The Role of Parental Coping in Children with Asthma’s Psychological Well-being and Asthma-related Quality of Life

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Objective The primary purpose of our study was to examine the relationship between parental coping and children with asthma’s psychological well-being and asthma-related quality of life (ArQL).

Methods Eighty-nine mother–child dyads with a child with asthma ranging in age from 8 to 12-years old participated. During baseline and 6 month follow-up visits, children completed questionnaires assessing anxiety and ArQL; mothers completed questionnaires assessing coping, ArQL, an index of recent stressors, and demographic/medical history forms.

Results Mothers who relied more on active coping strategies at baseline had children with better ArQL 6 months later, and those who relied on more avoidance coping strategies at baseline had children with poorer ArQL of life 6 months later.

Conclusions These results reveal that maternal coping plays an important role in the ArQL of children with asthma. Implications for interventions aimed at improving the physical and mental health of children with asthma are discussed.

Key words anxiety; asthma-related quality of life; parental coping; pediatric asthma.

Introduction

Asthma, a chronic inflammatory disease of the airways, is the most common chronic childhood illness affecting approximately 9 million children in the United States. Four million children had an asthma attack in the previous year (Summary Health Statistics for U.S. Children, 2004) and 12.8 million days of school are missed annually due to asthma (American Lung Association, 2005). The risks of asthma go beyond physical health problems (i.e., airway obstruction characterized by symptoms such as wheezing and shortness of breath), to include school absence, social restrictions (e.g., no overnight stays with friends), as well as elevated rates of affective disorders (i.e., anxiety-related disorders), increased life stress, and lower quality of life (American Lung Association, 2005; Ching, 2005; Mcquaid, Kopel, & Nassua, 2001; Wamboldt, Weintraub, Krafchick, & Wamboldt, 1996). As unhealthy environmental factors increase (i.e., air pollution), the number of children affected by childhood asthma continues to rise (Gauderman, 2006; Teague & Bayer, 2001). Thus, it is imperative to identify factors that may protect asthmatic children from the negative physical and psychological sequelae associated with having asthma.

Asthma is a chronic disorder that requires daily monitoring and administration of controller therapies for effective treatment. Typically, this is accomplished by both the affected child and their parents. The family’s ability to adapt to the multifaceted demands of a childhood chronic illness like asthma depends not only on the severity of the illness, but may also depend on the capacity of the person who is primarily responsible for disease management (i.e., parents) to evaluate and react to stressors (Folkman & Lazarus, 1988). In their recent review, Kaugars, Klinnert, & Bender (2004) suggest that parents’ or caregivers’ ability to manage or cope with chronic stressors could potentially protect children from the risks associated with asthma, yet little empirical research has explored this hypothesis. Thus, the primary goal of this study was to examine the relationship between parental coping and asthma-related quality of life as well as psychological well-being in children with asthma.

In the adult literature, the stress and coping model proposed by Lazarus and Folkman (1984) suggests that in addition to disease characteristics, coping style has an...
important role in disease outcome, including health-related quality of life and psychological adjustment. Indeed, this appears to be the case for chronically ill adults. Specifically, for adults with asthma, the use of active or approach coping strategies where the individual strives to change the stressor, has been associated with fewer severe asthma attacks (Staudenmayer, Kinsman, Dirks, Spector, & Wangaard, 1979), whereas the use of avoidance coping, which distances the individual from the stressor and precludes them from addressing the problem, has been shown to have long-term negative effects on adherence to treatment regimens (Sherbourne, Hays, Ordway, DiMatteo, & Kravitz, 1992). Further, a meta-analysis on adults coping with physical illness showed that a more avoidant coping style and a more emotional coping style were both negatively associated with psychological adjustment (Roesch & Weiner, 2001), and avoidance coping has been associated with lower health-related quality of life ratings for adults with asthma (Adams, Wilson, Smith, & Ruffin, 2004; Hesselink et al., 2004). However, for children with asthma, the association between asthma and quality of life has not yet been fully explored (Nishimura, Hajiro, Oga, Tsukino, & Ikeda, 2004), and the association between children’s coping and asthma has received sparse empirical examination. One study which explored the relationship between children’s coping with their asthma and perception of self-efficacy to manage their asthma found that children who employed more approach oriented coping strategies reported feeling more capable of managing their asthma (Schlossser & Havermans, 1992).

Following from these findings regarding coping and asthma outcomes, and coupled with the fact that parents are primarily responsible for managing their school-aged children’s asthma (i.e., adherence to treatment regimens, providing access to medicine and care, etc.), we hypothesize that parental coping ability influences children’s asthma outcomes, specifically their asthma-related quality of life and psychological well-being. Very few studies have directly examined the relation between parental coping ability and health outcomes in children with asthma (Dolinar, Kumar, Coutu-Wakulczyk, & Rowe, 2000; Holden, Chmielewski, Nelson, Kagar, & Foltz 1997), and no studies have examined the relationship between parental coping and either psychological adjustment or asthma-related quality of life of children with asthma. The sparse research available has been mixed, with one study reporting that maternal coping was unrelated to one indicator of asthma control, the use of hospitals for emergency care (Holden et al., 1997), while the other study reporting that improving parent’s asthma-specific coping skills was predictive of parent’s perceived improvement in their child’s asthma. However, both studies have limitations that make it difficult to interpret their findings. Specifically, Holden et al. (1997) only examined how maternal coping related to one asthma-related outcome measure, number of asthma-related hospitalizations, while Dolinar et al. (2000) relied only on parental report of asthma improvements. Thus, more research is needed to more thoroughly examine the relations between parental coping ability and various aspects of children’s asthma-related health outcomes (i.e., psychological well-being and asthma-related quality of life).

