmental tasks and the demands of parental illness (Christ, Siegel, & Sperber, 1994).

Interview data from a longitudinal study of the impact of breast cancer on the family revealed that younger school-age children worried about the integrity of the family and worried about the future (Lewis, Ellison, & Woods, 1985). The older children aged 10 to 13 years expressed positive and negative concerns about how their lives were changed by their mother's illness. Adolescents, in Piaget’s stage of formal operation, are capable of using abstract thinking about illness and death. Nevertheless, adolescents demonstrated contradictory feelings and conflicts related to increased responsibilities and decreased social activities due to their mother's illness conflicting with desire to take care of mothers. Children’s understanding of illness parallels the levels of cognitive maturity (Carson, Graveley, & Council, 1992). In a classic study, Bibace and Walsh (1980) observed that children in first concrete operational substage held the belief of illness that was caused by physical contact; children in second substage started to understand that illness was linked to internal effect not simply external contact. The degree of children’s cognitive maturity will affect how children appraise the cause, severity, and stressfulness of parental cancer,
which, in turn, highly related to the children’s adjustment to their parents’ illness (Hoke, 1996). Children’s levels of cognitive maturity do not necessarily correspond to a particular chronological age, nevertheless, all studies on children’s adjustment to parental cancer used chronological age as an index of children’s level of cognitive maturity. Small sample sizes compound the difficulty in evaluating differences in child adjustment based on age groups and levels of cognitive maturity. Only one study (Birenbaum et al., 1999) conducted a power analysis to determine a sample size that would provide adequate statistical power.

Birenbaum and her colleagues (1999) found that schoolage children were at greater risk for having adjustment problems (50%), compared to 14% of adolescents. On the other hand, older children do not necessarily adjust to parental illness better than younger children. For instance, Lichtman and colleagues (1984) found that mothers with breast cancer encountered more problems in their relationships with adolescents than with their younger or adult children. This study had no comparison groups so it is possible that the difficulties with adolescents were no different than those normally encountered in turbulent parent-adolescent relationship.

(2) Child gender. Gender is another characteristic that may influence the child’s adjustment. Girls tend to report more stressful life events than boys (Groer, Thomas, & Shoffner, 1992). Girls are more likely than boys to display depression in stressful situations (Rudolph & Hammen, 1999) while boys are more likely to demonstrate disruptive behaviors (Masten et al. 1988). Girls tend
to use more emotional expression and social support strategies to deal with stressful situations, while boys tend to use physical-oriented strategies (Ryan, 1989). Compas, Worsham, Ey, and Howell (1996) noted that emotion-focused coping strategies are related to greater avoidance and to higher symptoms of anxiety-depression. Avoidance strategies can impede coping efforts and hamper effective adjustment to stressful events (Carver et al., 1993; Stanton & Snider, 1993). Mechanisms such as the increased household responsibilities placed on girls (Grant & Compas, 1995) and emotion-focused coping strategies frequently used by girls (Ryan, 1989) may explain why adolescent girls are at risk for maladjustment to parental cancer. Thus, gender differences in children’s responses to their parents’ cancer have been suggested, but the reasons for these differences have not been empirically examined in depth (Hoke, 1996).

(3) Social/Emotional development. According to Piaget’s theory, children become more socialized and independent with age (Piaget & Inhelder, 1969). Gradually, peers become an important part of children’s lives. However, parents remain the main attachment figures for their children in times of need. Parents help their children regulate emotions when the children’s resources are taxed during pain, anxiety, or distress (Salisch, 2001). Even though children’s dependence on their parents gradually decreases, this reliance normally lasts into adolescence and beyond. When a parent is diagnosed with cancer, both parents may become physically and emotionally unavailable to their children due to the illness-related demands (Lewis, Hammond, & Woods, 1993; Lewis, Woods, Hough, & Bensley, 1989). Lewis et al. (1993) found that the demands
of illness are associated with parental depression, which, in turn negatively affects parenting ability (Zahlis & Lewis, 1998). Attachment-related studies support the idea that secure attachments are associated with fewer behavior problems for school-age children (Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998). Children’s lack of access to their ill parent, and lack of parental support negatively affect children’s coping ability and contribute to the development of behavior problems (Moss, Parent, Gosselin, Rousseau, & St-Laurent, 1996). Children’s psychosocial adjustment is thereby disrupted (Lewis et al., 1993).

(4) Children’s previous experience related to cancer or other illness. Although no research has examined how a child’s prior experience with cancer/illness affects his or her adjustment to current illness of the parent, one can make inferences based on the example of children’s responses to death. DeSpelder and Strickland (2002) stated that a child’s response to death is related to his or her previous experiences with death. These prior experiences, including whether adults convey appropriate information, or help children understand and cope with death may contribute to how children appraise and respond to death in the future. Children with a history of having difficulty in dealing with death are more likely to have problems in similar situations or demonstrate emotional problems in later life. Likewise, we may infer that children who have a parent diagnosed with cancer may show similar patterns.
Characteristics of Ill Parent and Family. Factors, such as gender of the ill parent, family's socioeconomic status and social support network modify the situation of a parent with cancer.

(1) Gender of ill parent. Several studies reported that adolescent girls whose mothers had cancer demonstrated higher levels of depression and anxiety than children whose fathers had cancer (Compas, Orosan, & Grant, 1993; Compas et al., 1994; Lichtman et al., 1984; Welch, Wadsworth, & Compas, 1996). Conclusions are premature because too few studies have compared children's adjustment to their parents' cancer based on gender of the parent.

(2) Nature of parent's illness. Armistead et al. (1995) indicated that some dimensions of physical illness, such as onset, course, outcome/prognosis, and degree of incapacitation caused by the illness, may affect children's adjustment; however, no studies have examined empirically the relationships among these variables. Buckley (1977) found that children's behavioral maladjustment was significantly associated with increased duration of parent’s cancer. Few children who were under the age of 19 showed behavioral regression when a parent’s illness was less than one year in duration. Contrary to their own hypothesis, Armsden and Lewis (1994) found that children whose mothers had breast cancer demonstrated fewer behavior problems and coped more effectively than children whose mothers had a non life-threatening disease such as fibrocystic breast disease or diabetes mellitus. The authors speculated that is that children may be more likely to demonstrate adjustment problems in the crisis phase of
their parents’ illness rather than after an extended period although that explanation does not fit their initial hypothesis. Armsden and Lewis did not study the children in the crisis phase. Hoke (2001) found that children whose mothers were diagnosed with breast cancer during the previous year did not demonstrate significantly increased adjustment problems compared to children whose mothers had recent benign breast biopsies. Another study revealed that children who had parents who were dying of cancer reported higher levels of depression and anxiety and low-self-esteem than children in the comparison group whose parents were not dying (Siegel et al., 1992). Lichtman and colleagues (1984) found that a poor prognosis, more serious surgery, more difficulty with radiation therapy or chemotherapy, and poorer adjustment of the ill mother contributed significantly to the deterioration of the mother-child relationship, which subsequently influences children’s adjustment.

(3) Family socioeconomic status. Hoke suggested that no differences were found in her study of children whose mothers had breast cancer versus benign breast biopsies because most of the families had middle to high socioeconomic status and therefore generally have more resources to cope with the stress; thus, children are better adjusted. However, Armistead et al. (1995) indicated that this factor has not been well-examined in studies of parental physical illness. The effect of family SES on children’s adjustment to parental cancer is still speculative.

(4) Social support network. Families that have a parent with cancer experience multidimensional demands. Social support networks reflect a
family’s practical supportive resources available for coping with stress. Children benefit by the positive influence of a support network on the parent with cancer. Lewis and her colleagues (1989) hypothesized that a family’s social support, the amount of assistance available for the family, has positive effects on family coping and can increase the family’s ability to cope with the demands of illness. This hypothesis was not supported. In a similar study of explanatory model testing, social support significantly predicted an ill parent’s level of depression. The higher the levels of social support, the less depressed were the ill parents (Lewis et al., 1993). However, social support did not to predict family coping behavior.

*Mediating Variables*

Mediators do not influence the intensity of the stressful situation but they influence family and child responses to the situation. The literature suggests that family coping, parent-child relationship, children’s appraisal of parental cancer, and children’s coping behavior are mediators that influence a child’s adjustment to parental cancer.

*Family coping.* Parental adjustment and marital adjustment influence family coping (Lewis et al., 1993). Lewis et al. (1989; 1993) found that the family’s coping behavior (measured by the familial introspection subscale of an adapted version of the F-COPE Scale) significantly influenced the quality of the relationship between the non-ill parents and their children (measured by the togetherness subscale of the Family Peer Relations Questionnaire; $r = 0.47$, $p < 0.001$, and $r = 0.48$, $p < 0.01$, respectively). In addition, family coping behavior
significantly affected children’s psychosocial functioning ($r = 0.22$, $p < 0.1$, and $r = 0.32$, $p < 0.05$, respectively).

Lewis et al. (1989;1993) examined the potential variables that might account for family coping when a mother had chronic illness, including social support (measured by the total functional variable of the Norbeck Social Support Scale), spousal psychological functioning (measured by the Center for Epidemiological Studies—Depression (CES-D) Scale), demands of illness (measured by the frequency of occurrence of recently experienced demands in the family demands subscale of the Demands of Illness Inventory), and marital adjustment (measured by the total scale score of Spanier’s Dyadic Adjustment Scale). More illness-related demands resulted in higher levels of depressed mood, which in turn, led to poorer marital adjustment. Well-adjusted marriages positively affected the family’s coping behavior. Children learn coping behaviors from family members, thus families who are able cope should positively influence children’s coping and, ultimately, their positive adjustment.

**Parent-child relationship.** Parent-child relationships play a critical role in children’s development (Nelson, Sloper, Charlton, & White, 1994). Lewis et al. (1993) found that children’s psychosocial functioning was better when the non-ill parent had more frequent interaction with them ($r = 0.44$, $p < 0.01$). Wellisch (1981) found that children’s behavior disorders were increased by 33% during the parental illness with cancer and that most parents negatively responded to their children’s behavioral problems instead of paying attention to the children or seeking mental health consultation for them. However, Lewandowski (1996)
indicated that the responses and coping strategies of children with a parent having cancer were frequently not identified by overwhelmed family members. Children’s feelings and concerns are also often unrecognized or ignored because parents usually doubt their children’s ability to understand or parents feel uncomfortable about exposing their children to such devastating news (DeSpelder & Stickland, 2002). Open and clear communication with children is an important way to enable children to master their distress and to prepare for any potential changes and/or loss arising from parental illness, including parental death. Communication also can help children correct distorted explanations of their parental illness and enhance coping ability and adjustment. Parental illness could result in parents being physically and emotionally inaccessible due to hospitalization and treatment demands and depression secondary to a cancer diagnosis (Brody, Stoneman, & Burke, 1987). Lichtman et al. (1984) found poorer psychological adjustment of an ill mother was significantly correlated with deteriorated mother-child relationship (r = .91, p < 0.002). Consequently, the physical, emotional, and developmental needs of the children might not be met by their parents (Hoke, 1996; Lewandowski, 1996). Single parents tended to be more distressed than married couples (Lewis et al., 1996). In a study of the impact of a mother’s chronic illness on the family, Lewis, Woods, Hough, and Bensley (1989) found that fathers’ depression did not have a direct effect on the quality of the father-child relationship. However, the child’s psychosocial functioning (measured by the peer relations subscale of the family Peer Relationship Questionnaire rated by
the father) was significantly positively correlated with the quality of the father-child relationship (measured by the togetherness subscale of the Family Peer Relations questionnaire; r = 0.44, p < 0.001) and negatively correlated with the level of marital adjustment (measured by the Spanier Dyadic Adjustment Scale; r = -0.45, p < 0.001).

Child’s appraisal of parental cancer. When children cannot acquire sufficient and accurate information about their parent’s illness from parents or others, children frequently use fantasies to appraise the cause and seriousness of parental illness (Hoke, 1996; Lewandowski, 1996). Research indicates that sharing of information and feelings about their parent’s illness will help children cope with the stressful situation (Issel, Ersek, & Lewis, 1990; Adams-Greenly & Moynihan, 1983; Lewandowski, 1996). The anxiety of children uninformed by their parents is significantly higher than informed children (Rosenheim & Reicher, 1985). The stress and coping process is mediated by cognitive appraisal of the stressor and one’s resources coping resources (Lazarus, 2000; Lazarus & Folkman, 1984). Cognitive appraisal is defined as “a process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being and, if so, in what way” (Folkman, Lazarus, Gruen, & DeLongis, 1986, p. 572). Children who have a parent with cancer might perceive their experience as irrelevant, benign-positive or stressful, according to Lazarus’ theory. If they perceive the event of parental diagnosis of cancer as stressful, the event becomes a stressor and is further appraised as a challenge, threat, harm and/or loss by the children. Compas et
al., (1996) found that children who appraised their parents’ illness as serious and stressful exhibited maladaptive coping behaviors. Children’s appraisals warrant further research to better understand their influence on adjustment.

*Child’s coping.* Children’s coping efforts are affected by their appraisal of the severity and stressfulness of their parents’ cancer, and in turn, their adjustment to this stressor (Compas et al., 1996; Nelson, Sloper, Charlton, & White, 1994). Lazarus and Folkman defined coping as a dynamic process and proposed three major types of coping including problem-focused, emotion-focused, and social support-seeking strategies (Lazarus, 2000). Problem-focused strategies are aimed at altering the stressful situation by either adjusting one’s self or changing the environment. Emotion-focused strategies are directed toward regulating one’s emotions related to the stressor. A third coping category includes the efforts of seeking, obtaining, and using social support. These strategies could be emotional- or problem-focused. A pilot study documented that children who have a parent with cancer used both emotion-focused and problem-focused coping strategies to cope with their stress caused by a parent’s cancer (Nelson et al., 1994). Issel, Ersek, and Lewis (1990) used family systems and cognitive development theories to examine how children cope with a mother’s breast cancer through interview. They concluded that four types of coping strategies had been used by the children, including “acting as though they were in their mother’s shoes” (e.g., being considerate, helping out, doing for mother), “carrying on business as usual” (e.g., acting normal, doing regular activities, putting it out of mind, not talking/thinking about it), “tapping
into group energy” (e.g., spending time together with family members, being with friends), and “putting the mother's illness on the table” (talking about it, thinking about it, went to the treatment place). However, neither study examined the effectiveness of children’s coping.

Regarding the relationship between coping strategies and psychological functioning, Forsythe and Compas (1987) found that psychological outcomes were associated with the goodness of fit between cognitive appraisal and coping with various life stressors. The stressful events appraised as controllable fit best with the use of problem-focused coping, while events perceived as uncontrollable fit best with emotion-focused coping. High “goodness of fit” between appraisals of the controllability of the stressful events and the use of problem- and emotion-focused coping is related to fewer psychological symptoms.

**Intervention Programs for Children Who Have A Parent With Cancer**

Interventions are designed to help children adjust to having a parent with cancer. Intervention can focus on any or all of the four mediators previously described. The demands and uncertainty of a parent’s illness with cancer may bring family members closer together (Armistead & Forehand, 1995), it pushes others further apart (Hough, Lewis, & Woods, 1991). Research suggests that psychological intervention programs can lead to improvement of mood, quality of life, coping skills, and stress management (Cunningham, Edmonds, & Williams, 1999) and enhance family members’ ability to cope with the stresses of cancer (Walsh-Burke, 1992). Although the number of clinical intervention
programs available for children whose parents have cancer are growing, only a few of the programs have been published, such as the Quest program (Heiney & Lesesne, 1996), “For Kids Only” program (Bedway & Smith, 1996), the Komen Kids (Hill, 1995), “Kids Can Cope” group intervention (Taylor-Brown et al., 1993), “Bear Essentials” program (Greening, 1992), “School-based Groups” for children of cancer patients (Call, 1990), and “The Kid’s Connection” support group for children who have a parent with cancer (Bourne & Tingwald, 1990). Details about purposes, program components, and evaluation methods of each intervention program are presented in Table 2.1.

The interventions were based on clinical observations of need for such programs, age-related concerns of children, and relevant research findings. Most of the programs contain three components including (1) education: educating children about cancer, (2) normalization: creating a safe environment in which allows them express their feelings and thoughts as well as provides them with psychological/ emotional support and, (3) building on existing strengths: helping them recognize their ability to cope with stressful event and further enhancing their coping skills. Most of intervention programs obtained an informal evaluation from children, parents/care givers, and/or staff and volunteers through methods such as verbal comments from participants, interviews, or questionnaires. Feedback from various resources revealed that the effects of those reported intervention programs on children and their families were clinically positive. However, none of the programs systematically evaluated their effects on children’s biopsychosocial adjustment or behavioral
change. None use comparison groups or rigorous research designs. Therefore, the results may be clinically significant but not convincing from the perspective of intervention research.

**Children’s Adjustment to Parental Cancer: A Theoretical Model**

The ultimate goal of theory and research in a practice discipline such as nursing, is development of effective nursing interventions. For maximum effectiveness, nursing interventions should be derived from theory, research, and clinical observations. Theories used in research include child developmental theory (child’s developmental characteristics in terms of cognitive and social/emotional), Lazarus’s stress and coping theory (stress and coping process), and family systems theory (the interdependent and mutually influenced relationships/interactions between the subsystems in the family). A theoretical model is a useful way to illustrate how important concepts interrelate. Lewis and her colleagues (1989; 1993) presented an explanatory model to explain family functioning when a mother has cancer or a chronic illness. This model focuses on the whole family functioning rather children’s adjustment. The relationships between the variables are complex. A nursing intervention model is proposed to illustrate how the stressor, moderators, mediators, and adjustment variables interrelated (Figure 2.1). Moderator variables represent “unchangeable” things, for example, characteristics of the individual such as age, gender, and race, that vary between individuals or families. A moderator is defined as an “independent variable that affects the strength and/or direction of the association” between the intervention and
another independent variable and an outcome variable (Bennett, 2000, p. 416). A variable can be statistically evaluated for its effect as a moderator. For example, if the interaction effect \((a \times b)\) between a nursing intervention \((a)\) and a suspected moderator \((b)\) is statistically significant and has a greater effect on the outcome than \(a\) or \(b\) alone \((a \times b > a, b)\) then \(b\) has a moderating effect (Figure 2.1). Mediators, on the other hand, are variables that vary within individuals or families. If a statistically significant direct effect of the intervention \((a)\) on the outcome variable exists and the effect of the intervention is augmented when added to the effect of a proposed mediator \((c)\) \((a + b > a)\) then \(c\) has a mediating effect (Figure 2.1). A causal model is proposed to illustrate moderator variables that may interact with an intervention and mediator variables that may augment to affect children’s adjustment to parental cancer (Figure 2.1). The diagnosis of parental cancer invariably leads to psychological and social stress in children. Theory and research reviewed in this article suggest that there are two major moderators (child characteristics and ill parent and family characteristics) and four mediators (family coping, parent-child relationship, child’s appraisal of parental cancer, and child’s coping) that influence the intervention and the outcome. A nursing intervention represents a program that may consider the impact of moderating or mediating variables, or both to promote children’s adjustment to parental cancer.

According to McCubbin and Patterson (1982), adjustment represents a short-term response. Adaptation implies long-term consequences. Based on Hoke’s classification (four types of children’s reactions to a parent’s cancer),
adjustment is defined as the degree to which a child is functioning in terms of emotional/mood, somatic, academic, as well as social and interpersonal dimensions. Maladjustment suggests that the child demonstrates more biopsychosocial problems than the average population. Bonadjustment suggests that children who have a parent with cancer have fewer than or the same level of biopsychosocial problems as the average population. Definitions and proposed methods of measures for each variable included in our model, are described in Table 2.2.

**Implications for Education, Policy, Research and Clinical Practice**

Educational programs for nurses and other healthcare professionals should include information about effects of parental illness on children. Parents need anticipatory guidance about how children may respond to serious parental illness. Children need factual, but developmentally appropriate information about their parents’ illness. In addition, it should be policy that caregivers of adults with cancer determine there are whether children in the family and provide anticipatory guidance and make appropriate referrals for these families, such as support groups for children and counseling.

Although a theoretical model can effectively guide research and intervention programs, methodological problems can limit the interpretation or generalizability of the research findings. These problems include small sample size, potential sampling bias/nonrepresentative samples (e.g., lack of consideration of other concurrent stressors), lack of comparison/control groups, and reliance on only parent reports of children’s outcomes. Child self-report and
biophysical methods such as salivary cortisol should be included as sources of data. A major gap in research and clinical practice lies in the lack of a model to systematically examine the process of children’s coping with parental cancer and test the effectiveness of nursing intervention programs. Most of research focuses on children’s reactions to parental cancer without examining the factors that influence their responses. How children cope with parental cancer and the effectiveness of their coping strategies are unclear as well. In addition, intervention programs lack systematic evaluation to assess their effectiveness.

Children’s adjustment is linked to both unchangeable and changeable characteristics (moderator and mediator variables). Some of these characteristics can augment the positive effect of an intervention. Intervention programs for parents to facilitate family coping ability and to improve parent-child relationship, as well as developmentally appropriate interventions for children are needed.

