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The Relationship Between Psychopathology in Caregivers
and their Children with Asthma

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May 2005

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CHILDREN WITH ASTHMA

The Relationship Between Psychopathology in Caregivers
and their Children with Asthma

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Abstract

Asthma is the leading chronic illness among children, and children with asthma have an increased risk not only for physical problems, but also for social and emotional difficulties related to their asthma. These risks are compounded when children have a caregiver who is depressed. The effects of maternal depression for children are complex and have been shown to persist into adolescence and adulthood. This is especially important because children with asthma, who are already at risk for psychopathology, may have increased internalizing and externalizing problems when their primary caregivers have depression or display depressive symptoms. Because depression affects cognitive functioning and energy and motivation levels, maternal depression may also be a risk factor associated with poorer medical adherence in children with asthma. This study of 96 children with asthma and their primary caregivers examined the relationship between psychopathology in caregivers and their children with asthma. It was predicted that children who have a caregiver with depression would have increased internalizing and externalizing disorders. Results from caregiver and teacher reports indicated that regardless of socioeconomic status, caregiver depression was associated with increased externalizing disorders in children with asthma. Caregiver reports of poorer quality of life were also associated with internalizing and externalizing disorders in children.

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Preface

There have been many changes in family life over the course of the 20th century, such as the retreat from marriage, increased single parent families, and delayed childbearing, and the impact of these changes has prompted intense debate. Is there a decline in the American family or is the family unit growing stronger? What impacts the family structure? Any way you look at it, our families greatly influence who we become, and a glimpse into a family's life can give much insight about an individual. In "Family--The Ties That Bind...And Gag!," Erma Bombeck wrote, "The family. We were a strange little band of characters trudging through life sharing diseases and toothpaste, coveting one another's desserts, hiding shampoo, borrowing money, locking each other out of our rooms, inflicting pain and kissing to heal it in the same instant, loving, laughing, defending, and trying to figure out the common thread that bound us all together." Bombeck's quote evokes many memories of my own family. From spilled milk at the dinner table to cheers and chants on the softball field, every family has its own vicissitudes. Personally, I believe that changes in family life offer opportunities to understand the complex relationships within families and the role of families in society. In this way, we can work together to design and implement strategies that address the larger structural issues facing modern families.

When I began my thesis in my sophomore year, I explored topics addressing issues in modern day families, such as sibling rivalry, the transmission of values in Native American families, and children who were raised by their grandparents. That same year, I became a research assistant at the Family

Research Lab and began to further develop my research skills through various experiences and tasks at the lab. I attended weekly meetings and presented relevant research articles, as well as provided support and child care for laboratory assessments, assisted on home visits, and conducted telephone diaries with primary caregivers. These duties allowed me to have direct contact and exchange with the families who were part of the project.

Through my work on the Family Life and Asthma Project, I began to learn about and understand the additional difficulties families face when their child has a chronic illness such as asthma. As part of my independent study at the lab, I listened to tapes of countless parents as they described their struggles with having a child with asthma, and I became interested in learning more about the ways children and their families successfully cope with these challenges.

In the fall of 2004, I wrote a literature review exploring the relationship between child narratives, maternal depression and pediatric adherence to daily-prescribed preventative asthma medications. I was interested in the ways that children with a depressed caregiver constructed their family environment. However, the data necessary to fully investigate this relationship was incomplete, and I had to investigate an alternate topic. After consultation with my advisor and a graduate student, I decided to examine caregiver depression and its relationship with internalizing and externalizing disorders in children who have asthma. I think this relationship is particularly important because caregiver depression greatly influences the experiences of family members, and, despite the fact that depression can be successfully treated, most people never seek treatment for the

disorder. Although previous research has examined risk factors for children with a depressed caregiver, I was interested in the risk factors for children with asthma, who are already at increased risk for internalizing and externalizing disorders.

Children with asthma are an especially important population because they experience daily social and emotional challenges resulting from their asthma, as well as the physical symptoms. Asthma can interfere with children's ability to participate fully in school and social activities, such as gym class activities. These limitations can be frustrating for these children.

One important aspect of this study is the inclusion of teachers' reports of children's behavior. I used this measure in order to gain a broader picture of the impact of a depressed caregiver on a child. In fact, teachers, as well as caregivers, reported more externalizing and overall problems in children with asthma who had a depressed caregiver. The teacher's perspective of children's disorder is especially important in this study because it offers a report beyond the primary caregiver and in an alternate setting. Furthermore, I believe that family, school, and health, including mental health, are inextricably linked, and that we must integrate family life, education, and health care in order to address the critical needs of children and families. Although these partnerships are currently developing, I believe my role as a future school psychologist is to expand the opportunities for families and schools to work with health professionals to promote the healthy development of children.

Overall, as a note to future Honors students, there are many challenges involved in writing an Honors thesis. Initially, it was difficult for me to recognize

that large-scale research projects are not necessarily feasible at the undergraduate level. Although it is wonderful to have big ideas, funding, time constraints, and a lack of participants can seriously limit the scope of a project. I think it was extremely helpful for me to expand my experiences in the Family Research Lab as part of my thesis because I was able to be an active part of a large-scale study, while also developing my individual interests. I truly feel I have advanced my skills beyond research assistant and that this experience has helped to prepare me for graduate school. Although I would encourage future students to seriously consider their willingness to devote their final spring time hours in Syracuse to preparing their thesis, I think that writing an Honors thesis has been a rewarding challenge.