Moreover, pediatric asthma is a stressful condition for the children afflicted with this illness, but it also creates a highly stressful situation for the parents of these children. In their recent review, Kaugars et al. (2004) indicate that parental psychological functioning influences pediatric asthma, and specifically that poorer parental psychological functioning is associated with worse asthma outcomes in children. Given the association between parental psychological functioning and children’s asthma outcomes, it would be beneficial to explore how parents of children with asthma coping ability relate to their own psychological functioning. To our knowledge, how parents of children with asthma coping ability relate to their general psychological functioning, or more specifically, to their asthma-specific quality of life has not been empirically examined.

**Current Study**

The purpose of this study was 2-fold. The primary purpose was to examine the potential role that parental coping plays in two facets of children with asthma’s health: psychological well-being (i.e., anxiety) and asthma-related quality of life. These associations were assessed concurrently as well as prospectively over a 6-month period of time. The secondary purpose was to explore the relation between parental coping and parent’s own psychological functioning (i.e., anxiety) and quality of life. Similar to the primary analyses, the parent-only associations were assessed concurrently as well as prospectively over 6 months. Regarding our primary objective, we hypothesized that mother’s style of coping would be associated with her child’s anxiety and quality of life. Specifically, mothers who used more positive, approach-oriented coping strategies (i.e., active, cognitive, and social support) would have children with lower anxiety and higher asthma-related quality of life, both concurrently and prospectively, after controlling for...
asthma severity and recent family stressors. In contrast, mothers who used more avoidance coping would have children with higher anxiety and lower quality of life both concurrently and prospectively, after controlling for asthma severity and recent family stressors. Concerning our secondary purpose, we hypothesize that mother’s style of coping would be associated with her own anxiety level and quality of life. Specifically, mothers who used more positive, approach-oriented coping strategies (i.e., active, cognitive, and social support) would have lower anxiety and higher quality of life, both concurrently and prospectively, after controlling for child’s asthma severity and recent family stressors. Also, mothers who used more avoidance coping would have higher anxiety and lower quality of life both concurrently and prospectively, after controlling for asthma severity and recent family stressors.

Method
Participants
Eighty-nine ethnically and socio-economically diverse mother–child dyads with an asthmatic child (males = 54, females = 33) ranging in age from 8- to 12-years old (mean age = 10.2 years, SD = 1.47) were recruited to participate in the study from a pediatric pulmonologist’s office, brochures distributed through pediatric asthma clinics, or brochures distributed at summer asthma camps in the greater metropolitan Atlanta area. If mothers indicated they were interested in the study, they were then contacted by telephone to ensure that their child had asthma and were within the age range. If the child met these (i.e., had asthma and between the ages of 8 and 12 years of age) inclusion criteria then the study was more thoroughly explained to the mother. The majority of children recruited into the study had been diagnosed with asthma before the age of 4. After dyads agreed to participate, the first home visit was scheduled and fully informed consent and assent was obtained from the mother and child, as approved by the university’s Institutional Review Board. Eighty-percent of those contacted to participate in the study met the enrollment criteria and agreed to participate in the study.

Procedure
Data were collected in the participants’ home by one of three trained, female research assistants during two home visits. The first home visit began with a warm-up period to establish rapport. Next, the research assistant administered questionnaires assessing anxiety, coping, and health-related quality of life to the child, while the mother completed questionnaires assessing coping, anxiety, and quality of life independently. Additionally, mothers completed several forms regarding her child’s general health and asthma history, as well as current asthma regimen and medications, an index of family-related life stressors, and demographic information. Finally, children’s pulmonary functioning was assessed with a calibrated portable lung function device (KoKo Peak Electronic Peak Flow Monitor, manufactured by Ferrasis) and expressed according to population reference standards of Hankinson, Ordencrantz, & Fedan (1999). Six months later, at another home visit, the mother–child dyad jointly completed anxiety and health-related quality of life scales. At the conclusion of each home visit the dyads were thanked for their participation, and the child was given two movie tickets for their participation; the mother received a check for $50 for her participation in the project.

Questionnaire Measures
Over the course of the study both mothers and children completed a variety of questionnaires. Only the questionnaires used in the analyses for this study are described. Presented below are descriptions of questionnaires completed by the mother, followed by descriptions of questionnaires completed by the child.

State-Trait Anxiety Measure (STAI-Y2)
This measure was used to assess the mother’s general level of anxiety, and therefore only required the mother to complete the trait anxiety scale (Y2) (Spielberger, Gorsuch, & Lushane, 1970). A higher score on the scale indicated higher general anxiety. This measure has been shown to be reliable, with a median r-coefficient (across samples of working adults, students, and military) of .90 (Spielberger, 1983). The STAI-Y2 has also been shown to be a valid measure of trait anxiety, and is highly correlated with other widely used measures of trait anxiety (correlations ranging from .85 to .73) (see Spielberger, 1983 for details).

