Psychological Distress in High-Risk Youth With Asthma

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Objective: To examine the relationship between asthma and psychological distress among adolescents already at-risk for adjustment problems secondary to lower economic strata and educational or vocational failure.

Method: Twenty-five high-risk adolescents with asthma and 25 high-risk controls without asthma 16 to 21 years old completed the Brief Symptom Inventory, the Beck Depression Inventory, and the Beck Anxiety Inventory.

Results: Adolescents with asthma had significantly higher scores on multiple measures of psychological distress. Specifically, adolescents with asthma evidenced higher levels of anxiety, depression, and global psychological distress than those without asthma.

Conclusions: High-risk adolescents with asthma may be more likely to experience psychological distress than those without asthma. Our findings suggest that asthma constitutes an additional significant independent stressor or risk factor among adolescents who already are at high risk for multiple adjustment problems.

Key words: asthma; psychological distress; anxiety; depression; adolescents; income; minorities; risk factors.

Asthma is the most common chronic illness in the United States (Halfon & Newacheck, 1993). Asthma is a chronic inflammatory disorder of the airways resulting in recurrent episodes of wheezing, breathlessness, chest tightness, and cough (National Heart, Lung, and Blood Institute, 1997). Characterized by an intermittent and variable disease course, asthma symptoms may remit spontaneously or require intensive treatment (Creer & Bender, 1993, 1995). Approximately 4.8 million (6.9%) Americans under 18 years of age suffer from asthma (Centers for Disease Control and Prevention [CDC], 1996). Despite significant advances in the medical treatment of asthma, morbidity and mortality rates associated with pediatric asthma continue to rise (CDC, 1998).

Consistently, research has demonstrated that rates of asthma are higher among ethnic minority groups than among nonminority groups (Weitzman, Gortmaker, & Sobel, 1990). Prevalence rates of asthma are higher among African American children (CDC, 1996; Weitzman et al., 1990) and higher among Puerto Rican children than children from other minority groups (Carter-Pokras & Gergen, 1993). Not only is asthma more prevalent among minority populations, the negative consequences of the illness are more insidious. Morbidity and
mortality rates associated with asthma are higher among those in racial and ethnic minority groups than nonminority groups (Schwartz, Gold, Dockery, Weiss, & Speizer, 1990). The CDC (1996) reported that the annual death rate from asthma-related factors for individuals between 15 and 24 years of age was six times higher for African Americans than for Caucasians. Further, African Americans with asthma under 24 years of age are 3.4 times more likely to be hospitalized than Caucasians (CDC, 1996). Clearly, members of certain ethnic minority groups are at higher risk for asthma and asthma-related complications.

Members of low socioeconomic status (SES) groups also tend to be at higher risk for asthma and asthma-related complications. In general, low SES has been associated with a number of direct and indirect effects on health conditions, including asthma (Halfon & Newacheck, 1993), diabetes (Australander et al., 1990), and cardiovascular disease (Pickering, 1999). Specifically, low SES is associated with higher rates of asthma prevalence, morbidity, and mortality among minority children and adolescents (Evans, 1992; Weitzman et al., 1990). With regard to asthma, Halfon and Newacheck (1993) reviewed data from the National Health Interview Survey on Child Health, which indicated that poor children spent more days in bed per year, had 40% fewer planned doctors visits, and 40% more hospitalizations due to asthma than nonpoor children. Such negative consequences may in part result from the poor treatment adherence found in low-income children with asthma (Celano, Geller, Philips, & Ziman, 1998). Furthermore, a number of researchers have posited that differences observed between minority and nonminority groups in asthma may be due to the fact that a larger proportion of minorities are of low SES, which consequently restricts their access to health care and exposes them to more hazardous environments (Baum, Garofalo, & Yali, 1999).