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The Relationship Between Psychopathology in Caregivers
and their Children with Asthma

Asthma is a chronic inflammation of the bronchial airways characterized by reversible episodes of airflow obstruction (American Lung Association, 2004a). Currently, it is the leading chronic illness among children, affecting an estimated 9 million children under the age of 18 years (Achintya, Schiller, & Tai, 2002). Asthma rates and severity continue to increase rapidly (Wamboldt, Weintraub, Krafchick, & Wamboldt, 1996). Between 1980 and 1996, asthma prevalence increased an average of 4.3 % each year among children (Center for Disease Control, 2004). Furthermore, asthma is the third leading cause of hospitalization among children under the age of 15 (American Lung Association, 2004b).

Although there is no cure for asthma, asthma symptoms are manageable and can be controlled through daily-prescribed at-home medical treatment (American Academy of Allergy Asthma & Immunology, 2003). Recent findings suggest that children with asthma generally take less than 60% of medications (Bender, Wamboldt, O'Connor, Rand, Szeffler, Milgrom, et al., 2000; McQuaid, Kopel, Klein, & Fritz, 2003). Regardless of children's knowledge about asthma, medication adherence has been found to be negatively associated with the age, so that younger children are considered more adherent than adolescents (McQuaid, et al., 2003). This finding underscores the continued importance of parental participation in asthma management for older children.

Asthma and Psychopathology in Children

Children with asthma are not only troubled by the physical symptoms associated with asthma, such as wheezing and coughing, but also the social and emotional difficulties they experience daily that result from their asthma (Juniper, Guyatt, Feeny, Ferried, Griffith, & Townsend, 1996). Children may also be distressed that asthma interferes with their schoolwork, social activities, and participation in athletics, which may increase their likelihood of acting out both emotionally and physically. Although there has been no evidence to support a relationship between asthma and hyperactivity (Biederman, Milberger, Faraone, Guite, & Warburton, 1994), when compared to children without asthma, children with asthma were more likely to develop anxiety disorders, simple phobia, separation anxiety, panic disorder, and overanxious disorder (Carr, 1998; Ortega, Huertas, Canino, Ramierez, & Rubio-Stipec, 2002; Perna, Bertani, Politi, Colombo, & Bellodi, 1997; Slattery, Klein, Mannuzza, Moulton, Pine, & Klein, 2002; Vila, Nollet-Clemencon, de Blic, Mouren-Simeoni, & Scheinmann, 2000). In fact, in a review of recent literature, Wamboldt and Wamboldt (2000) report findings that children with on-going health conditions have 2.2 to 2.4 times greater risk for emotional disorder, behavioral problems, and school-related adjustment problems than healthy children. In addition, the presence of a chronic illness in children has been shown to increase parental susceptibility to depression (not necessarily into the clinical range) and marital discord (Wamboldt & Wamboldt, 2000). Additional stressors for the family associated with illness may increase the risk of psychopathology in children; however, chronic illness does

not directly lead to psychopathology in children. Thus, it is important to consider how aspects of the caregiving environment may increase the child's risk of developing mental health problems. This risk factor to be considered in this study is parental psychopathology.

Although numerous studies have explored the link between asthma and increased risk of depression and anxiety disorders, the mechanisms that may lead to this relationship have not been thoroughly investigated. Family and parent variables as well as life stress have been identified as better predictors of emotional outcomes in children with an illness than the type, severity, or duration of the illness (Lavigne & Faier-Routman, 1993). Goodwin, Fergusson, and Horwood (2004) found that asthma in adolescence was associated with an increased likelihood of major depression, panic attacks, and anxiety disorders. However, after controlling for non-observed potentially confounding factors using a fixed effects logistic regression model, the authors found that asthma was not significantly associated with any of the disorders previously listed and suggest that the relationship between asthma and depressive and anxiety disorders is non-causal, reflecting common factors associated with both outcomes. Specifically, exposure to childhood adversity, including family instability and parental adjustment problems, may contribute to increased anxiety and depression in children with asthma. Therefore, because these disorders are not directly linked to asthma, research should explore additional contributors to psychopathology in children with asthma.

Asthma and Quality of Life

The quality of life of caregivers is an important consideration in children's environment and management of asthma. Parents' of children with asthma experiences of limitations and anxieties are often referred to as their quality of life. Quality of life information provides health care providers additional information regarding the impact of the illness on the family. When a child has a chronic illness, primary caregivers experience increased stress and additional burdens. Although all parents experience stress, parents of children with a chronic illness have specific additional demands, such as treatment monitoring, caretaking, family maintenance, and additional financial concerns (Duis, Summers, & Summers, 1997; Hauenstein, 1990; Turner, Henson, Holaday, & Swan, 1992). Thus, parents of children with chronic health problems report higher levels of stress (Goldberg, Morris, Simmons, Fowler, & Levison, 1990; Hanson & Hanline, 1990; Krauss, 1993; Krulik, Turner-Henson, Kanematsu, Al-Ma'aitah, Swan & Holaday, 1999), and perceived parenting stress is greater for mothers of asthmatic children than for mothers with healthy children (Carson & Schauer, 1992).

