Illness Uncertainty, Attributional Style, and Psychological Adjustment in Older Adolescents and Young Adults with Asthma

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Examined psychological adjustment in a college sample of older adolescents and young adults (n = 49) with histories of childhood asthma. A substantial number of subjects evidenced clinically significant levels of overall distress. In addition, greater perceived asthma uncertainty and increased stable attributions for negative events were significantly associated with poorer psychological adjustment after controlling for demographic and disease variables. Further analyses revealed a moderating influence of uncertainty on attribution-adjustment relationships. These findings provide initial support for a cognitive diathesis-stress view of adjustment in long-standing asthma. Results also support a growing body of evidence suggesting that the focus of efforts to enhance adjustment to asthma need to be expanded beyond childhood and early adolescence.

KEY WORDS: asthma; college students; adjustment.

Asthma is the most common childhood chronic illness in the United States (Weitzman, Gortmaker, Sobol, & Perrin, 1992). It is also a costly illness in terms

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of its considerable academic, medical, and financial impact (Gergen & Weiss, 1990; Weiss, Gergen, & Hodgson, 1992). Also, asthma incidence, severity, and mortality have all demonstrated substantial increases in recent years (Weiss & Wegener, 1990). Thus, asthma continues to be a potentially life-threatening disease posing a host of obstacles for patients, their families, and health care professionals (Miller & Wood, 1991).

Studies also indicate that individuals with asthma are at increased risk for psychological adjustment difficulties (e.g., Bennett, 1994), and that psychosocial variables are associated with increases in both morbidity and mortality of asthma (Lehrer, Isenberg, & Hochron, 1993; Miller, 1987). Although it is apparent that emotional adjustment is an important feature of clinical management in pediatric asthma, few studies exist that reliably identify the psychosocial factors most salient to adjustment. Less is known about the potential long-term adjustment problems faced by older adolescents and young adults, despite the fact that asthma symptoms often persist into later adolescence and/or reappear in adulthood for a substantial number of individuals (Kelly, Hudson, Phelan, Pain, & Olinsky, 1987).

It is unlikely that a distinctive set of psychosocial features exists common to all individuals with asthma (Creer, 1994). However, it does appear that the hallmark disease features of asthma (i.e., its intermittent, unpredictable, and reversible nature) contribute to variable expectations and significant uncertainty about the illness (Creer & Bender, 1995), which may precipitate adjustment problems. Studies have demonstrated that perceived uncertainty/unpredictability is reliably associated with emotional difficulties in individuals across numerous chronic medical conditions (Ireys, Werthamer-Larsson, Kolodner, & Gross, 1994). Because illness uncertainty and unpredictability are integral components of asthma, their potential contribution to long-term emotional adjustment warrants further consideration. Given that asthma continues to pose significant academic, medical management, and psychosocial difficulties into adolescence and adulthood (Jolicoeur, Boyer, Reeder, & Turner, 1994), information gleaned from such examinations could reveal details about emotional adjustment in a neglected segment of the asthma population.

The present study examined the manner in which illness uncertainty and attributional style influence emotional adjustment in a college sample of older adolescents and young adults with histories of childhood asthma. We focused on illness uncertainty and attributional style because these cognitive appraisal processes appear particularly relevant to the experience of asthma in two distinct ways. First, studies suggest that emotional distress is often amplified in aversive situations in which the perceived effectiveness of available coping strategies is uncertain (e.g., Lazarus & Folkman, 1984) or when uncertainty becomes so great that aversive outcomes are perceived as inevitable and largely uncontrol-

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noncontingency, individuals tend to initiate causal searches to explain these irreversible outcomes, which serve to modify expectancies and responses to future events (Abramson, Seligman, & Teasdale, 1978). Thus, individuals' appraised uncertainty for situations and outcome expectancies for future events may contribute significantly to emotional adjustment. Both of these appear to be likely responses to the ambiguous conditions frequently encountered by individuals with asthma (Creer & Bender, 1993).

We utilized a cognitive diathesis-stress conceptualization of adjustment to examine the nature of relationships between illness uncertainty, attributional style, and psychological adjustment. Cognitive diathesis-stress models suggest that cognitive appraisal mechanisms, like causal attributions, function as distal or predisposing cognitive diatheses which are manifested when individuals come into contact with situational or proximal stressors in the environment, such as increased illness uncertainty (Metalsky & Joiner, 1992). Thus, the primary interest of our investigation was to examine both the direct effects of illness uncertainty and causal attributions on psychological adjustment and the potential moderating effects of illness uncertainty on attribution-adjustment relationships (e.g., Peyrot, 1996).