The extant literature also indicates that children and adolescents with asthma, including those of minority and low SES status, are at a greater risk for psychological distress and adjustment problems than healthy children (Kashani, Koing, & Sheperd, 1988; MacLean, Perrin, Gortmaker, & Pierre, 1992) and children with other chronic illnesses (Bennett, 1994). Mullins and colleagues (1997) have hypothesized that increased psychological distress among children with asthma is due to the intermittent, unpredictable, and reversible nature of asthma symptoms. These characteristics contribute to variable expectations and significant uncertainty about the illness (Creer & Bender, 1995) and therefore may precipitate adjustment problems (Mullins et al., 1997). Studies have demonstrated that perceived uncertainty/unpredictability is reliably associated with emotional difficulties in individuals across multiple chronic medical conditions (Mast, 1995). Thus, illness uncertainty and unpredictability associated with asthma may contribute to long-term emotional adjustment problems (Mullins et al., 1997).

The psychological symptoms of children and adolescents with asthma typically include symptoms of depression (Bennett, 1994; Chaney, Mullins, Uretsky, & Pace, 1999; Gizynski & Shapiro, 1990; Nelms, 1989; Seigel, Golden, Gough, Lashley, & Sacker, 1990) and anxiety (Bussing & Burket, 1993; Bussing, Burket, & Kelleher, 1996; Celano & Geller, 1993; MacLean et al., 1992; Vila, Nollet-Clemencon, de Blic, Mouren-Simeoni, & Scheinmann, 2000). Among children and adolescents, asthma has been associated with behavioral and school-related problems, social competency problems, and lower self-esteem (Hambly, Brazil, Furrow, & Chua, 1989). Further, children with asthma are at higher risk for problems with academic achievement than their peers without asthma (Thompson & Gustafson, 1996). Indeed, the relationship of asthma to academic, medical, and psychosocial adjustment problems persists well into later adolescence and adulthood (Chaney et al., 1999; Jolicoeur, Boyer, Reeder, & Turner, 1994; Mullins et al., 1997).

Yet, regardless of health status, low SES has been associated with internalizing (Duncan, Brooks-Gunn, & Klebanov, 1994; McLeod & Shanahan, 1993; Pagani, Boulerice, & Tremblay, 1997) and externalizing problems (McLeod & Shanahan, 1993; Pagani et al., 1997), as well as poor academic functioning, decreased preschool ability, lower test scores in later childhood, school failure, school disengagement, and dropping out of school (Brooks-Gunn, Guo, & Furstenberg, 1993; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Guo, Brooks-Gunn, & Harris, 1996). Likewise, some minority groups are at higher risk for experiencing psychological distress than nonminority groups regardless of health status or SES (Kessler & Neighbors, 1986). Quite possibly, individuals who are members of an ethnic minority group or of low SES and have asthma may experience more psychological distress and lower levels of
adolescents with asthma would be at greater risk of evidencing negative emotional states and the development of psychological distress than those without asthma. Therefore, we predicted that “high-risk” adolescents with asthma would demonstrate higher rates of distress than “high-risk” adolescents without asthma on specific measures of anxiety and depression and a global measure of psychological distress.

**Method**

**Participants**

Fifty adolescents, including 25 with asthma and 25 matched controls without asthma, were recruited from a Job Corps facility in the midwestern United States. Job Corps is a comprehensive residential education and job-training program for high-risk youths between 16 and 24 years of age. Job Corps serves as an alternative training opportunity for young people who have experienced problems in traditional educational or vocational systems, dropped out of high school, or are experiencing problems with career goals. Eligibility for entry into Job Corps is dependent on adolescents being of low income (below state poverty criteria) and either (1) a school dropout, (2) in need of additional educational or vocational training, or (3) in need of intensive career counseling and assistance in order to participate successfully in regular schoolwork or to secure and hold employment (Job Corps, 2000).

The participants (26 girls, 24 boys) had an average age of 18.5 years. Participants in the sample identified themselves as African American (52%), Caucasian (36%), Hispanic (8%), and Native American (4%). Highest level of education completed, obtained via self-report, was as follows: eighth grade (4%), ninth grade (24%), tenth grade (30%), eleventh grade (24%), twelfth grade (16%), and general equivalency diploma (2%).