Furthermore, caregivers of children with asthma are limited in their normal daily activities and report additional anxieties and emotional stresses (Townsend, Feeny, Guyatt, Furlong, Seip, & Dolovich, 1991). Moreover, the ability of family members to look out for each other and provide emotional support has been linked with the experience of distress associated with asthma symptoms (Sawyer, Spurrier, Kennedy, & Martin, 2001). Negative affect, an

average of anxiety and depressive reported symptoms, was significantly related to the caregiver's report of quality of life, and factors related to caregivers' emotional functioning accounted for most of this relationship (Price, Bratton, & Klinnert, 2002). As a result, an examination of parental emotional stressors is essential in understanding childhood outcomes for children with asthma.

Caregiver Depression and Child Outcomes

Depression affects 9.5 percent of the population or about 18.8 million American adults in any given 1-year period (National Institute for Mental Health, 2000). Depression is experienced almost twice as often in women as it is in men (Blehar & Oren, 1997). In fact, depression is the number one cause of disability in women, and one in four women will experience severe depression at some point in her life (National Mental Health Information Center, 2000). Because women are often the primary caregivers and kinkeepers of families, depression often interferes with the functioning of families. In fact, mothers with depressive symptomatology are more likely to have a child who develops mental health problems (Downey & Coyne, 1990).

According to Bronfenbrenner's (1986) ecological systems model, children's immediate environment is influenced by a number of factors including the microsystem, which includes family and parents, and the mesosystem, which includes the interrelationships between these microsystems. The quality of these interrelationships among systems may affect the development of emotional or behavioral disorders in children. This interplay among systems is evident in the relationship between psychopathology and family characteristics.

The effects of maternal depression for children are complex and have been shown to persist into adolescence and adulthood. In fact, maternal maladjustment, along with decreased family cohesion, poor child-concept, and decreased child intelligence, were the most salient predictors of psychological adjustment in chronically ill children (Lavigne & Faier-Routman, 1993). Gelfand and Teti (1990) found maternal depression was associated with unresponsiveness, inattentiveness, intrusiveness, poor discipline, and negative perceptions of children in parenting situations.

Depression is also associated with decreased problem solving, attention span, and memory (as cited in Adams, Wilson, Taylor, Daly, Tursan d'Espaignet, Dal Grande, et al., 2005). Children with a depressed mother showed passive noncompliance, less mature expression, lower interaction, less creative play, and lower cognitive performance. For school age children, the consequences of maternal depression have been associated with impaired adaptive functioning, internalizing and externalizing problems, affective disorders, anxiety disorders, conduct disorders, attention deficit/hyperactivity disorder, and lower intelligence scores (Canadian Pediatric Society, 2004). Specifically, one study found that maternal distress was linked with mother-reported child disruptive behavior problems in boys, even after controlling for socioeconomic status and parenting stress, which suggests a reciprocal relationship between symptomatology in mothers and children (Barry, Dunlap, Cotton, Lochman, & Wells, 2005).

Affects of Caregiver Depression on Medical Adherence

Depression has been found to interfere with the ability to perform routine daily functioning and to cause significant distress (Webb, Dietrick, Katon, & Schwenk, 2000; Hays, Wells, Sherbourne, Rogers, & Spritzer, 1995). Previous research indicates that greater parental stress is linked with less optimal parent and family functioning, less optimal parent and child interactions, and lower child developmental competence (as cited in Crnic & Greenberg, 1990). Depression also affects cognitive functioning, energy levels, and motivational levels (DiMatteo, Lepper, & Croghan, 2000). Furthermore, in a study examining the impact of childhood asthma on the child's family, parental emotional distress and amount of social support were the only predictors of how much impact a child's asthma had on the family (Frankel & Wamboldt, 1998).

Adherence to daily-prescribed medications is one way to control asthma symptoms. Adherence is a particularly important factor because improper adherence to medical regimens may increase children's physical and emotional symptoms. Adherence often depends on the patient or caregiver's ability to properly follow the physician's medical advice. However, many family factors may impair the caregiver's ability to manage asthma (Kaugars, Klinnert, & Bender, 2004). Caregiver depression impairs parents' ability to manage effectively their child's asthma. In fact, depression has been linked with medical noncompliance. For example, in one study depressed patients, whether children or adults, were three times less likely to adhere to medical regimens than their nondepressed counterparts (DiMatteo et al., 2000).

Certain beliefs and attitudes are associated with maternal depression that may influence adherence. Mothers with depressive symptoms reported greater emotional distress and asthma-related interference in their daily activities which was caused by their lack of confidence in the medications, reduced ability to control symptoms, and poorer self-efficacy (Bartlett, Krishnan, Riekert, Butz, Malveaux, & Rand, 2004). Because it seriously limits daily functioning, depression may affect one's willingness and capability to adhere to their children's treatment regimen.