The diagnosis of cancer is a devastating experience for families [Lewis, 1986]. If the family is in the stage of child-bearing or child-rearing, the impact becomes more complicated because the families have to not only respond to the demands and contingencies of cancer diagnosis, but also provide family members with appropriate nurturance and developmental needs [Lewis et al., 1985]. Unfortunately, children’s needs are often unrecognized by their overwhelmed parents [Lewandowski, 1996]. Parental cancer especially represents a significant stressor for children due to the potential threat of the death of their parents. Under these circumstances, families experience extreme
challenges of multiple unpredictable demands. All of these situations might affect the child’s overall adjustment and trigger a variety of physiological, psychological, and behavioral stress responses. More research focused on the impact of moderators and mediators on children’s adjustment to their parents’ cancer is needed. Moderators can help explain individual differences in children’s reactions to parental cancer and identify high-risk groups. Mediators such as family coping, parent-child relationship, child’s appraisal, and child’s coping are changeable and maybe the focus of nursing intervention. This two-dimensional model suggests a unidirectional relationship among several variables and children’s outcomes, but few phenomena are actually unidirectional. Longitudinal studies will clarify the reciprocal relationships among variables. This model is a beginning effort to summarize theory and extant research on the effects of parental cancer on children.
<table>
<thead>
<tr>
<th>Author</th>
<th>Program</th>
<th>Age group</th>
<th>Purpose &amp; theoretical base</th>
<th>Time frame &amp; components</th>
<th>Evaluation methods</th>
<th>Results of evaluation</th>
</tr>
</thead>
</table>
| Bedway & Smith  | For Kids Only                  | Pre-schoolers through adolescents with a parent, grandparent, sibling, or significant others with cancer | To provide children with education and support as well as to identify children who need more in-depth counseling | One-day workshop  
1. introduction exercise (30 mins) – introduce each other and share information  
2. Clay sculptures (45 mins) – allow children to depict their perception of cancer  
3. Cancer overview and quiz game (60 mins)  
4. Tour of radiation oncology (30 mins) – educate children about radiation therapy and alleviate their fears  
5. Tour of inpatient oncology (30 mins) -- educate children about hospitals and the hospitalization experience and alleviate their fear  
6. Journaling (30 mins) – provide children with a method of expressing thoughts and feelings  
7. Feelings (45 mins) – allow children to express feelings about the family member’s disease and its impact | Verbal comments from participants and their families  
Questionnaires for parents of children – satisfaction with the program’s format, content, time and location  
Questions for both participants – the need for an ongoing support group and a newsletter | No details about the results. Two information were provided: 1) data from the evaluations were used to revise and expand the program, and 2) the responses to the need for an ongoing support group and a newsletter were positive |
Table 2.1 continued

<table>
<thead>
<tr>
<th>Bedway &amp; Smith (1996) (cont’d)</th>
<th>For Kids Only (cont’d)</th>
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<tbody>
<tr>
<td>8. Healing cream (30 mins) – provide children with opportunity to gifts to family members</td>
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<tr>
<td>Celebration (30 mins) – summarize the program and provide parents with an opportunity to talk to facilitators</td>
<td></td>
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<table>
<thead>
<tr>
<th>Bourne &amp; Tingwald (1990)</th>
<th>Children ages 5-15 who have a parent with cancer</th>
<th>To provide information and support for children who have a parent with cancer</th>
<th>Monthly meeting (1.5 hours)</th>
<th>Not reported</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Kids Connection</td>
<td></td>
<td>1. Information sharing – names, ages, grade levels, and why come to the group</td>
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<td></td>
<td></td>
<td>2. Write about or draw their feelings, fears, questions, and concerns in the notebook given to them. Children can choose to share or not to share the contents of the notebook with the group</td>
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<td></td>
<td></td>
<td>3. Feelings addressed constantly through rounds by the facilitators posing questions, such as “Has anything happened since we last meet?”, “How are you getting along with your friends?”, “How are things different since your mom or dad has cancer?”</td>
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<td></td>
<td></td>
<td>Integrate a knowledge of children’s feelings by discussing their notebooks, drawing pictures, and creating a mural</td>
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</tbody>
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Table 2.1 continued

<table>
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<tr>
<th>Call (1990)</th>
<th>Grades 6-12 children who have a loved one with life-threatening illness (it is cancer in the majority of instances) or who have a parent (or a significant other) has died.</th>
<th>To help children develop coping skills as to as minimize their emotional difficulties</th>
<th>Meet once a week for 10 weeks (held on school grounds during school hours; each session lasts around 50-55 minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“School-based Groups” for children of cancer patients</td>
<td>Group size: 5-11 members (the average is 6-9 members)</td>
<td>1. Education: provide children with information about the parent’s disease and the methods of treatment 2. Normalization: one aim is to encourage children to express their intense feelings and make them understand the negative feelings are normal. Another aim is to give children permission to relax and have fun—to take a break from the illness and the grieving and they are not betraying a parent by being involved with friends or joyful activities 3. Building on existing strengths: help children recognize their existing strengths and increase their coping skills to deal with the crisis</td>
<td>Verbal and written evaluations from children, counselors, teachers, and parents. However, no formal evaluation forms have been developed or used to assess the effects of the program. The author highlighted the need for further research in developing tools for evaluating the long-term effects of group participation</td>
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<td></td>
<td></td>
<td></td>
<td>Feedback from children: extremely positive (no detailed information) Positive effects on children have been reported by counselors, teachers, and parents: less angry and worried, improved concentration and grades, more openly sharing their feelings, and becoming calmer</td>
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<th>Table 2.1 continued</th>
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<tbody>
<tr>
<td>Children ages 4 to 8 with a parent with cancer</td>
</tr>
<tr>
<td><strong>To help families:</strong></td>
</tr>
<tr>
<td>1. understand how children perceive illness, separation, and loss</td>
</tr>
<tr>
<td>2. discuss the concerns of patients, spouses, and children in a supportive setting</td>
</tr>
<tr>
<td>3. develop coping strategies to manage better the emotional difficulties caused by a parent’s illness</td>
</tr>
<tr>
<td><strong>Monthly meeting (1.5 hours)</strong></td>
</tr>
<tr>
<td>Themes of the meetings (each them involves various activities related to the theme):</td>
</tr>
<tr>
<td>1. Visiting the hospital: a discussion about hospital routines and an explanation of chemotherapy and its side effects. Present the experience of visiting a parent in the hospital by a puppet show</td>
</tr>
<tr>
<td>2. Friends: friendship help them feel more comfortable</td>
</tr>
<tr>
<td>3. Feelings: recognize and express their own feelings</td>
</tr>
<tr>
<td>4. Sharing: the idea of “the gift of love”</td>
</tr>
<tr>
<td>5. New beginnings: “ups and downs” experience</td>
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<tr>
<td>6. Rainbows: reflect the idea that it takes both sunshine and rain to make a rainbow</td>
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<tr>
<td>7. Families: highlight different types of families and relationships as well as the special nature of</td>
</tr>
<tr>
<td>8. Medical equipment: allow children to be aware of hospital equipment</td>
</tr>
<tr>
<td><strong>Examine the data shared by participants and facilitator</strong></td>
</tr>
<tr>
<td><strong>Parental feedback was highly positive. The author indicated although this evaluation strategy did not provide a hard measure of the program’s success, the data did reflect that the program was processed in the right direction. Also, the team is developing a formal evaluation tool that can be administered to parents and children at the end of one year.</strong></td>
</tr>
<tr>
<td>Additional helpful material:</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>1. Resource packets—relevant literature, play materials, and resources for the families</td>
</tr>
<tr>
<td>2. A bibliography of books available at the public library</td>
</tr>
</tbody>
</table>

| Five areas that will be addressed in the instrument include: (1) parents’ comments on children’s feedback about the group, (2) children’s behavioral changes noted by the parents, (3) information on how family members are currently coping, (4) parent’s critiques of resource materials, and (5) parental evaluations of specific elements of the program and suggestions for improvement (p. 59) |
### Table 2.1 continued

| Quest | Purpose: promote children's ability to cope with a parent's or grandparent's cancer diagnosis | Goals: promote more positive communication about the illness within the family system, increase children's understanding and knowledge about cancer, normalize feelings and concerns of children, and decrease the sense of isolation of children | Biannual evening program (each session lasts 2 hours) Include the essential components education and support that have been identified in the research and clinical literature 1. Parent pre-program interview (30-45 minutes); parents are asked the following questions—the diagnosis, if the child is aware of it, if the parent has noticed any behavior changes since the diagnosis, coping methods used to help the child by parents, and the child's attitude toward attending the program as well as the parents' goals for the child. In addition, parents may be provided with information to improve communication with the child and to decrease parents' concerns about talking with the child. Also, they may be given specific information to use with the child. 1. Children's evaluation the coordinators developed a simple scale that included (1) forced-choice items (a Liker-type scale used for the older children and teenagers; a modified visual analog scale used for younger children) evaluate children's feelings about attendance, the value of the activities, and the presence of therapeutic group factors, and (2) open-ended responses—ask children what the best part of the program is. Children are also encouraged to write meaningful comments, such as what they learned. Care givers' post-program interview: parents stated that their children enjoyed the program, including all the information they received in the lecture and on the tours, especially. 1. Children's evaluation from 12-18 years: according to the authors, the evaluations were overwhelming positive (mean = 3.00-3.75 on a scale of 1.0 to 4.0 with 4.0 being the most positive). "Tours" was the participants' favorite activity 2. Care givers' postprogram interview: parents stated that their children enjoyed the program, including all the information they received in the lecture and on the tours, especially. 3. 4. 
| Heiney & Lesesne (1996) | Children and teenagers who have a parent or a grandparent with cancer (age groups: 5-7, 8-9, 10-12, and 13 years and older) | 1. Children's evaluation the coordinators developed a simple scale that included (1) forced-choice items (a Liker-type scale used for the older children and teenagers; a modified visual analog scale used for younger children) evaluate children's feelings about attendance, the value of the activities, and the presence of therapeutic group factors, and (2) open-ended responses—ask children what the best part of the program is. Children are also encouraged to write meaningful comments, such as what they learned. Care givers’ post-program interview: parents stated that their children enjoyed the program, including all the information they received in the lecture and on the tours, especially. 3. 4. |
Finally, details about the program are reviewed.

5. Agenda: getting to know you activities, hospital tour, age-appropriate evaluation and thoughts sharing about what children learned or gained from the program. When parents pick up their child, they are given a packet of information and a report form describing their child’s participation in the program.

2. Interview: this was conducted within 2 weeks after the program gathering information on the child’s response to the program and the parents’ perceptions of the value of the program. Most of the parents believed that their children benefited from attending the program and noticed that their children were more informed and open about the diagnosis and treatment of their loved one with cancer.

3. Staff and volunteer evaluation: after the first four Quest programs, the staff met and critiqued the format, information, and logistic issues of the program. They also reviewed children’s evaluations and reported on activities and the participant’s responses to them. Regarding the value of the handouts and booklets, parents perceived that they were helpful. The feedback from, made parents more aware of their child’s ability to understand and cope with their loved one’s illness. In addition, parents had many complimentary comments about the program and its benefit.

3. Staff and volunteer evaluation: based on the staff feedback and suggestions, several activities were modified.

Table 2.1 continued
| Hill (1995) | Children aged 7 to 17 years who have a parent with any type of cancer (split into groups by age level) | Provide children with an emotionally safe environment. Help children learn to express their feelings and to improve communication with their family, friends as well as health professionals. Also, help them learn new coping skills. | The program include: 1. A 24-hour hotline 2. A monthly meeting with speakers to talk about specific topics 3. Meet on other occasions to just have fun without talking about cancer | Not reported | N/A |

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<tr>
<th>Kids Can Cope</th>
<th>Children aged 5-18 years who have a parent has been diagnosed with cancer (divided into 3 groups of between 4 and 8 members on the basis of age and level of maturity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Educate children about cancer and its treatment. 2. Provide them with chances to share their feelings and concerns in a supportive environment with others who are in similar situations. 3. Increase their repertoire of coping strategies.</td>
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<tr>
<td></td>
<td>Twice a year (fall &amp; spring; the program consists of 6 weekly after-school sessions for the children and one evening information session for the parents in the final week of the program) 1. First session: build group trust and cohesion and to assess the children’s understanding of cancer. 2. Second session: focus on the physical aspects of cancer and its treatment, including feelings and fears about death and the unstable nature of the disease. Tours of the radiation therapy and chemotherapy clinics provide the children with “hand-on” experience with the treatment.</td>
</tr>
<tr>
<td></td>
<td>No formal evaluations have been conducted</td>
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<thead>
<tr>
<th>Taylor-Brown, Acheson, &amp; Farber, 1993 (cont'd)</th>
<th>Kids Can Cope (cont'd)</th>
</tr>
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<tbody>
<tr>
<td>3. Third and fourth sessions: deal with feelings—provide the children with an opportunity to talk about their own experiences of having a parent with cancer and to explore their feelings about changes in the family</td>
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<tr>
<td>4. Fifth and sixth sessions: focus on coping skills and strategies and group closure. The 6th session also includes a “graduation” pizza party</td>
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Fig. 2.1: A model of children's adjustment to parental cancer

Stressor: Having a parent with cancer

Moderators:
- Child characteristics:
  - Age
  - Sex
  - Social/Emotional development (e.g., temperament)
  - Previous experience related to cancer or other illness
  - Concurrent stressors
- Ill parent and family characteristics:
  - Sex of ill parent
  - Nature of illness (type, stage and length of illness)
  - Family socioeconomic status
  - Family social network
  - Concurrent stressors

Mediators:
- Family coping
- Parent-child relationship
- Child's appraisal of parent's cancer
- Child's coping strategies

Outcomes:
- Bonadjustment
- Maladjustment

Nursing Intervention

a x b
<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
<th>Measures</th>
</tr>
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<tbody>
<tr>
<td>Stage of social/emotional development</td>
<td>Development of emotional communication, self-understanding, ability to manage one’s own feelings, knowledge about other people, interpersonal skills, friendships, intimate relationships, and moral reasoning and behavior (Berk, 2000, p.5)</td>
<td>Based on the period of development</td>
</tr>
<tr>
<td>Nature of illness</td>
<td>Type, stage, and length of cancer</td>
<td>1. Parent-report  2. Interview  3. Demographic form</td>
</tr>
<tr>
<td>Family socioeconomic status</td>
<td>Residence, educational level, income, occupation, etc.</td>
<td>1. The average of the parents’ educational and occupational status. Six variables can be used to compute the score: both parents’ educational levels, and the levels of occupational involvement with data and with people from the Directory of Occupational Titles (Lewis et al., 1989; 1993).  2. Index of Social Position Score devised by Hollingshead &amp; Redlich, 1958, p. 394  3. Parent-report  4. Interview  5. Demographic form</td>
</tr>
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Table 2.2: Definitions of concepts in the model and the methods of measure
<table>
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<tr>
<td>Family coping</td>
<td>Parents' cognitive and behavioral efforts to manage, reduce, or tolerate the internal and/or external demands that are created by the cancer diagnosis of a parent in the family</td>
<td>1. The familial introspection subscale of an adapted version of the F-COPES Scale (McCubbin, Larsen, &amp; Olson, 1982)</td>
</tr>
<tr>
<td>Parent-child relationship</td>
<td>The extent to which parent(s)'s physical and emotional accessibility to the child, including communication between parent(s) and the child (the pattern and frequency talking with the parent), the child perceived assistance from the parent(s) with personal problems</td>
<td>1. Child-Parent Attachment Subscale of the Relationships Scale 2. The togetherness subscale of the Family Peer Relations Questionnaire (Ellison, 1983; 1985)</td>
</tr>
<tr>
<td>Child’s appraisal of parent’s cancer</td>
<td>Child’s judgments that parental cancer is irrelevant (parental cancer has no significance for the child’s well-being), benign-positive (parental cancer does not tax or exceed the child’s resources and signals only positive consequences), or stressful appraisals. The stressful appraisals include harm/loss, threat, or challenge. Harm/loss and threat are characterized by negative emotions, such as fear, anger, or resentment, whereas challenge appraisals are manifested at pleasurable emotions, such as excitement and eagerness. The definition for each stressful appraisal is: 1. Harm/loss: refers to injury or damage already occurred, for example, loss of self-esteem, damage to parent-child relationship. 2. Threats: refers to a potential for harm or loss. 3. Challenge: refers to an opportunity for growth, mastery, or gain.</td>
<td>1. Self-report 2. Parent-report 3. Interview</td>
</tr>
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<tr>
<th>Child’s coping</th>
<th>Definiton</th>
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<th>Anxiety</th>
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<tbody>
<tr>
<td>Child’s cognitive and behavioral efforts to manage, reduce, or tolerate the internal and/or external demands that are created by the cancer diagnosis of a parent in the family</td>
<td></td>
<td>1. Interview</td>
<td>1. Revised-Children’s Manifest Anxiety Scale (R-CMAS) (Reynolds &amp; Richmond, 1985)</td>
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<tr>
<td></td>
<td>Refers to child’s short-term outcome, such as mood and self-esteem changes, academic changes, somatic symptoms, and social interpersonal changes.</td>
<td></td>
<td>4. Salivary Cortisol Testing</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Depression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Children’s Depression Inventory (CDI): for preadolescent (Kovacs, 1985)</td>
<td></td>
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<td></td>
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<td></td>
<td>Psychosocial adjustment &amp; stress response symptoms</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>3. Personality Inventory for Children (PIC) (Lachar, 1992)</td>
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<td></td>
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<td></td>
<td>Continued</td>
</tr>
<tr>
<td>Adjustment (cont’d))</td>
<td>Psychosocial adjustment &amp; stress response symptoms (cont’d)</td>
<td>4. Impact of Event Scale (IES) (Horowitz, Wilner, &amp; Alvarez, 1979)</td>
<td></td>
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<td></td>
<td>5. The peer relations subscale of the Family Peer Relationship Questionnaire (Ellison, 1983; 1985)</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>1. Personal Attribute Inventory for Children (PAIC) (Parish &amp; Taylor, 1978a; 1978b; 1979)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Self-Esteem Inventory (SEI) – short form (Coopersmith, 1984)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic performance</td>
<td>1. Self-report</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Parent-report</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3. Teacher-report</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4. Interview</td>
<td></td>
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</tr>
</tbody>
</table>

Refers to child’s short-term outcome, such as mood and self-esteem changes, academic changes, somatic symptoms, and social interpersonal changes. (cont’d)
CHAPTER 3

EVIDENCE FOR RELIABILITY & VALIDITY OF HUMAN FIGURE DRAWINGS AS A MEASURE OF CHILDREN’S EMOTIONAL STATUS

The use of drawings as a tool for assessment of emotional status and personality emerged around 1940 (Malchiodi, 1998). Projective drawing techniques are based on the accepted belief that drawings can be representative of an individual’s self-concept, anxiety, attitude, or conflict (Koppitz, 1983; Ryan-Wenger, 2001). Drawings are beneficial when a child cannot verbally express him or herself appropriately. Projective drawings are ranked in the top 10 most frequently used psychological assessment procedures and are the second leading technique recommended by clinical psychologists for clinical students to learn about (Watkins, Campbell, Neiberding, & Hallmar, 1995). Despite the popularity of the HFD, the controversy and criticism regarding the reliability and validity of the HFD still continues. Therefore, this article will discuss the normative development of Human Figure Drawings (HFD), the reliability and validity of using HFD when using this tool to assess a child’s emotional status, and implications for using HFD in practice.
Development of Human Figure Drawings

Drawings are not spontaneous but rather an intentional process involving identification through projection and introjection (Machover, 1949). As we grow, we associate various sensations, perceptions, and emotions with our bodies. As a result, drawing a human figure provides a natural vehicle for expression of one's needs and conflicts (Machover, 1949). Drawing requires motor skills to hold and use a pencil as well as transferring thoughts into intentional hand movements (Ryan-Wenger, 2001). As motor skills and cognitive functioning develop, drawing becomes more representational and detailed (Lowenfeld & Edwards, 2000). Understanding of drawing development in children is an essential; otherwise inappropriate interpretations may result (DiLeo, 1983).

The Scribbling Stage (Ages 18 months to 3 Years)

Initial drawing emerges in children at ages 18 months to 2 years and focus on the action of the drawing. These movements are generally spontaneous and/or unplanned with little control of motions (Malchiodi, 1998). The drawing consists of unsystematically scattered lines with an occasional closed circle or square (Chandler & Johnson, 1991; DiLeo, 1970; Lowenfeld & Edwards, 2000; Kellogg, 1969; Lowenfeld, 1947; Malchiodi, 1998). Gradually, the child enjoys the kinesthetic experience and begins to direct his or her attention to producing marks on whatever surface shows before him or her. The meanings of scribbles has changed from a belief that scribbles are simply the traces of movements of the arm, wrist, and hand (Goodenough, 1926) to a perspective that scribbles may actually represent something to the child.
(Lowenfeld, 1947). However, the encouragement of adults may contribute to the
development of meaning in children’s scribble as well.

The Schematic Stage (Ages 3 to 9 Years)

Children at this stage develop schemata to represent people, objects,
and environment (Malchiodi, 1998; Mortensen, 1991). Their drawings tend to be
more symbolic than naturalistic. As the child approaches age 3, the child begins
to draw with a single line rather than a group of scribbled lines (Kellogg, 1969).
Scribbles evolve into circular strokes viewed as the earliest expression of art in
children (DiLeo, 1973). Drawings of children at 3 and 4 years of age are
dominated by a circle cut by a cross, called the “mandala”, are viewed as the
first truly representational figure (Gardner, 1980; Kellog, 1966; Malchiodi, 1998).
By the ages of 4 to 5 years, human figures emerge in drawings (Kellogg, 1966).
The human figure, called the “tadpole,” consists of a circle (a rudimentary head)
with two smaller circles for eyes and another one for mouth and two long lines
(legs) attached. Arms are generally omitted in early drawings. Labeling the HFD
as a boy or girl is evident by age 4 (Kellogg, 1969). By the age of 6 years, the
tadpole figure is gradually replaced by a human figure, which is composed of a
head, trunk, and additional details. Common items found in 70% of children’s
drawings in this age group include the head, eyes, mouth, and legs (Norford &
Barakat, 1990). Order and space relationships are evident in drawings by age 6
(Lowenfeld & Edwards, 2000). These children’s drawings represent an active
knowledge of the subject. Transparencies, such as viewing body parts beneath
clothing, vanish as children’s visual realism takes over (DiLeo, 1983). Around
age 7, human figures include the major body parts and are drawn less as “stick figures” and more like real human beings (Chandler & Johnson, 1991; Goodenough, 1926; Koppitz, 1984).

The Naturalistic Stage (Ages 9 to 13 Years)

Typically, drawings of school-age children contain more detail and are differentiated in sexual characteristics (e.g., hairstyle, clothing; Malchiodi, 1998). Children become critical of their drawing as drawings become a reflection of how things really look (Lowenfeld & Edwards, 2000). Early representations of a human are always full-faced or facing forward in the drawing. By 8-10 years of age, the child begins a transitional period in HFD by drawing a profile of the face but with two eyes (Di Leo, 1970). This transition marks the beginning of a shift from the child’s drawings reflecting his perception to that of the adult’s perception of reality. Profile drawing is a prelude to the depiction of movement within the drawing; however 80-85% of adolescents and young adults will not achieve this milestone (Di Leo, 1970; Goodenough, 1926). During the transitional period, opacity is substituted for transparency. Shadowing and 3-dimensional objects are included in drawings during this stage (Lowenfeld & Edwards, 2000). By age 12, drawing is no longer a spontaneous form of art.

There are a large number of developmental items and general tendencies that emerge in HFD regardless of variations in the sample (Mortensen, 1984). Table 3.1 provides a summary of the typical traits found in children’s drawings by age at which the trait first appears. Traits vary by age
and gender. Boys are more likely to omit arms, trunk, and clothing; however these omissions decrease with age. Asymmetry in facial features and legs is seen more often in boys’ drawings. Boys are quicker than girls to draw HFD with movement, placing the arms in a position other than straight out, use accessories, separate the thumb from the fingers, and draw hands, fingers, knees, chin, and details of the nose (bridge of the nose). Girls’ advances in HFD include drawing structure in the hair and curls, jewelry, special types of shoes, trousers, and jackets. Girls are more likely than boys to draw with symmetry, sketching, and shading of a limited area.

**Human Figure Drawings as a Measurement Tool**

Drawing of a human figure is an easy and enjoyable task for the child. The child is given a 8 ½ x 11” blank piece of paper and a #2 pencil, and instructed to “draw one whole person. You can draw any kind of person you want to draw, but not a stick figure” (Koppitz, 1984, p. 10). No time limit is given; however most children finish their picture within ten minutes. The investigator gives no suggestions about content or style. The child usually draws without looking up at an adult model. The child draws what has impressed him mentally and emotionally (Di Leo, 1970). Drawings are assessed for overall appearance and inclusion of emotional indicators.

The order in which a drawing emerges reveals the child’s emotions or quality of relationships with friends and family. Children begin their picture of a human by drawing the head (Koppitz, 1983). Those children who draw the feet or hands before the head tend to have difficulty in interpersonal relationships
because people communicate with their eyes and mouths not by kicking or hitting. An inability to complete a drawing of a person reflects negative feelings toward the person that the child was trying to draw. Children draw pictures of a person who concerns them most at that time (Di Leo, 1983; Koppitz, 1983). For example a child, who is angry with a sibling, will draw his brother or sister. The quality of the drawing reflects the child’s underlying feelings and attitudes (Koppitz, 1983). Erasing displays anxiety (Machover, 1949). Erasures represent an attempt to alter the drawing and achieve perfection. Erasures are present in all of the drawings at ages 12-13 indicating greater self-criticism and a growing sense of realism (Mortensen, 1984). Children, who are socially inhibited or nonverbal, welcome the opportunity to release their private fantasies, anxieties, and guilt upon the object in their drawing (Machover, 1949).

The human figure drawing, which is a reflection of the child at that particular point in time, reveals his or her feelings (Di Leo, 1973). Insecure and anxious children draw small figures. Also, anxious children tend to shade parts of the figure (Di Leo, 1973; Machover, 1949). Shading of clothing is associated with conflict in regard to body concealment and fear to expose the body (Machover, 1949). Timidity or passivity is revealed by the absence of arms. Hidden hands express guilt. Exaggerated size of hands is symbolic of aggression (Di Leo, 1973).

HFD play an important role in the assessment of personality and intellect, especially where verbal communication is impaired or repressed (Di Leo, 1983). Interpretation of symbols should be individualistic and not taken out
of context. Interpretation consists of a global impression (i.e., spontaneous, drawn from memory, freely drawn & bold, elaborate, or fantasy) followed by a content analysis (presence of body parts & clothing).