**METHOD**

*Participants and Procedures*

Participants (21 male; 28 female) ranging from 17 to 26 years of age ($M = 19.8, SD = 2.0$) were obtained through general subject pools at two Midwestern universities. Participants were primarily Caucasian (76%; $n = 37$), followed by African American (20%; $n = 10$), Hispanic American (2%; $n = 1$), and Asian American (2%; $n = 1$). Eighty-eight percent of participants were from middle- to upper middle-class socioeconomic (SES) backgrounds (i.e., Hollingshead, 1957, Class III or above). Duration of illness ranged from 5 to 24 years ($M = 13.0, SD = 5.1$); all participants had been diagnosed with asthma by the age of 12. Ninety-two percent ($n = 45$) of the participants were being treated for their asthma by a physician. The nature of the current sample (i.e., college students from a broad geographic area) precluded the use of physician/biomedical ratings of asthma severity, and as such, they were not included in the current study.

Parallel administration procedures were followed by investigators at both participating universities. Participants individually completed study packets containing measures of general demographic information and self-report questionnaires. Participants recruited from Sites 1 ($n = 34$) and 2 ($n = 15$) did not differ in terms of demographic, disease, or psychological parameters, $F(8, 40) = 1.43$, $p = .15$. 
 Measures

The Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1994) consists of 90 psychological symptom items rated on a 1 (not at all) to 5 (extremely) scale; it yields nine symptom cluster scores and three summary scores. Of the three summary scores, the global symptom index (GSI) is considered the most reliable indicator of overall distress; GSI scores were converted to T scores according to nonpatient community norms. In addition, T scores were examined in terms of caseness (i.e., GSI T score or two or more subscale T scores ≥ 63, Derogatis, 1994). Previous studies have demonstrated the utility of the SCL-90-R in assessing parameters of adjustment in chronic illness (e.g., Thompson et al., 1994). Cronbach's (1951) alpha reliability was .89 for the GSI in the present study.

The Mishel Uncertainty in Illness Scale-Community Form (MUIS-C; Mishel & Braden, 1988) is a 23-item scale that asks respondents to rate items on a 5-point scale that depict the four components of illness uncertainty: ambiguity, uncertainty, lack of information, and unpredictability. The MUIS-C yields a single composite score, with higher scores reflecting greater illness uncertainty. Previous studies have shown the MUIS-C to be a reliable and valid measure of illness uncertainty across a number of chronic disease states (e.g., Mishel & Braden, 1988; Mullins et al., 1995). An acceptable level of internal consistency (α = .85) was observed for the MUIS-C (M = 48.2, SD = 13.9) in the present study.

The Attributional Style Questionnaire (ASQ; Peterson et al., 1982), a 48-item measure, assesses individuals' causal explanations for six positive and six negative hypothetical events (e.g., “A friend treats you badly”). Respondents rate the major cause for each event on a 7-point scale along internal, stable, and global attribution dimensions (e.g., Abramson et al., 1978), yielding three attribution scores for positive events and three for negative events. Because causal attributions for positive events are not central to cognitive diathesis-stress theories (e.g., Metalsky & Joiner, 1992), only negative attribution dimensions, internal negative (IN): M = 24.8, SD = 4.7; stable negative (SN): M = 27.1, SD = 6.2; and global negative (GN): M = 25.0, SD = 5.8, were examined. Internal consistency reliabilities for the IN, SN, and GN dimensions were .70, .59, and .67, respectively.

 RESULTS

 Preliminary Analyses

Examination of overall psychological adjustment showed that GSI scores on the SCL-90-R (M = 61.5, SD = 9.2) fell just beyond 1 standard deviation of the normative group (M = 50, SD ± 10; Derogatis, 1994), indicating that overall
levels of distress were slightly elevated. Also, approximately 37% (n = 18) of participants evidenced clinically significant levels of psychological distress according to caseness criteria. This far exceeds the expected 10% caseness rate established in nonpatient community samples (Derogatis, 1994), but is consistent with estimates of psychological maladjustment (41%) in young adults with asthma (Badoux & Levy, 1994). Initial zero-order and partial correlations also were performed and appear in Table I.

**Primary Analyses**

Three separate hierarchical multiple regression equations (e.g., Cohen & Cohen, 1983) were constructed to examine the direct and interaction effects of illness uncertainty and causal attributions on psychological adjustment. In each equation, treatment status and illness duration were entered on Step 1, followed by simultaneous entry of age, gender, and SES on Step 2. Illness uncertainty and an attribution dimension (i.e., IN, SN, or GN) were entered on Step 3 of each equation. On Step 4, the corresponding Illness Uncertainty × Attribution interaction term was entered (Table II). To minimize potential problems with multicollinearity, deviation scores were created for the continuous level covariates (i.e., illness duration, age, and SES) and for the predictor (i.e., attribution) and moderator (i.e., illness uncertainty) variables by subtracting the group mean values on these variables from the subjects' original raw values (e.g., Aiken & West, 1991).