According to U.S. Department of Health and Human Services, mental health in children is influenced by the interaction of a child and his or her environment and should be considered in the context of the family and peers, school, home, and community (1999). Internalizing disorders are related to problems within the individual and are usually characterized by worry, low self-esteem, and sadness whereas externalizing disorders are usually associated with inattention, bad conduct, and opposition and defiance (Ollendick, Shortt, & Sander, 2005). Internalizing disorders of childhood and adolescence include anxiety disorders, such as separation anxiety, generalized anxiety, and social phobia, and mood disorders, such as major depressive disorder, dysthymia, and bipolar disorder. Syndromes of depression and anxiety very commonly co-occur in children (U.S. Department of Health and Human Services, 1999). Externalizing disorders of childhood and adolescence include attention-deficit/hyperactivity, elimination disorders, oppositional defiant disorder, and conduct disorder.

Goals of Study

Children with asthma often report increased psychopathology. Research indicates that the relationship between asthma and psychopathology is non-linear. Instead, the increased prevalence of psychopathology in children with asthma may be attributed to additional exposure to childhood adversity and additional family factors. The effects of maternal depression for children are complex and have been shown to persist into adolescence and adulthood. Research has shown that maternal depression is associated with unresponsiveness, inattentiveness, intrusiveness, poor discipline, and negative perceptions of children in parenting situations. Children with asthma, who are already at risk for psychopathology, may have increased internalizing and externalizing problems when their primary caregivers have depression or display depressive symptoms. The mechanisms that may lead to this relationship have not been thoroughly addressed in the literature.

This study seeks to examine the relationship between maternal psychopathology and internalizing and externalizing disorders in children with asthma. There are two main research questions: What is the relationship between maternal psychopathology and internalizing and externalizing disorders in children with asthma? What is the relationship between the quality of life of caregivers and internalizing and externalizing disorders in children with asthma? There are two main hypotheses. First, it is predicted that children who have a caregiver with depression will have increased internalizing and externalizing disorders. Second, it is predicted that caregivers who report poorer quality of life will have increased psychopathology in their children with asthma.

Method

Sample

This study was conducted as a secondary data analysis collected through the Family Life and Asthma Project, a NIH-funded longitudinal project examining asthma coping strategies of children and their families. Participants included 96 children with mild-to-severe asthma and their primary caregivers. Participants were recruited from four specialty pulmonary pediatric clinics located in the central New York Region in order to target a diverse range of participants. Data were collected from May 2003 to May 2004. The child sample was comprised of 25% African American, 63% Caucasian, 2% Hispanic, 2% Native American, and 7% who identified as other. The sample was relatively representative of families in the metropolitan area.

Primary caregiver characteristics. Primary caregivers included ninety-three mothers, three fathers, and two other caregivers (see Table 1). The primary caregivers in this study had an average age of 35.34 years ($SD = 5.83$). Mother's marital status included 51% married, 6% separated, 11% divorced, 5% remarried after divorce, 18% single, and 9% cohabitating or living with partner. Caregivers' racial background included 25% African American, 63% Caucasian, 2% Hispanic, 2% Native American, and 7% who identified as other. Eighty-eight percent of the sample had at least a high school diploma or GED. The average household socioeconomic status level was 37.97 ($SD = 16.64$) on the Hollingshead Four-Factor Index, indicating that on average, families were in Group III (Hollingshead, 1975). Group III includes occupations such as machine operators and semiskilled workers.

Child characteristics. Sixty boys and thirty-six girls participated in the study (see Table 2). The greater number of boys was expected because the nationwide prevalence for males with asthma is higher than for females (Achintya et al., 2002). The mean age was 7.95 years (SD = 2.08, range = 5 to 12 years). All of the children in the study had an asthma diagnosis for at least a year and were prescribed a daily asthma medication for at least six months. Children were excluded if they had an additional chronic illness (e.g., diabetes, cystic fibrosis, and documented developmental disability) or if they were diagnosed with asthma and adherence to daily medication was not part of their prescribed regimen.

Procedures

The Family Life and Asthma Project is approved by the Institutional Review Board at Syracuse University and SUNY Upstate Medical University. After being recruited from four pediatric clinics, families were contacted to schedule a visit at the Family Life and Asthma Project laboratory. In three of the four clinics, letters were sent from the physician's office notifying the parents of the study. In the fourth clinic, research assistants talked with family members during a visit with the respiratory therapist. Families were informed that the purpose of the study was to investigate interventions to assist families manage their child's asthma. Research staff obtained informed consent from the caregiver and verbal assent from the child. Primary Caregivers completed a Background Information Questionnaire, Brief Symptom Inventory, Pediatric Asthma Caregivers Quality of Life, and Child Behavior Checklist, along with other measures that were included in the study. Parents provided the name of the child's

teacher, who was mailed a Teacher Report Form. At the completion of the study, families were compensated a minimum of \$200, which was distributed over a six-week period and included the initial visit, a home visit, and medication tracking. Families were also reimbursed the co-pay expense of the medication being tracked while participating in the study. Teachers were compensated \$15 for the completion and return of the Teacher Report Form.

Measures

Background Information Questionnaire. This questionnaire collected demographic data, including the child's sex, age, and grade level in school, the number of siblings and their ages, sexes, and grade levels in school. Primary caregiver demographic data included marital status, occupation, education level, and racial background.