Modified COPE Scale: Family Bereavement Project
Sandler, 1996)
This 36 question scale was used to assess maternal general coping style. General coping was assessed rather than asthma-specific coping because stressors extrinsic to asthma can also impact asthma outcomes. Thus, we decided to include a more global measure of coping ability. Each mother was asked to rate on a 1-to-4 Likert scale (with 1 being “Didn’t do this at all” and 4 being “Did this a lot”) how often she engaged in a variety of different coping strategies. With a sample of divorced
mothers, a five factor structure was identified using a confirmatory factor analysis of the coping questionnaire. The five distinct coping factors were active coping, cognitive coping, social support seeking, avoidance, and other/religion coping (see Zautra, Sheets, & Sandler, 1996, for a detailed description of the construct validity of this scale). An average score was derived for each of four coping dimensions (active, cognitive, social support, and avoidance). Active coping questions assessed the extent to which an individual uses planning and problem-solving strategies to cope with stressors (e.g., “You concentrated your efforts on doing something about it”). Cognitive coping questions assessed the extent to which an individual cognitively reframed the situation, in order to cope with a stressor (e.g., “You looked for something good in what was happening”). Social support coping questions assessed the extent to which an individual relies on others for emotional or instrumental support during times of stress (e.g., “You asked people who have similar experiences what they did”). Avoidance coping questions assessed the extent to which an individual uses avoidance or denial to cope with stressors (e.g., “You acted as though it hadn’t even happened”). We did not use the other/religion coping category because this factor has not demonstrated adequate validity.

Paediatric Asthma Caregiver’s Quality of Life Questionnaire
This 13-item questionnaire was used to assess maternal asthma-related quality of life by as asking mothers to rate on a 7-point Likert scale (1 = None of the time and 7 = All of the time), how often they had experienced the particular item in the past week (e.g., “In the past week, did you have sleepless nights because of your child’s asthma?”) (Juniper et al., 1996a). The measure yields two sub-scale scores; activity limitation (four items) and emotional function (nine items), with higher scores meaning a higher quality of life for that sub-scale. The activity limitations sub-scale captured the extent to which mother’s daily activities were limited or interrupted by their child’s asthma (e.g., “Did your child’s asthma interfere your job or work around the house?”). The emotional function sub-scale captured the extent to which mother’s experienced emotional distress due to their child’s asthma (e.g., “Did you feel helpless or frightened when your child experienced cough, wheeze, or breathlessness?”).

Family Inventory of Life Events and Changes (FILE)
The FILE was used as an index of recent stressful life events in the family. Mothers were asked to indicate by marking “yes” or “no” as to which of the 71 items on a checklist their family had experienced in the past 12 months (McCubbin, Patterson, Wilson, & Filsinger, 1983). Each of the 71 items is associated with a point value, with events deemed as more stressful receiving greater values (e.g., “Increased conflict with in-laws or relatives” receives a score of 40 and “A child family member died” receives a score of 99). Values associated with items ranged from 19 to 99. To calculate a total index score, the point values associated with each item the mother indicated that their family had experienced were totaled. Thus, higher scores indicate the family had experienced more stressful experiences in the prior year.

How-I-Feel Questionnaire (STAIC-T)
This measure was used to assess the child’s general level of anxiety, and therefore only required the child to complete the trait anxiety scale (Spielberger, Edwards, Montuori, & Lushane, 1970). The trait anxiety scale is comprised of 20 statements that asked the child how they generally feel. A higher score on the scale indicated higher general anxiety. The trait anxiety scale has been shown to have high reliability, with an r-coefficient of .78 for males and .81 for females (Spielberger, 1973). Also, this trait anxiety scale has been shown to be a valid measure by its correlations with two widely used measures of trait anxiety in children: Children’s Manifest Anxiety Scale (Castaneda, McCandless, & Palermo, 1956) and the General Anxiety Scale for Children (Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). The STAIC-T scale correlated .75 with the CMAS and .63 with the GASC.

Paediatric Asthma Quality of Life Questionnaire
This 23 item questionnaire was used to assess the child’s asthma-related quality of life by as asking them to rate on a 7-point Likert scale (1 = extremely bothered and 7 = not bothered), how bothered they had been by a particular issue in the past week (e.g., “How bothered have you been during the last week doing activities with friends and family (such as playing at recess and doing things with your family)?”) (Juniper et al., 1996b). The measure yields three sub-scale scores: symptoms (10 items), activity limitation (5 items), and emotional function (8 items), with higher scores meaning a higher quality of life for that sub-scale. The activity limitations sub-scale assessed the extent to which the child’s normal activities had been disrupted by their asthma (e.g., “How bothered have you been during the last week doing activities with friends and family (such as playing at recess and doing things with your family)?”). The symptoms sub-scale assessed the extent to which...
the child experienced asthma-specific symptoms in the past week (e.g., “How bothered have you been during the past week by wheezing?”). The emotional function subscale assessed the extent to which the child had been bothered emotionally by their asthma (e.g., “How often during the past week did you feel frustrated because of your asthma?”).

Children’s Coping Strategy Checklist
This 52 question measure was given to assess children’s general coping styles. (Ayers, Sandler, West, & Roosa, 1996). It is comparable to the maternal coping questionnaire. To facilitate the child’s comprehension and completion of the questionnaire, the research assistant read a variety of coping strategies children could possibly engage in and then asked the child to rate, how often they engaged in each strategy by pointing to an index card that corresponded to a 1-to-4 Likert scale (with 1 being never and 4 being most of the time). An example item is: “When I have a problem I think of what I could do before I do something.” The answers were systematically grouped into four distinct coping dimensions: active coping, distraction, support, and avoidance (see Ayers et al., 1996, for a detailed description of the four dimensional structure). An average score was derived for each of the four coping dimensions.