Koppitz (1968) first systematically examined the HFD of children aged 5 to 12 for developmental and emotional signs and symbols. She identified 30 clinically valid emotional indicators (EI) consisting of 8 quality signs, 13 special features, and 8 omissions (Table 3.2). Her later work gave rise to 28 EI for children ages 11 to 14 years (Koppitz, 1984). These EI are further classified into 5 kinds of emotional problems (i.e., impulsivity, insecurity or inadequacy, anxiety, shyness or timidity, and anger or aggressiveness) that children exhibited. Emotional indicators such as big hands, no eyes, or slanting figure are not related to age or maturation but are found more often in drawings of children with emotional and behavior problems (Koppitz, 1983). Koppitz provides criteria for the presence or absence of each emotional indicator, for example tiny figure (2" or less), big figure (9" or more), or figure slanting 15 degrees. Most EI are the same for both age groups with the following exceptions: EI for younger children include “omission of the body” and “three or more figures drawn." The comparison of the description and interpretation of EI on HFD for younger children ages 5 to 12 and older children ages 11 to 14 is described in Table 3.3. It is worth noting that the descriptions of the three items between these two age groups are slightly different, including slanted figure, tiny head, and genitals and/or nude figure. The presence of two or more emotional indicators in a drawing may reflect emotional problems, and suggest
a need for further evaluation. With respect to the interpretations of each item, Koppitz (1968, 1984) provided similar but slightly different interpretations for each age group. The EI are scored as absent = 0 or present = 1, for a total possible score of 30. In order to prevent misinterpreting a drawing, the child is asked to describe the picture, who is in the picture, and what the person is doing. Drawings are analyzed by the presence or absence of emotional indicators; however these indicators are not scores and should not be added into a total score (Koppitz, 1983). Some emotional indicators such as a grotesque figure may be more reflective of emotional problems than other indicators (Koppitz, 1983). Therefore, a summative score lacks the characteristic of equal intervals required for most statistical analysis (Ryan-Wenger, 2001). Scores for the emotional indicators are given a score of one or zero, so summation scores from a group of “normal” children will be skewed because most of the children will score zero (Ryan-Wenger, 2001). Nonparametric tests can be used for categorical or ordinal level data as well as skewed data (Pett, 1997).

When employing the EI to evaluate HFDs, Koppitz (1968, 1983, 1984) emphasized that it is imperative to remember the following principles. First, a meaningful diagnosis or evaluation of children’s behaviors or difficulties cannot be based on any single emotional indicator on a HFD. Second, when analyzing a HFD, one should always consider the whole figure drawn and the combination of various signs and indicators as well. Further, in order to assess potential emotional problems present in children, analysis of drawings should be used in
combination with other diagnostic instruments, observations of the child, and with developmental and background information in terms of the child’s age, sex, maturation, emotional status social as well as cultural background.

Emotional indicators used to analyze Human Figure drawings may have different meanings depending on the situation (Koppitz, 1983). For example, a small person may reflect timidity or depression. Presence of an emotional indicator should be determined from the evaluation of the whole Human Figure drawing and observing the child in different settings. Drawings reflect the child’s attitude at that moment and both drawings and attitudes change over time. Drawings should be used with other diagnostic instruments, observations of the child, and with background information in order to diagnose an emotional problem (Koppitz, 1983).

**Reliability and Validity of Human Figure Drawings**

Common criticism about the use of projective drawings in psychological assessment includes lack of empirical support and a lack of reliable scoring systems (Bardos & Powell, 2001; Motta, Little, & Tobin, 1993; Roback, 1968; Swenson, 1968). Sign and global approaches are the two major approaches to the scoring and interpretation of human figure drawings (Lilienfeld, Wood, Grab, 2000). The sign approach is based on the assumption that drawings allow an individual to express him or herself by projecting his or her emotions (Machover, 1949). Through the drawings, an individual reflects something about self when asked to draw a human figure. Machover asserted that diverse signs derived from human figure drawings are correlated with the presence of specific
personality and psychopathological characteristics. These signs are qualitative in nature and not derived from a normative database (Bardos & Powell, 2001). Koppitz developed a global approach to quantitatively score a HFD which included a set of emotional indicators (EI) and emphasized making the interpretation of children’s emotional status based on the number of EI demonstrated in the HFD.

Empirical evaluations of human figure drawings reveal that when compared to the global approach, the sign approach reveals poor reliability and validity; however some HFD signs possessed high or acceptable interrater reliability (Kahill, 1984; Lilienfeld, Wood, Grab, 2000; Swenson, 1968).

Results of Prior Comprehensive Reviews of Studies on HFDs

Between 1956 and 1968, there have been 6 extensive reviews of research on HFD. Studies of HFD between 1956 and 1966 concluded that the global approach to the interpretation of HFD could not be supported by the available research (Suinn & Oskamp, 1969; Roback, 1968; Swensen, 1957). By 1968, the use of HFD as a clinical tool as well as the empirical support for the global approach for analyzing HFD had substantially increased (Swensen, 1968). Klopfer and Taulbee (1976) concluded that the analysis of HFD lacked empirical support and are only meaningful when analysis includes comments from the child. The impact of confounding variables such as artistic ability needed to be controlled in research and should be considered before making inferences about psychodynamics (Kahill, 1984; Teichman, 2001).
According to the sign approach for interpretation, individual EI can reveal specific emotions (Table 3.2). However, according to Koppitz (1968, 1983, 1984), making conclusions about a child’s emotional status should be based on the total number of EI present on the whole HFD rather than a single specific sign on the drawing.

Reliability

Several factors contribute to the reliability of drawing tests, such as the stability of drawings from one occasion to the next (test-retest reliability), the extent to which clinicians can agree on scoring the various features of a drawing (inter-rater reliability/agreement), and the extent to which clinicians can agree on the psychological significance of the features (Thomas & Silk, 1990). Among these factors, the test-rest reliability of the HFD may face more challenges when compared to others. In a study designed to develop a scoring system for HFD and differentiate between normal and clinical populations, the test-retest reliability was substantial ($r = 0.67, p < 0.001$) (Bardos & Powell, 2001; Naglieri, mcNeish, & Bardos, 1991). Thomas and Jolley (1998) commented if a child’s figure drawing can yield useful information, then two drawings by the same child should show the same characteristics. Koppitz (1968) argued that a child’s anxiety might be expressed in a variety of ways at various times and that different children could respond to the same stressor in different ways. Any single EI cannot be used on its own to distinguish an emotionally-disturbed child or help identify the specific nature of the emotional problem.
Among the sixteen studies reviewed (Table 3.4), inter-rater reliabilities were commonly reported, with the majorities between 0.70 and 0.90 and one below 0.60. The inter-rater agreements ranged from 85% to 98%. Despite high levels of inter-rater reliability/agreement, Lilienfeld et al. (2000) asserted that one should be cautious when interpreting the reliability of the HFD because some EI may possess high inter-rater reliability but its overall reliability may be poor. According to Lilienfeld and colleagues (2000), the internal consistencies of HFD have been generally acceptable, even though some have been only moderate. Using Draw-A-Person: Screening Procedure for Emotional Disturbance (DAP: SPED), a more recently developed screening tool designed to identify children and adolescents with emotional or behavioral disorders, internal consistencies were found to be very high with $r = 0.76$ (ages 6-9), $r = 0.77$ (ages 9-12), and $r = 0.71$ (ages 13-17) (Bardos & Powell, 2001; Naglieri, McNeish, & Bardos, 1991).

Validity

Even though early studies report that HFD are unable to predict psychological problems, HFD are a typically considered to be a valid means to assess children’s emotional status and are frequently used to distinguish normal from emotionally-disturbed children when combined to other diagnostic measures (Cox & Catte, 2000). Some studies reported the proportion of correct judgment in predicting the psychological state to be between 49 – 68% (Hiler & Nesvig, 1965; McNeish & Naglieri, 1993; Porteous, 1996). According to Catte and Cox (1999), there were no differences between the well-adjusted and
emotionally-disturbed groups in the inclusion of specific EI in HFD. This inference brings up a need for further investigation about whether the EI identified by Koppitz are still valid for contemporary children. Catte and Cox (1999) thereby replicated Koppitz’s study in the UK and found that 5 EI were no longer considered valid for either boys or girls (i.e., shading of face, shading of body/limbs, big figure, short arms, and legs pressed together), 2 EI were not valid for boys (i.e., no teeth and no neck), and 8 EI have changed in the age at which they occur less frequent and can be scored as an EI. Furthermore, using this revised coding system Catte and Cox reanalyzed the data derived from their first study and found that the revised EI could significantly differentiate clinical and comparison groups.

**Use of HFD in Practice**

Watkins and colleagues (1995) found that projective drawings were among the 10 psychological assessment procedures most frequently administered by clinical psychologists to gather information about the social-emotional functioning. More specifically, 80% of clinical psychologists reported that they used projective drawings at least “occasionally” in their work settings and 39% indicated that they “frequently” or “always” administered projective drawings. Human figure drawings, such as Draw-Person-Test, Kinetic Family Drawings, and House-Tree-Person have been frequently used by psychologists in clinical settings (Cummings, 1986).

Many studies have been conducted to estimate the prevalence of psychiatric morbidity. For example, Roberts and his colleagues (1998) indicated
the average prevalence rate of psychopathology among children and adolescents was 15.8% (range 1% to 51%) based on a review of 52 published studies conducted over the past 4 decades. In an epidemiological study revealed 1 in 5 children in the Middle East community had a psychiatric disorder, which is similar to the findings from Western studies (Eapen, Jakka, & Abou-Saleh, 2003). However, none of these children had received any professional help. These studies suggest that psychological problems are prevalent in children and adolescents as well as highlight the importance of early identification of mental health problems. Untreated mental health problems may subsequently result in the development of more severe psychosocial dysfunction. Therefore, when working with children in school, clinics or hospital, nurses need to be vigilant about children’s emotional and psychological status in addition to their physical needs. Drawing is an inexpensive and easily administered tool because paper and pencils are readily available in school settings, clinics and hospitals. In addition, drawing also offers an alternative to self-expression especially when children do not have the verbal skills to express themselves.

**Conclusion**

Psychological disorders as well as physiologic health problems are not diagnosed with a single diagnostic or screening test. Children’s drawings have been used as method of assessing emotional problems in children for many years. In conjunction with other screening tools, this review of empirical
evidence provides relatively strong support for the reliability and validity of HFD in assessment of children’s emotional status.
Age 4: Head  Eyes
      Mouth  Legs

Age 5:
  Head      Hair
  Eyes      Eye lashes
  Eye brows  Pupils
  Nose      Mouth
  Chin      Ears
  Neck      Arms attached to trunk at the proper place
  Fingers   Legs
  Feet      Shoes
  Trunk     2 pieces of clothing
  Shading   Positioning in center of paper
  Figure drawn without transparencies

Age 6:
  Cupid bow
  Neckline marked by more than a line
  Patterns in clothes
  Sleeves
  Complete dress
  Pockets
  Facial details
  Iris
  Hands
  Placement of arms other than straight out or down at side

Age 7:
  Heels
  Knees
  Asymmetry-movement  Profile
  Sketch

Age 8:
  Good integration
  Curved transition from neck to head or trunk
  Breast (female)
  Structure of hair (female)
  Clothing: trousers, stockings, jacket

Age 9:
  Beard
  Hands in pocket
  Shading light and think
  Fashionable clothes

Age 10:
  Include head and upper portion of body
  Cheeks

Table 3.1: Typical items found in children’s drawings by age

Brown, 1990; Di Leo, 1970; Kellogg, 1979; Mortensen, 1984; Norford & Barakat, 1990
**Quality Signs**

- poor integration of parts of figure
- shading of the face or part of it
- shading of the body and/limbs
- shading of the hands and/or neck
- gross asymmetry of limbs
- figure slanting by 15 degrees or more
- tiny figure, 2” or less in height
- big figure, 9” or more in height
- transparencies

**Special Features**

- tiny head, 1/10th of total height of figure
- crossed eyes, both eyes turned inward
- teeth
- short arms, not long enough to reach waistline
- long arms, that could reach below kneeline
- arms clinging to side of body
- big hands, as bigger than face of figure
- hands cut off, arms without hands and fingers
- legs pressed together
- genitals
- monster or grotesque figure
- three or more figures spontaneously drawn
- clouds, rain, snow

**Omissions**

- omission of eyes
- omission of nose
- omission of mouth
- omission of body
- omission of arms
- omission of legs
- omission of feet
- omission of neck

| Total number of Els: _____ |

0 = not present in drawing
1 = present in drawing

Table 3.2: Emotional indicators on human figure drawings

Koppitz, 1968
<table>
<thead>
<tr>
<th>Description</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age 5-12</strong></td>
<td><strong>Age 11-15</strong></td>
</tr>
<tr>
<td>Age 5-12</td>
<td>Age 11-14</td>
</tr>
<tr>
<td><strong>Monsters or grotesque/ Bizarre figure</strong></td>
<td>Figure representing nonhuman, degraded or ridiculous person (the grotesqueness of figure must be deliberate on part of the child and not the result of his immaturity or lack of drawing skill).&lt;sup&gt;1,2&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Transparencies</strong></td>
<td>Transparencies involving major portions of body or limbs (single line or lines of arms crossing body not scored).&lt;sup&gt;1,2&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Slanted figure</strong></td>
<td>Vertical axis of figure tilted by 15° or more from the perpendicular&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Tiny figure</strong></td>
<td>Figure 2” (5cm.) or less in height.&lt;sup&gt;1,2&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Table 3.3: Descriptions and interpretations of emotional indicators
<table>
<thead>
<tr>
<th>Gestalt (cont’d)</th>
<th>Big figure</th>
<th>Figure 9” (23cm,) or more in height.(^1,2)</th>
<th>Immaturity and poor inner controls(^1)</th>
<th>Impulsivity.(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Tiny head</td>
<td>Height of head less than one-tenth of total figure.(^1)</td>
<td>The height of the head is less than one-eighth the height of the total figure.(^2)</td>
<td>Intense feelings of intellectual inadequacy.(^1)</td>
</tr>
<tr>
<td>Face</td>
<td>Deliberate shading of whole face or part of it including “freckles”, “measles” etc. (an even, light shading of face and hands to represent skin color is not scored).(^1,2)</td>
<td>Severe anxiety, poor self-concept (partial shading indicated anxiety about shaded part).(^1)</td>
<td>Anxiety (is defined as distress or uneasiness of mind regarding the body (body anxiety), actions, or future events; or as troubled, unsettled, or worried; or as a prolonged state of apprehension).(^2)</td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td>Both eyes turned in or turned out (sideway glance of eyes not scored).(^1,2)</td>
<td>Hostility toward others, rebellion, anger, things are out of focus, can’t or won’t conform to expected behavior.(^1)</td>
<td>Anger, Aggressiveness (is defined as displeasure, resentment, exasperation, or indignation; offensive action in general; revengeful emotion aimed at others who are perceived as inflicting wrong; verbal or physical assultive actions; rage resulting from frustration. Anger can be directed toward others, toward oneself, or toward objects).(^2)</td>
<td></td>
</tr>
<tr>
<td>Nose</td>
<td>There is complete absence of eyes. This item is not checked if the eyes are drawn closed or as vacant circles, or if the eyes are covered by dark glasses.(^1,2)</td>
<td>Socially isolated, tend to deny problems, refuse to face world, escape into fantasy.(^1)</td>
<td>Anxiety.(^2)</td>
<td></td>
</tr>
</tbody>
</table>

Continued
Table 3.3 continued

<table>
<thead>
<tr>
<th>Mouth</th>
<th>Omission of mouth</th>
<th>There is no indication of a mouth. This item is not checked when the mouth is covered by an object such as a football helmet.</th>
<th>Anxiety, insecurity and withdrawal including passive resistance; inability or refusal to communicate with others, fear, perfectionism, depression.</th>
<th>Shyness, timidity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teeth</td>
<td>One or more</td>
<td>Any representation of one or more teeth appears.</td>
<td>Aggressiveness (must be present with other EIs to be significant).</td>
<td>Anger, Aggressiveness.</td>
</tr>
<tr>
<td>Neck</td>
<td>Omission of neck</td>
<td>No connection exists between the head and body; the head is barely touching the body; the body is directly attached to the body without any indication of neck.</td>
<td>Immaturity, impulsivity and poor inner controls, poor coordination of impulses and behavior.</td>
<td>Impulsivity.</td>
</tr>
<tr>
<td>Neck</td>
<td>Shading of neck (no other shading)</td>
<td>Shaded neck indicates struggles to control impulses.</td>
<td>Anxiety.</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>Omission of body and/or limbs</td>
<td>The shaded area designates the area of specific concern. Special emphasis on the genital area either through shading, heavily reinforced lines, or by drawing attention to the fly or zipper on pants reflects sexual anxiety.</td>
<td>Body anxiety.</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>Shading of body and/or limbs</td>
<td>Not an EI for this age.</td>
<td>Serious sign of psychopathology which may reflect mental retardation, cortical malfunctioning, severe immaturity due to developmental lag. Emotional disturbance with acute body anxiety.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Limbs</th>
<th>Gross asymmetry of arms or legs continued</th>
<th>Associated with poor coordination and impulsiveness, reflects physical awkwardness and inadequacy.(^1)</th>
<th>Impulsivity.(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms cling to side of body</td>
<td>One arm or leg differs markedly in shape from the other arm or leg. This item is not scored if arms or legs are similar in shape but just a bit uneven in size.(^1,2)</td>
<td>Rigid inner control, poor interpersonal relationships (significant in combination with other EIs).(^1)</td>
<td>Shyness, timidity.(^2)</td>
</tr>
<tr>
<td>Short arms</td>
<td>There is no space between the body and arm.(^1,2)</td>
<td>Tendency to withdraw from others, lack of aggressiveness.(^1)</td>
<td>Shyness, timidity.(^2)</td>
</tr>
<tr>
<td>Long arms</td>
<td>Short stubs are drawn for arms; the arms are not long enough to reach the waistline of the figure.(^1,2)</td>
<td>Aggressive reaching out to others.(^1)</td>
<td>Anger, Aggressiveness.(^2)</td>
</tr>
<tr>
<td>Omission of arm</td>
<td>Arms are excessively long, long enough to reach below the knee or where the knee of the figure should be.(^1,2)</td>
<td>Anxiety and guilt over socially unacceptable behavior involving arms or hands.(^1)</td>
<td>Insecurity, Feelings of inadequacy.(^2)</td>
</tr>
<tr>
<td>Big hands</td>
<td>No arms or hands are drawn; hands appear only without arms.(^1,2)</td>
<td>Aggressive behavior involving the hands.(^1)</td>
<td>Anger, Aggressiveness.(^2)</td>
</tr>
<tr>
<td>Shading of hands</td>
<td>The hands are as big or bigger than the face of the figure.(^1,2)</td>
<td>Anxiety over some real or imagined activities involving the hands.(^1)</td>
<td>Anxiety.(^2)</td>
</tr>
<tr>
<td>Hands cut off</td>
<td>Shading of hands.(^1,2)</td>
<td>Inadequacy or guilt over failure to act correctly or over the inability to act at all.(^1)</td>
<td>Insecurity, Feelings of inadequacy.(^2)</td>
</tr>
<tr>
<td>Leg pressed together</td>
<td>Arms are drawn with neither hands or fingers. This item is not checked if the hands are hidden behind the back of the figure or the hands are in pocket.(^1,2)</td>
<td>Tenseness, rigid attempt to control own sexual urges or concern over a sexual act by others.(^1)</td>
<td>Anxiety.(^2)</td>
</tr>
<tr>
<td>Limbs (cont’d)</td>
<td>Omission of legs</td>
<td>No legs or feet are drawn; feet appear only without legs.</td>
<td>Intense anxiety and insecurity regarding the legs.</td>
</tr>
<tr>
<td>---------------</td>
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<td>---------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Omission of feet</td>
<td>Legs only are drawn; both feet and legs are cut off by the edge of the paper.</td>
<td>Insecurity and helplessness, “no feet to stand on”.</td>
<td>Insecurity, Feelings of inadequacy.</td>
</tr>
</tbody>
</table>

| Genitals and/or nude figure | Realistic or unmistakably symbolic representation of genitals. | Nude representation of the figure is drawn; realistic drawing of genitals, unmistakably symbolic representation of genitals appears; secondary sexual characteristic, breasts are shown. | Acute anxiety, poor impulse control, extremely disturbed (sign of serious psychopathology, overly aggressive. | Anger, Aggressiveness. |

Continued
<table>
<thead>
<tr>
<th>Other:</th>
<th>Poor integration of parts of figure</th>
<th>One or more parts of figure are not jointed to the rest of figure; some part only connected by a single line or are barely touching other part. ¹,²</th>
<th>Immaturity, instability, impulsivity, poor coordination. ¹</th>
<th>Impulsivity. ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three or more figures</td>
<td>Several figures shown who are not interrelated or engaged in meaningful activity; repeated drawing of figures when only “a” figure was requested. ¹</td>
<td>Not an EI for this age.</td>
<td>Perseveration, lack of a feeling of identity, very dependent (always associated with poor school achievement, limited ability, from large culturally deprived families and/or who are brain damaged). ¹</td>
<td>N/A</td>
</tr>
</tbody>
</table>

¹ Koppitz, 1968  
² Koppitz, 1984
### Table 3.4: Reliability and validity of human figure drawings

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Purpose/ Hypothesis</th>
<th>Subjects</th>
<th>Reliability</th>
<th>Validity</th>
</tr>
</thead>
</table>
| Carroll & Ryan-Wenger (1999) | 1. Examine the relationship between the manifest anxiety levels of children and the presence of EIs in their HFD  
2. Examine the relationship between the number of self-reported fears of children and the presence of EIs in their HFD | 90 children (51.1% of boys, 48.9% of girls)  
Age: 8-12 | Not reported | Known-groups:  
1. The anxiety scores were substantially correlated with the total number of EIs (eta correlation = 0.607)  
2. The numbers of fears were very highly correlated with total number of EIs (contingency coefficient = 0.746) |
| Catte & Cox (1999) | Study1: Comparing the EIs on the HFDs of children with emotional disturbance and those considered to be well-adjusted  
Study 2: Replicate Koppitz's study in the UK children to see if any changes have occurred since the Koppitz's normative data were collected | Study 1:  
1. 44 boys (clinical group)  
Age: 6-12  
2. 44 boys (chronological age matched group <CA group>)  
Age: 6-11  
3. 44 boys (mental age matched group <MA group>); the groups were matched on the WISC-III  
Age: 6-11 | Study 1: Inter-rater reliability: Three raters scored the drawings independently the scores of each pairs of raters were correlated using Pearson’s product-moment correlation (r), r = 0.94, 0.89, and 0.87 respectively, mean = 0.90 | Study 1: Known-groups:  
1. There was a significant difference among 3 groups (F(2, 129) = 7.63, p < 0.001)  
2. The clinical group scored significantly higher (more EIs) than the CA group (p <0.05) and the MA group (p < 0.05)  
3. There is no difference in EIs scores between the CA and MA groups  
Study 2: Normative group:  
1. 5 EIs were no longer considered valid for either sex  
2. 2 EIs were not valid for boys |
### Table 3.4 continued

| Catte & Cox (1999) (cont’d) | Study 3: Use the revised EIs from Study 2 to determine the differences among 3 groups from Study 1 | Study 3: Sample from Study 1 | Study 3: Not reported | Study 3: Known-groups:  
1. The effect of rescoring was that the number of children who scored 2 or more EIs was reduced in all 3 groups  
2. There was a significant difference among 3 groups (F(2, 129) = 12.87, p < 0.001)  
3. The clinical group scored significantly higher (more EIs) than the CA group (p < 0.05) and the MA group (p < 0.05)  
4. There is no difference in EIs scores between the CA and MA groups |
| --- | --- | --- | --- |
| Cox & Catte (2000) | Determine whether the significant difference in EIs between emotionally disturbed and well-adjusted children would remain if the groups were matched on the Goodenough-Harris scoring system | 1. 44 boys (clinical group) Age: 6-12  
2. 44 boys (mental age matched group < MA group>); the groups were matched on the Goodenough-Harris Draw-A-Man test Age: 6-11 | Inter-rater reliability Two raters scored each drawing based on the Goodenough-Harris scale and the revised EIs, using Pearson’s product-moment correlation, r = 0.89 and 0.90, respectively | Known-groups: There was no difference between two groups in the number of EIs ($\chi^2(1) = 1.98$, ns) |
Table 3.4 continued

| Fuller, Preuss, & Hawkins (1970) | Replicate the validity study by Koppitz (1966) of 30 EIs on HFDs | 80 normal public school children: 40 boys (40 girls) & 72 emotionally disturbed children (40 boys & 32 girls) | Age: 5-12 | Inter-rater reliability Normal group: \( r = 0.84 \) Disturbed group: \( r = 0.71 \) | Known-groups: 66 (82%) well-adjusted children were correctly identified; 30 (41%) emotionally disturbed children were accurately classified. Results supported Koppitz’s findings that EIs occur more often in HFDs of disturbed children. Two or more EIs present in the HFDs may be an aid in deciding if a child is disturbed |
| Fuller & Vance (1997) | Interscorers’ agreement of the HFDs | 30 subjects randomly selected from 132 pupils referred for special education services | Inter-scores’ agreement: 85% | N/A |