Results revealed that both MUIS-C and SN attributions exerted independent main effects on GSI scores (Equation 2); IN and GN main effects were nonsig-

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**Table I. Zero-order and Partial Correlations Among Cognitive Appraisal and Adjustment Variables***

<table>
<thead>
<tr>
<th></th>
<th>GSI</th>
<th>MUIS-C</th>
<th>IN</th>
<th>SN</th>
<th>GN</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSI</td>
<td>—</td>
<td>.46*</td>
<td>.41*</td>
<td>.40*</td>
<td>.41*</td>
</tr>
<tr>
<td>MUIS-C</td>
<td></td>
<td>—</td>
<td>.04</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>IN</td>
<td></td>
<td></td>
<td>.27*</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>SN</td>
<td></td>
<td>.43*</td>
<td>.08</td>
<td>.08</td>
<td>—</td>
</tr>
<tr>
<td>GN</td>
<td>.36*</td>
<td>.05</td>
<td>.18</td>
<td>.42*</td>
<td>—</td>
</tr>
</tbody>
</table>

*Partial correlations, controlling for disease (i.e., treatment status, duration) and demographic (i.e., age, gender, and SES) variables, appear above the diagonal (in parentheses). GSI = Global Symptom Index on the Symptom Checklist 90-Revised; MUIS-C = Mishel Uncertainty in Illness-Community Form; IN = Internal Negative Attributions; SN = Stable Negative Attributions; GN = Global Negative Attributions on the Attributional Style Questionnaire.

$p < .03$.

$p < .01$.

$p < .001$. 
Table II. Hierarchical Regression Analyses Predicting Psychological Adjustment (GSI)

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>( t ) for within set predictors</th>
<th>( R^2 )-change for step</th>
<th>( F )-change for step</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Illness duration</td>
<td>Equation 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment status</td>
<td>(-1.31)</td>
<td>0.02</td>
<td>0.37</td>
</tr>
<tr>
<td>2 Age</td>
<td>0.79</td>
<td>0.05</td>
<td>0.74</td>
</tr>
<tr>
<td>Gender</td>
<td>(-0.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>(-0.99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Illness uncertainty (MUIS-C)</td>
<td>2.94(^c)</td>
<td>0.27</td>
<td>8.10(^c)</td>
</tr>
<tr>
<td>Internal negative (IN)</td>
<td>(-0.60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 MUIS-C × IN</td>
<td>(-0.14)</td>
<td>&lt;.01</td>
<td>0.11</td>
</tr>
<tr>
<td>3 Illness uncertainty (MUIS-C)</td>
<td>3.37(^c)</td>
<td>0.35</td>
<td>12.08(^d)</td>
</tr>
<tr>
<td>Stable negative (SN)</td>
<td>3.33(^c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 MUIS-C × SN</td>
<td>(-1.06)</td>
<td>0.01</td>
<td>0.85</td>
</tr>
<tr>
<td>3 Illness uncertainty (MUIS-C)</td>
<td>3.10(^c)</td>
<td>0.40</td>
<td>15.18(^d)</td>
</tr>
<tr>
<td>Global negative (GN)</td>
<td>2.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 MUIS-C × GN</td>
<td>2.23(^b)</td>
<td>0.06</td>
<td>4.96(^b)</td>
</tr>
</tbody>
</table>

\(^a\)Steps 1 and 2 were the same in all three regression equations and are shown only once.
\(^b\)\( p < .04.\)
\(^c\)\( p < .01.\)
\(^d\)\( p < .001.\)

significant. Results of Equation 3 demonstrated that the interaction of MUIS-C and GN attributions accounted for a significant 6% increase in incremental variance in psychological adjustment, \( F_{\text{change}} = 4.96, p < .04.\) The positive \( t \) value for the MUIS-C × GN interaction term indicated that global negative attributions were more closely associated with increased levels of psychological distress under conditions of increased illness uncertainty. Neither MUIS-C × IN nor MUIS-C × SN interactions contributed significant additional variance to psychological adjustment.