Asthma Severity
Asthma severity was scored at baseline with a composite index that included four domains equally weighted based on (a) history of unscheduled health care access for asthma care and parent perception of asthma control, (b) level of asthma controller and rescue medication use, (c) lung function, and (d) the child’s assessment of recent asthma symptoms and activity limitation. A score for each domain was calculated, and the sum of scores for the four domains defined the net asthma severity score, with higher overall scores indicating more severe asthma. This conceptualization of asthma severity is consistent with other researchers who have used a similar, multi-component measure to assess asthma severity (Juniper, O’Byrne, Guyatt, Ferrie, & King, 1999; Juniper, Guyatt, Cox, Ferrie, & King, 1999; Revicki, Leidy, Brennan-Diemer, Sorensen, & Togias, 1998).

Results
In order to fully examine the two sets of hypotheses, results are presented as follows: (a) descriptive data pertaining to mothers’ and children’s measures, (b) bivariate relations among the primary predictor variables (i.e., four maternal coping variables, asthma severity, and FILE score) and the child and maternal outcome variables (i.e., anxiety scores and asthma-related quality of life scores), which were assessed at baseline and again at the 6-month follow-up visit, (c) regression analyses predicting children’s and mother’s baseline anxiety scores and asthma-related quality of life scores, and (d) regression analyses predicting children’s and mother’s 6-month follow-up anxiety scores and asthma-related quality of life scores. All results presented are significant at the \( p \leq .05 \) level unless otherwise noted. Age, gender, and child coping were virtually unrelated to any of the measures, and were therefore excluded from further analyses.\(^1\)

Preliminary Analyses
Descriptive Characteristics of Mothers and Children
Approximately 70% of the sample were Caucasian, 23% African American, and 5% were of Asian or multiracial backgrounds. Fourteen percent of mothers had completed some high school or a high school degree, 37% had some college, 32% had a college degree, and 17% had a postgraduate degree. Pertaining to family structure, of the 89 dyads participating, 71% had the biological father living in the home, 24% of the children were only children, 43% had one sibling, and 33% of the children had two or more siblings. Mothers and children completed questionnaires at baseline assessment and the outcome measures (anxiety and asthma-related quality of life) were also completed again at the 6-month follow-up assessment. Means and standard deviations are presented in Table I. In addition, mothers and children were asked “Who is the person responsible for managing your asthma?”. Ninety-three percent of mothers said they were primarily responsible for managing their child’s asthma, and 81% of children said their mother was primarily responsible for managing their asthma. Asthma severity scores were normally distributed and ranged from 2 to 20 with a mean score for the sample of 9.2 and median 9.0. Also, the four maternal coping strategies scores were intercorrelated and revealed that mothers who endorsed using more active coping strategies also significantly used more cognitive \((r = .64, p \leq .001)\) and social support strategies \((r = .60, p \leq .001)\), and avoidance coping strategy usage was not significantly related to any of the

\(^1\) The four child coping variables were only scarcely correlated with maternal coping variables or with any of the health outcomes (anxiety or quality of life scale scores) in this data set, thus were not included in any regression analyses. This data is available from the first author upon request.
Also, higher reliance on avoidance coping was associated with lower anxiety and better quality of life for both children and mothers (concurrently and prospectively). Maternal active, cognitive, and social support, as well as child’s emotionality and activity limitations were related to avoidance coping usage. Despite the four dimensions of coping being separate, the four coping strategy subscales were significantly correlated only with avoidance coping usage. Three aforementioned coping strategy subscales. Thus, although the four dimensions of coping are separate, active, cognitive, and social support, seeking strategy usage seem to be interrelated for individuals but they are not related to avoidance coping usage.

### Bivariate Relations among the Primary Predictor Variables and the Child and Maternal Outcomes

Six variables are included as predictors in all regression models. These variables are maternal active, cognitive, social support, and avoidance coping, as well as child’s asthma severity and the family’s FILE scores which will be controlled for in regression analyses. Bivariate relationships between the predictor variables and child and maternal anxiety scores and asthma-related quality of life scores (baseline and 6-month follow-up scores) appear in Table II. Asthma severity was correlated with almost all of the outcome scores, both at baseline and follow-up, with more severe asthma being associated with higher anxiety and lower quality of life for both children and mothers. The FILE was significantly positively correlated only with maternal anxiety at baseline and follow-up. The higher usage of maternal coping dimensions included in a positive coping style (active and cognitive) were associated with lower anxiety and better quality of life for children and mothers (concurrently and prospectively). Also, higher reliance on avoidance coping was associated with higher anxiety and poorer quality of life in children and mothers (concurrently and prospectively).

### Concurrent Regression Analyses

In order to examine the associations between maternal coping and anxiety and asthma-related quality of life (for children and mothers), a series of hierarchical regression models were built to predict the concurrent anxiety and quality of life for children and mothers. Children’s asthma severity scores were entered on the first step in all models to control for disease characteristics. Also, FILE scores were entered on the first step to control for the impact of recent stressful events. Maternal active, cognitive, social support, and avoidance coping were entered simultaneously as predictors in the final step in all models.