**Measures**

*The Beck Depression Inventory II* (BDI; Beck, Steer, & Brown, 1996). The BDI is a 21-item self-report measure used to assess depressive symptomatology in individuals 13 years and older. For each item, a respondent chooses one of four descriptive statements regarding their thoughts, feelings, and functional status over the past 2 weeks. Each state-
ment represents a 4-point scale, ranging from 0 to 3 in terms of severity. An overall BDI score is obtained by summing the ratings of the 21 items, (range = 0–63). As a screening instrument for depression, BDI scores fall into four categories: 0–13 = “minimal depression,” 14–19 = “mild depression,” 20–28 = “moderate depression,” and 29–63 = “severe depression.” The BDI has high internal consistency (r = .92) and high test-retest reliability (r = .93) (Beck et al., 1996). Internal consistency for the BDI in this sample is high (α = .91).

The Beck Anxiety Inventory (BAI; Beck & Steer, 1993). The BAI is a 21-item self-report measure used to assess anxiety in adolescents and adults. For each item, a respondent rates anxiety symptoms during the past week on a 4-point scale ranging from 0 (“not at all”) to 3 (“severely, I could barely stand it”). An overall BAI score is obtained by summing the ratings of the 21 items, (range = 0–63). As a screening instrument for anxiety, BAI scores fall into four categories: 0–7 = “minimal anxiety,” 8–15 = “mild anxiety,” 16–25 = “moderate anxiety,” and 26–63 = “severe anxiety.” The BAI has high internal consistency (r = .92) and adequate test-retest reliability (r = .75) (Beck & Steer, 1993). Internal consistency for the BAI in the present sample is high (α = .89).

The Brief Symptom Inventory (BSI; Derogatis, 1993.) The BSI is an abbreviated 53-item version of the Symptom Checklist-90-Revised that assesses nine clinical dimensions of psychological distress. Respondents rate the perceived severity of a number of psychological and physical symptoms experienced during the previous 7 days on a 5-point scale ranging from 0 (“not at all”) to 4 (“extremely”). The measure also yields a Global Severity Index (GSI), which can be used to assess overall distress. Raw scores on the nine clinical subscales and the GSI were converted to T scores using nonpatient adolescent norms. These scores were also used to compute caseness criteria, a clinical index of distress, defined by a T score ≥ 63 on the GSI or a T score ≥ 63 on two or more BSI subscales. The BSI has adequate internal consistency (rs = .71–.85) and test-retest reliability (rs = .68–.91).

Procedure

All new residential trainees entering the Job Corps facility over a 4-month period were invited to participate in the study during their third week on campus. Because adolescents sometimes have initial difficulty making the transition from home to Job Corps, the third week on campus was chosen for data collection. Data collection took place in a classroom setting, the same time and day each week. If trainees were absent on the day they were eligible to participate, they were recruited the following week. Because Job Corps serves as legal guardian for trainees who are minors (less than 18 years of age) while they are enrolled in the program, the Job Corps Center Director was able to give consent for minors to participate. Minors signed assent forms if they chose to participate, and those 18 years or older signed consent forms. Consent/assent forms were completed by trainees after the primary investigator reviewed the purposes of the project. After participants had signed consent/assent forms, questionnaire packets were distributed. Trainees who participated received a “Positive Event Report,” which was used to gain additional privileges on campus. All procedures were in keeping with standards established by the university institutional review board (IRB) and the American Psychological Association (APA).

Design

Two hundred twenty-one adolescents (80%) initially completed questionnaires, with 55 individuals (20%) declining to participate. Of the 221 adolescents who completed questionnaires, 5 failed to complete the chronic illness section, resulting in a total sample of 216. Twenty-five adolescents between the ages of 16 and 21 (11%) self-reported they had been diagnosed with asthma. The 25 participants with asthma were matched with 25 of the 191 adolescents without asthma on gender and race. Additionally, participants were matched with respect to age (within 16 months) and highest level of education completed (within 1 year).

Results

Preliminary Analyses

Preliminary analyses were first conducted to identify the relationship of demographic variables (age, race, gender, and education) to measures of psychological distress. No significant correlations were found between demographic variables and adjustment variables (see Table I). Because adolescents with asthma were matched with controls without
asthma on age, race, gender, and education, there were no between-group differences on these variables.