Socioeconomic Status. The Hollingshead Four-Factor Index of Social Status (Hollingshead, 1975) estimates social status based on the occupation, education, and marital status of the individual. Occupations and education were categorized and assigned numbers, wherein participants identified the category that included their occupation and the category that included their education. The occupation level was then computed by multiplying the occupation category by five, and the education level was computed by multiplying the education by three. For two-parent households, scores were computed by multiplying the occupation level by the education level for each parent, adding them, and then dividing by two. The scores for single-parent households were computed by multiplying the occupation level and the education level. A high score indicates greater

educational attainment and occupational status, whereas a low score indicates lesser educational attainment and occupational status. Scores can range from 6 to 66. Hollingshead scores can be further grouped into five levels of social strata as follows: scores from 6-19 are placed in group I, 20-29 in group II, 30-39 in group III, 40-54 in group IV, and 55-66 in group V (Hollingshead, 1975).

Brief Symptom Inventory–BSI (Derogatis, 1975). The BSI is a 53 item self-report symptom inventory designed to reflect the psychological symptom patterns of patient and non-patient community respondents. Items are rated on a five-point scale of distress (0-4), ranging from “not at all” (0) at one end to “extremely” (4) at the other. The primary dimensions are Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. Three global indices were developed, including Global Severity Index, Positive Symptom Total, and Positive Symptom Distress Index. Raw scores were calculated by adding the values for the items in each of the symptom dimensions and then dividing the number by the total number of items completed in that dimension. Raw scores were then converted to standardized T-scores to enable comparisons.

Child Behavior Checklist for Ages 6-18-CBCL (Achenbach, 1991; Achenbach & Rescorla, 2001). The CBCL/6-18 is a measure completed by parents and used to assess children’s behavior. The first section consists of 20 competence items relating to child’s activities, social relations, and school performance and the second section consists of 120 items that have parents rate children’s behavior or emotional problems during the past 6 months. The scale’s

response choices are 0= Not True (as far as you know), 1= Somewhat or Sometimes True, and 2= Very True or Often True. The scale is electronically scored and includes raw scores, T scores, and percentiles for three competence scales (Activities, Social, and School), Total Competence, and Internalizing, Externalizing, and Total Problems. Cross-informant scales for the Teacher Report Form include Aggressive Behavior; Anxious/Depressed; Attention Problems; Rule-Breaking Behavior; Social Problems; Somatic Complaints; Thought Problems; and Withdrawn/Depressed. There are six DSM-oriented scales: Affective Problems, Anxiety Problems, Somatic Problems; Attention Deficit/Hyperactivity Problems; Oppositional Defiant Problems; and Conduct Problems.

Child Behavior Checklist 1 ½-5-CBCL. (Achenbach, 1991; Achenbach & Rescorla, 2001). The CBCL/1 ½-5 is a measure completed by parents that obtains parents' ratings of 99 problem items. Derived scores indicate cross-informant syndromes: Emotionally Reactive, Anxious/Depressed, Somatic Complaints, Withdrawn, Attention Problems, Aggressive Behavior, and Sleep Problems. It also includes DSM-oriented scales: Affective Problems, Anxiety Problems; Pervasive Developmental Problems, Attention Deficit/Hyperactivity Problems; and Oppositional Defiant Problems.

Teacher Report Form-TRF (Achenbach, 1991; Achenbach & Rescorla, 2001). The TRF is designed for teachers to assess child behavior problems that a child may display in school. The TRF also obtains teachers' reports of academic performance, adaptive functioning, and behavioral/emotional problems.

Academic performance is rated on a five-point scale ranging from 1 (far below grade level) to 5 (far above grade level). Adaptive functioning is assessed using a 7-point scale that compares the child to typical students on work ethic, appropriate behavior, amount of learning, and happiness. Items on the problem section contain statements regarding the child's behavior. The teacher determines how well each statement describes the child within the previous two months. The scale's response choices are 0= Not True, 1= Somewhat or Sometimes True, and 2= Very True or Often True. Ninety-three of the 118 items have counterparts on the CBCL/6-18. The remaining items address school behaviors unobservable to parents, such as classroom disruptions and difficulty following directions. The TRF is electronically scored and provides raw scores, T scores, and percentiles.

Pediatric Asthma Caregiver Quality of Life Questionnaire-PACQLQ.

(Juniper, Guyatt, Feeny, Ferried, Griffith, & Townsend, 1996). The PACQLQ is a 13-item self-report questionnaire designed to measure the limitations and anxieties of parents of children with asthma. Responses to each item are on a 7-point Likert scale, in which 1 represents severe impairment and 7 represents no impairment. Thus, higher scores indicate better quality of life. Individual items within the questionnaire are weighted equally and the results are expressed as the mean score per item for each of the two domains, emotional functioning and activity limitation, and for the overall quality of life. Emotional functioning includes 9 items, such as "Did you feel helpless or frightened when your child experienced cough, wheeze, or breathlessness" and "Did you feel frustrated or impatient because your child was irritable due to asthma." Activity limitation

includes 4 items, such as “Did your family need to change plans because of your child’s asthma” and “Did you have sleepless nights because of your child’s asthma.”