Table III summarizes the standardized β’s at the final step of all concurrent regression models. In the model predicting child anxiety, the two-step model best fit the data, with maternal avoidance coping accounting for a significant increase in variance explained above to that of asthma severity ($R^2 = 0.23$, $\Delta R^2 = 0.12$, $F(6,82) = 3.45$, $p < 0.01$). In the model predicting child asthma-related quality of life symptoms subscale scores (ArQL-sym), the two-step model best fit the data, with maternal cognitive

### Table I. Means and Standard Deviations for the Mother’s and Children’s Measures

<table>
<thead>
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<th>Variable</th>
<th>Time point</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>6 month follow-up</td>
</tr>
<tr>
<td>Maternal variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family stressors</td>
<td>396.57 (299.21)</td>
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</tr>
<tr>
<td>Active coping</td>
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</tr>
<tr>
<td>Cognitive coping</td>
<td>3.12 (0.53)</td>
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</tr>
<tr>
<td>Social support coping</td>
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<td>Avoidance coping</td>
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</tr>
<tr>
<td>Asthma quality of life</td>
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<td></td>
</tr>
<tr>
<td>Activity limitations</td>
<td>5.02 (1.56)</td>
<td>5.95 (1.39)</td>
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<tr>
<td>Emotionality</td>
<td>5.44 (1.21)</td>
<td>5.79 (1.21)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>36.18 (9.86)</td>
<td>36.01 (8.65)</td>
</tr>
</tbody>
</table>

NA = variable not assessed at 6-month follow-up.

### Table II. Bivariate Relations Between Predictors and Outcomes

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Outcomes</th>
<th>Asthma severity</th>
<th>FILE</th>
<th>Active coping</th>
<th>Cognitive coping</th>
<th>Soc Sup.</th>
<th>Avoidance coping</th>
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<td>Child baseline</td>
<td></td>
<td></td>
<td></td>
<td>.32*</td>
<td>.26*</td>
<td>.20*</td>
<td>−.19*</td>
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<td>ArQL-sym.</td>
<td>.58**</td>
<td>.02</td>
<td>.23*</td>
<td>.26*</td>
<td>.20*</td>
<td>−.19*</td>
<td></td>
</tr>
<tr>
<td>ArQL-act.</td>
<td>−.44**</td>
<td>.01</td>
<td>.05</td>
<td>.19*</td>
<td>.09</td>
<td>−.11</td>
<td></td>
</tr>
<tr>
<td>ArQL-emol.</td>
<td>−.60**</td>
<td>.03</td>
<td>.18*</td>
<td>.24*</td>
<td>.18*</td>
<td>−.16</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>.32**</td>
<td>.13</td>
<td>−.21*</td>
<td>−.23*</td>
<td>−.26*</td>
<td>.27*</td>
<td></td>
</tr>
<tr>
<td>Child follow-up</td>
<td></td>
<td></td>
<td></td>
<td>.32*</td>
<td>.13*</td>
<td>.04*</td>
<td>−.01</td>
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<tr>
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<td>.16</td>
<td>.02</td>
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<td>.14</td>
<td>−.22*</td>
<td>−.20*</td>
<td>−.18</td>
<td>.32**</td>
<td></td>
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<tr>
<td>Maternal baseline</td>
<td></td>
<td></td>
<td></td>
<td>.26*</td>
<td>.14</td>
<td>−.22*</td>
<td>−.20*</td>
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<tr>
<td>ArQL-emol.</td>
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<td>.04</td>
<td>.23*</td>
<td>.09</td>
<td>.08</td>
<td>−.32**</td>
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<td>−.25*</td>
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<td>−.13</td>
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<td></td>
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</tbody>
</table>

*p < .05, **p < .01, †p = .10.
and avoidance coping ($p = .09$) accounting for a significant increase in the variance explained above that accounted for by asthma severity ($R^2 = .41$, $\Delta R^2 = .08$, $F(6, 82) = 8.94$, $p < .001$). In the model predicting child asthma-related quality of life activity limitations subscale scores (ArQL-act), the two-step model best fit the data, with maternal cognitive and active coping ($p = .07$) accounting for a significant increase in the variance explained above that accounted for by asthma severity ($R^2 = .29$, $\Delta R^2 = .09$, $F(6,82) = 5.04$, $p < .001$). In the model predicting child asthma-related quality of life emotional function subscale scores (ArQL-emo), the two-step model best fit the data, with maternal cognitive coping accounting for a significant increase in the variance explained above that accounted for by asthma severity ($R^2 = .45$, $\Delta R^2 = .08$, $F(6,82) = 10.12$, $p < .001$). In the model predicting maternal anxiety, the two-step model best fit the data, with maternal cognitive, and avoidance coping accounting for a significant increase in variance explained above that of family stressors (FILE) ($R^2 = .32$, $\Delta R^2 = .14$, $F(6,81) = 5.82$, $p < .001$). In the model predicting maternal asthma-related quality of life activity limitations subscale scores (ArQL-act), the two-step model best fit the data, with maternal active, social support ($p = .10$), and avoidance coping ($p = .10$) accounting for a significant increase in the variance explained above that accounted for by asthma severity ($R^2 = .33$, $\Delta R^2 = .12$, $F(6,82) = 6.30$, $p < .001$). Finally, in the model predicting maternal asthma-related quality of life emotional function subscale scores (ArQL-emo), the two step model best fit the data, with maternal avoidance coping accounting for a significant increase in the variance explained above that accounted for by asthma severity ($R^2 = .24$, $\Delta R^2 = .11$, $F(6,82) = 4.03$, $p \leq .001$).