Continued
Table 3.4 continued

<table>
<thead>
<tr>
<th>Hiler &amp; Nesvig (1965)</th>
<th>1. Evaluate if the criteria used to infer pathology and normality from HFDs (draw a person and a person of the opposite sex) is valid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Further test the effectiveness of each criterion</td>
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<tr>
<td></td>
<td>Sample 1: 30 normal (20 boys &amp; 10 girls) 30 psychiatric adolescents (21 boys &amp; 9 girls) Age: 13-16</td>
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<tr>
<td></td>
<td>Sample 2 (for cross-validation): 43 well-adjusted adolescents 43 patients: (within the same age range) as well-adjusted group</td>
</tr>
<tr>
<td></td>
<td>Inter-rater reliability coefficients (from Sample 2 among 3 raters): 0.76, 0.71, and 0.66 with a mean of 0.71</td>
</tr>
<tr>
<td></td>
<td>Known-groups: 1. Valid criteria of pathology: bizarre, distorted, incomplete, and transparent</td>
</tr>
<tr>
<td></td>
<td>2. Valid criteria of normality: happy expression, nothing pathological</td>
</tr>
<tr>
<td></td>
<td>3. Non-psychologists discriminated as well as psychologists (65% &amp; 64% accuracy, respectively)</td>
</tr>
<tr>
<td></td>
<td>4. The prediction Formula discriminated with 79% accuracy on cross-validation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Koppitz (1966)</th>
<th>1. EIs would occur more often on the HFDs of children with emotional problems than on the drawings of well-adjusted pupils</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2. The HFDs of children with emotional problems would show a higher incidence of EIs than the HFDs of well-adjusted pupils</td>
</tr>
<tr>
<td></td>
<td>76 pairs of public school children matched for age &amp; sex (group A = 76 patients in a child guidance clinic; group B = 76 well-adjusted students in the same elementary school; each group included 32 boys &amp; 44 girls) Age: 5-12</td>
</tr>
<tr>
<td></td>
<td>Inter-rater agreement: 95%</td>
</tr>
<tr>
<td></td>
<td>Known-groups: 1. 12 out of 30 EIs were able to differentiate significantly between clinic &amp; well-adjusted population (12 EIs: poor integration; shading body, limbs; shading hands, neck; gross asymmetry of limbs; slanting figure; transparencies; tiny figure; big figure; short arms; big hands; hands cut off; neck)</td>
</tr>
</tbody>
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Table 3.4 continued

<table>
<thead>
<tr>
<th>Known-groups:</th>
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<tbody>
<tr>
<td>2. 58 well-adjusted pupils (75%) did not have any EIs showing on the HFDs at all, while only 7 clinic patients did not have any EIs ($x^2 = 67.19, p &lt; 0.001$).</td>
</tr>
<tr>
<td>3. 55 clinic patients (75%) showed 2 or more EIs on their drawings, but only 4 well-adjusted pupils had 2 or more EIs exhibited on their drawings ($x^2 = 69.26, p &lt; 0.001$).</td>
</tr>
<tr>
<td>4. HFDs of clinic patients showed a higher incidence of EIs than those of well-adjusted pupils. Two or more EIs on a HFD are highly suggestive of emotional problems.</td>
</tr>
</tbody>
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Continued
| Matto (2002) | Investigate the criterion-related validity of the Draw-A-Person: Screening Procedure for Emotional Disturbance (DAP: SPED) by comparing with 2 different instruments 2 instruments: 1. SAC: a shortened version of the Child Behavior Checklist used to evaluate the child’s internalizing and externalizing behaviors 2. CAAP: the Child and Adolescent Adjustment Profile used to evaluate the child’s psychological adjustment | 68 children who were receiving clinical services through outpatient (n = 37) or residential treatment centers (n = 31) on the east coast Age: 6-12 | 1. Inter-rater agreement: 98% (from a about 30% random sample of study cases 2. Between-rater Pearson correlations: 0.98 3. Internal consistency: $\alpha = 0.62$ | Criterion-related validity: 1. After controlling for CAAP Hostility, results showed that DAP: SPED was “not” a significant predictor of externalizing behavioral disturbance ($\beta = 0.017, p = 0.829$) 2. After controlling for CAAP withdrawal, DAP: SPED showed a moderate and statistically significant strength in predicting internalizing behavioral disturbance ($\beta = 0.329, p = 0.001$) |
Table 3.4 continued

<table>
<thead>
<tr>
<th>McNeilish &amp; Naglieri (1993)</th>
<th>Examine the effectiveness of DAP: SPED on discriminating children and adolescents who are emotionally non-disturbed from those with serious emotional disturbance (SED)</th>
<th>81 receiving regular Education children and adolescents Mean age = 10.6 81 special education students Mean age = 10.6 Two groups were matched on age, gender (all boys), race (25% black, 75% white), and intelligence (measured by the Matrix Analogies Test-Short Form, MAT-SF)</th>
<th>Not reported. Predictive validity: 1. Students in the special education group demonstrated a mean DAP: SPED T score of 55.3, which was significantly higher ($t = 4.0$, $p &lt; 0.001$) than the mean of 49.5 for students in the regular education group 2. 68% of non-disturbed students were correctly identified; 49% of the students with SED correctly identified. Overall, the correct judgments were 59%</th>
</tr>
</thead>
</table>

Continued
Table 3.4 continued

| Goals for developing DAP: SPED | 1. Provide an objective and reliable scoring system for HFDs  
2. Differentiate between normal and clinical populations  
3. Administered individually or in group settings | Normative sample:  
2,260 children and adolescents  
Age: 6-17  
Ethnicity, parent’s occupation, and household income have been taken into consideration  
Four studies --  
Study 1:  
Special Ed: 81 (mean age = 10.6)  
Normal: 81 (mean age = 10.6)  
Study 2:  
Clinical: 49 (mean age = 15.3)  
Normal: 218 (mean age = 12.9)  
Study 3:  
Special Ed: 58 (mean age = 12.1)  
Normal: 262 (mean age = 11.3)  
Study 4:  
Clinical: 54 (mean age = 13)  
Normal: 262 (mean age = 12) | Results from Normative sample --  
1. Internal consistency  
Age 6-9: \( \alpha = 0.76 \)  
Age 9-12: \( \alpha = 0.77 \)  
Age 13-17: \( \alpha = 0.71 \)  
2. Test-retest reliability  
\( r = 0.67 \) (\( p < 0.001 \))  
3. Inter-rater reliability: \( r = 0.84 \) (\( p < 0.001 \))  
4. Intra-rater reliability: \( r = 0.83 \) (\( p < 0.001 \)) | Results from 4 studies --  
Known-groups:  
Significant chi-squares were obtained from 4 studies  
Study 1:  
\( x^2 = 5.01 \)  
\( p < 0.05 \)  
Study 1:  
\( x^2 = 14.47 \)  
\( p < 0.0001 \)  
Study 3:  
\( x^2 = 9 \)  
\( p < 0.005 \)  
Study 4:  
\( x^2 = 6.5 \)  
\( p < 0.01 \)  
The results indicated DAP: SPED can differentiate between normal and clinical populations as well as provide substantial support for the use of the DAP: SPED as a screening instrument for emotional disturbance |
<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Participants</th>
<th>Results</th>
<th>Known-groups:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naglieri &amp; Pfeiffer (1992)</td>
<td>Examine the effectiveness of DAP: SPED to discriminate normal individuals from those in a psychiatric day treatment program</td>
<td>108 children &amp; adolescents (54 normal control subjects matched to a sample of 54 students who were attending a psychiatric day treatment program) Percentage of boys/girls: clinical = 78/22; normal = 83/17 Age: 7-17</td>
<td>The evidence reliability of DAP: SPED are reported to be “good to excellent” (Naglieri, McNeish, &amp; Bardos 1991) Known-groups: 1. The DAP: SPED mean T score of clinical sample (T score = 56.63, SD = 10.27) was significantly higher (t = 4.05, p &lt; 0.001) than that of normal subjects (T score = 49.37, SD = 8.68). 2. 62.96% of the entire sample (108) were correctly classified, 77.78% of the normal subjects were correctly identified, and 48.15% of the clinical sample were identified.</td>
<td></td>
</tr>
<tr>
<td>Oas (1984)</td>
<td>Examine the validity of Draw-A-Person (DAP) and Bender Gestalt (BG) in measuring impulsivity of adolescents</td>
<td>100 psychiatrically hospitalized adolescents 114 non-hospitalized adolescents</td>
<td>Interrater reliability: r &gt; 0.90</td>
<td>Impulsivity of adolescents was highly correlated with drawing performance on DAP &amp; BG. Also, DAP &amp; BG significantly discriminated between impulsive and non-impulsive adolescents</td>
</tr>
</tbody>
</table>

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Table 3.4 continued

<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Sample Characteristics</th>
<th>Results</th>
<th>Predictive validity: Predictive validity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porteous (1996)</td>
<td>Test the relationship between EI scores on the Drawings Test and Maladjustment of children</td>
<td>65 index cases (children scored on Rutter Child Behavior Scales over the standard cut-off points were placed into Index category for possible maladjustment) in Cork County, Ireland. 75 control cases. All children from Cork County, Ireland.</td>
<td>Not reported</td>
<td>Predictive validity: 50% of cases were correctly classified. When the distinction between Borderline Maladjusted and Maladjusted was disregarded, over 65% of cases were correctly classified.</td>
</tr>
<tr>
<td>Skybo (2004)</td>
<td>Assess children’s impact to witnessing violence.</td>
<td>N = 63 43 male 20 female Mean age 9</td>
<td>Scored based on Koppitz’ 30 EI Inter-rater reliability 97.6%</td>
<td>EI did not significantly correlate with total # of violent exposures.</td>
</tr>
</tbody>
</table>
| Year | Exam: relation between global ratings of HFDs and psychological adjustment (5 years following a residential education program for Vietnamese refugees) | 61 Vietnamese refugees (56 boys & 5 girls) Age: 6 –17 | Inter-rater reliability:  
1. Overall artistic quality (OAQ): r = 0.79  
2. Bizarreness: r = 0.70  
3. Estimated adjustment of the client: r = 0.63  
4. Emotional indicators (EIs): r = 0.54 | Concurrent validity:  
1. All 4 variables were significantly inter-correlated and there was a particularly strong correlation among OAQ, bizarreness, and estimated adjustment (r = 0.85 – 0.94). In addition, a higher number of EIs was associated with lower OAQ (r = -0.32), more bizarre drawings (r = -0.38), and poorer estimated adjustment (r = -0.4)  
Predictive Validity:  
2. Only "bizarreness" significantly predicted overall adjustment of children. When the number of emotional indicators was adopted as a covariate, bizarreness had a partial $r^2 = 0.199$ (p < 0.01) |
| Zucker, Fingan, Doering, & Bradley (1983) | Use Koppitz’s (1968) criteria to evaluate the proportion of EIs on HFDs among 4 groups of children | Four groups of children
1. 36 gender-referred children (referred for gender-identity disorder) (31 boys, 5 girls)
2. 31 siblings of the gender-referred children (18 boys, 13 girls)
3. 23 children with psychiatric problems (20 boys, 3 girls)
4. 30 normal children (15 boys, 15 girls)
Mean age: 7-8 | Inters-scorer agreement: 92.3% | Known-Groups:
1. The proportion of EIs on HFDs of the opposite-sex drawings did not differentiate the normal children from the other 3 groups
2. The normal children had a significantly smaller proportion of EIs on the same-sex drawings |
CHAPTER 4

BIOPSYPHOSOCIAL IMPACT OF PARENTAL CANCER ON SCHOOLAGERS

Significance and Literature Review

According to the American Cancer Society, cancer is the second leading cause of death in the United States (U.S.), exceeded only by heart disease. In addition, about 1,368,030 new cancer cases are expected in 2004. (American Cancer Society, 2004). According to National Cancer Institute and U.S. Bureau of the Census, approximately 128,089 children had a parent diagnosed with cancer in 1998 (as cited in Birenbaum, Yancey, Phillips, Chand, & Huster, 1999). Cancer is a family affair (Baider & Kaplan De Nour, 1988; Germono, 1996; Lewis, Ellison, & Woods, 1985). When a parent is diagnosed with cancer, there may be changes in the parent-child interaction and the situation may be a significant stressor for children that may trigger a variety of physiological, psychological, and behavioral stress responses. However, most of existing data focuses on parents and their spouses. Children have received relatively little attention in research literature.

Several children’s negative reactions to a parent’s cancer have been identified (Hoke, 1996). Although no research has identified true psychiatric
disorders in these children, a wide range of biopsychosocial and behavioral adjustment problems in children is evident. What are the factors that influence this process, and which factors are amenable to change? The literature provides some answers. In the face of this stress, children need to adapt to many changes in their lives. But what influences the children’s ability to deal with these changes caused by parental cancer? Lewandowski (1996) indicated that the coping strategies and the stress responses of children with a parent having cancer are frequently not identified by overstressful family members. Whether or not a parent’s cancer produces an adverse effect on her or his children’s adjustment depends on multidimensional factors, such as the child’s cognitive-developmental level, the child’s perception of the parental illness, the parent-child relationship, and the nature and meaning of the cancer to the child and the family (Lewis, Ellison, & Woods, 1985; Lewis, 1989). How children cope with their parent’s illness will affect children’s stress responses (Compas, Worsham, Ey, & Howell, 1996; Nelson, Sloper, Charlton, & White, 1994). Children’s coping efforts are closely related to their appraisal of the severity and stressfulness of their parents’ cancer (Compas, Worsham, Ey, & Howell, 1996).

Clinical and research literature focuses mostly on children’s adjustment to having a parent with breast cancer. It is not known if the type of cancer is a relevant factor in children’s responses. A lack of comparison groups and control of other concurrent stressors in most studies prevents conclusions that children’s adjustment problems were caused by the diagnosis of cancer in the family. Among the very few studies with comparison groups (e.g., Arneden &
Lewis, 1994; Hoke, 2001; Siegel et al., 1992), findings were inconsistent among the groups. Perhaps relevant contributing or confounding variables (e.g., concurrent stressors experienced by the children) might not have been examined concurrently in the studies.

Most of research focuses on children’s reactions to parental cancer without examining the factors that influence their responses. Except for confirming the impact of parental cancer on their children, a comprehensive knowledge of the whole process of children’s adjustment to parental cancer is required in order to help these children adjust themselves to their parents’ illness. Unfortunately, no research has fully examined the factors that contribute to a child’s adjustment to his or her parent’s cancer. The relationship between these children’s coping strategies and their biopsychosocial stress responses is also understudied. Children’s adjustment is linked to both unchangeable and changeable characteristics (moderator and mediator variables). Some of these characteristics can augment the positive effect of an intervention. Pre-existing variables such as age and gender of the child, a child’s temperament, or gender of the ill parent are moderators that will influence the situation that causes stress. The second category mediators, includes factors that exert their influence after the occurrence of parental illness, for example, the quality of the parent-child relationship, the child’s appraisal of parental cancer, or the coping strategies used by the child. More understanding about the concurrent stressors these children experience, the parent-child relationship, how children appraise their parent’s illness, other stressors these children and their parents may
experience, the stress responses that children present, the ways that children cope with their parents’ illness, and the relationship among the above factors (i.e., temperament, stressors, parent-child relationship, children’s appraisal of parental illness, coping strategies, and stress responses) will help to comprehend the impact of parental cancer on children and further help to develop effective interventions that prevent adverse effects on children. Contradictory findings between children and parents (e.g., the study of Welch, Wadsworth, & Compas, 1996) highlight the substantive importance of determining stress responses and coping from the children’s perspectives. The findings of this study will fill the aforementioned knowledge gaps in terms of theoretical and clinical nursing perspectives. Additionally, all this information will contribute to the development of effective interventions and further enhance children’s adjustment to their parents’ illness with cancer. Furthermore, findings from this research may be useful to explain children’s responses to other serious parental illness as well. This study will focus on parental cancer because of the prevalence of cancer and cancer treatment that is often lengthy and debilitating.

Specific Aims

The specific aims of this study include:

1. To determine children’s appraisal of the stressfulness of their parents’ illness and previous experience related to cancer or other illness.
2. To characterize concurrent stressors experienced by the children in addition to having a parent with cancer.
3. To characterize the frequency and effectiveness of the children’s coping strategies.

4. To determine the children’s physiological, behavioral and psychosocial stress responses through measures of salivary cortisol, stress symptoms, and emotional indicators on human figure drawings.

5. To examine parent-child relationship and its impact on children’s appraisal of their parents’ illness.

6. To determine the relationships between the independent variables (children’s, the parent-child relationship, the children’s appraisal of their parents’ illness, additional stressors, and coping strategies) and the children’s stress responses (physiological, behavioral and psychosocial stress responses).

Theoretical Framework

The theoretical framework (Figure 4.1) for this study is an integration of Lazarus’s Cognitive Appraisal Theory of Stress and Coping, cognitive developmental theory with respect to children’s appraisal, social/emotional developmental theory related to children’s temperament and their relationship with their parents, and physiologic stress response theory. The integration of the above theories will help characterize the stress-coping process of children who have a parent with cancer.

Lazarus’s Cognitive Appraisal Theory of Stress and Coping

According to the Lazarus cognitive appraisal theory of stress and coping (Lazarus & Folkman, 1984; Lazarus, 2000), the presence of a parent’s cancer...
could be an environmental stress for children. Stress is mediated by cognitive appraisal, which is defined as “a process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being and, if so, in what way” (Folkman, Lazarus, Gruen, & DeLongis, 1986, p. 572). Children’s age, cognitive level, gender, values, commitment, and beliefs (personal factors) and social support, the degree of seriousness of parents’ illness, and increased event uncertainty (environmental factors) influence the cognitive appraisal process and subsequent coping. Children who have a parent ill with cancer might perceive their experience as irrelevant, benign-positive or stressful (primary appraisal). If they perceive the event of parental diagnosis of cancer as stressful, the event becomes a stressor and is appraised as a challenge, threat, harm and/or loss by the children. In order to meet the increased demand resulting from the parents’ illness, children consider their resources and options available for coping with the stressor, assess the possibility that a given coping option will work, and evaluate the likelihood that they can apply specific coping strategies effectively (secondary appraisal). Then, children of parents diagnosed with cancer apply particular coping skills to manage the stress associated with their parents’ illness and to regulate their own emotions (coping). Lazarus and Folkman defined coping as a dynamic process and proposed three major types of coping (Lazarus, 2000; Lazarus & Folkman, 1984). Problem-focused strategies are aimed at altering the stress situation by either adjusting self or changing the environment. Emotion-focused strategies are directed toward regulating the individual
emotions related to the stressor. A third coping category includes the efforts of seeking, obtaining, and using social support, which could be emotional- or problem-focused. Reappraising the meaning of the stressor is often effective in helping cope with a stressor. The short-term and long-term outcomes of psychological well-being, somatic health/illness, and social functioning are mediated by the individual variables, environment variables, and the appraisal process. Overall, according to Lazarus’s theory, the outcomes of children’s coping with and adjustment to the parental cancer can be determined by how they appraise the parental illness, available resources and options for them to cope with this stressful event, and the type of the coping strategies they use.

**Cognitive Developmental Theory**

Appraisal plays a significant role in the process of stress and coping (Lazarus & Folkman, 1984). Children’s cognitive level will affect their appraisal of stressors and coping strategies. According to the cognitive-developmental theory of Piaget, school-age children are in “concrete operational” stage (Piaget & Inhelder, 1969). In this stage, school-age children are capable of thinking more logically and flexibly when dealing with concrete information than preschoolers. However, they may have difficulty applying the general principle of conservation to all relevant situations. Conservation is the concept that “certain physical characteristics of objects remain the same, even when their outward appearance changes” (Berk 2000, p. 240). The ability of conservation represents that children are able to coordinate several perspectives of the task (decentration) instead of centering on only one and they are able to reverse
their thinking (reversibility) as well. Although they begin to develop abstractions, elementary schoolagers’ ability for cause and effect reasoning better with concrete concepts than with abstract concepts. In other words, children who have a parent with cancer are able to understand the changes related to their parents’ cancer such as hair loss, weight loss, and illness behavior through concrete observations. However, regarding the abstract concept of “cancer”, treatments and more subtle effects like depression, children may have difficulty. Because of their ego-centrism, school-age children are likely to believe that their own wrong-doing results in their parent’s illness.

Social/Emotional Developmental Theory

According to Piaget’s theory, school-age children are more socialized and independent than early childhood youth (Piaget & Inhelder, 1969). Peers become an important part in the life of school-age children. However, parents are still the main attachment figures for their children when they are in times of need. Parents help their children regulate their emotions when the children’s resources are taxed during pain, anxiety, or distress (Salisch, 2001). Emotional maturity influences children’s appraisal of stressors and coping strategies. Even though children’s dependence on their parents gradually decreases, reliance on parents during stress may last up to adolescence and beyond. That is, the role of parents in supporting their children’s psychological functioning remains important when their children are in need. The lack of parents’ support may impede children’s ability to develop and practice coping strategies and may contribute to the development of behavior problems (Moss, Parent, Gosselin,
Attachment-related studies support the idea that secure attachments are associated with fewer behavior problems in school-age children (Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998).

Human figure drawings (HFD) represent a form of “non-verbal communication between the child and the psychologist/clinician” (Koppitz, 1983). Due to the limitation of cognitive capability, children often cannot adequately verbalize their feelings and emotions. Health professionals thereby often use projective techniques to aid them in assessing the child. HFD can be used for developmental and emotional assessment based on the structure and content of the drawings. The structure of HFD is predictive of children’s maturation and age, while the style and quality reveal children’s self-concept, attitudes, anxieties and conflicts (Koppitz, 1968, 1983, & 1984). Koppitz (1968) developed 30 emotional indicators (EI) to assess the presence of emotional disturbance in HFD (e.g., poor integration of parts, shading). These EI are clinical signs that may reflect children’s hidden attitudes and characteristics. Children with emotional and behavioral problems include more EI on their drawings, while EI rarely appear on the drawings of well-adjusted children (Koppitz, 1983). Koppitz indicated that two or more EI on a HFD may reveal the presence of emotional disturbance and requires follow-up. However, not all emotionally disturbed children present three or more EI on their human figure drawings. In addition, due to the difference of individual situations, various EI may represent the same emotional problem and a single EI may reflect different underlying meanings.
Physiologic Stress Response Theory

Selye originally defined stress as “the nonspecific responses of the body to any demand” (Selye, 1976, p.1). During stress the nervous system and the endocrine system play important roles in maintaining homeostasis of the body. Cortisol, the major glucocorticoid secreted by the adrenal cortex, is an essential hormone produced to respond to physical and psychological stressors by regulating somatic functions such as energy release (e.g., increasing gluconeogenesis), immune function (e.g., inhibiting inflammatory response), mental activity (e.g., alertness), growth (e.g., inhibiting the secretion of growth hormone), and reproductive function (e.g., decreasing the release of gonadal steroids) (Flinn & England, 1997; Mason, 1968; Selye, 1976). Salivary cortisol can accurately reflect the levels of unbound cortisol in serum (Kirschbaum & Hellhammer, 1994). In addition, due to the noninvasiveness of sampling, salivary cortisol is thereby commonly used as a physiologic indicator reflecting stress levels.

Methods

Research Design

This study used a descriptive, cross-sectional approach to examine the stressors, stress levels, and coping strategies of school-age children with a parent who has cancer.