Results

The Relationship Between Demographics and BSI, PACQLQ, CBCL, and TRF. In order to rule out the possibility of demographic confounds, sample correlates between the Hollingshead and other measures were calculated. A description of the distribution of demographic characteristics of primary caregivers and children, including percentages of the total sample are shown (see Tables 1, 2). Pairwise correlations between demographics and the BSI are depicted in Table 3 and indicate that maternal depression was significantly related to lower socioeconomic status ($r = -.31, p = .003$), but there was no relationship between anxiety and socioeconomic status ($r = -.17, p = .12$). All three domains of the PACQLQ were significantly related to mother age and SES (see Table 3). Child age was significantly related to mother’s reports of externalizing disorders in children on the CBCL (see Table 3). Teachers’ reports of increased internalizing, externalizing, and total problems in children were significantly related to lower SES (see Table 3). The total problems of children, as reported by the teacher, were also related to younger age of the mother.

In order to account for the relationship between SES and maternal depression, a simple linear regression was conducted between teacher report of child problems, maternal depression, and SES. It was found that maternal depression significantly accounted for the variance in teacher’s report of total

child problems (adjusted $r^2 = .09$; $F(1, 72) = 5.42$, $p < .03$). In addition, a simple linear regression was computed between teacher report of child problems, emotional functioning, and SES. It was found that poorer quality of life associated with emotional functioning accounted for a significant proportion of the variance in teacher's report of total child problems (adjusted $r^2 = .08$; $F(1, 72) = 4.59$, $p < .03$).

BSI and PACQLQ. Caregivers with depression significantly reported poorer quality of life on all three domains: Emotional Functioning ($r = -.40$, $p = .0001$), Activity Limitation ($r = -.35$, $p = .0006$), and Overall ($r = -.39$, $p = .0001$) (see Table 4). In addition, caregivers with anxiety reported poorer quality of life on all three domains: Emotional Functioning ($r = -.34$, $p = .0001$), Activity Limitation ($r = -.26$, $p = .01$), and Overall ($r = -.32$, $p = .002$).

BSI and CBCL. It was predicted that mothers with depression would report more internalizing and externalizing problems in their children. The results of a pairwise linear regression are depicted in Table 5. Specifically, maternal depression was correlated with mother report of child internalizing problems ($r = .27$, $p = .009$), externalizing disorders ($r = .27$, $p = .008$), and total child problems ($r = .29$, $p = .006$).

PACQLQ and CBCL. In a pairwise linear regression, a trend is seen between mothers who reported poorer emotional functioning and poorer overall quality of life and mother report of internalizing problems in their children ($r = -.19$, $p = .06$; $r = -.18$, $p = .09$) (see Table 6). In addition, there were significant relationships between poorer parent emotional quality of life and externalizing

problems in their children ($r = -.23$, $p = .028$) and overall child problems ($r = -.28$, $p = .009$). Mother's overall quality of life was also significantly related to mother report of externalizing and total problems in children ($r = -.21$, $p = .05$; $r = -.28$, $p = .009$). A trend is also seen between increased limits in mothers' activities and mothers' total reported problems in children ($r = -.20$, $p = .055$).

TRF and BSI. Pairwise correlations are reported in Table 7 and indicate that teacher's report increased externalizing ($r = .25$, $p = .02$) and overall ($r = .34$, $p = .003$) problems in children with a depressed caregiver. There were no significant relationships between teacher report of externalizing and overall problems and anxiety in mothers.

TRF and PACQLQ. In a pairwise linear regression are depicted in Table 8. Mother reports of lower emotional functioning and lower overall quality of life were related to teacher report of total problems in children ($r = -.29$, $p = .009$; $r = -.27$, $p = .02$) (see Table 8).

Discussion

Children with asthma are at increased risk for mental health problems, but what effect does the presence of a depressed caregiver have on the occurrence of psychopathology in children with asthma? Results suggest that children with asthma who also have a depressed caregiver are more likely to display externalizing problems than children with asthma who have a non-depressed caregiver. Mothers with depression reported increased internalizing, externalizing, and overall problems in their children. Because mothers with depression are more likely to over report and over generalize problems in their children, teacher report

of childhood problems was examined. However, it is important to note that mothers who suffer from mood disorders may be more attuned to their children's symptoms of internalizing disorders, especially because internalizing disorders are often difficult for families to notice and for clinicians to diagnose in young children (Ingersoll & Eist, 1998).

Poverty is a major risk factor for depression among women. Women with low incomes, especially mothers of young children, report high levels of depressive symptoms (Belle & Doucet, 2003; Gymanfi, Brooks-Gunn, & Jackson, 2001; Hammack, Robinson, Crawford, & Li, 2004). In fact, a recent study found that over ¼ of mothers who were welfare recipients met the criteria for major depression (Siefert, Bowman, Heflin, Danziger & Williams, 2000). However, the impact of depression accounted for more of the variance than SES in teachers' reports of child problems in children with asthma who also had a caregiver with depression. Thus, the increase in depression among children with asthma is not necessarily related to economic stresses.