### Table III. Concurrent Regression Analyses Predicting Child and Maternal Anxiety and Asthma-related Quality of Life (ArQL) at final step

<table>
<thead>
<tr>
<th>Predictors</th>
<th>ArQL-Anxiety</th>
<th>ArQL-ArQL</th>
<th>ArQL-ArQL</th>
<th>ArQL-Anxiety</th>
<th>ArQL-ArQL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma Sev.</td>
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<td>-.56**</td>
<td>-.48**</td>
<td>-.58**</td>
<td>.07</td>
</tr>
<tr>
<td>FILE</td>
<td>.06</td>
<td>.06</td>
<td>.06</td>
<td>.08</td>
<td>.31**</td>
</tr>
<tr>
<td>Coping</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>.07</td>
<td>.01</td>
<td>-.25†</td>
<td>-.04</td>
<td>-.03</td>
</tr>
<tr>
<td>Cognitive</td>
<td>-.17</td>
<td>.25*</td>
<td>.36**</td>
<td>-.30**</td>
<td>-.24*</td>
</tr>
<tr>
<td>Soc Sup</td>
<td>-.18</td>
<td>-.08</td>
<td>-.14</td>
<td>-.07</td>
<td>.05</td>
</tr>
<tr>
<td>Avoid.</td>
<td>.27*</td>
<td>-.16†</td>
<td>-.10</td>
<td>-.14</td>
<td>.31**</td>
</tr>
</tbody>
</table>

†$p < .10$, *$p < .05$, **$p < .01$.

### Table IV. Prospective Regression Analyses Predicting Child and Maternal Anxiety and Asthma-related Quality of Life (ArQL) over 6 Months

<table>
<thead>
<tr>
<th>Predictors</th>
<th>ArQL-Anxiety</th>
<th>ArQL-ArQL</th>
<th>ArQL-ArQL</th>
<th>ArQL-Anxiety</th>
<th>ArQL-ArQL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Score</td>
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<td>.39**</td>
<td>.39**</td>
<td>.43**</td>
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<tr>
<td>Asthma Sev.</td>
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<td>-.01</td>
<td>-.03</td>
<td>.01</td>
<td>.13</td>
</tr>
<tr>
<td>FILE</td>
<td>.02</td>
<td>.17</td>
<td>.11</td>
<td>.08</td>
<td>.06</td>
</tr>
<tr>
<td>Coping</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>-.04</td>
<td>.13</td>
<td>.31*</td>
<td>.31*</td>
<td>-.10</td>
</tr>
<tr>
<td>Cognitive</td>
<td>-.05</td>
<td>-.14</td>
<td>-.06</td>
<td>-.12</td>
<td>-.10</td>
</tr>
<tr>
<td>Soc Sup</td>
<td>-.01</td>
<td>-.04</td>
<td>-.04</td>
<td>-.06</td>
<td>.03</td>
</tr>
<tr>
<td>Avoid.</td>
<td>.15</td>
<td>-.25†</td>
<td>-.05</td>
<td>-.27**</td>
<td>.18*</td>
</tr>
</tbody>
</table>

$^aBaseline$ score represents the corresponding baseline value for each outcome at 6-month follow-up.
†$p < .10$, *$p < .05$, **$p < .01$.

### Prospective Regression Analyses

In order to examine whether maternal coping is predictive of anxiety and asthma-related quality of life (for children and mothers), a series of hierarchical regression models were built to predict the prospective (6-month follow-up) anxiety and quality of life for children and mothers. Children’s asthma severity scores were entered on the first step in all models to control for disease characteristics. Again, FILE scores were entered on the first step to control for the impact of recent stressful events. Additionally, the baseline scores for its corresponding follow-up scores were entered on the first step in the relevant model to control for baseline levels (e.g., baseline child anxiety scores were entered as a predictor in the model predicting 6-month follow-up child anxiety). Maternal active, cognitive, social support, and avoidance coping were entered simultaneously as predictors in the final step in all models.

Table IV summarizes the standardized $\beta$’s at the final step of all prospective regression models. In the model predicting child anxiety, the one-step model, with only the control variables, best fit the data, with child anxiety at baseline being the only significant predictor of child anxiety at the 6-month follow-up ($R^2 = .42$, $F(7,76) = 7.96$, $p < .001$). In the model predicting child asthma-related quality of life symptoms subscale scores (ArQL-sym), the two-step model best fit the data, with maternal avoidance coping accounting for a marginally significant (Sig. $F_\Delta = .09$) increase in the variance explained above that accounted for by the control variables in the first step (baseline ArQL-sym, etc.) ($R^2 = .28$, $\Delta R^2 = .08$, $F(7,77) = 3.93$, $p \leq .001$). In the
model predicting child asthma-related quality of life activity limitations subscale scores (ArQL-act), the addition of the coping variable at the second step did not account for a significant increase in variance explained, however, the overall model with both steps was significant, with both the baseline child ArQL-act score and maternal active coping as a significant predictors of child ArQL-act scores at the 6-month follow-up ($R^2 = .26$, $\Delta R^2 = .07$, $F(7,77) = 3.57$, $p < .01$). In the model predicting child asthma-related quality of life emotional function subscale scores (ArQL-emo), the two-step model best fit the data, with maternal active and avoidance coping accounting for a significant increase in the variance explained above that accounted for by the control variables in the first step (baseline ArQL-emo, etc) [$R^2 = .40$, $\Delta R^2 = .14$, $F(7,77) = 10.66$, $p < .001$]. In the model predicting maternal anxiety, the two-step model best fit the data, with maternal active avoidance coping accounting for a significant increase in variance explained above that of the control variables at the first step (baseline maternal anxiety, etc) [$R^2 = .63$, $\Delta R^2 = .05$, $F(7,76) = 16.60$, $p < .001$]. In the model predicting maternal asthma-related quality of life activity limitations subscale scores (ArQL-act), the one-step model, with only the control variables, best fit the data, with baseline ArQL-act being the only significant predictor of maternal ArQL-act at the 6-month follow-up [$R^2 = .18$, $F(7,77) = 5.44$, $p < .01$]. Finally, in the model predicting maternal asthma-related quality of life emotional function subscale scores (ArQL-emo), the two-step model, best fit the data, with maternal avoidance and cognitive coping ($p = .09$) accounting for a marginally significant ($\text{Sig. } F(2,77) = .09$) increase in the variance explained above that accounted for by the control variables in the first step (baseline ArQL-emo, etc.) [$R^2 = .36$, $\Delta R^2 = .08$, $F(7,77) = 5.67$, $p < .001$].