**Primary Analyses**

A multivariate analysis of variance (MANOVA) was conducted to examine mean differences in depression, anxiety, and global distress between high-risk adolescents with asthma and controls without asthma (see Table II). The MANOVA identified significant differences on all dimensions of distress: depression, \( F(1, 48) = 13.2, p < .001 \); anxiety, \( F(1, 48) = 5.8, p < .05 \); and global distress, \( F(1, 48) = 7.6, p < .01 \). Thus, high-risk adolescents with asthma had significantly higher scores across all three measures of distress than high-risk adolescents without asthma.

Although statistically significant, the finding of mean differences did not fully address the issue of clinically significant differences between high-risk adolescents with asthma and high-risk adolescents without asthma. Therefore, examination of BDI and BAI severity categories and BSI caseness criteria was conducted. Examination of BDI depression severity categories indicated that 32% of adolescents with asthma fell into the “moderate” and “severe” depression categories, compared with 8% of adolescents without asthma (see Figure 1). Examination of BAI anxiety severity categories indicated that 32% of adolescents with asthma fell into the “moderate” and “severe” anxiety categories, compared with 24% of adolescents without asthma (see Figure 1). These results indicate that both groups of adolescents endorsed relatively high levels of distress. Chi-square analyses of BDI and BAI severity categories resulted in BDI (\( \chi^2 [3, N = 50] = 7.75, p = .051 \)) and BAI (\( \chi^2 [3, N = 50] = 9.20, p < .05 \)), thereby indicating that high-risk adolescents with asthma were more likely to fall into more severe categories. Additionally, analyses of adolescents BSI-GSI T-scores indicated that 20 adolescents (80%) with asthma and 14 adolescents (56%) without asthma met caseness criteria on the BSI-GSI (\( \chi^2 [1, N = 50] = 3.31, p = .069 \)). Based on severity cutoff scores, high-risk adolescents with asthma tended to endorse higher levels of clinical severity than high-risk adolescents without asthma, with significant differences occurring for BAI severity and differences in BDI and BSI severity approaching significance.

**Discussion**

In this study, high-risk adolescents with asthma had significantly higher scores on multiple measures of distress than a matched sample of adolescents without asthma. Specifically, adolescents with asthma

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**Table I.** Zero-Order Correlations Among Study Variables

<table>
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<th>Measure</th>
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<td>5. Caucasian</td>
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<td>.113</td>
<td>—.192</td>
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<td>6. Hispanic</td>
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<td>7. Native American</td>
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<td>—.153</td>
<td>—.060</td>
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<td>8. BSI-GSI</td>
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<td>—.177</td>
<td>—.148</td>
<td>—.208</td>
<td>.151</td>
<td>.181</td>
<td>—.086</td>
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<td>9. BDI</td>
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<td>—.088</td>
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<td>.254</td>
<td>—.024</td>
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<td>10. BAI</td>
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<td>.153</td>
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**Table II.** MANOVA Results

<table>
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<th>Variable</th>
<th>Control</th>
<th>Asthma</th>
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<tbody>
<tr>
<td>Variable</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>BSI-GSI</td>
<td>0.67</td>
<td>0.63</td>
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<tr>
<td>BDI</td>
<td>6.53</td>
<td>6.48</td>
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<tr>
<td>BAI</td>
<td>7.44</td>
<td>8.81</td>
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BSI-GSI = Brief Symptom Inventory, Global Severity Index; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.  
*\( p < .05 \)  
**\( p < .01 \)
had significantly higher scores on measures of anxiety, depressive symptomatology, and global distress. Our results also indicated that both high-risk adolescents with and without asthma report relatively high levels of distress. Specifically, adolescents from low-income strata with academic and vocational difficulties endorsed relatively high levels of both anxiety and depressive symptomatology and overall distress. However, our examination of both means and severity cutoffs suggests that statistically and clinically relevant differences exist between high-risk adolescents with and without asthma. Although both groups endorsed high levels of distress, high-risk adolescents with asthma were more likely to be in the clinical range across all three measures of distress. Our results are consistent with most other studies of high-risk youth suggesting that low SES and academic/vocational difficulties constitute risk factors for adjustment problems; however, our findings suggest that asthma status serves as an additional risk factor in terms of psychological adjustment.

