



## The role of panic-fear in comorbid asthma and panic disorder

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### ABSTRACT

We examined mediational models of panic-fear, panic disorder (PD), and asthma outcomes among adult asthma patients. PD was assessed by the Anxiety Disorders Interview Schedule. Twenty-one asthma-PD patients and 27 asthma-only patients completed spirometry and questionnaires. Asthma-PD patients reported greater illness-specific and generalized panic-fear than asthma-only patients, despite no differences in asthma severity or physical symptoms during asthma attacks. Illness-specific panic-fear mediated the relationship between PD and poorer health-related quality of life, including emotional disturbance due to asthma. Illness-specific panic-fear was associated with more primary care office visits for asthma. Asthma-PD patients reported greater irritability during asthma attacks than asthma-only patients. Generalized panic-fear was directly associated with restriction of activities due to asthma and use of rescue medication for asthma. Neither measure of panic-fear was associated with asthma severity. Panic-fear experienced during asthma attacks may be an important area to target for improving health-related quality of life among asthma-PD patients.

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### 1. Introduction

Panic-fear has been established as a risk factor for greater asthma morbidity, independent of objective measures of pulmonary function (Dirks, Fross, & Evans, 1977; Dirks, Horton, Kinsman, Fross, & Jones, 1978; Dirks, Kinsman, et al., 1977; Dirks, Kinsman, Horton, Fross, & Jones, 1978; Dirks, Schraa, Brown, & Kinsman, 1980; Kleiger & Dirks, 1979). Most of this research was conducted in the 1970s on inpatients with asthma at National Jewish Medical and Research Center. Two types of panic-fear have been identified with each having a unique association with asthma morbidity. Illness-specific panic-fear refers to anxiety elicited in response to asthma symptoms. Generalized panic-fear is a stable, personality construct that reflects trait anxiety extending beyond asthma symptoms. Illness-specific panic-fear has been shown to be adaptive for asthma and the mechanism might involve vigilance to asthma symptoms (Kinsman, Dirks, Jones, & Dahlem, 1980). Patients with high illness-specific panic-

fear were rehospitalized for asthma half as frequently within 6 months after discharge, compared with patients having low illness-specific panic-fear (Staudenmayer, Kinsman, Dirks, Spector, & Wangaard, 1979). Low illness-specific panic-fear was also a robust predictor of future asthma attacks and emergency health care use among patients who suffered a recent asthma attack (Greaves, Eiser, Seamark, & Halpin, 2002). Earlier research suggested that high illness-specific panic-fear was associated with overuse of PRN (i.e., as-needed)  $\beta_2$ -agonist medications for asthma (Dahlem, Kinsman, & Horton, 1977). However, subsequent analyses of these data (Kinsman, Dirks, Jones, & Dahlem, 1980) and other research (Dirks, Fross, et al., 1977; Dirks, Jones, & Kinsman, 1977) have shown that high generalized panic-fear explains more variance than high illness-specific panic-fear in these maladaptive health outcomes. Kinsman, Dirks, and Jones (1982) concluded that high illness-specific panic-fear might mobilize the patient to carry out asthma self-management plans among patients with only moderate levels of generalized panic-fear. However, patients with high levels of both types of panic-fear are the most likely to panic during asthma attacks, use excessive asthma medications, and hyperventilate (Kinsman, Dirks, & Dahlem, 1980; Kinsman, Dirks, & Jones, 1980).

Both high and low levels of generalized panic-fear have been linked to greater asthma morbidity. High levels of generalized panic-fear have been associated with overuse of PRN  $\beta_2$ -agonist

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medications (Kinsman, Dirks, & Dahlem, 1980), stronger prescriptions of corticosteroids (Dirks, Horton, et al., 1978), longer hospitalizations (Dirks, Kinsman et al., 1977), and more frequent hospital readmissions for asthma (Dirks et al., 1980). The dependent and helpless nature of patients with high generalized panic-fear has been hypothesized as being particularly detrimental for asthma self-management (Kinsman, Dirks, Jones, & Dahlem, 1980). In contrast, the excessively independent nature characterized by low generalized panic-fear may result in failure to seek appropriate medical assistance for asthma. Low levels of generalized panic-fear have predicted high rates of rehospitalization (Dirks, Kinsman, et al., 1978) and underutilization of asthma medications (Kleiger & Dirks, 1979). All of these findings on panic-fear were independent of objective measures of asthma severity.

More recently, attention in the asthma field has shifted toward panic disorder (PD). A growing body of clinical (Brown, Khan, & Mahadi, 2000; Carr, Lehrer, & Hochron, 1992; Carr, Lehrer, Rausch, & Hochron, 1994; Davis, Ross, & MacDonald, 2002; Lavoie et al., 2005; Nascimento et al., 2002; Shavitt, Gentil, & Mandetta, 1992; Yellowlees, Haynes, Potts, & Ruffin, 1988) and community studies (Goodwin, Jacobi, & Thefeld, 2003; Hasler et al., 2005) have shown that there is significant comorbidity between asthma and PD. A 20-year longitudinal, community-based study showed that adults with asthma were 4½ times more likely to develop PD than adults without asthma (Hasler et al., 2005). Conversely, PD was also associated with subsequent asthma morbidity. Data on an overlapping sample of participants from the present study showed that asthma patients with PD (asthma-PD) had greater perceived impairment from asthma and health care utilization for asthma than patients without asthma (Feldman, Lehrer, Borson, Hallstrand, & Siddique, 2005). No differences were found on asthma severity. Models have been proposed addressing hypothesized mediators in this relationship between PD and adverse asthma outcomes (Feldman, Giardino, & Lehrer, 2000; Katon, Richardson, Lozano, & McCauley, 2004). However, there has been a gap in the literature addressing empirical support for these proposed mechanisms (Katon et al., 2004).