**Discussion**

Although theorists have proposed that parental coping ability might play a role in children’s illness outcomes (physical and psychological), this study presents some of the first empirical data to demonstrate this relation. In families coping with a child’s asthma, we found that maternal coping strategies are related to maternal anxiety and asthma-related quality of life both concurrently and over time, and, most important, were related to children’s anxiety and asthma-related quality of life both concurrently and over time. These results reveal the critical role that mothers, as the primary agents of caregiving and health management, play in children’s health outcomes.

More specifically, we hypothesized that mothers who utilized approach-oriented coping skills would have children with lower anxiety and higher asthma-related quality of life and that children of mothers relying more on avoidant coping strategies would have higher anxiety and lower asthma-related quality of life, at baseline and over time. Our results support these hypotheses, as we found that mothers who indicated higher usage of avoidance coping strategies have children with higher anxiety at baseline. Although maternal coping was not related to children’s anxiety 6 months later, children’s baseline anxiety levels were significantly associated with child anxiety at the month follow-up. Importantly, regression analyses indicated strong concurrent and prospective relations between maternal coping and children’s asthma quality of life. In terms of concurrent relations, mothers who reported more cognitive coping have children who display fewer asthma-related symptoms, fewer asthma-related limitations, and better emotional functioning at baseline. Thus, at baseline, mothers who were better able to cope through cognitive mechanisms, such as restructuring, have children who displayed higher asthma-related quality of life, and mothers who more frequently relied on avoidant coping have children who reported more anxiety.

In terms of relations over time, we again found that maternal coping was associated with children’s asthma-related quality of life over a 6-month period. More specifically, mothers who engaged in more active, approach-oriented coping have children who, over time, reported fewer asthma-related limitations, and higher emotional functioning than children of mothers who engaged in less active coping. In contrast, mothers who engaged in more avoidant coping have children who reported more asthma-related symptoms and lower emotional functioning over time. Interestingly, these results replicate patterns observed in samples of adults with asthma. Studies have found that adults with asthma who rely on active coping strategies have fewer asthma attacks (Staudenmayer et al., 1979), and those who rely more on avoidance strategies have problems adhering to treatment regimens and lower quality of life ratings (Hesselink et al., 2004; Sherbourne et al., 1992).

Taken together, the regression analyses suggest that maternal coping is critical for both concurrent and future child quality of life and psychological well-being, but in somewhat different ways. Mothers who are better able to cognitively restructure the situation have children who concurrently show higher asthma-related quality of life, whereas mothers who are better able to engage in active
coping, which includes active planning and problem solving, have children who subsequently display higher asthma-related quality of life. On the surface, these findings appear to depict inconsistencies in how maternal approach oriented coping strategies relate to child quality of life over time. However, it is important to note that given the high intercorrelations observed between the three maternal approach oriented coping strategies, it is highly likely that these findings are referring to the same mothers and more generally indicate that maternal approach oriented strategy usage is positively associated with both concurrent and prospective child quality of life. Additionally, if this interpretation is correct, then this pattern suggests that mothers who generally employ more approach oriented coping strategies may assist children concurrently by helping them to think about their illness in more constructive ways, but may facilitate subsequent health outcome through active planning and taking concrete steps to deal with asthma-related issues.

In regards to the inconsistencies over time in how maternal avoidance coping strategy usage relates to child quality of life and anxiety, it is not readily apparent why maternal avoidance coping would significantly relate to higher child anxiety at baseline only and to lower child quality of life 6 months later only. Perhaps because child baseline anxiety is so strongly predictive of subsequent child anxiety, it would be difficult to find a significant relation between maternal avoidant coping and child follow-up anxiety above and beyond child baseline anxiety. As for the relation between avoidance coping and child quality of life 6 months later only, more research is necessary to better understand and explain exactly how maternal avoidance relates to child quality of life concurrently and over time.

A secondary objective of this research was to examine relations between maternal coping strategy usage relates to child quality of life and anxiety. Not surprisingly, we found that mothers who utilized more approach oriented coping skills report lower levels of anxiety and higher quality of life in relation to their children’s asthma. Regression analyses further indicated that higher maternal avoidant coping was concurrently related to higher maternal anxiety and lower maternal emotional functioning. In addition, higher maternal active coping was concurrently related to fewer maternal asthma-related limitations. Prospectively, again, higher maternal avoidant coping was related to higher maternal anxiety 6 months later, as well as lower emotional functioning.