Sample

Power analysis for canonical correlation (medium effect size of canonical correlation = $f^2 = .15$, alpha = .05, power of .80) among the stress moderators,
mediators, and physiological, psychosocial, and behavioral stress responses, the optimum sample size indicates that at least forty-five boys and girls are required (Cohen, 1988).

The inclusion criteria were: 1) male and female children between 7 to 12 years of age who live with a parent diagnosed with cancer, 2) able to understand, read, and speak English, 3) not having attended a support group, 4) enrolled in appropriate grade for their age at school (a proxy for developmental age), and 5) both children and their parents agree to participate in the study. Only one child per family will be included to maintain independent observations. Children with mental retardation were excluded from the study. A convenience sample of 51 children (7-12 years) was recruited from the Kids Can Cope, Too! Program (prior to attending the first meeting), the inpatient units and the outpatient clinics at Arthur G. James Cancer Hospital, a National Cancer Institute funded Comprehensive Cancer Center. All data were collected at each subject own home. Due to the limitation of traveling distance, 2 children came to the clinical site with parents and completed all the questionnaires in a quiet area and another 6 children completed the questionnaires at home.

The researcher was physically on the clinical settings to recruit potential subjects. Parents or legal guardians were introduced about the details of this study via a recruitment letter and verbal explanation. Before consent was signed, verbal clarification of the study was provided. Because most of time children were not in the clinical settings with their parents, an explanation of the study was provided to the children by their parents. Assent was obtained prior
to entrance into the study. After completion of all measurements, children were
given a gift certificate to Toys “R” Us. in the amount of $20 dollars for their
participation.

Instruments

Demographic data about the children and their families were obtained
from parents’ responses to the demographic questionnaire. Children’s appraisal
of their parents’ illness and previous experience related to cancer were
evaluated by several close-ended questions and open-ended questions. The
major variables examined in the study include children’s concurrent stressors,
types and effectiveness of coping strategies, parent-child relationship, and
stress responses. Concurrent stressors of children will be measured by the Feel
Bad Scale. The Children’s Coping Strategies Scale was used to measure the
types, frequencies, and effectiveness of coping strategies. The Family Peer
Relationship Questionnaire (FPRQ) was used to evaluate the quality of parent-
child relationship. The physiological, behavioral, and psychological stress
responses were evaluated from the perspectives of both the child and the
parent through measuring the child’s salivary cortisol level and using the
Children’s Stress Symptom Scale, the projective technique of Human Figure
Drawing, and the Child Behavior Checklist/6-18.

Feel Bad Scale (FBS). The FBS is a 20-item self-report stressor
instrument scored on a scale of 1-5 for frequency of occurrence and level of
severity (Lewis, Seigel, & Lewis, 1984). Validity is supported by the generation
of items through small group discussions and individual interviews with 50-60
fifth and sixth graders. The internal consistency of the FBS, a Cronbach alpha of .82, was yielded from the administration of the FBS to over 2,400 fifth graders. The positive relationship between FBS scores and children’s self-ratings of psychological state provided the evidence of convergent validity. Higher scores reflect greater stress than lower scores. Item scores are summed to obtain total scores, ranging from 20 to 100. The instrument has been widely used with 8–12 year olds with internal consistency measures > .80.

Children’s Coping Scale (CCS). The CCS is a self-report instrument developed in a sequence of studies from 1986 to 1990, and includes 24 coping strategies (Ryan, 1989; Ryan-Wenger, 1990). Validity is supported by generation of items from individual questionnaires and group discussions with 103 8- to 12- year-old children, grades 3 through 6. Children rate each coping strategy for both frequency of use (never to most of the time) and degree of effectiveness (does not help to helps a lot) on a scale of 0 to 3. Item scores are summed to obtain total scores, ranging from 0 to 72. Higher scores indicate a greater repertoire and effectiveness of coping strategies (i.e., better coping skills) than lower scores. The Cronbach alpha measure of internal consistency of the CCS was .79 obtained from 250 children. Test-retest reliability was .81. Construct validity was supported by the significantly higher frequency and effectiveness scores among asymptomatic children compared to children with one or more stress-related symptoms (Ryan-Wenger, 1990; Ryan-Wenger & Copeland, 1994).
Family Peer Relationship Questionnaire (FPRQ). The FPRQ was developed to measure the quality of parent-child relationship from the perspectives of both the parent and the child between ages 7 to 12 (Ellison, 1985). Both the parent and the child forms consist of three subscales - togetherness, nurturance/disclosure, and parent as mediator. All items are scored on a 1 (low frequency of a particular behavior) to 5 (high frequency) scale. The mean of the three subscales in each instrument represents the quality of parent-child relationship. Both forms will be used in the present study. In Hough et al's (2003) study, the reliabilities of the subscales ranged from 0.70 to 0.82.

Salivary Cortisol Testing. Cortisol is a hormone released from the adrenal cortex. Cortisol levels increase during stress. Normally, cortisol is released in a rhythmic pattern with levels higher in the morning (6:00 – 8:00 AM), lower in the evening (4:00 – 6:00 PM), and negligible by midnight. The normal ranges of salivary cortisol in the morning and evening for children aged 5 through 15 years are from 3.3 to 26.6 nmol/L and 0 to 7.1 nmol/L, respectively (Price, Close, & Fielding, 1983). These amounts correspond to a range of .12 -.96 µg/dL. The correlation between serum and saliva cortisol is r = .96 which is evidence that salivary cortisol is an excellent proxy for serum cortisol (Salimetrics, LLC, 2000a). Children’s physiological stress response will be measured by salivary cortisol level, using a Salimetrics HS-Cortisol kit (Salimetrics, LLC, 2000a). The kit is calibrated to detect from 0.007 to 1.8 µg/dl (Salimetrics, LLC, 2000a). The minimal level of cortisol (the lower limit of
sensitivity) that can be distinguished from zero is < 0.007 µg/dl. Intra-assay coefficient of variation (CV) and inter-assay coefficient of variation (CV) are reported as 5.74% and 6.78%, respectively (Salimetrics, LLC, 2000b). The intra-assay coefficient of variation will be based on a standard laboratory practice and measurement of quality control (high and low controls) that are run routinely in the laboratory on the cortisol plate with the samples. The inter-assay coefficient of variation will be calculated based on the between the duplicates of each sample.

*Children’s Stress Symptom Scale (CSSS).* The CSSS, a 24-item self-report instrument, will be used to measure children’s stress-related symptoms (Sharrer & Ryan-Wenger, 2002). The content validity is supported by generation of items from individual questionnaires and group discussions with 194 children ages 8 to 12 years from three types of schools: rural, urban, parochial in a large Midwestern state. The children generated a list of 507 stress symptoms, which were inductively sorted into 24 mutually exclusive categories by two investigators. The 24 categories are represented by the 24 items on the instrument. The Cronbach alpha measure of internal consistency of the CSSS was .91 obtained from 17 inner city children.

*Human Figure Drawing.* The human figure drawing (HFD) is a projective technique in which a child is given a pencil and a blank piece of paper, and asked to draw a person. The content of the drawings is analyzed for presence or absence of 30 Emotional Indicators (EI) (Koppitz, 1968). The unit of analysis is frequency of EIs. The emotional indicators are not scores, but clinical signs
that may reflect children’s hidden attitudes and characteristics. EIIs occur more often on the drawings of children with emotional and behavioral problems (Koppitz, 1983 & 1966). Two or more EIIs on a HFD may reveal the presence of emotional disturbance, and indicate a need for more in-depth follow-up.

*Child Behavior Checklist/6-18-Parent Form (CBCL).* The CBCL, a 118-item checklist of behavioral and emotional problems as well as social competence, will be completed by the participant’s parent (Achenbach, 2001). Parents are asked to identify their child’s problem behaviors within the past 6 months and to rate the 112 problem behavior items on a scale of 0 to 2 (0 = not true; 1 = somewhat or sometimes true; 2 = very true or often true). The raw scores can be converted into normalized T scores. CBCL T scores can be derived for internalizing (e.g., fears, worries, sadness) and externalizing (e.g., fighting, disobedience, hyperactivity) problems as well as total behavior problems. These T scores reflect a child’s level of problem behavior relative to national normative sample for the child’s age and gender. Internal consistency reliability correlations range from 0.78-0.97 for 10 empirically based subscales, and the total scale. Content validity is supported by the fact that items were developed and refined on the basis of research, literature searches, consultation with experts, pilot testing and practical experience. All problem scales scores distinguish between referred and non-referred children at p < 0.01.
Procedure

Two days before the home visit, the researcher called parents to remind parents to collect the three saliva samples in the morning within 20 minutes of waking and verify that they understand the procedure for collecting a saliva specimen. On the day of the home visit, children drew a picture of a person (HFD), completed the interview, and then the researcher read items from the FBS, CCS, FPRQ-child form and the CSSS unless child is comfortable with reading them themselves. Children were given the opportunity to ask questions for clarification. In the meantime, parents completed demographic data form, the FPRQ-parent form, and the CBCL. The entire process lasted approximately one hour but some children spent more time to complete all the questionnaires. The saliva specimens were transferred to the biochemical refrigerator at the College of Nursing’s Center for Nursing Research laboratory right after the home visit.

Results

Demographics of the sample

Eighty-seven families had been approached throughout the 4½ month process of the subject recruitment. Fifty-nine percent of the families recruited participated in the study (n = 51). Table 4.1 presents 16 different reasons that the 36 families declined. The 3 most common reasons were “parents did not want to burden their children by having them involved in the study,” “parents believed their children were doing well,” and “children did not know their parents had cancer.” Four parents said that their children did not want to participate in
the study and another 4 parents said that it was too much for them due to their own health status.

Demographic characteristics of the children’s parents (including 3 grandparents) are presented in Table 4.2. A little more than half (59%) were educated with some college or higher degrees. One-third of the parents had some high school or were high school graduates, or GED. Nearly two-thirds of parents (63%) were employed. With respect to the resources of health insurance, 41 families (80%) had private health insurance, 9 families (18%) had public health insurance and only 1 family (2%) did not have any insurance. Over half of the families had more than $50,000 annual income. The household size ranged from 2 to 9. The majority of the families’ household size was 3 to 5 (n = 47, 83%). In addition to the child who participated in the study, more than half of the families (n = 26, 51%) had other school-agers or younger children at home.

Table 4.3 presents the demographic characteristics of the ill parent/grandparent which included 42 females (82%) and 9 males (18%). About 59% of them were educated beyond two year or technical degrees and 39% were employed. The mean age of the ill parents/grandparents was 42.3 years (range 30 – 67). Thirty-nine parents/grandparents were married (76.5%) with a mean of 14.4 years married and 12 parents/grandparents (23.5%) were single, separated or divorced.

The types of cancer the ill parents/grandparents had and the stage of the diagnoses were varied, but the diagnosis was predominantly breast cancer (69%) and the stage of cancer was predominantly stage II (21.6%) and stage IV.
(27.5%) (Table 4.4). Over two-thirds of ill parents/grandparents (n = 34, 66.7%) were receiving treatment while one-third of ill parent/grandparents were in remission. Length of time their parents and the children had known about the diagnosis was about the same with a mean of about 30 months (Table 4.5).

The sample of the children consisted of 23 boys (45%) and 28 girls (55%) ranging in age from 7 through 12 with a mean age of 9.92 years (SD = 1.26). Table 4.6 summarizes the characteristics of this sample. The sample was predominantly White (84%). The data of forty-five children (88%) were obtained through home visits by the investigator. Due to the limitation of traveling distance, 6 children (12%) completed the questionnaires at home according to instructions given to the parents by the investigator. Before data were collected, 10 children had attended different types of counseling to cope with their parental illness (n = 7), parental illness and parental divorce (n = 1), or their own ADHD disorder (n = 1), and to learn anger management (n = 1). Eleven children (22%) had ADHD, ADD, asthma, or sensory integration dysfunction disorders. Fifteen children were taking medications for their disorders or allergy problems while the data were collected.

Among 51 children, 12 children (24%) experienced other stressors such as moving, friends moving and changing school in the past 3 months and 2 children (4%) encountered parental separation or divorce. More than half of the children (n = 29, 57%) had previous experience with death of a loved one and more than one-third of children (n = 18, 35%) had previous experience with a loved one with cancer. More than one-third of parents (n = 10, 35%) indicated
the relationship between the child and the deceased loved one was very close or close (Table 4.7). Half of the children (n = 15, 62%) adjusted fairly well, well, or very well. Other responses to the situation include sad, upset, difficult, scared, ask lots of questions and quiet. In respect to the relationship between the child and the person having cancer, more than two-thirds were first degree relatives (grandparents, parents). According to parents’ reports, about half of the children (n = 9, 50%) who had previous experience with loved one having cancer adjusted to the situation well while another half of the children demonstrated various responses (e.g., scared, feeling stressful, did not say much) and felt confused and asked lots of questions or did not understand the situation at that time (Table 4.8). Children demonstrated a wide variety of good and difficult things occurring within their families after their parents’ diagnosis of cancer (Table 4.9 and Table 4.10). Of the 31 children who responded to this question, the most frequently reported positive things were “family becomes closer” (n = 6, 12%), “become more helpful around the house” (n = 5, 10%), and “get to see other family members more often” (n=4, 8%). “Unable to spend enough time with ill parent” (n = 8, 16%) and “unable to do something as before” (n = 6, 12%) were the two difficult things mentioned most frequently.

**Specific Aim #1 - To determine children’s appraisal of the stressfulness of their parents’ illness**

Children were asked “how upsetting is it for you right now?” on a scale of 1 – 5, not upsetting at all to very upsetting. The average level was moderately low (mean = 2.8, Table 4.11), with a mode of 3 (kind of upsetting). Almost two-
thirds (n = 32, 63%) of the children believed their parents’ treatment would work very well. None of the children thought their parents’ treatment would not work at all. Most children evaluated their own adjustment to their parents’ illness as very well (n = 23, 45%) (Table 4.12). Only 2 children reported their adjustment was not well at all. In regard to children’s appraisal of the situation they were currently experiencing, 15 children (29%) thought they could change the situation (Table 4.13). The reasons are presented in Table 4.14. Two in 3 children believed they could change the situation they were experiencing by being more helpful to their parents and by praying to God.

**Specific Aim #2 - To characterize concurrent stressors experienced by the children in addition to having a parent with cancer**

The coefficient alpha of the Feel Bad Scale with this sample of children with parents having cancer was 0.77 for the frequency rating and 0.91 for the severity rating. The 20 items of the Feel Bad Scale including the stressor rank, frequency, severity rating, and severity rank, for each item are presented in Table 4.15. The total frequency range is from 24 to 63 with a mean of 37.0 (SD = 8.7, Skewness= 0.95, Kurtosis = 0.78); the total severity range is from 22 to 92 with a mean of 57.4 (SD = 16.9, Skewness= -0.00, Kurtosis = -0.21). The stressors having nothing to do (n = 41, 80%), having your parents argue in front of you (n = 39, 76%), feeling sick (n = 39, 76%), and not having homework done on time (n = 35, 69%) were the items reported occurring most frequently.

Nevertheless, the most frequently occurring items were, in general, not those that were most negatively rated for severity. Three exceptions were having your
parents argue in front of you, which was rated 2\textsuperscript{nd} in frequency and 4\textsuperscript{th} in severity, not having homework done on time, which occurred 4\textsuperscript{th} in frequency and 6\textsuperscript{th} in terms of severity, and not spending enough time with mom or dad, which was rated 6\textsuperscript{th} in frequency and 5\textsuperscript{th} in severity.

**Specific Aim #3 - To characterize the frequency and effectiveness of the children’s coping strategies**

Before filling in the Children’s Coping Scale (CCS), each child was asked to answer an open-ended question about how they manage their feelings and thoughts about their parents’ illness. Being helpful to parents (n = 9, 17\%), talking to parents or someone else (n = 9, 17\%), praying (n = 8, 16\%), doing something to get the mind off it (n = 7, 14\%), and trying to forget about it or not to think about it (n = 5, 10\%) were most commonly reported (Table 4.16).

The alpha coefficient of the CCS of the frequency ratings in this study was 0.85, which indicates that the CSS has good internal consistency. The total frequency range is from 3 to 48 with a mean of 23.54 (SD = 10.33, Skewness= 0.56, Kurtosis = -0.55); the total effectiveness range is from 3 to 63 with a mean of 22.20 (SD = 11.12, Skewness= 0.82, Kurtosis = 2.09). The 24 items of the CCS including the coping rank, frequency, effectiveness rating, and effectiveness rank, for each item are presented in Table 4.17. Pray, think about it, say I’m sorry, try to relax or stay calm, tell the truth, and watch TV, play video games or listen to music were the items used most frequently to cope with their parents’ illness. In general, the most effective items were also those that were
used most frequently. One exception was cuddle my pet or stuffed animal, which was rated 5\textsuperscript{th} in effectiveness and 14\textsuperscript{th} in frequency.

**Specific Aim #4 - To determine the children’s physiological, behavioral and psychosocial stress responses through measures of salivary cortisol, stress symptoms, and emotional indicators on human figure drawings**

The results of the salivary cortisol levels for 3 continuous mornings as well as the intra- and inter- coefficients of variation are presented in Table 4.18 and Table 4.19, respectively. The intra-assay coefficient of variation was 3.3\% (range: 2.83\% - 3.84\%). The average inter-assay coefficient of variation was 2.7\% with 3.8\% for high (mean of 1.020 µg/dL) and 1.6\% for low (mean of 0.111 µg/dL). The intra- and inter-assay coefficients of variation indicated very good reliability of the results. Overall, most of the children’s cortisol levels were within the normal range of .12 - .96 µg/dL. Although the girls’ cortisol levels were slightly higher than the boys’, they were not statistically significant except on the third morning (\(t = -3.05, p = 0.004\)).

Before filling in the Children’s Stress Symptom Scale (CSSS), each child was asked to answer two open-ended questions about how they think and feel about their parents’ illness. Perhaps due to the limitation of their cognitive development, many children had difficulty in differentiating the difference between “think” and “feel.” Therefore, all the responses related to the children’s thoughts and feelings about their parents’ cancer are summarized in the same table (Table 4.20). Among 43 responses, sad (n = 21, 41\%) and scared/feel terrified (n = 19, 37\%) were the most reported feelings. Other most reported
thoughts and feelings were I think my parent/grandparent is going to survive (n = 6, 12%), I think my parent/grandparent may die of cancer (n=5, 10%), I felt scared or terrified about my parent’s illness (n = 5, 10%).

The internal consistency of the frequency ratings on the CSSS was high ($\alpha = 0.86$). The total frequency range is from 0 to 32 with a mean of 14.33 ($SD = 8.62$, Skewness= 0.29, Kurtosis = -0.74); the total severity range is from 0 to 44 with a mean of 13.22 ($SD = 10.32$, Skewness= 0.89, Kurtosis = 0.72). Table 4.21 presents the symptom rank, frequency, severity rating, and impact rank, for each item of the 24 items of the CSSS. The symptoms worried (n = 48, 94%), cry or feel sad (n = 41, 80%), afraid (n = 40, 77%) were most commonly reported and these symptoms were ranked as having the greatest impact as well. Generally, the most severely rated items were those that occurred frequently. Three exceptions were ashamed, stomachache, and feeling sick, which all were rated 8th in severity, but were rated 11th, 14th, and 17th in frequency, respectively.

In this study, the Cronbach alpha coefficients for the Child Behavior Checklist (CBCL) were 0.90 for the total scale, 0.59 for Competence scale, 0.89 for the Internalizing scale, and 0.82 for the Externalizing scale. Table 4.22 through Table 4.24 present the mean T scores and the ranges in normal, borderline and clinical ranges on competence scales 8 syndrome subscales, internalizing, externalizing and total problem scales. Forty-four, 1, and 6 children had normal, borderline and clinical T scores, respectively, on the competence scale. The majority of the children (76% - 94%) had normal T
scores on each syndrome subscale. The numbers of children whose syndrome subscale T scores were in the clinical range ranged from 3 (6%) to 6 (12%). As a group, Internalizing T scores showed that 1 in 5 children (n = 10) were in clinical range. Externalizing T scores demonstrated 14% of the children were in clinical range. The total problem T scores indicated 69% of children (n = 35) were within the non-clinical range, 10% of children (n = 5) were in the borderline clinical range, and 22% of children (n = 11) were in clinical range (Table 4.23).

The inter-rater agreement of two scores using Koppitz scoring system (Koppitz, 1968) for emotional indicators on the Human Figure Drawings (HFD) was 97.62%. The distribution of 30 Emotional Indicators (EI) in the human figure drawings is presented in Table 4.25. The most common EI were gross asymmetry of limbs (n = 22, 43.1%), short arms (n = 16, 31.4%), and no neck (n = 13, 25.5%). On average, boys had significantly more EI per drawing than girls (68 versus 49, t = 2.61, p = 0.012). Two or more EI were evident in 30 of the drawings (58.8%) (Table 4.26), which suggests a need for further psychological analysis (Koppitz, 1968).

**Specific Aim #5 - To examine parent-child relationship and its impact on children’s appraisal of their parents’ illness**

The Cronbach alpha coefficients of the Family Peer Relationship Questionnaire (FPRQ) subscales ranged from 0.70 to 0.94 except for the subscale of “togetherness with mother” on the child form which was 0.67. According to instrument instructions, the quality of parent-child relationship was computed by averaging the mean of the three parent report subscales and the
mean of the three child report subscales for a range of 1 to 5 (Table 4.27). Children’s perceptions of the relationships between them and their mothers and fathers were not significantly different from their parents’ perceptions. None of the parent-child relationships from parents’ or children’s perceptions had a significant impact on children’s appraisal of “How upsetting is it for you right now?” (Table 4.28). However, children’s perceptions of the relationships between them and their mothers and fathers were significantly related to children’s more positive appraisal of “How well do you think your parents’ treatment will work?” (19.5% of the variance explained by child-mother relationship, and 24.6% of the variance explained by child-father relationship) (Table 4.29). Neither of parents’ perceptions of the relationships between them and their children significantly contributed to children’s appraisal of their parents’ treatment working or not.

**Specific Aim #6 - To determine the relationships between the independent variables (the parent-child relationship, the children’s appraisal of their parents’ illness, additional stressors, and coping strategies) and the children’s stress responses.**

Table 4.30 presents the relationships among the “independent variables” (children’s appraisal of their parents’ illness, parent-child relationship, children’s concurrent stressors, coping strategies) and children’s biopsychosocial stress responses (reflected on the salivary cortisol levels, total # of Emotional Indicators (EI), the total score of the frequency and the severity subscales of the Children’s Stress Symptoms Scale (CSSS), and the total score of the Child
Behavior Checklist (CBCL)). Children’s appraisal of having a parent with cancer were positively correlated with symptom severity on the CSSS \((r = .229, p < .05)\). The better the children’s perceptions of the relationships between them and their parents were, the more positively the children appraised their parents’ treatment would work \((r = .374 \text{ and } r = .410, p < .01, \text{ respectively})\). Higher quality of child-mother relationship was related to lower scores on the CBCL \((r = -.315, p < .05)\). Children’s scores on the severity subscale of the Feel Bad Scale were positively associated with the severity subscale of the CSSS \((r = .417, p < .01)\). Children’s who experienced more concurrent stressors had higher scores on the CBCL \((r = .389, p < .01)\). Coping effectiveness and the scores on both the frequency subscale and severity subscale of the CSSS were significantly positively correlated \((r = .314 \text{ and } r = .343, p < .05)\).

Canonical correlations presented on the Tables 4.31 through Table 4.34 demonstrated the relationships between 2 sets of variables (independent variables and children’s stress responses). The only difference among these 4 tables is one of the independent variables - the children’s or parents’ perceptions of child-parent relationships. Significant canonical correlations appeared when child-mother relationships from the perspectives of the children and the mothers were treated as the independent variables of the quality of parent-child relationship. Both results showed that only the first variate was significant \((p = .005)\). When “child-mother relationship from children’s perspectives” was included in the analysis, the first variate indicates children who appraise having a parent with cancer as more upsetting, appraise their
parent’s treatment as more negative, have more concurrent stressors and more effective coping and lower quality of child-mother relationship, have more emotional indicators in children’s drawings, more stress symptoms, less severity in stress symptoms, and higher CBCL total score. When mother-child relationship from mother’s perspectives was included in the analysis, mother-child relationship is not meaningful (|structure coefficient| < 0.30) in interpreting the correlations between the 2 sets of variables. The total variances of the dependent variables explained by the independent variables were 21.5% (when child-mother relationship from children’s perspectives” was considered) and 22.1% (when mother-child relationship from mother’s perspectives” was considered).

