Concerns about Physical Symptoms are Associated with Overuse of Health Care and Short-acting Medication Among Individuals with Asthma

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INTRODUCTION

- The physical concerns facet of anxiety sensitivity (AS-P) describes the fear of anxious arousal (e.g., breathlessness = suffocation) and is associated with worse asthma symptom severity above smoking status, negative affect, and asthma control.
- Anxious arousal in respiratory conditions associated with ↑ health care use, including emergency department (ED) visits, hospitalizations, and overuse of short-acting inhalers.
- ↑ health care use → worse perceived asthma symptom severity and substantial economic burden.
- We **hypothesized** heightened AS-P would be associated with ED visits, hospitalizations, and overuse of short-acting medication, above established risk factors.

METHOD

- Adults (N = 447; M_{age} = 45.71; 52.6% White) with asthma (51.5%) or asthma and COPD (48.5%) completed an online battery of questionnaires.
- The primary hypothesis was tested using a series of hierarchical multiple logistic regressions.

RESULTS

- Past-year health care use was common: ED visits (29.0%), hospitalizations (20.8%), overuse of short-acting inhalers (37.1%)
- The likelihood of each health care use outcome was increased by AS-P (see Tables 1-3).

DISCUSSION

- Results suggest AS-P is an important risk factor for overutilization of costly acute medical care and short-acting medication among those with asthma.
- CBT is effective for improving anxiety symptoms and asthma quality of life; yet, interventions could be improved by targeting asthma-specific processes.
  - Addressing maladaptive concerns (e.g., breathlessness) directly may improve treatment efficacy and asthma outcomes, reducing burden on the individual and health care system.

After accounting for health status and perceived stress, **physical concerns of anxiety sensitivity** increases the likelihood of **emergency department visits**, **hospitalizations**, and **overuse of inhalers** among adults with **asthma**.

Table 1. Hierarchical logistic regression examining predictors of emergency department visits

Predictor	X^2	*AOR*	*p*	*95% CI*
Step 1	**47.103**		**< .001**	
Health insurance		0.764	.411	0.401-1.453
Smoking status		2.703	< .001	1.896-3.853
Perceived stress		1.395	.005	1.108-1.757
Step 2	**93.012**		**< .001**	
Health insurance		0.728	.356	0.370-1.429
Smoking status		2.160	< .001	1.491-3.127
Perceived stress		1.104	.439	0.859-1.419
AS-P		1.108	< .001	1.074-1.150

Table 2. Hierarchical logistic regression examining predictors of hospitalizations

Predictor	X^2	*AOR*	*p*	*95% CI*
Step 1	**42.854**		**< .001**	
Health insurance		1.332	.482	0.598-2.967
Smoking status		3.278	< .001	2.158-4.981
Perceived stress		1.322	.036	1.019-1.716
Step 2	**81.909**		**< .001**	
Health insurance		1.356	.473	0.590-3.113
Smoking status		2.605	< .001	1.688-4.021
Perceived stress		1.035	.812	.779-1.376
AS-P		1.111	< .001	1.074-1.150

Table 3. Hierarchical logistic regression examining predictors of overuse of short-acting inhalers

Predictor	X^2	*AOR*	*p*	*95% CI*
Step 1	**81.858**		**< .001**	
Health insurance		1.035	.930	0.483-2.218
Smoking status		4.377	< .001	2.902-6.602
Perceived stress		1.782	< .001	1.357-2.341
Step 2	**136.634**		**< .001**	
Health insurance		1.092	.832	0.484-2.466
Smoking status		3.703	< .001	2.401-5.710
Perceived stress		1.356	.046	1.006-1.827
AS-P		1.134	< .001	1.095-1.175

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Background: Anxiety sensitivity (AS) is a well-established transdiagnostic risk factor for psychological disorders and chronic medical conditions (Horenstein et al., 2018). In particular, studies have demonstrated concerns about the physical consequences of anxiety-like symptoms (i.e., AS physical concerns [AS-P]) are associated with worse asthma symptom severity, over and above known risk factors such as smoking status, negative affect, and asthma control (Avallone et al., 2011; McLeish et al., 2011). Importantly, anxious arousal in individuals with respiratory conditions contributes to increased use of healthcare services including overuse of short-acting inhalers (Gerald et al., 2015), worse control of respiratory symptoms (Baiardini et al., 2015), and respiratory-related emergency department visits and hospitalizations (Kullowatz et al., 2007). Alarmingly, these factors counterintuitively contribute to worse perceived symptom severity and quality of life (Feldman et al., 2005), and substantially increase economic burden on the healthcare system (Ivanova et al., 2012). Elucidating the role of AS-P over and above known vulnerabilities in asthma-related outcomes has the potential to inform the use of brief targeted interventions for AS (e.g., Keough & Schmidt, 2012). We predicted heightened levels of AS-P would be associated with emergency department visits, hospitalizations, and overuse of short-acting medication, after controlling for known risk factors in a sample of adults with asthma.

Method: Participants were a diverse sample of 447 U.S. adults (M_{age} = 45.71; 57.5% female; 52.6% White, 26.4% Black; 27.1% Latinx) with asthma (51.5%) or asthma and COPD (48.5%). Participants completed an online battery of self-report questionnaires including demographics, short-acting inhaler overuse, healthcare utilization, and AS. A series of logistic regressions, with control variables in Step 1 and AS-P in Step 2, were conducted to examine each outcome.

Results: Regarding healthcare utilization, 20.8% reported past-year hospitalization, 29.0% presented to the emergency department, and 37.1% of participants reported overuse of short-acting inhalers. After controlling for perceived stress, health insurance, and smoking status, higher levels of AS-P significantly increased the likelihood of emergency department visits (AOR = 1.11, 95%CI [1.07, 1.15]), hospitalizations (AOR = 1.12, 95%CI [1.08, 1.17]), and overuse of short-acting medication (AOR = 1.12, 95%CI [1.08, 1.17]).

Discussion: Results underscore the importance of AS-P in overutilization of costly acute medical care and short-acting medication, above and beyond known risk factors. Although CBT is effective in reducing anxiety symptoms and improving asthma-related quality of life, prior research has indicated treatment should be modified to target processes specific to asthma (Deshmukh et al., 2007). Addressing maladaptive concerns related to physical symptoms of asthma, such as breathlessness (Williams et al., 2015), may be a key factor for improving treatment efficacy and asthma outcomes, and reducing the burden on the healthcare system.

Keywords: Health Psychology, Behavioral Medicine, Risk/Vulnerability Factors

Measures: Anxiety Sensitivity Index – 3; Asthma Control Test; Perceived Stress Scale

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