Furthermore, teacher reports also show that children with a depressed caregiver have increased externalizing and total problems, regardless of socioeconomic status. It is important to note that mothers who are depressed will not necessarily have a child with depression or other internalizing disorders. The relationship is specific for maternal depression and externalizing disorders. There are several explanations for this result. First, the relationship between depressive symptomatology in mothers and disruptive behaviors in children may be reciprocal. That is –children's behavior problems contribute to depression in

mothers and in turn, depression influences the behaviors in children (Barry et al., 2005). These child characteristics may affect the stress level of mothers (Gelfand, Teti, & Fox, 1992).

Second, depressed women are more likely to view their young children as less acceptable and less personally rewarding, which may contribute to increased acting out in children (Gelfand, Teti, & Fox, 1992). A woman with depression may have limited available resources, such as time and attention, for some of the tasks associated with taking care of children.

In addition, internalizing disorders are often difficult to diagnose in young children and may be particularly difficult for teachers to identify. The National Institute of Mental Health reports that children show slightly different behaviors, such as getting in trouble at school, school refusal, and worrying a parent may die, when they are experiencing depression. However, it is difficult to determine if these behaviors are part of normal development or attributed to depression (2000). Furthermore, young children are not likely to display traditional symptoms of internalizing disorders and may not have the depth of thought to indicate internalizing symptoms to caregivers. Thus, some of the behaviors associated with depression in young children may be misconstrued as externalizing behaviors. The American Academy of Pediatrics reports that behavior is a form of communication that children use to express their needs and children learn quickly behaviors, such as acting out, that gets their parents' attention and their needs met. This is especially important since maternal depression is associated with inattentiveness (Gelfand & Teti, 1990).

It is interesting that results were not significant for disorders in children anxiety in mothers. Anxiety was only related to mother's report of total problems in children and teachers did not report increased total problems for children with an anxious caregiver. Perhaps anxiety in mothers serves a function for children with asthma; however, additional research is needed to clarify the relationship between these variables.

It is often difficult for child outcomes to be associated with the presence of a single factor, such as maternal depression. Cumulative disadvantage takes into account the way numerous factors, such as low-income, health care, maternal age, marital discord, and maternal mental health, combine to limit long-term opportunities for many groups (Williams, Anderson, McGee, & Silva, 1990). Rutter also argues for a multiple contextual risk model that states the number of risk factors is more important than any particular individual risk factor. For example, psychiatric risk for a group of children rose from 2% to 20% whether families reported 0-1 risk factors or 4 or more risk factors (1979).

What is it about depressed caregivers that increase externalizing behavior disorders in children with asthma? Maternal depression has been associated with poor discipline, inattentiveness, and negative perceptions of children in parenting situations, which may contribute to a lack of behavior expectations and the external display of emotions in children (Gelfand & Teti, 1990). Specifically, children with a chronic illness are already at risk for a number of internalizing disorders and may require increased attention that depressed caregivers are unable to provide adequately.

How does the quality of life of caregivers affect children with asthma? As expected, caregivers with anxiety and depression reported poorer quality of life. Specifically, caregivers with anxiety and depression also reported poorer emotional functioning. Mothers' report of poorer quality of life and poorer emotional functioning was also related to teacher's report of child behavior problems. Although quality of life and the BSI may both measure negative mood, this relationship suggests that quality of life, along with maternal psychopathology, is an important predictor of internalizing and externalizing problems in children and may be a useful in addressing these problems. This builds upon previous research that indicates emotional problems were linked to parental and child quality of life, with behavior problems having a significant affect the quality of life of parents (Vila, Hayder, Bertrand, Falissard, de Blic, Mouren-Simeon, et al., 2003).

Limitations and Future Research Directions

This study had several limitations. First, the study relies heavily on caregiver and teacher report of child symptoms. Depressed caregivers have the tendency to over report symptomatology in their children, and teachers may not gain a complete picture of internalizing disorders in children. Father reports of child disorders were minimal. In order to gain a better picture of the experience of psychopathology in children, future research direction should include child reported symptomatology as well as additional father and other caregiver reports.

This study does not include any report of parental stress or asthma severity. Women who perceive parenting tasks associated with a having a child

with a chronic illness as limiting, burdensome, or interfering with everyday routines may also have increased anxiety disorders (Gelfand et al., 1992).

Furthermore, asthma severity may play a role in psychopathology in children, and frequent hospitalizations have been linked with increased anxiety-related symptoms (Nouwen, Freeston, Labbe, & Boutlet, 1999). In addition, parental quality of life has been directly linked to the child's asthma severity (Halterman, Yoos, Conn, Callahan, Montes, Neely, et al., 2004). Future research should include measures of parenting stress as well as indicators of asthma severity.

Behavioral problems in children are more likely in children with an early onset of asthma (Mrazek, Schuman, & Klinnert, 1998). Additional research should focus on the role of familial adjustment to asthma and the ways it affects the health of family members. In addition, this research focuses solely on maternal psychopathology as a risk factor for psychopathology in children with asthma. Research is needed to understand the resiliency factors in children with a chronic illness and a depressed caregiver.