The overarching goal of the present study was to bridge the gap in the asthma literature between panic-fear and PD by examining these anxiety constructs in the same sample of patients. The construct of health-related quality of life was never examined in the original panic-fear studies. Furthermore, illness-specific and generalized panic-fear have not been examined in asthma-PD patients. Although illness-specific panic-fear may be adaptive for some asthma outcome measures, high levels of anxiety focused on asthma may drive excessive worry between episodes and impair health-related quality of life among PD patients. We hypothesized that asthma-PD patients would report greater illness-specific and generalized panic-fear than asthma patients without PD (asthma-only). We also hypothesized that the previously reported link between PD and health-related quality of life (Feldman, Lehrer, et al., 2005) would be mediated by illness-specific panic-fear. Although this study includes a reanalysis of data previously reported (Feldman, Lehrer et al., 2005), we have not reported analyses on panic-fear data.

## 2. Methods

### 2.1. Subjects

Patients with asthma were recruited from primary care and specialized asthma clinics, newspaper advertisements, and flyers in the community (see Feldman, Lehrer et al., 2005 for criteria for asthma diagnosis). Inclusion criteria also required a diagnosis of PD at least 12 months prior to the testing session in order to coincide

with the minimum duration of asthma and the dependent variable of health care use. Exclusion criteria were emphysema or any non-asthma respiratory disease, heart disease, stroke, neurological disorder, cancer, or organ transplant; bipolar disorder, alcohol/substance dependence, or psychosis; mental retardation, inability to read English, and pregnancy. Informed consent was obtained and the study was approved by institutional review boards.

### 2.2. Measures

The Autonomic Nervous System Questionnaire (Stein et al., 1999) and the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999) were administered to asthma patients in clinic waiting rooms as an initial screen for targeting patients with PD for the purposes of over-sampling.

The Anxiety Disorders Interview Schedule (ADIS-IV) is a semi-structured psychological interview (Brown, Di Nardo, & Barlow, 1994) that was administered to all patients to establish psychiatric diagnoses using DSM-IV criteria (American Psychiatric Association, 2000). Furthermore, interviewers followed guidelines to carefully differentiate between asthma and PD to ensure accurate diagnoses (Feldman et al., 2000). For example, symptoms of wheezing, mucus production, and coughing characterize asthma (Schmaling & Bell, 1997). Panic attacks are more likely to have a rapid onset (i.e., peak of symptoms within 10 min) and shorter overall duration. Interviewers also focused on assessment of triggers, situations where attacks occurred, and whether panic occurred exclusively within the context of asthma exacerbation. Advanced graduate students conducted these interviews under the supervision of a licensed clinical psychologist and psychiatrist.

The Asthma Quality of Life Questionnaire (AQLQ), a 32-item scale, was used to measure functional impairment due to asthma during the past week across the following domains: emotions, activity limitation, and asthma symptoms (Juniper, Guyatt, Ferrie, & Griffith, 1993). Numerous studies have demonstrated that the AQLQ is a well-validated instrument for assessment of health-related quality of life in asthma (Juniper et al., 1993; Juniper, Norman, Cox, & Roberts, 2001; Leidy & Coughlin, 1998; Sanjuas et al., 2002). Lower scores on the AQLQ indicate poorer health-related quality of life.

The Asthma Symptom Checklist (ASC) was used to assess illness-specific panic-fear experienced during asthma attacks, in addition to irritability, fatigue, hyperventilation, and bronchoconstriction (Brooks et al., 1989; Kinsman, Luparello, O'Banion, & Spector, 1973). The panic-fear subscale of the Minnesota Multiphasic Personality Inventory (MMPI) was used to assess generalized panic-fear (Dirks, Jones, et al., 1977). Both the ASC and MMPI were the measures used in the earlier panic-fear studies and both have excellent reliability and validity (Brooks et al., 1989; Dirks, Jones, et al., 1977; Kinsman et al., 1973).

Health care utilization was assessed via medical chart review to determine the number of primary care office visits for asthma during the past 12 months. The chart review was conducted by a research assistant, who was blind to patients' levels of panic-fear and the hypotheses of the study. An office visit was coded as asthma-related if progress notes indicated that asthma symptoms or medications were discussed, or if pulmonary function testing was conducted.

Asthma severity classification was based on National Heart Lung and Blood Institute (NHLBI) guidelines (NHLBI, 1997, 2002). Spirometry was conducted using American Thoracic Society (1995) standards to obtain %FEV<sub>1</sub>, which is recommended for assessment of pulmonary function (NHLBI, 1997, 2002). Asthma medication and symptom severity were categorized using NHLBI guidelines and based on patients' self-report. Mild intermittent and persistent

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