Discussion

Sample

Of those parents who declined to participate, 23 parents (63.9%) were receiving treatment, which is similar to the proportion of the parents who did participate (66.7% were concurrently receiving treatment. The reasons for not participating were that parents did not want to upset or burden their children, parents believed their children are doing fine, and children had no idea about their parents having cancer. This is consistent with Barbes et al. (2000), who found that one of the reasons that the parents did not communicate with their children was to prevent the children’s distress or to minimize the children’s difficulties. But in fact, one study showed that children who were informed the real situation about their parents’ illness demonstrated lower anxiety scores
than those were not informed (Rosenheim & Reicher, 1985). Research has also shown that parents are often unaware of the distress levels of their children and perceive their children as not distressed (Lewis, Ellison, & Woods, 1985; Welch, Wadsworth, & Compas, 1996). Researchers cannot directly ask these children how they adjust to their parents’ cancer because of human subject issues. Nevertheless, some parents believed “communication” could reduce children’s distress. However, providing children with developmentally appropriate information needs to be emphasized with parents who have cancer because children who do not know the real situation may fantasize the situation, think it is worse than it is, or blame themselves for their parents being ill, which may jeopardize children’s psychosocial and physical adjustment to this pervasive stressor. One child in this study provides a good example. A 9 year old boy revealed that he believed he caused his mother’s cancer because he had a big fight with his mother the day before his mother was diagnosed with breast cancer. He said that he sometimes “felt ashamed and felt bad about myself.” Both parents were shocked to learn about this situation. The mother told the investigator it was hard to talk to her son about her “breast” because it is a private, female body part. She did not actually reveal the news to her son. The child’s grandmother told the boy, but didn’t say what words she used to describe the illness. This case raises an issue about the importance of offering parents advice on what and how to tell their children. In discussion with parents outside of this study, parents often revealed their need to know how and what to tell their children about their illness and how to help their children cope with
their illness as well. Although parents received helpful discussion with their physicians about their illness, not many parents were offered help with talking to their children from their own physicians. They often learned the relevant information from books or consulted their children’s pediatricians instead.

Although National Cancer Institute and U.S. Bureau of the Census estimated that about 128,089 children had a parent diagnosed with cancer in 1998 (as cited in Birenbaum, Yancey, Phillips, Chand, & Huster, 1999), the number of who currently have a parent with cancer is not known. No complete database information about cancer patients’ children is available. It is important to note that more than half of the children in this study had other school-age or younger siblings at home. Many parents expressed concerns about their other children. In order to maintain independent observations, only one child per family was recruited in this study. Every child is unique in the way they interpret and manage parent’s illness. For example, some children identified “becoming more helpful around the house” as positive things occurring within their families but other children considered this as a difficult thing. A study that focuses on all the siblings in a family would require special analysis techniques to account for the relationships between subjects. Nevertheless, family studies would provide important information for intervention.

Most of children appraised having a parent with cancer as “kind of upsetting” for them, however, the majority of the children were very optimistic about their parents’ recovery. Further analysis shows that children’s appraisal of having a parent with cancer was positively significantly correlated with the
severity of their symptoms. Children’s appraisal of their parents’ treatment was positively significantly correlated with their perceptions of the relationships with their parents. This is consistent with Lazarus theory (Lazarus & Folkman, 1984; Lazarus, 2000) that suggests personal factors (e.g., age, gender) and environmental factors (e.g., social support, the degree of severity of the situation) influence a person’s cognitive appraisal process. The better quality of the parent-child relationship from a child’s perspective, the more optimistic a child perceives the situation and the less severe a child perceives their stress responses. Perhaps because most of the children perceived the situation as relatively low or moderate stress, there is no significant correlation between children’s appraisal and their stress symptoms or coping effectiveness.

Concurrent stressors

Children identified “having your parents argue in front of you,” “not having homework done on time,” and “not spending enough time with mom or dad” as stressors that occurred most frequently and were perceived as most severe. “Not spending enough time with mom or dad” is the 6th most frequent stressor, in Lewis, Siegel, and Lewis’s study (1984) of a sample of school children. Not spending enough time with parents is of concern for children who have a parent with cancer. Parents with cancer often become more physically and emotionally unavailable for their children due to the illness symptoms or the treatment or their own emotional response to their illness. Many children in this study said that it was very difficult for them when their parents were not around. Because of being so afraid that his mother might be going to die of cancer, a
boy in this study was anxious to spend more time with his mother. He purposely behaved badly in school so he would be withdrawn from school to stay at home with his mother. His parents knew the mother’s cancer affected the boy a lot, but they did not realize know it was that serious. According to social/emotional developmental theory, even though peers gradually become significant to school-age children, children at this age are still emotionally attached to their parents. Some children may verbally express their worries and anxiety but others may not. Therefore, parents and clinicians especially need to pay more attention to those children who tend to hold everything inside them.

Coping strategies

In addition to “being more helpful to parents,” “praying to God” was the 2nd reasons that children believed they could change the situation they were experiencing. “Pray” was the most frequently used and most effective coping strategy. Perhaps because cancer is difficult to cure, spiritual support becomes the most effective coping strategy that children rely on to manage the situation that is beyond their control. In a study of children with asthma (Ryan-Wenger & Walsh, 1994), “pray” was rarely used or perceived as effective. Coping strategies used by children in this study were consistent with 3 of the 4 types of coping identified by Issel, Ersek, and Lewis (1990) including “say I’m sorry, tell the truth (in parent’s shoes),” “think about it (on the table),” and “watch TV, play video games or listen to music, do something active, like walk, run, skate, dance, bike, etc. (business as usual).” Consistent with the coping strategies used most frequently by children with asthma (Ryan-Wenger & Walsh, 1994), “
try to relax or stay calm,” watch TV, play video games or listen to music,” “say I’m sorry,” and “tell the truth” were used most frequently and effectively by the children in this study. Children said that the main reason that they used “say I’m sorry,” and “tell the truth” as the ways to cope with their parents’ cancer was that the children did not want to upset their parents. When difficult things occurred within the families after their parents’ were diagnosed with cancer, some children perceived a “need to help or take care of ill parent a lot and need to do more chores” as difficult for them. “Talk to someone” was one of the most effective coping strategies identified by the children, but one 9 year old boy considered it as an ineffective coping method. The reason was that he talked to his little brother who was 5 years old. This suggests the effectiveness of the same coping strategy may vary from person to person but the criteria that children use to evaluate a coping strategy as effective or ineffective may be helpful in explaining what makes it effective or ineffective. Child development theory may also provide some explanation. Incongruities between children’s and parents’ perceptions suggest that close and open parent-child communication is of importance in understanding how children adjust to their parents’ cancer.

Stress responses

Salivary cortisol was used to measure the children’s stress levels. Collecting the salivary cortisol from each child at the same time related to the stressor point (e.g., one month after the diagnosis) would be the ideal way to detect and compare children’s stress levels. However, this would be extremely
difficult logistically. The health status of cancer patients is hard to predict. In discussion with the children they often revealed that they adjusted well to their parents’ cancer because their parents were getting better or they believed their parents would get better. This may suggest why the average cortisol level of the children in this study was within the normal range. While working with children who are experiencing such a pervasive stressor, clinicians could periodically measure salivary cortisol as an indicator of children’s stress levels.

Sharrer and Ryan-Wenger (2002) identified two major categories of stress-related stress symptoms, including cognitive/emotional and physiological symptoms. The predominant stress symptoms related to parental cancer identified by the children in this study were cognitive/emotional such as worried, cry or feel sad, afraid, nervous, bad, mad, and confused. Although physiological symptoms such as stomachache and feeling sick were not reported as frequently as cognitive/emotional symptoms, they were rated higher in severity. Cancer is life-threatening. Children are frequently overwhelmed when they learn that their parents have it. Even though the parents are in remission, children are still afraid that cancer will come back. Many children whose parents were in remission when the investigator approached them expressed their worries about their parents even when their parents only went to the clinic for follow-up or when their parents had a cold.

In addition to stress symptoms related to parental cancer, children raised by single parents raise additional concerns. If the parent dies, these children’s living arrangements will become another challenge for them. A 9 year old girl
said she was so afraid and worried that her mother would die of cancer. Because if it happened, she worried that she and her siblings would be sent to foster families. A 10 year old boy started to cry and told the investigator “who would not be so scared of losing their parents?” while filling in the Children Stress Symptom Scale (CSSS). He and his brother may need to be separated and raised by different families if the mother’s plan for them did not work out successfully.

Children’s total frequency and severity scores could range from 0 to 72 on the CSSS. In this study, the total frequency range was 0 to 32 with a mean of 14.33 and the total severity range was 0 to 44 with a mean of 13.22, therefore, the children did not report high stress symptom levels, which is consistent with their normal cortisol levels. When symptom scores are compared to internalizing and externalizing T scores from the Child Behavior Checklist (CBCL), the results indicated that parents reported more stress symptoms than the children did. This is opposite to the findings of Welch, Wadsworth, and Compas (1996) in their study of children and adolescents. Either children adjust better than parents thought, or children themselves did not recognize their own adjustment problems. For example, an 8 year old girl demonstrated a lot of anger toward her parents after her father was diagnosed with cancer and subsequently started receiving several sessions of counseling treatment. However, she did not consider that “mad” was one of her stress symptoms associated with her father's cancer when she was interviewed by the investigator. On the other hand, this also reflects the parents’ concerns about
their children. Stress symptom items on the CSSS and the CBCL are not the same, however, so relative differences in scores may be accurate.

A 9 year old boy in this study stated he felt ashamed about himself sometimes because he thought he was not helpful enough to his mother. Another 11 year old boy felt ashamed about himself sometimes because he thought he complained too much about being unable to do certain things that he or the family used to do before his mother was diagnosed with breast cancer. School-age children are emotionally still very close to their parents but they gradually start to develop independence. After a parent is diagnosed with cancer, the changes in their lives often make them feel overwhelmed and they revert to a stage when they were more secure and seek more time with parents. Open communication will help parents understand their children’s adjustment issues and prevent children from blaming themselves. These children’s statements may not be generalizable, however, they are helpful to clinicians to learn how some children adjust to their parents’ cancer. Future research should examine reasons why children differ in their stress symptoms, and how their perceptions influence their symptoms.

Twenty-one of the 30 the emotional indicators (EI) were included in the children’s human figure drawings (HFD). EI included in the HFD could be associated with children’s emotional stress responses to parental cancer including gross asymmetry of limbs (impulsivity), short arms (shyness or timidity), no neck (impulsivity), no nose (shyness or timidity), slanting figure (insecurity), big hands (anger or aggressiveness), tiny figure (shyness or
timidity), legs pressed together (anxiety), and monster or grotesque/bizarre figure (insecurity or low self-concept) (Koppitz, 1984). Although more than half of the children had 2 or more than EI in their drawings, the total number of EI did not significantly correlate with the CSSS or the CBCL. The frequency distributions for both CSSS and CBCL scores were positively skewed. This limited variability may account for the absence of correlations.

**Parent-child relationship**

Research shows that the quality of the parent-child relationship is significantly and positively related to children’s psychosocial functioning (Lewis et al., 1993; Lewis, Woods, Hough, & Bensley, 1989; Lichtman et al., 1984). In this study, only child-mother relationship from children’s perspectives were associated with lower CBCL scores. No previous research has examined how the quality of the parent-child relationship influences children’s appraisal of their parents’ cancer. In this study, the better the child-parent relationship, the more the children believe that their parents’ treatment will work.

**Interrelationships among variables**

Results from canonical correlation analysis offer evidence of a significant relationship among children’s appraisal of the stressfulness of their parents’ cancer, concurrent stressors, coping strategies, parent-child relationship, and children’s biopsychosocial stress responses. Most simple correlations were in the expected direction. However, more effective coping was correlated with more emotional indicators (EIs) in children’s drawings, more stress symptoms
and higher CBCL score but less severe stress symptoms. These unexpected results require further examination. Coping is a dynamic process yet the data were collected cross-sectionally. Correlation analysis cannot determine the cause and effect between variables. It is possible that children’s stress responses appeared first, then they applied coping strategies. The stress symptoms are thus appraised as less severe, even though there were many different symptoms.

A limitation of this study is that children whose parents’ health status were relatively critical, whose parents were suffering more pain or adverse effects from the treatment, or whose parents’ cancer became progressive were unable to participate in the study. These children might have higher stress levels and more stress symptoms associated with their parents’ cancer than children whose parents’ illness status is relatively stable. Lack of representation of these children limits generalizability of the results from this study to children of the latter type. Another limitation is the cross-sectional aspect of this study. Longitudinal research that examines children’s responses over time as their parents’ condition fluctuates would provide valuable insight into children’s ability to cope. Some children may not share their feelings and thoughts to their own parents or close relatives. Instead, they may reveal such stress-related responses through acting out or anger toward their parents that is unacceptable either at home or school. Parents often do not recognize their children’s adjustment problems to their cancer until their children demonstrate behavior problems or emotional disturbance. Likewise, some children may not have felt
comfortable revealing their own feelings and thoughts associated with their experience of having a parent diagnosed with cancer to the investigator who is a total stranger to them. Due to this reason, some children may become nervous, which impedes their thoughts and responses. The use of the questionnaires helps with this problem. On the other hand, the questionnaires may not capture all potential responses. For example, being more helpful to their parents, the most common coping strategy reported in an open-ended question, is not in the Children’s Coping Scale.

Findings from this study can help nurses and other health professionals understand the relationships among children’s concurrent stressors, children’s appraisal of their parents’ cancer, parent-child relationship, coping strategies and biopsychosocial stress-related responses. Health professionals can use this information to provide anticipatory guidance to parents and children, to alert parents to their children’s adjustment problems, and to help their children identify ineffective and effective coping strategies.

**Conclusion**

When a parent is diagnosed with cancer, it is difficult for both parents and their children and it certainly raises many challenges for the ill parent and the entire family. Healthcare professionals have the responsibility to instruct parents about what and how to tell their children, how to help their children to cope with this pervasive stressor and minimize their stress symptoms. Children’s schoolteachers also need to be told about the parental cancer so the children’s behavior changes can be understood within the context of the
parental illness. When necessary, children should be referred to counselors, psychologists or psychiatrists for before the problems get worse.

This is the first study to measure variables related to the entire scope of the stress-coping process. The sample size was large enough to detect significant differences where they exist. Future research will focus on longitudinal studies, and theory testing research. Other factors that may contribute to children’s resilience will be investigated as well, including temperament, social supports, ill parents’ depression status, etc. Cultural differences on this issue will be examined by replicating the study outside the U.S. Triangulation methods may be helpful to clarify the contradictions that are observed. In addition to children and their parents, schoolteachers would be a good source in understanding children’s stress symptoms associated with their parents’ cancer shown at school. The development of research-based intervention programs to promote children’s physical and psychological health and prevent potential emotional harm would be the long-term goal of this investigator’s program of research. To date, no research has examined the effects of intervention programs on children who have a parent diagnosed with cancer, although many such programs exist.
Stressor: Having a parent with cancer

Moderators:
- Child characteristics:
  - Age
  - Sex
  - Social/Emotional development (e.g., temperament)
  - Previous experience related to cancer or other illness
  - Concurrent stressors
- Ill parent and family characteristics:
  - Sex of ill parent
  - Nature of illness (type, stage and length of illness)
  - Family socioeconomic status
  - Family social network
  - Concurrent stressors

Mediators
- Family coping
- Parent-child relationship
- Child's appraisal of parent's cancer
- Child's coping strategies

Outcomes
- Biopsychosocial stress responses on CBCL, CSSS, HFDs, and Salivary cortisol

Fig. 4.1: A model of children's adjustment to parental cancer

1 variables in blue are measured in this study
<table>
<thead>
<tr>
<th>Reasons for declining (n=36*)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Parents did not want to upset or burden their children by having them involved in this study.</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>2. Parents believed their children are doing ok.</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>3. Children did not know their parents have cancer.</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>4. Parent thought it was too much for them because their health status was not good (e.g., too weak due to chemo therapy, having uncontrollable pain)</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>5. Children did not want to participate in the study, according to the parents.</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>6. Parents lived too far away from Columbus (more 2 ½ hours)</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>7. Parents were not interested in participating in the study.</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>8. Parents had a recurrence/parents’ situation deteriorated</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>9. Spouse did not agree to participate in the study.</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>10. Parent believed their children were not good candidates for the study (e.g., the child had other medical problems, the parent hadn’t start treatment yet).</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>11. Parents believed cancer was gone and all behind them.</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>12. Children had too much on their plates already (e.g., moving, changing school).</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>13. Parent did not think their children would do it because they did not even want to talk about it to the parents.</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>14. Parents did not like the phrase of the open-ended questions related to the use of the “cancer” word</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>15. Parents’ concerns about collecting saliva samples</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>16. Parents passed away.</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

*Some parents made more than one response

Table 4.1: Reasons that parents and their children declined to be in the study
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mother/Grandma (n=51)</th>
<th>Father/Grandpa (n=51)</th>
<th>Total (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhD</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Master</td>
<td>6</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>College</td>
<td>14</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>Some college</td>
<td>11</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Two year or technical degree</td>
<td>6</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>High School Graduate, GED</td>
<td>11</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Some high school</td>
<td>3</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22</td>
<td>43</td>
<td>42</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>57</td>
<td>8</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td># of Families (n=51)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family income level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 8,000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$8,000 – $15,000</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15,000 – $25,000</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$25,000 – $35,000</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$35,000 – $50,000</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than $50,000</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>28</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2: Description of the families of the sample of children with parents having cancer
<table>
<thead>
<tr>
<th>Variable</th>
<th># of Families (n=51)</th>
<th>% of Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition of siblings living together</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No other siblings</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Preschooler</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Kindergarteners</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Preschooler +</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kindergarteners</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Preschoolers + Schoolagers</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kindergarteners + Schoolagers</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kindergarteners + Schoolagers + Teenagers</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Schoolagers</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Schoolagers + Teenagers</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Schoolagers + Teenagers + Adult children</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Teenagers</td>
<td>22</td>
<td>43</td>
</tr>
<tr>
<td>Adult children</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Variable</td>
<td>Men (n=9, 18%)</td>
<td>Women (n=42, 82%)</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 – 34</td>
<td>1 (SF)</td>
<td>4 (M)</td>
</tr>
<tr>
<td>35 – 39</td>
<td>1 (F)</td>
<td>10 (M)</td>
</tr>
<tr>
<td>40 – 44</td>
<td>1 (SF)</td>
<td>18 (M)</td>
</tr>
<tr>
<td>45 – 49</td>
<td>3 (F)</td>
<td>7 (M)</td>
</tr>
<tr>
<td>50 – 54</td>
<td>2 (1F &amp; 1SF)</td>
<td>1 (M)</td>
</tr>
<tr>
<td>60 – 64</td>
<td>0</td>
<td>2 (GM)</td>
</tr>
<tr>
<td>65 – 69</td>
<td>1 (GF)</td>
<td>0</td>
</tr>
</tbody>
</table>

40 mothers(M), 5 fathers(F), 3 step-father(SF), 2 grandma(GM) & 1 grandpa(GF)
Range=37 (30-67)  Mean age=42.3 (Standard Deviation=7.55)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n=9)</th>
<th>Women (n=42)</th>
<th>Total (n=51)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master</td>
<td>0</td>
<td>6 (5M &amp; 1GM)</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>College</td>
<td>2 (1F &amp; 1SF)</td>
<td>13 (M)</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Some college</td>
<td>1 (F)</td>
<td>8 (M)</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Two year or technical degree</td>
<td>2 (2F)</td>
<td>3 (M)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>High School Graduate, GED</td>
<td>3 (2SF &amp; 1 GP)</td>
<td>9 (M)</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Some high School</td>
<td>1 (F)</td>
<td>2 (1M &amp; 1 GM)</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n=9)</th>
<th>Women (n=42)</th>
<th>Total (n=51)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Yes</td>
<td>4 (2F &amp; 2 SF)</td>
<td>16 (14M &amp; 2 GM)</td>
<td>20</td>
<td>39</td>
</tr>
<tr>
<td>No</td>
<td>5 (3F, 1 SF &amp; 1GP)</td>
<td>26 (26M)</td>
<td>31</td>
<td>61</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n=9)</th>
<th>Women (n=42)</th>
<th>Total (n=51)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>5 (4M &amp; 1GM)</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>9 (5F, 3 SF &amp; 1GF)</td>
<td>30 (M)</td>
<td>39</td>
<td>76.5</td>
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<td>Separated</td>
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<td>2</td>
<td>3.9</td>
</tr>
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<td>Divorced</td>
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<td>5 (4M &amp; 1GM)</td>
<td>5</td>
<td>9.8</td>
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Continued

Table 4.3: Demographic characteristics of the ill parents/grandparents

120
Table 4.3 continued

<table>
<thead>
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<th>Variable</th>
<th>Men (n=9)</th>
<th>Women (n=32)</th>
<th>Total (n=41)</th>
<th>%</th>
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<td>Married Years</td>
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<td>0 – 4</td>
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<td>2 (M)</td>
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<td>7.8</td>
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<tr>
<td>5 – 9</td>
<td>1 (SF)</td>
<td>4 (M)</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>10 – 14</td>
<td>0</td>
<td>12 (M)</td>
<td>12</td>
<td>23.5</td>
</tr>
<tr>
<td>15 – 19</td>
<td>4 (3F &amp; 1GF)</td>
<td>7 (M)</td>
<td>11</td>
<td>21.6</td>
</tr>
<tr>
<td>20 – 24</td>
<td>0</td>
<td>6 (M)</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>25 – 29</td>
<td>2 (F)</td>
<td>0</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>More than 30</td>
<td>0</td>
<td>1 (M)</td>
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<td>2</td>
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</table>

Range=29.5 (0.5-30) Mean=14.4 (Standard Deviation=6.62)
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<th>Women (n=42)</th>
<th>Total (n=51)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Cancer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>0</td>
<td>35 (33M &amp; 2GM)</td>
<td>35</td>
<td>69</td>
</tr>
<tr>
<td>Rectal Cancer</td>
<td>1 (F)</td>
<td>1 (M)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Cervical Cancer</td>
<td>0</td>
<td>1 (M)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>CML</td>
<td>1 (F)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>CMML</td>
<td>1 (F)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Myelofibrosis</td>
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<td>1 (M)</td>
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</tr>
<tr>
<td>Hodgkin’s Lymphoma</td>
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<td>1 (M)</td>
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<td>2</td>
</tr>
<tr>
<td>Lung Cancer</td>
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<td>1 (M)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Metastatic Esophageal Cancer</td>
<td>1 (F)</td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Metastatic Osteosarcoma</td>
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<td>1 (M)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Metastatic Peritoneal Mesothelioma</td>
<td>1 (SF)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Multiple Myeloma</td>
<td>1 (F)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Neuroendocrine</td>
<td>1 (SF)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nodular</td>
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<td>1 (M)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Melanoma/Gliosarcoma</td>
<td>1 (SF)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Squamous Cell Carcinoma</td>
<td>1 (GF)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Throat Cancer</td>
<td>1 (GF)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Stage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1 (M)</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>7 (6M &amp; 1GM)</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>11 (M)</td>
<td>11</td>
<td>21.6</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>6 (5M &amp; 1 GM)</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>4</td>
<td>4 (2F, 1SF &amp; 1GF)</td>
<td>10 (M)</td>
<td>14</td>
<td>27.5</td>
</tr>
<tr>
<td>Unsure</td>
<td>0</td>
<td>1 (M)</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5 (3F &amp; 2SF)</td>
<td>6 (M)</td>
<td>11</td>
<td>21.6</td>
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</table>

Table 4.4: Nature of ill parents’ illness
Table 4.4: continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n=9)</th>
<th>Women (n=42)</th>
<th>Total (n=51)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Treatment or Remission</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Treatment</td>
<td>7 (3F, 3SF &amp; 1 GF)</td>
<td>27 (25M &amp; 2GM)</td>
<td>34</td>
<td>66.7</td>
</tr>
<tr>
<td>In Remission &lt; 1 year</td>
<td>1 (F)</td>
<td>8 (M)</td>
<td>9</td>
<td>17.6</td>
</tr>
<tr>
<td>In Remission &gt; 2 year</td>
<td>1 (F)</td>
<td>7 (M)</td>
<td>8</td>
<td>15.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parents (n=51)</th>
<th></th>
<th>Children (n=51)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of time parents and children had known about the diagnosis</strong></td>
<td>Parents (n=51)</td>
<td></td>
<td>Children (n=51)</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1 – 6 months</td>
<td>11</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>7 – 12 months</td>
<td>6</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>13 – 18 months</td>
<td>6</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>19 – 24 months</td>
<td>5</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>25 – 30 months</td>
<td>3</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>31 – 36 months</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>37 – 42 months</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>43 – 48 months</td>
<td>4</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>49 – 60 months</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>61 – 72 months</td>
<td>5</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>73 – 87 months</td>
<td>4</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Mean = 31.81 (months)</strong></td>
<td></td>
<td><strong>Mean = 30.13 (months)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SD = 28.42</strong></td>
<td></td>
<td><strong>SD = 25.88</strong></td>
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</table>

Table 4.5: Length of time parents and children have known about the diagnosis
<table>
<thead>
<tr>
<th>Variables</th>
<th>Boys (n=23, 45%)</th>
<th>Girls (n=28, 55%)</th>
<th>Total (n=51)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>35</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100</td>
<td>28</td>
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</tbody>
</table>

Mean age=9.92 years (Standard Deviation= 1.26)

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Boys (n=23, 45%)</th>
<th>Girls (n=28, 55%)</th>
<th>Total (n=51)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
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<td>0</td>
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</tr>
<tr>
<td>African American</td>
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<td>13</td>
<td>2</td>
</tr>
<tr>
<td>White</td>
<td>19</td>
<td>83</td>
<td>24</td>
</tr>
<tr>
<td>Biracial</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100</td>
<td>28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ways of data being collected</th>
<th>Boys (n=23, 45%)</th>
<th>Girls (n=28, 55%)</th>
<th>Total (n=51)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Home visit</td>
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<td>87</td>
<td>23</td>
</tr>
<tr>
<td>Outpatient clinic</td>
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<td>1</td>
</tr>
<tr>
<td>Self-completed</td>
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<td>9</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
<th>Attending counseling</th>
<th>Boys (n=23, 45%)</th>
<th>Girls (n=28, 55%)</th>
<th>Total (n=51)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>6</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>74</td>
<td>24</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Type of counseling</th>
<th>Boys (n=23, 45%)</th>
<th>Girls (n=28, 55%)</th>
<th>Total (n=51)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kids Can Cope</td>
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<td>13</td>
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<td>Child psychiatrist</td>
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<tr>
<td>School counselor</td>
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</tr>
<tr>
<td>Anger Management</td>
<td>1</td>
<td>4</td>
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</tr>
</tbody>
</table>

*Figures may not total 100% due to rounding error.