Another limitation to this study is the potential reporting bias due to single parent reports on the BSI, PACQLQ, and CBCL. Future research should include child-reports of internalizing and externalizing disorders, as well as quality of life. Additionally, this study is correlational and therefore cannot presume causation. Indeed, on one hand, children with internalizing and externalizing disorders influence maternal psychopathology. On the other hand, maternal psychopathology influences children with internalizing and externalizing disorders.

Implications

It is important to examine factors that may influence childhood adjustment, especially in children with asthma. Specifically, psychopathology in childhood affects adolescent and adult outcomes. Maternal depression is one risk factor associated with increased disorders in children with asthma and associated with poorer medication adherence. Clinicians who fail to take into account maternal and child psychopathology may find treatment regimens ineffective. Psychopathology affects the family unit; therefore, treatment for asthma must address the physical and mental health needs of the family and individuals within the family.

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Appendix

Table 1

Demographic Characteristics of Primary Caregivers

	N	% of Total Sample
Primary Caregiver		
Mother	93	96
Father	3	3
Other Caregiver	2	2
Marital Status		
Married	48	51
Separated	6	6
Divorced	10	11
Widowed	0	0
Remarried after Divorce	5	5
Cohabiting/Living with Partner	9	9
Single/Never Married	17	18
Race/Ethnicity		
African-American	24	25
Caucasian	61	64
Hispanic	2	2
Asian	0	0
Native American	2	2
Other	7	7
Education		
< 7 th grade	0	0
Junior high school	3	3
Partial high school	9	9
High school graduate/GED	15	16
Partial college/Specialized training	29	30
College graduate	27	28
Graduate/professional degree	13	14
Hollingshead		
	20	I
	13	II
	15	III
	30	IV
	18	V

Table 2

Demographic Characteristics of Children

	N	% of Total Sample
Sex		
Male	60	62.5
Female	36	37.5
	X(SD)	Range
Age	7.95(2.08)	5-12

Table 3
Pairwise Correlations Between Continuous Demographic Variables and Measures

Variable	Child Age		Mother Age		SES		Caregiver Education	
	r	p	r	p	r	p	r	p
BSI-Depression	.13	.21	-.17	.09	-.31	.003*	-.27	.009**
BSI-Anxiety	.12	.24	-.19	.06	-.16	.12	-.15	.14
PACQLQ-Emotional	.96	.36	.33	.001**	.23	.03*	.27	.008**
PACQLQ-Activity	.08	.42	.23	.02*	.27	.007**	.29	.005**
PACQLQ-Overall	.095	.37	.31	.003**	.25	.01**	.29	.005**
CBCL-Internalizing	.18	.08	.05	.61	-.10	.34	.03	.79
CBCL-Externalizing	.35	.0007**	.02	.85	-.06	.57	-.02	.87
CBCL-Total	.02	.85	-.05	.67	-.10	.33	-.02	.82
TRF-Internalizing	.06	.59	-.20	.08	-.21	.056*	-.15	.19
TRF-Externalizing	.08	.49	-.16	.15	-.29	.02*	-.23	.04*
TRF-Total	.05	.65	-.23	.04*	-.24	.04*	-.07	.56

* $p < .05$, ** $p < .01$

Table 4

Pairwise Correlations Between PACQLQ and BSI

Variable	Emotional Functioning		Activity Limitations		Overall	
	r	p	r	p	r	p
Depression	-.40	.0001**	-.35	.0006**	-.397	.0001**
Anxiety	-.34	.001**	-.26	.01**	-.32	.002**

* p < .05, ** p < .01

Table 5

Pairwise Correlations Between CBCL and BSI

Variable	Internalizing		Externalizing		Total	
	r	p	r	p	r	p
Depression	.27	.009**	.27	.009**	.29	.006**
Anxiety	.17	.10	.13	.21	.32	.002**

* p < .05, ** p < .01

Table 6

Pairwise Correlations Between CBCL and PACQLQ

Variable	Internalizing		Externalizing		Total	
	r	p	r	p	r	p
Emotional Functioning	-.195	.06	-.23	.03*	-.297	.005**
Activity Limitations	-.12	.26	-.14	.187	-.20	.055*
Overall	-.18	.095	-.21	.05*	-.28	.009**

* p < .05, ** p < .01

Table 7

Pairwise Correlations Between TRF and BSI

Variable	Internalizing		Externalizing		Total	
	r	p	r	p	r	p
Depression	.06	.59	.25	.02*	.34	.003**
Anxiety	.10	.36	.12	.29	.18	.13

* p < .05, ** p < .01

Table 8

Pairwise Correlations Between TRF and PACQLQ

Variable	Internalizing		Externalizing		Total	
	r	p	r	p	r	p
Emotional Functioning	-.02	.83	-.18	.11	-.29	.009**
Activity Limitations	-.02	.84	-.10	.36	-.20	.08
Overall	-.02	.83	-.16	.17	-.27	.02*

* p < .05, ** p < .01

Table 9

Pairwise Correlations Between TRF and CBCL

Variable	Internalizing		Externalizing		Total	
	r	p	r	p	r	p
Internalizing	.03	.79	.23	.04*	.39	.0006**
Externalizing	-.08	.51	.16	.15	.23	.04*
Total	.27	.02*	.34	.002**	.51	.000**

* p < .05, ** p < .01