Such findings are of particular concern, given that asthma prevalence, morbidity, and mortality rates among minority and low SES populations are higher than those for nonminority and higher SES populations with asthma (CDC, 1996; Evans, 1992). Specifically, minority and low SES adolescents lack access to both mental and physical health care resources (Baum et al., 1999), potentially decreasing opportunity for routine medical care and decreasing adherence (Celano et al., 1998). Furthermore, these adolescents often lack access to supportive family environments, which can potentially serve as a protective factor in the asthma-distress relationship (e.g., Markson & Fiese, 2000). In addition, these adolescents are more likely to be susceptible to other risk factors such as poor academic functioning, further placing them at risk for poor adjustment (Duncan et al., 1998; Guo et al., 1996). Therefore, adolescents with asthma from minority and low SES populations constitute a group that must manage the additional stressor of a chronic illness, potentially influencing medical, developmental, and psychological outcomes (Thompson, Gustafson, Hamlett, & Spock, 1992).

Our findings need to be considered in light of several limitations. First, our assessment of subjects’ health status was solely based on self-report. Because of this, we were not able to control for illness-related variables such as duration and severity of illness. Second, the outcome measures assessed psychological distress and did not assess mediating or moderating variables that could help us understand the mechanisms through which asthma causes psychological distress (i.e., mediators) or factors that strengthen or weaken the asthma-distress relationship (i.e., moderators). Nor can we determine the direction of causality. It is unclear from our findings whether asthma acts as a stressor that increases risk.
of psychological distress or whether greater psychological distress exacerbates asthma symptoms. Additionally, our sole reliance on self-report measures precludes independent verification of adolescents’ distress and levels of functional adaptation.

Despite these limitations, we believe that this study has several methodological strengths. First, by matching subjects on age, gender, education, and ethnicity, we were able to minimize the probability that an uncontrolled variable accounted for the observed differences between adolescents with asthma and controls without asthma, although matching cannot ensure that all third variables are controlled. Second, instead of controlling for SES statistically, all participants met state poverty criteria, thus demonstrating a measure of equivalence across all participants in regard to SES. Furthermore, the study is the first to empirically examine whether having a chronic illness, such as asthma, serves as an additional risk factor in a population already at high risk.

These findings hold important implications for the mental and physical health of high-risk adolescents with asthma. Clearly, high-risk adolescents with asthma in this sample are more likely to experience distress than those without asthma. This is consistent with the hypothesis that the intermittent and unpredictable nature of asthma symptoms contributes to distress. Reciprocally, increased distress potentially exacerbates asthma symptoms and impedes regimen adherence, resulting in decreased overall health. Additionally, the results of this study indicate that health care providers should be aware that asthma itself may be a major contributor to levels of psychological distress above and beyond the presence of multiple psychological risk factors. Therefore, screening high-risk adolescents with asthma on a regular basis for psychological distress would increase the likelihood that those experiencing distress are identified and provided with the appropriate medical and psychological services.

By recognizing and treating psychological distress, we can minimize the potential interference of psychological symptoms with asthma care and health care utilization.

These findings highlight the need for further investigation in a number of areas. Since adolescents with asthma appear to be at risk for increased levels of distress, examination of cognitive variables (e.g., appraisal of illness-related events and cognitive coping strategies) that might distinguish high-risk adolescents with asthma from those without is needed (Mullins et al., 1997). Indeed, few studies have examined potential differences in cognitive appraisal processes and coping strategies employed by ethnic minority group and nonminority groups (Leonetti, 1997). Identification of cognitive appraisal and coping strategies may also inform clinicians regarding forms of intervention. Further investigation of potential mediating and moderating variables is needed to identify the mechanisms influencing the relationship between asthma and distress. Finally, if asthma constitutes an additional risk factor for distress, the relationship of other illnesses to ethnicity and low SES should be investigated. We cannot assume that disease status is necessarily an additional risk factor across other types of illnesses in high-risk youth.

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