These results suggest that maternal coping is related in somewhat different ways to their own well-being, in contrast to their children’s health outcomes. Maternal avoidant coping was the strongest and only consistent predictor of maternal well-being, with more avoidant mothers showing poorer psychological outcome both concurrently and over time. This is in accord with much of the research on adult coping, that shows that avoidant coping is a fairly stable coping style that has been highly associated with poor psychological outcome (Folkman & Lazarus, 1988; Roesch & Weiner, 2001). These mothers also have children who report higher concurrent anxiety and more asthma-related symptoms over time. Thus, maternal avoidant coping seems to be detrimental for both mothers and their children.

Intriguingly, in contrast, maternal approach-oriented coping strategies may be more beneficial for their children’s future health than for the mothers’ themselves. One possible explanation is that mothers are primarily responsible for managing and coordinating myriad aspects of their children’s illness and health management, and are therefore coping with a different set of stressors than are the children themselves. By actively organizing and planning the many facets of the medical management of their children’s illness, mothers who cope more effectively may be better able to affect better prospective health outcome in their children, but simultaneously impose more limitations on their own life. In partial support of this interpretation, mothers who report engaging in more social support seeking coping indicate a trend towards more asthma-related limitations on their own life at baseline assessment, suggesting that they may be reaching out to others to manage stressors when the demands of the illness are excessively imposing on their lives.

However, due to the correlational nature of this study, another possible explanation exists for the lack of prospective relations between parental coping and quality of life and anxiety 6 months later. Specifically, given that there were concurrent associations between active and cognitive approach coping strategies and parental asthma-related quality of life and anxiety, this could also suggest that higher quality of life and lower anxiety allow parents to engage in more approach-oriented coping, and hence one sees concurrent, but not prospective associations. More research is necessary to determine the exact nature of the relation between parental approach-oriented coping and parental well-being.

**Implications**

Given that children with asthma with poor psychological functioning are more likely to experience increased morbidity, need more asthma medication, require
longer and more frequent asthma-related hospitalizations, and have higher mortality rates (Creer & Bender, 1995), the associations found between maternal coping and children’s asthma-related quality of life and psychological well-being in this sample of asthmatic children have potentially significant implications for clinical practice. Specifically, interventions or health education programs for children with asthma may benefit from including a component for the parent responsible for managing or monitoring the child’s treatment regimen. Such a parent-directed component should focus not only on health and disease management, but also should include coping skills training designed to reduce avoidant coping and promote approach-oriented coping techniques for managing the daily issues and stressors created by the child’s asthma. Our results suggest that intervening on parental coping could directly improve children’s asthma-related quality of life (i.e., activity limitations, symptoms, and emotional functioning), as well as positively impact parental quality of life and anxiety, which have been indirectly linked to child health (Kaugars et al., 2004). However, this potential indirect path between parental coping, parental psychological well-being, and child health outcome was not formally explored in this study and requires further empirical research.

Another potential intervention for asthmatic parent-child dyads pertains to coping communication. A large body of research has demonstrated that adults, who are better able to construct coherent and explanatory narratives of stressful life events, subsequently show better physical and psychological outcome (Pennebaker, 1997). In previous research, we have found that mothers who cope more effectively discuss stressful asthma-related events with their children in more explanatory and emotionally expressive ways, and these more explanatory and emotionally expressive narratives are, in turn, related to better coping skills in children, as well as fewer internalizing and externalizing behaviors (Fivush & Sales, 2006; Sales & Fivush, 2005). Taken together, our current and past findings suggest that it may be potentially beneficial for children with asthma’s psychological well-being to train parents and children on how to cope with asthma, and how to communicate coherently about asthma-related stressors.

Limitations and Future Directions

One strength of this study is the longitudinal design, which allowed an investigation of how maternal coping is related to both the mothers’ and the children’s outcomes over time. However, because of the correlational nature of this study, we cannot establish causality between maternal coping and child outcomes. Moreover, although the results point to the important role that maternal coping skills play in both concurrent and prospective outcomes for both themselves and their children, the question of how maternal coping is effective remains unanswered. Kliewer and her colleagues (Kliewer, 1997; Kliewer et al., 2007; Miller, Kliewer, Hepworth, & Sandler, 1994) have suggested that children learn coping skills from their mothers through modeling and direct teaching. It is possible that children of mothers who utilize more effective coping skills learn more effective coping skills themselves, and this is the process by which maternal coping skills affect child outcome. We did not find support for this in our study as we found virtually no relations between maternal coping and child coping. However, the lack of relations between maternal-child coping could be due to our measure of child coping which might have been too difficult for the younger children in our study. Future research should include a more thorough examination of children’s coping skills, ones which are appropriate for younger children. Furthermore, although our sample included various ethnicities, it was a predominately white, middle-class sample, thereby potentially limiting the generalizability of these findings. Future research should explore these relations among other populations of asthmatic children and their families.

Conclusions

In summary, these results reveal the critical role that maternal coping plays in children’s quality of life and psychological well-being in families coping with childhood asthma. The results further suggest that interventions aimed at improving asthma-related quality of life for children might benefit from including their caregivers as well, and should focus not simply on health management per se, but also on helping to teach mothers how to better cope with the daily issues of managing a family with a child with a chronic illness.

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Conflicts of interest: None declared.

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