Continued

Table 4.6: Demographic characteristics of the sample of children with parents having cancer
Table 4.6 continued

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<tr>
<th>Variables</th>
<th>Boys (n=23, 45%)</th>
<th></th>
<th></th>
<th>Girls (n=28, 55%)</th>
<th></th>
<th></th>
<th>Total (n=51)</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
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</tr>
<tr>
<td>Disorder</td>
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</tr>
<tr>
<td>ADHD</td>
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<td>17</td>
<td>3</td>
<td>11</td>
<td>7</td>
<td>14</td>
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</tr>
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<td>4</td>
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<td>Sensory</td>
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<tr>
<td>Integration dysfunction</td>
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<tr>
<td>Taking prescribed medications</td>
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<td>30</td>
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<td>15</td>
<td>29</td>
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<td>71</td>
<td>36</td>
<td>71</td>
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</tr>
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<td>Stressful events &amp; losses within the past 3 months</td>
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<td>11</td>
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<td>12</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Friends moving</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changing school</td>
<td>3</td>
<td>13</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>8</td>
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<tr>
<td>Parents divorce</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents separate</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous Experience with death of a loved one</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>61</td>
<td>15</td>
<td>54</td>
<td>29</td>
<td>57</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>39</td>
<td>13</td>
<td>46</td>
<td>22</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous Experience with a loved one having cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>39</td>
<td>9</td>
<td>32</td>
<td>18</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>61</td>
<td>19</td>
<td>68</td>
<td>33</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td>Number of Children (n=29)</td>
<td>% of Children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------</td>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship between the child and the deceased loved one</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very close</td>
<td>6</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close</td>
<td>4</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairly close</td>
<td>2</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not real close</td>
<td>6</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No information provided</td>
<td>11</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of Children (n=29*)</th>
<th>% of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>How the child adjusted to the deceased loved one’s death?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very well</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Well</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>Fairly well</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Upset</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Scared, frightened</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Difficult for the child</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Asked lots of questions</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Quiet</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Sad</td>
<td>7</td>
<td>24</td>
</tr>
</tbody>
</table>

*Some children made more than one response.

Table 4.7: Relationship between the child and the deceased loved one
<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of Children (n=18*)</th>
<th>% of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationship between the child and the person with cancer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grandfather</td>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>Grandmother</td>
<td>7</td>
<td>39</td>
</tr>
<tr>
<td>Father</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Younger brother</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Great aunt &amp; Great uncle</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Aunt</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Grandfather &amp; boyfriend of Mother’s friend</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Friend’s father</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td><strong>How the child adjusted to the person’s cancer?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very well</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Well</td>
<td>7</td>
<td>39</td>
</tr>
<tr>
<td>Well but becomes harder on the child when he’s getting older</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Scared</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Confused and wondering</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Asked questions</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Stressful</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Didn’t say much</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Didn’t understand what’s going on</td>
<td>3</td>
<td>17</td>
</tr>
</tbody>
</table>

*Some children made more than one response

Table 4.8: Relationship between the child and the person having cancer
<table>
<thead>
<tr>
<th>Positive Things Happening in the Families (n=51*)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannot think of anything</td>
<td>20</td>
<td>39</td>
</tr>
<tr>
<td>Family becomes closer</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Become more helpful around the house (e.g., do more chores for parents)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Get to see other family members like grandparents more often</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Learn to do lots of new things like household chores or cancer</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Bring family closer to God</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Spend more time with ill parent</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Get lots of presents</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Be closer to ill parent</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Learn to appreciate ill parent more</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Spend more time with well parent</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Family members communicate with each other more often</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Family living setting is rearranged</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Be able to help breast cancer patients by raising money</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Learn “cry &amp; grieve” is ok</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>People treat me nicely</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Do better in school</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Move away from my dad</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Some children made more than one response

Table 4.9: Children’s perspectives about the positive things happening within the families after their parents diagnosed with cancer
<table>
<thead>
<tr>
<th>Difficult Things Happening in the Families (n=51*)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannot think of anything</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Ill parent is often not around or unable to spend enough time with ill parent</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Be unable to do something as before (e.g., go on family vacation)</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Need to help or take care of ill parent a lot</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Family becomes sad more often</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Worry everything about ill parent all the time</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Need to help around the house a lot or do more chores</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Changes of Living arrangements</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Be unable to get what we want as before</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Well parent is not around very often</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cry a lot</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Family members fight with each other a lot</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Well parent need to work harder</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Worry about family financial problems</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other family members did not offer their support as they promised</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Worry about having to go to a foster family if ill parent died</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Become more distant with people</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>People ask questions like “Is your mom dead yet?”</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Need to be quiet all the time</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Grandma visits a lot but I don’t really like it because she is too strict in many ways</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nothing has been the same</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Try to cause less stress</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Some children made more than one response

Table 4.10: Children’s perspectives about the difficult things happening within the families after their parents diagnosed with cancer
<table>
<thead>
<tr>
<th>Questions</th>
<th>Children’s Responses</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>How upsetting is it for you right now?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work at all</td>
<td>In between</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 (12)</td>
<td>14 (28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work pretty well</td>
<td>Work very well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (0)</td>
<td>7 (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (24)</td>
<td>32 (63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How well do you think your parent’s treatment will work?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work at all</td>
<td>In between</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work pretty well</td>
<td>Work very well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (4)</td>
<td>18 (35)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 (16)</td>
<td>23 (45)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.11: Children's appraisal of the stressfulness of their parents’ illness

<table>
<thead>
<tr>
<th>Question</th>
<th>Children’s Responses</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>How well do you think you are dealing with your parent’s cancer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not well at all</td>
<td>In between</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (4)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretty well</td>
<td>In between</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 (35)</td>
<td>8 (16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 (45)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.12: Children's appraisal of their adjustment to their parents’ illness
Do you think you can change this situation you are experiencing now?

<table>
<thead>
<tr>
<th>Question</th>
<th>Children’s Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Do you think you can change this situation</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 4.13: Children’s appraisal of the situation they are currently experiencing

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Number of Children (n=15)</th>
<th>% of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>By being more helpful</td>
<td>8</td>
<td>53</td>
</tr>
<tr>
<td>By praying to God</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Emotional support for ill parent</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Fantasy thinking</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>By waiting until it is over</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Doctor’s words</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>By talking with other people</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 4.14: Reasons that children believed that they could change the situation they were experiencing
<table>
<thead>
<tr>
<th>Stressors</th>
<th>Frequency rank</th>
<th># of children with stressor (%)</th>
<th>Frequency that stressors are experienced</th>
<th>Severity rating</th>
<th>Severity rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having nothing to do</td>
<td>1</td>
<td>41 (80)</td>
<td>1 or 2 times: 18</td>
<td>Not bad: 12</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sometimes: 16</td>
<td>A little bad: 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Often: 5</td>
<td>Pretty bad: 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All the time: 2</td>
<td>Real bad: 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 8</td>
<td></td>
</tr>
<tr>
<td>Having your parents argue in front of you</td>
<td>2</td>
<td>39 (76)</td>
<td>1 or 2 times: 24</td>
<td>Not bad: 4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sometimes: 8</td>
<td>A little bad: 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Often: 5</td>
<td>Pretty bad: 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All the time: 2</td>
<td>Real bad: 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 10</td>
<td></td>
</tr>
<tr>
<td>Feeling sick</td>
<td>2</td>
<td>39 (76)</td>
<td>1 or 2 times: 18</td>
<td>Not bad: 8</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sometimes: 16</td>
<td>A little bad: 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Often: 4</td>
<td>Pretty bad: 17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All the time: 1</td>
<td>Real bad: 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 6</td>
<td></td>
</tr>
<tr>
<td>Not having homework done on time</td>
<td>4</td>
<td>35 (69)</td>
<td>1 or 2 times: 23</td>
<td>Not bad: 7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sometimes: 7</td>
<td>A little bad: 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Often: 4</td>
<td>Pretty bad: 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All the time: 1</td>
<td>Real bad: 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 8</td>
<td></td>
</tr>
<tr>
<td>Being pressured to get good grades</td>
<td>5</td>
<td>33 (65)</td>
<td>1 or 2 times: 12</td>
<td>Not bad: 15</td>
<td>18</td>
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<td></td>
<td></td>
<td></td>
<td>Sometimes: 8</td>
<td>A little bad: 16</td>
<td></td>
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<td>Often: 8</td>
<td>Pretty bad: 12</td>
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<td></td>
<td></td>
<td></td>
<td>All the time: 5</td>
<td>Real bad: 4</td>
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<td></td>
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<td></td>
<td></td>
<td>Terrible: 4</td>
<td></td>
</tr>
<tr>
<td>Not spending enough time with your mom or dad</td>
<td>6</td>
<td>31 (61)</td>
<td>1 or 2 times: 10</td>
<td>Not bad: 9</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sometimes: 13</td>
<td>A little bad: 7</td>
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<td>Often: 6</td>
<td>Pretty bad: 16</td>
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<td></td>
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<td>All the time: 2</td>
<td>Real bad: 10</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 9</td>
<td></td>
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</table>

Table 4.15: Concurrent stressors experienced by the children in addition to having a parent with cancer (n=51)
<table>
<thead>
<tr>
<th>Stressors</th>
<th>Frequency rank</th>
<th># of children with stressor (%)</th>
<th>Frequency that stressors are experienced</th>
<th>Severity rating</th>
<th>Severity rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fighting with your parents about house rules</td>
<td>6</td>
<td>31 (61)</td>
<td>1 or 2 times: 16 Sometimes: 10 Often: 3 All the time: 2</td>
<td>Not bad: 11 A little bad: 9 Pretty bad: 15 Real bad: 10 Terrible: 6</td>
<td>10</td>
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<tr>
<td>Not having enough money to spend</td>
<td>6</td>
<td>31 (61)</td>
<td>1 or 2 times: 12 Sometimes: 8 Often: 6 All the time: 5</td>
<td>Not bad: 12 A little bad: 14 Pretty bad: 7 Real bad: 11 Terrible: 7</td>
<td>14</td>
</tr>
<tr>
<td>Feeling left out of the group</td>
<td>9</td>
<td>29 (57)</td>
<td>1 or 2 times: 16 Sometimes: 10 Often: 2 All the time: 1</td>
<td>Not bad: 6 A little bad: 7 Pretty bad: 14 Real bad: 12 Terrible: 12</td>
<td>3</td>
</tr>
<tr>
<td>Being late for school</td>
<td>9</td>
<td>29 (57)</td>
<td>1 or 2 times: 20 Sometimes: 5 Often: 2 All the time: 2</td>
<td>Not bad: 15 A little bad: 13 Pretty bad: 8 Real bad: 8 Terrible: 7</td>
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<tr>
<td>Not being able to dress the way you want to</td>
<td>11</td>
<td>26 (51)</td>
<td>1 or 2 times: 14 Sometimes: 7 Often: 2 All the time: 3</td>
<td>Not bad: 22 A little bad: 7 Pretty bad: 7 Real bad: 10 Terrible: 5</td>
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<tr>
<td>Feeling like your body is changing</td>
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<td>25 (49)</td>
<td>1 or 2 times: 14 Sometimes: 9 Often: 2 All the time: 0</td>
<td>Not bad: 21 A little bad: 15 Pretty bad: 4 Real bad: 6 Terrible: 5</td>
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<tr>
<td>Being smaller than others your age</td>
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<td>22 (43)</td>
<td>1 or 2 times: 10 Sometimes: 5 Often: 4 All the time: 3</td>
<td>Not bad: 26 A little bad: 11 Pretty bad: 4 Real bad: 3 Terrible: 7</td>
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<tr>
<td>Stressors</td>
<td>Frequency rank</td>
<td># of children with stressor (%)</td>
<td>Frequency that stressors are experienced</td>
<td>Severity rating</td>
<td>Severity rank</td>
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<tr>
<td>Not being good enough at sports</td>
<td>14</td>
<td>19 (37)</td>
<td>1 or 2 times: 13</td>
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<td></td>
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<td>Sometimes: 4</td>
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<td>Often: 1</td>
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<td>All the time: 1</td>
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<td>Not bad: 15</td>
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<td>A little bad: 14</td>
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<td>Real bad: 5</td>
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<td>Terrible: 7</td>
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<tr>
<td>Not getting along with your teacher</td>
<td>15</td>
<td>16 (31)</td>
<td>1 or 2 times: 11</td>
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<td>Sometimes: 3</td>
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<td>All the time: 1</td>
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<td>Not bad: 9</td>
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<td>A little bad: 10</td>
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<td>Terrible: 13</td>
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<tr>
<td>Moving from one place to another</td>
<td>15</td>
<td>16 (31)</td>
<td>1 or 2 times: 14</td>
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<td>Sometimes: 2</td>
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<td>Pretty bad: 10</td>
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<td>Terrible: 14</td>
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<td>Having parents separate</td>
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<td>Sometimes: 1</td>
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<td>Not bad: 6</td>
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<td>Changing schools</td>
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<td>Being Overweight or bigger than others your age</td>
<td>19</td>
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<td>Sometimes: 4</td>
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<td>Often: 1</td>
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<td>All the time: 2</td>
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<td>A little bad: 7</td>
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<td>Pretty bad: 9</td>
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<td>Real bad: 13</td>
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<td></td>
<td>Terrible: 10</td>
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<tr>
<td>Being pressured to try something new, like a cigarette, that you really don’t want to try</td>
<td>20</td>
<td>5 (10)</td>
<td>1 or 2 times: 2</td>
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<td></td>
<td></td>
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<td>Sometimes: 2</td>
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<td>Often: 1</td>
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<td>All the time: 1</td>
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<td>Not bad: 4</td>
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<td>1</td>
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<td></td>
<td>A little bad: 7</td>
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<td>Pretty bad: 5</td>
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<td>Real bad: 12</td>
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<td></td>
<td></td>
<td></td>
<td>Terrible: 23</td>
<td></td>
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<tr>
<td>Ways to deal with parental cancer</td>
<td>Number of Children (n=51*)</td>
<td>% of Children</td>
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<td>----------------------------------</td>
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<tr>
<td>Be helpful to parents</td>
<td>9</td>
<td>17</td>
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<td></td>
<td></td>
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<tr>
<td>Talk to parents or someone else</td>
<td>9</td>
<td>17</td>
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<td></td>
</tr>
<tr>
<td>Pray</td>
<td>8</td>
<td>16</td>
<td></td>
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<tr>
<td>Do something to get the mind off it (e.g., do sports, get out and play with friends, watch TV, play video games, etc.)</td>
<td>7</td>
<td>14</td>
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<tr>
<td>Try to forget about it or not to think about it</td>
<td>5</td>
<td>10</td>
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<tr>
<td>Play with pets or stuff animals</td>
<td>3</td>
<td>6</td>
<td></td>
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<td></td>
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<tr>
<td>Be nice to ill parent</td>
<td>3</td>
<td>6</td>
<td></td>
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<tr>
<td>Be alone</td>
<td>2</td>
<td>4</td>
<td></td>
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<tr>
<td>Have faith (By thinking the ill parent is going be ok)</td>
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<td>4</td>
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<td>Think of positive side</td>
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<td>4</td>
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<td>Think of good times</td>
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<td>2</td>
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<td>Wishful thinking (e.g., hope it goes away)</td>
<td>1</td>
<td>2</td>
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<td>Listen to music</td>
<td>1</td>
<td>2</td>
<td></td>
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<tr>
<td>Read books</td>
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<td>2</td>
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</tbody>
</table>

*Some children made more than one response

Table 4.16: Ways of children’s dealing with their feelings and thought about their parents’ cancer
<table>
<thead>
<tr>
<th>Coping</th>
<th>Coping rank</th>
<th># of children using this coping (%)</th>
<th>Frequency that coping is used</th>
<th>Effectiveness rating</th>
<th>Effectiveness rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pray</td>
<td>1</td>
<td>43 (84)</td>
<td>Once in awhile: 13 A lot: 16 Most of the time: 14</td>
<td>Not helpful: 0 Helps a little: 8 Helps a lot: 20 Always helps: 15</td>
<td>1</td>
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<tr>
<td>Think about it</td>
<td>2</td>
<td>42 (82)</td>
<td>Once in awhile: 21 A lot: 14 Most of the time: 7</td>
<td>Not helpful: 3 Helps a little: 18 Helps a lot: 16 Always helps: 5</td>
<td>6</td>
</tr>
<tr>
<td>Say I’m sorry</td>
<td>3</td>
<td>41 (80)</td>
<td>Once in awhile: 22 A lot: 14 Most of the time: 5</td>
<td>Not helpful: 3 Helps a little: 13 Helps a lot: 20 Always helps: 5</td>
<td>3</td>
</tr>
<tr>
<td>Try to relax or stay calm</td>
<td>3</td>
<td>41 (80)</td>
<td>Once in awhile: 14 A lot: 20 Most of the time: 7</td>
<td>Not helpful: 1 Helps a little: 17 Helps a lot: 17 Always helps: 6</td>
<td>4</td>
</tr>
<tr>
<td>Tell the truth</td>
<td>5</td>
<td>40 (78)</td>
<td>Once in awhile: 10 A lot: 11 Most of the time: 19</td>
<td>Not helpful: 1 Helps a little: 11 Helps a lot: 14 Always helps: 14</td>
<td>2</td>
</tr>
<tr>
<td>Watch TV, play video games or listen to music</td>
<td>5</td>
<td>40 (78)</td>
<td>Once in awhile: 4 A lot: 17 Most of the time: 19</td>
<td>Not helpful: 4 Helps a little: 19 Helps a lot: 8 Always helps: 9</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 4.17: Frequency and effectiveness of children’s coping strategies (n=51)
<table>
<thead>
<tr>
<th>Coping</th>
<th>Coping rank</th>
<th># of children using this coping (%)</th>
<th>Frequency that coping is used</th>
<th>Effectiveness rating</th>
<th>Effectiveness rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do something active, like walk, run, skate, dance, bike, etc.</td>
<td>7</td>
<td>37 (73)</td>
<td>Once in awhile: 11  A lot: 17  Most of the time: 9</td>
<td>Not helpful: 2  Helps a little: 14  Helps a lot: 14  Always helps: 7</td>
<td>6</td>
</tr>
<tr>
<td>Play a game or something</td>
<td>7</td>
<td>37 (73)</td>
<td>Once in awhile: 19  A lot: 12  Most of the time: 6</td>
<td>Not helpful: 3  Helps a little: 17  Helps a lot: 13  Always helps: 4</td>
<td>9</td>
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<tr>
<td>Talk to someone</td>
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<td>36 (71)</td>
<td>Once in awhile: 20  A lot: 13  Most of the time: 3</td>
<td>Not helpful: 1  Helps a little: 15  Helps a lot: 11  Always helps: 9</td>
<td>8</td>
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<tr>
<td>Do work around the house</td>
<td>10</td>
<td>34 (67)</td>
<td>Once in awhile: 20  A lot: 8  Most of the time: 6</td>
<td>Not helpful: 4  Helps a little: 17  Helps a lot: 9  Always helps: 4</td>
<td>14</td>
</tr>
<tr>
<td>Draw, write or read something</td>
<td>10</td>
<td>34 (67)</td>
<td>Once in awhile: 17  A lot: 11  Most of the time: 6</td>
<td>Not helpful: 0  Helps a little: 18  Helps a lot: 12  Always helps: 4</td>
<td>12</td>
</tr>
<tr>
<td>Do something about it</td>
<td>12</td>
<td>33 (65)</td>
<td>Once in awhile: 25  A lot: 5  Most of the time: 3</td>
<td>Not helpful: 0  Helps a little: 16  Helps a lot: 12  Always helps: 5</td>
<td>9</td>
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<tr>
<td>Try to forget about it</td>
<td>13</td>
<td>32 (63)</td>
<td>Once in awhile: 17  A lot: 11  Most of the time: 4</td>
<td>Not helpful: 5  Helps a little: 11  Helps a lot: 12  Always helps: 4</td>
<td>12</td>
</tr>
<tr>
<td>Cuddle my pet or stuffed animal</td>
<td>14</td>
<td>31 (61)</td>
<td>Once in awhile: 13  A lot: 12  Most of the time: 6</td>
<td>Not helpful: 0  Helps a little: 9  Helps a lot: 14  Always helps: 8</td>
<td>5</td>
</tr>
<tr>
<td>Coping</td>
<td>Coping rank</td>
<td># of children using this coping (%)</td>
<td>Frequency that coping is used</td>
<td>Effectiveness rating</td>
<td>Effectiveness rank</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------</td>
<td>-------------------------------------</td>
<td>------------------------------</td>
<td>-------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Be by myself or be alone</td>
<td>15</td>
<td>28 (55)</td>
<td>Once in awhile: 19</td>
<td>Not helpful: 0</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 6</td>
<td>Helps a little: 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 3</td>
<td>Helps a lot: 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 4</td>
<td></td>
</tr>
<tr>
<td>Eat or drink something</td>
<td>16</td>
<td>25 (49)</td>
<td>Once in awhile: 10</td>
<td>Not helpful: 4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 10</td>
<td>Helps a little: 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 5</td>
<td>Helps a lot: 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 2</td>
<td></td>
</tr>
<tr>
<td>Sleep or take a nap</td>
<td>17</td>
<td>24 (47)</td>
<td>Once in awhile: 18</td>
<td>Not helpful: 0</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 5</td>
<td>Helps a little: 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 1</td>
<td>Helps a lot: 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 4</td>
<td></td>
</tr>
<tr>
<td>Talk to myself</td>
<td>17</td>
<td>24 (47)</td>
<td>Once in awhile: 15</td>
<td>Not helpful: 2</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 7</td>
<td>Helps a little: 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 2</td>
<td>Helps a lot: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 4</td>
<td></td>
</tr>
<tr>
<td>Bite my nails or crack my knuckles</td>
<td>19</td>
<td>21 (41)</td>
<td>Once in awhile: 10</td>
<td>Not helpful: 7</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 6</td>
<td>Helps a little: 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 5</td>
<td>Helps a lot: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 2</td>
<td></td>
</tr>
<tr>
<td>Daydream</td>
<td>20</td>
<td>18 (35)</td>
<td>Once in awhile: 14</td>
<td>Not helpful: 7</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 2</td>
<td>Helps a little: 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 2</td>
<td>Helps a lot: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 1</td>
<td></td>
</tr>
<tr>
<td>Fight with someone</td>
<td>21</td>
<td>9 (18)</td>
<td>Once in awhile: 6</td>
<td>Not helpful: 6</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 3</td>
<td>Helps a little: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 0</td>
<td>Helps a lot: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 1</td>
<td></td>
</tr>
<tr>
<td>Yell or scream</td>
<td>21</td>
<td>9 (18)</td>
<td>Once in awhile: 6</td>
<td>Not helpful: 3</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 3</td>
<td>Helps a little: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 0</td>
<td>Helps a lot: 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 0</td>
<td></td>
</tr>
<tr>
<td>Hit, throw or break things</td>
<td>23</td>
<td>8 (16)</td>
<td>Once in awhile: 7</td>
<td>Not helpful: 3</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 1</td>
<td>Helps a little: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 0</td>
<td>Helps a lot: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 0</td>
<td></td>
</tr>
<tr>
<td>Pick on someone</td>
<td>24</td>
<td>6 (12)</td>
<td>Once in awhile: 4</td>
<td>Not helpful: 4</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 1</td>
<td>Helps a little: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 1</td>
<td>Helps a lot: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always helps: 0</td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td>1 st Morning</td>
<td>2 nd Morning</td>
<td>3 rd Morning</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Cortisol levels</td>
<td>0.50</td>
<td>0.54</td>
<td>0.45</td>
<td>0.26</td>
<td>0.44</td>
</tr>
<tr>
<td>Range</td>
<td>0.50 – 1.04</td>
<td>0.06 – 1.16</td>
<td>0.05 – 1.12</td>
<td>0.05 – 1.16</td>
<td></td>
</tr>
<tr>
<td>Intraassay CV (%)</td>
<td>3.23</td>
<td>2.83</td>
<td>3.84</td>
<td>3.30</td>
<td></td>
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<tr>
<td>Interassay CV (%)</td>
<td>3.8 for high (mean of 1.020 ug/dL)</td>
<td>1.6 for low (mean of 0.111 ug/dL)</td>
<td>average CV = 2.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.18: Cortisol levels and coefficients of variation of children’s saliva samples