DISCUSSION

The present study examined the influence of illness uncertainty and causal attributions on psychological adjustment in a group of older adolescents and young adults with histories of childhood asthma. Results indicate that both greater illness uncertainty and increased stable attributions for negative events had independent effects on poorer adjustment, controlling for demographic and disease variables. These independent effects suggest parallel mechanisms by which cognitive appraisals potentially influence psychological adjustment. Al-
though speculative, it may be that the intermittent nature of asthma fosters a sense of increased perceived illness uncertainty for important events, such as asthma management. Over time, uncertainty becomes associated with aversive outcomes (i.e., poorer disease control) and subsequent increases in emotional distress. Repeated exposure to uncontrollable aspects of asthma may also engender an overall pessimistic cognitive style whereby the individual comes to expect negative outcomes for a variety of events and perceives these untoward outcomes as inevitable or irreversible (i.e., stable causal attributions). Thus, our data may indicate that both uncertainty about the illness (e.g., Mullins et al., 1995) and certainty for future negative outcomes (e.g., Andersen & Lyon, 1987) contribute to poorer psychological adjustment in adults with asthma.

Additional analyses reveal a significant interaction between global negative attributions and illness uncertainty, indicating that uncertainty moderated the observed attribution–adjustment relationship. Thus, perceived illness uncertainty accentuated the untoward influence of pessimistic causal attributions on adjustment; decreased illness uncertainty attenuated these effects. These findings provide initial support for a cognitive diathesis-stress view of adjustment in adult asthma in which causal attributions for negative events contribute to psychological distress when individuals encounter proximal stressors in their environment, such as illness uncertainty (see Metalsky & Joiner, 1992).

The present results are consistent with previous studies indicating that both children and adults with asthma are at increased risk for experiencing problems with psychological adjustment (e.g., Badoux & Levy, 1994; Bennett, 1994). Our findings also suggest that psychosocial services for the management of asthma need to be extended well beyond childhood and early adolescence (e.g., Jolicoeur et al., 1994). Indeed, research suggests that the lack of asthma education and training received by most college students is largely responsible for disease-related difficulties they experience, such as increased hospitalization, interference with activities, and excessive school/work absences (Friday & Fireman, 1988). Unfortunately, we can only speculate about the extent to which inadequate asthma information and training may have contributed to perceptions of asthma uncertainty and psychological adjustment in the present study.

Our findings are qualified by a number of methodological limitations. First, we included a limited sample of participants from a select population of adults (i.e., college students) with long-standing asthma. Thus, our results may reflect characteristics of relatively resilient individuals with asthma who have developed effective means of coping with their illness. Also, we did not employ measures that assess specific disease features, such as asthma type (e.g., seasonal, perennial) or severity. Although 92% of individuals in the sample were presently receiving medical treatment for their asthma, and all participants had been diagnosed prior to the age of 12, more detailed information about the nature or severity of participants’ disease course is unknown. Next, the lack of comparison
groups of healthy individuals or individuals with other chronic illnesses limits interpretation of our results. For example, it could be argued that because the demographic composition of the normative group (used to derive T scores) is dissimilar to our sample, the mean score and caseness comparisons made in the present study are suspect. Similarly, the relationships between cognitive appraisal and adjustment in the present study may not be specific to individuals with long-standing asthma and may reflect processes that are unrelated to chronic illness or hold true for a number of chronic medical conditions (e.g., Schoenherr, Brown, Baldwin, & Kaslow, 1992). Finally, our study is cross-sectional in nature and temporal relationships among variables are speculative. Although we offer a cognitive diathesis-stress interpretation for our findings, it is equally plausible that distressed individuals in our sample were simply more negative about their situation and this pessimistic outlook tainted perceptions of illness (i.e., uncertainty) and non-illness-related events (i.e., causal attributions). Future studies should examine cognitive appraisal–adjustment relationships longitudinally to discern the nature of these relationships in long-standing asthma.

Certainly, these limitations preclude decisive conclusions about the data. However, experimental data recently collected in our laboratory may shed some light on the present findings. We have found that young adults with long-standing asthma demonstrate a greater susceptibility to the untoward effects of experimentally induced learned helplessness compared to their healthy peers (Chaney, Mullins, Uretsky, Pace, & Werden, 1996). Moreover, individuals with long-standing asthma were found to exhibit an unusual “depressive self-focusing style” (Pysczcynski & Greenberg, 1987, p. 106) following exposure to uncontrollable failure on an experimental task. Results of the present study, along with our preliminary experimental findings, suggest that persons with long-standing asthma may develop perceptions of illness uncertainty/controllability and adopt cognitive appraisal patterns that place them at risk for emotional adjustment problems. The intermittent and unpredictable nature of asthma appears to play a role in this process.

REFERENCES


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