<table>
<thead>
<tr>
<th>Variables</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>Mean</td>
<td>SD</td>
<td>n</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1 st Morning</td>
<td>22</td>
<td>0.40</td>
<td>0.21</td>
<td>27</td>
<td>0.58</td>
</tr>
<tr>
<td>2 nd Morning</td>
<td>21</td>
<td>0.42</td>
<td>0.27</td>
<td>26</td>
<td>0.47</td>
</tr>
<tr>
<td>3 rd Morning</td>
<td>22</td>
<td>0.34</td>
<td>0.15</td>
<td>26</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Table 4.19: Cortisol levels of the saliva samples of boys and girls
<table>
<thead>
<tr>
<th>Children's Thoughts and Feelings (n=51*)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think my mom/grandma is going to survive/be ok/get better</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>I think my parent may die of cancer</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>I do not like it.</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>I do not think a lot about it</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>I think my parent hurts really bad</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>It stinks!</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>It is okay</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>It makes me feel that I should help out</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>I never expected my parent would get cancer</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>I think it would be painful to have cancer</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It is a loss for me</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am not sad because cancer runs in my family</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It is natural that my mom has cancer because grandma and aunt had breast cancer as well</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I think my parent’s life is at risk</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I thought my parent is going to die</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It makes me want to help ill people</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It is weird for my dad to have cancer</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I wish I could never have such kind of experience</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I understand my stepfather’s cancer could become serious</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I only think about it when I am alone at night</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It is hard to deal with</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It does not bother me</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I feel better because she is doing ok</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I feel good because my mom is going to be ok</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Just think about my mom having cancer</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Lose attention -- My mom is the most important person in the family now</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Loss feeling --I am not going to get everything I want</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I may get it as well</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>It does not affect me a lot</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I do not feel worried because we have God on our side</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I feel he needs me to help him do things</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Some children made more than one response

Table 4.20: Children's thoughts and feelings about their parents' cancer
Table 4.20 continued

<table>
<thead>
<tr>
<th>Children’s Thoughts and Feelings (n=51*)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sad</td>
<td>21</td>
<td>41</td>
</tr>
<tr>
<td>Scared/feel terrified</td>
<td>19</td>
<td>37</td>
</tr>
<tr>
<td>Bad</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Confused</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Mad at cancer/Mad</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Feel happy that she did not die/that she recovered</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Feel sorry for my mom</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cry a lot</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Make me feel awkward</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Feel uncomfortable when my mom is hurting</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Proud of my mom because she is a survivor</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Feel happy that I get to learn more about cancer</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Some children made more than one response
<table>
<thead>
<tr>
<th>Stress symptom</th>
<th>Symptom rank</th>
<th># of children with symptom (%)</th>
<th>Frequency that symptoms are experienced</th>
<th>Severity rating</th>
<th>Impact rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worried</td>
<td>1</td>
<td>48 (94)</td>
<td>Once in awhile: 23 A lot: 17 Most of the time: 8</td>
<td>Not bad: 9 Kind of bad: 16 Pretty bad: 13 Terrible: 10</td>
<td>1</td>
</tr>
<tr>
<td>Cry or feel sad</td>
<td>2</td>
<td>41 (80)</td>
<td>Once in awhile: 28 A lot: 7 Most of the time: 6</td>
<td>Not bad: 6 Kind of bad: 15 Pretty bad: 13 Terrible: 7</td>
<td>2</td>
</tr>
<tr>
<td>Afraid</td>
<td>3</td>
<td>40 (77)</td>
<td>Once in awhile: 27 A lot: 7 Most of the time: 6</td>
<td>Not bad: 6 Kind of bad: 17 Pretty bad: 12 Terrible: 5</td>
<td>3</td>
</tr>
<tr>
<td>Nervous</td>
<td>4</td>
<td>37 (73)</td>
<td>Once in awhile: 23 A lot: 12 Most of the time: 2</td>
<td>Not bad: 11 Kind of bad: 12 Pretty bad: 11 Terrible: 3</td>
<td>4</td>
</tr>
<tr>
<td>Bad</td>
<td>5</td>
<td>36 (71)</td>
<td>Once in awhile: 23 A lot: 11 Most of the time: 2</td>
<td>Not bad: 7 Kind of bad: 15 Pretty bad: 11 Terrible: 3</td>
<td>4</td>
</tr>
<tr>
<td>Confused</td>
<td>7</td>
<td>29 (57)</td>
<td>Once in awhile: 18 A lot: 8 Most of the time: 3</td>
<td>Not bad: 3 Kind of bad: 17 Pretty bad: 5 Terrible: 4</td>
<td>7</td>
</tr>
<tr>
<td>Shaky</td>
<td>8</td>
<td>22 (43)</td>
<td>Once in awhile: 17 A lot: 4 Most of the time: 1</td>
<td>Not bad: 5 Kind of bad: 11 Pretty bad: 4 Terrible: 2</td>
<td>12</td>
</tr>
</tbody>
</table>

Continued

Table 4.21: Frequency and severity of children's stress symptoms (n=51)
<table>
<thead>
<tr>
<th>Stress symptom</th>
<th>Symptom rank</th>
<th># of children with symptom (%)</th>
<th>Frequency that symptoms are experienced</th>
<th>Severity rating</th>
<th>Impact rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tired</td>
<td>8</td>
<td>22 (43)</td>
<td>Once in awhile: 14</td>
<td>Not bad: 4</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 7</td>
<td>Kind of bad: 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 1</td>
<td>Pretty bad: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 1</td>
<td></td>
</tr>
<tr>
<td>Want to hit someone or something</td>
<td>10</td>
<td>20 (39)</td>
<td>Once in awhile: 14</td>
<td>Not bad: 3</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 3</td>
<td>Kind of bad: 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 3</td>
<td>Pretty bad: 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 2</td>
<td></td>
</tr>
<tr>
<td>Ashamed</td>
<td>11</td>
<td>19 (37)</td>
<td>Once in awhile: 15</td>
<td>Not bad: 2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 3</td>
<td>Kind of bad: 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 1</td>
<td>Pretty bad: 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 3</td>
<td></td>
</tr>
<tr>
<td>Heart beats funny/fast</td>
<td>12</td>
<td>18 (35)</td>
<td>Once in awhile: 13</td>
<td>Not bad: 7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 3</td>
<td>Kind of bad: 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 2</td>
<td>Pretty bad: 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 1</td>
<td></td>
</tr>
<tr>
<td>Sweaty</td>
<td>12</td>
<td>18 (35)</td>
<td>Once in awhile: 12</td>
<td>Not bad: 8</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A lot: 4</td>
<td>Kind of bad: 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most of the time: 2</td>
<td>Pretty bad: 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terrible: 1</td>
<td></td>
</tr>
<tr>
<td>Stomach-ache</td>
<td>14</td>
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Table 4.21 continued

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Table 4.22: T score of children’s CBCL Competence Scales
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Table 4.23: T score of children’s CBCL Syndrome Scales
Table 4.23 continued

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Table 4.24: Children's Internalizing and Externalizing Problem T score
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<th># of children</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross asymmetry of limbs</td>
<td>1</td>
<td>22</td>
<td>43.1</td>
</tr>
<tr>
<td>Short arms</td>
<td>2</td>
<td>16</td>
<td>31.4</td>
</tr>
<tr>
<td>No neck</td>
<td>3</td>
<td>13</td>
<td>25.5</td>
</tr>
<tr>
<td>No nose</td>
<td>4</td>
<td>8</td>
<td>15.7</td>
</tr>
<tr>
<td>Slanting figure</td>
<td>5</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td>Big hands</td>
<td>6</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>Tiny figure</td>
<td>7</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Legs pressed together</td>
<td>7</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Monster</td>
<td>7</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Poor integration of body parts</td>
<td>10</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Teeth</td>
<td>10</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Arms clinging to side of body</td>
<td>10</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>No feet</td>
<td>10</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Transparencies</td>
<td>14</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td>Hands cut off</td>
<td>14</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td>Big figure</td>
<td>16</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>Long arms</td>
<td>16</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>Shading of body or limbs</td>
<td>18</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Crossed eyes</td>
<td>18</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Clouds, rain, snow</td>
<td>18</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>No legs</td>
<td>18</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Shading of face</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shading of hands or neck</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tiny head</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Genitals</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Three or more figures drawn</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No eyes</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No mouth</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No body</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No arms</td>
<td>22</td>
<td>0</td>
<td>0</td>
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</table>

Table 4.25: Emotional Indicators present in human figure drawings (HFD) (n=51)
### Table 4.26: Total number of Emotional Indicators present in human figure drawings

<table>
<thead>
<tr>
<th>Total # of EI present in HFD</th>
<th>Boys</th>
<th>Girls</th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>29.4</td>
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<td>2</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>15.7</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>23.5</td>
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<tr>
<td>4</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
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</table>

Boys: Total scores range: 0-8   Mean=3.0   Standard Deviation=1.8   Mode=3
Girls: Total scores range: 0-6   Mean=1.8   Standard Deviation=1.5   Mode=1
Total: Total scores range: 0-8   Mean=2.3   Standard Deviation=1.7   Mode=1

### Table 4.27: Relationships between parents and children

<table>
<thead>
<tr>
<th>Variables</th>
<th>Child vs. Mother (n=51)</th>
<th></th>
<th>Child</th>
<th>Mother</th>
<th>t</th>
<th>p</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Togetherness</td>
<td>2.80</td>
<td>0.53</td>
<td>3.01</td>
<td>0.37</td>
<td>-2.87</td>
<td>0.006</td>
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<tr>
<td>Nurture/disclose</td>
<td>3.99</td>
<td>0.77</td>
<td>4.13</td>
<td>0.69</td>
<td>-1.04</td>
<td>0.304</td>
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<tr>
<td>Peer relations</td>
<td>4.16</td>
<td>0.57</td>
<td>4.10</td>
<td>0.40</td>
<td>0.68</td>
<td>0.500</td>
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<td>Total</td>
<td>3.65</td>
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<td>3.74</td>
<td>0.32</td>
<td>-1.29</td>
<td>0.215</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
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<td>2.70</td>
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<td>0.010</td>
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<tr>
<td>Nurture/disclose</td>
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<td>1.05</td>
<td>3.90</td>
<td>0.63</td>
<td>-1.68</td>
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<td>4.01</td>
<td>0.40</td>
<td>0.99</td>
<td>0.327</td>
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<tr>
<td>Total</td>
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<td>0.69</td>
<td>3.53</td>
<td>0.35</td>
<td>-1.38</td>
<td>0.176</td>
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</table>

Table 4.27: Relationships between parents and children
<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>St. Error</th>
<th>r</th>
<th>r-squared</th>
<th>r-squared change</th>
<th>t</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
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<td>1.195</td>
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<td>0.003</td>
<td>1.975</td>
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<td></td>
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<td></td>
<td>0.003</td>
<td>0.675</td>
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<tr>
<td></td>
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<td>0.003</td>
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<td>0.021</td>
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<td>0.020</td>
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<td>Child-father relationship</td>
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<td></td>
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<td></td>
<td>0.021</td>
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<td></td>
<td>0.145</td>
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<td>0.021</td>
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<td>0.309</td>
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<td>1.860</td>
<td>-0.002</td>
<td>0.028</td>
<td>0.001</td>
<td>1.650</td>
<td>0.108</td>
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<td></td>
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<td></td>
<td>0.001</td>
<td>-0.165</td>
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<td></td>
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<td>1.860</td>
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<td>0.028</td>
<td>0.001</td>
<td>1.650</td>
<td>0.108</td>
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<tr>
<td>Father-child relationship</td>
<td></td>
<td></td>
<td>0.010</td>
<td></td>
<td>0.001</td>
<td>-0.165</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>0.028</td>
<td></td>
<td>0.001</td>
<td></td>
<td>0.870</td>
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Dependent variable: How upsetting is it for you right now?

Table 4.28: Simple linear regression analysis between children’s appraisal of having a parent with cancer and the relationships of children and parents.
<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>St. Error</th>
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<th>r-squared</th>
<th>r-squared change</th>
<th>t</th>
<th>p</th>
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</thead>
<tbody>
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<td>0.195</td>
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<td>0.004</td>
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<td>0.246</td>
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Dependent variable: How well do you think your parent’s treatment will work?

Table 4.29: Simple linear regression analysis between children’s appraisal of their parental treatment and the relationships of children and parents
Table 4.30 Correlations among independent variables (1-9) and biopsychosocial stress responses (10-14)

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<th>4</th>
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<th>11</th>
<th>12</th>
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<th>14</th>
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<tbody>
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<td>2. Child’s appraisal II</td>
<td>- .185</td>
<td>-.223</td>
<td>-.001</td>
<td>.374**</td>
<td>.410**</td>
<td>.159</td>
<td>.056</td>
<td>-.024</td>
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<td>-.227</td>
<td>-.022</td>
<td>-.288</td>
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<td>3. Severity score on FBS</td>
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<td>.233</td>
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<td>.171</td>
<td>.124</td>
<td>-.025</td>
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<td>.021</td>
<td>.113</td>
<td>.417**</td>
<td>.174</td>
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<td>4. Frequency score on FBS</td>
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<td>-.145</td>
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<td>-.139</td>
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<td>.187</td>
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<td>.389**</td>
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<tr>
<td>5. Coping effectiveness score</td>
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<td>.068</td>
<td>.105</td>
<td>.314*</td>
<td>.343*</td>
<td>.149</td>
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<tr>
<td>6. Child-mother relationship</td>
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<td>.246</td>
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<td>.078</td>
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<td>-.041</td>
<td>.175</td>
<td>-.315*</td>
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<td>7. Child-father relationship</td>
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<td>10. Cortisol levels</td>
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</tbody>
</table>

*a Child’s appraisal I: How upsetting is it for you right now?  
b Child’s appraisal II: How well do you think your parent’s treatment will work?  
*p < .05, **p < .01, two-tailed
<table>
<thead>
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<th>Variable Sets</th>
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<th>5</th>
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<td>Set 1: independent variables</td>
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<td>.325&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.295</td>
<td>-.212</td>
<td>-.592&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.336&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
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<td>-.420&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.112</td>
<td>-.356</td>
<td>.610&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Severity score on FBS</td>
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<td>-6.680&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.385</td>
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<td>Frequency score on FBS</td>
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<td>.058</td>
<td>.558&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.215</td>
<td>.719&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Coping effectiveness score</td>
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<td>-.257&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>-.555&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.585&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Child-mother relationship</td>
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<td>.810&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Set 2: dependent variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cortisol levels</td>
<td>-.260</td>
<td>-.130</td>
<td>.573&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.174</td>
<td>.820&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td># of emotional indicators</td>
<td>.170&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.035</td>
<td>-.199</td>
<td>-1.003&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.191</td>
</tr>
<tr>
<td>Frequency score on CSSS</td>
<td>.812&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.374</td>
<td>.815&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.094</td>
<td>-.546&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Severity score on CSSS</td>
<td>-.395&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.842&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.081&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.051</td>
<td>.128&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total score of CBCL</td>
<td>.787&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.080</td>
<td>-.351</td>
<td>.554</td>
<td>.274&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Canonical correlations</td>
<td>.795</td>
<td>.476</td>
<td>.359</td>
<td>.154</td>
<td>.021</td>
</tr>
<tr>
<td>p</td>
<td>=.005</td>
<td>=.721</td>
<td>=.908</td>
<td>=.988</td>
<td>=.922</td>
</tr>
<tr>
<td>Variance explained</td>
<td>15.7%</td>
<td>2.3%</td>
<td>3.1%</td>
<td>0.4%</td>
<td>0%</td>
</tr>
<tr>
<td>Total variance explained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21.5%</td>
</tr>
</tbody>
</table>

<sup>a</sup> | Structure coefficients | ≥ 0.30

Table 4.31: Canonical correlation analysis between child’s appraisal, concurrent stressors, coping effectiveness, and child-mother relationship (set 1) and biopsychosocial responses (set 2)
<table>
<thead>
<tr>
<th>Variable Sets</th>
<th>Canonical Variates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Set 1: independent variables</td>
<td></td>
</tr>
<tr>
<td>Child’s appraisal of having a parent with cancer</td>
<td>.375</td>
</tr>
<tr>
<td>Child’s appraisal of parental treatment</td>
<td>-.583&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Severity score on FBS</td>
<td>.186</td>
</tr>
<tr>
<td>Frequency score on FBS</td>
<td>.357&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Coping effectiveness score</td>
<td>.280</td>
</tr>
<tr>
<td>Child-father relationship</td>
<td>-.429&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Set 2: dependent variables</td>
<td></td>
</tr>
<tr>
<td>Cortisol levels</td>
<td>-.441&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td># of emotional indicators</td>
<td>.118&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Frequency score on CSSS</td>
<td>.944&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Severity score on CSSS</td>
<td>-.422&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total score of CBCL</td>
<td>.672&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Canonical correlations</td>
<td>.776</td>
</tr>
<tr>
<td>p = .057</td>
<td>p = .801</td>
</tr>
<tr>
<td>Variance explained</td>
<td>15.6%</td>
</tr>
<tr>
<td>Total variance explained</td>
<td>22.7%</td>
</tr>
</tbody>
</table>

<sup>a</sup> | Structure coefficients| ≥ 0.30

Table 4.32: Canonical correlation analysis between child’s appraisal, concurrent stressors, coping effectiveness, and child-father relationship (set 1) and biopsychosocial responses (set 2)
<table>
<thead>
<tr>
<th>Variable Sets</th>
<th>Canonical Variates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Set 1: independent variables</td>
<td></td>
</tr>
<tr>
<td>Child’s appraisal of having a parent with cancer</td>
<td>0.333^a</td>
</tr>
<tr>
<td>Child’s appraisal of parental treatment</td>
<td>-0.668^a</td>
</tr>
<tr>
<td>Severity score on FBS</td>
<td>0.182</td>
</tr>
<tr>
<td>Frequency score on FBS</td>
<td>0.406^a</td>
</tr>
<tr>
<td>Coping effectiveness score</td>
<td>0.194^a</td>
</tr>
<tr>
<td>Mother-child relationship</td>
<td>0.123</td>
</tr>
<tr>
<td>Set 2: dependent variables</td>
<td></td>
</tr>
<tr>
<td>Cortisol levels</td>
<td>-0.223</td>
</tr>
<tr>
<td># of emotional indicators</td>
<td>0.185^a</td>
</tr>
<tr>
<td>Frequency score on CSSS</td>
<td>0.851^a</td>
</tr>
<tr>
<td>Severity score on CSSS</td>
<td>-0.369^a</td>
</tr>
<tr>
<td>Total score of CBCL</td>
<td>0.739^a</td>
</tr>
<tr>
<td>Canonical correlations</td>
<td>0.789</td>
</tr>
<tr>
<td>p = 0.005</td>
<td>p = 0.689</td>
</tr>
<tr>
<td>Variance explained</td>
<td>16.3%</td>
</tr>
<tr>
<td>Total variance explained</td>
<td>22.1%</td>
</tr>
</tbody>
</table>

^a | Structure coefficients| ≥ 0.30

Table 4.33: Canonical correlation analysis between child’s appraisal, concurrent stressors, coping effectiveness, and mother-child relationship (set 1) and biopsychosocial responses (set 2)
<table>
<thead>
<tr>
<th>Variable Sets</th>
<th>Canonical Variates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Set 1: independent variables</td>
<td></td>
</tr>
<tr>
<td>Child’s appraisal of having a parent with cancer</td>
<td>.497&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Child’s appraisal of parental treatment</td>
<td>-.716&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Severity score on FBS</td>
<td>.432&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Frequency score on FBS</td>
<td>.281&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Coping effectiveness score</td>
<td>.211&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Father-child relationship</td>
<td>-.019&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Set 2: dependent variables</td>
<td></td>
</tr>
<tr>
<td>Cortisol levels</td>
<td>-.456&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td># of emotional indicators</td>
<td>.201&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Frequency score on CSSS</td>
<td>.901&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Severity score on CSSS</td>
<td>-.300&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total score of CBCL</td>
<td>.771&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Canonical correlations</td>
<td>.638</td>
</tr>
<tr>
<td>p = .825</td>
<td>p = .974</td>
</tr>
<tr>
<td>Variance explained</td>
<td>10.1%</td>
</tr>
<tr>
<td>Total variance explained</td>
<td>16.9%</td>
</tr>
</tbody>
</table>

<sup>a</sup> | Structure coefficients| ≥ 0.30

Table 4.34: Canonical correlation analysis between child’s appraisal, concurrent stressors, coping effectiveness, and father-child relationship (set 1) and biopsychosocial responses (set 2)
BIBLIOGRAPHY


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