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Ethnic Differences in Somatic Symptom Reporting in Children With Asthma and Their Parents

JUAN C. VASQUEZ, B.A,

Bradley Hasbro Children's Research Center and the Warren Alpert Medical School of Brown University

GREGORY K. FRITZ, M.D,

Bradley Hasbro Children's Research Center and the Warren Alpert Medical School of Brown University

SHERYL J. KOPEL, M.Sc,

Bradley Hasbro Children's Research Center and the Warren Alpert Medical School of Brown University

RONALD SEIFER, Ph.D,

Bradley Hasbro Children's Research Center and the Warren Alpert Medical School of Brown University

ELIZABETH L. McQUAID, Ph.D, and

Bradley Hasbro Children's Research Center and the Warren Alpert Medical School of Brown University

GLORISA CANINO, Ph.D

University of Puerto Rico

Abstract

Objectives—The purpose of this study is to examine the association between child and parent somatic symptom reporting and pediatric asthma morbidity in Latino and non-Latino white children.

Method—The study consists of 786 children, 7 to 15 years of age, in Rhode Island (RI) and Puerto Rico. Children's and parents' levels of general somatic symptoms were assessed with well-established self-report measures. Clinician-determined asthma severity was based on reported medication use, asthma symptom history, and spirometry results. Asthma-related health care use and functional morbidity was obtained via parent self-report.

Results—Child and parent reports of general somatic symptoms were significantly related to pediatric asthma functional morbidity when controlling for poverty, parent education, child's age, and asthma severity. In controlling for covariates, Latino children in RI reported higher levels of somatic symptoms than Island Puerto Rican children, and RI Latino parents reported more somatic symptoms than RI non-Latino white parents ($p < .05$).

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Correspondence to Gregory Fritz, M.D., Department of Psychiatry, Bradley Hasbro Research Center, Coro West 2.155, 1 Hoppin Street, Providence, RI 02903; Gfritz@lifespan.org.

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Conclusions—This study replicates and extends to children in previous research showing higher levels of symptom reporting in Latinos relative to whites. Results also provide new insight into the relation between general somatic symptom reports and pediatric asthma. Ethnic differences in somatic symptom reporting may be an important factor underlying asthma disparities between Latino and non-Latino white children.

Keywords

asthma; health disparities; somatization

Somatization is a facet of psychosocial functioning that has not been studied in relation to cultural influences or differential health outcomes between Latino and non-Latino white (NLW) children. The prevalence of pediatric somatization disorder as diagnosed by the *DSM* criteria is low, yet the reporting of somatic symptoms with minimal or no physical illness seems to be a common finding in pediatric populations.^{1,2} For example, Garber et al.³ found that only 1.1% of children in their sample of 540 children met criteria for somatization disorder, whereas 15.2% reported at least four somatic symptoms. Fritz et al.¹ argued that the low frequency of somatization disorder in children and adolescents is likely due to the fact that the *DSM* criteria are based on adults. In nonchronically ill children, there are few data on the epidemiology of somatization, but one study found that minority status, having parents of lower education, and urban residence were associated with increased somatic symptom reporting.⁴

Children reporting more somatic symptoms, without an underlying chronic illness, have nonetheless been found to be at a higher risk for functional impairment, to experience greater use of health care services, and to have increased rates of school absenteeism.^{1,2,4,5} Examining a sample of 21,065 children with recurrent somatic complaints without organic etiology, Campo et al.⁴ found that 33.9% of children identified as somatizers via parental report met the criteria for frequent health care use in the previous 6 months compared with 11.5% of nonsomatizing children. However, most studies of childhood somatization^{4–6} have not included a medical assessment to definitively evaluate whether a child's somatic complaints are a result of an underlying physical illness. Further research is needed to differentiate "true" somatization (usually thought of as a tendency to experience and communicate somatic distress in response to psychosocial stress)⁷ from complaints stemming from actual medical illness.

Mental health professionals often deal with somatization in the context of a chronic medical illness in their work as consultants to pediatricians in a children's hospital. Asthma is the most common chronic pediatric illness in the United States.^{8,9} Epidemiological studies have shown that ethnic minorities, particularly Latino and African American children, have a disproportionately higher burden of disease when compared with NLW children.^{8–12} Numerous research efforts have been launched to study not only the underlying environmental, social, and systematic health care factors but also the psychosocial dynamics driving childhood asthma disparities.^{11,13,14}

Although there are no data specifically on the relation between somatization and asthma morbidity, children with asthma have been found to be at a higher risk for behavioral difficulties and psychological disturbances, such as comorbid anxiety and depressive disorders, when compared with children without asthma.^{14–18} Moreover, the presence of comorbid psychological disorders has been associated with increased childhood asthma morbidity and mortality.^{19–21}

When considering the influence of child somatic symptom reporting on health outcomes, it is important to remember that it is often a caregiver that makes health care decisions. Hence, information on both child and parent somatic symptom reporting will likely provide a more comprehensive understanding of the complex relation between somatic symptom reporting, health care use, and childhood asthma morbidity, although there is little research that tests this theory directly. In one study,²² children with asthma whose parents scored above the cutoff on the somatic subscale of the Brief Symptom Inventory²³ experienced 69% more asthma-related hospitalizations at a 9-month follow-up compared with children whose parents scored below the cutoff. Two studies by Livingston²⁴ and Livingston and colleagues²⁵ in nonasthmatic populations showed that children whose parents reported more somatic symptoms had significantly more psychiatric disorders, suicide attempts, unexplained somatic symptoms, visits to the emergency department (ED), and missed school than children of nonsomatic symptom-reporting parents. Taken together, the literature indicates that asthmatic children of caregivers with mental health problems such as depression and anxiety experience more hospitalizations, more ED visits, and greater asthma morbidity relative to other children.^{14,22,26,27}

The relation between somatic symptom reporting and sociodemographic characteristics is less clear. Some studies have shown increased somatic symptom reporting in adults with lower levels of education,^{28–31} lower income,^{28,32,33} and ethnic minority or nonwhite status.^{31,34–36} Although few studies have directly compared somatization rates between Latinos or Latino subgroups and NLWs,³⁷ there are data suggesting that Island Puerto Rican adults report more somatic symptoms than either NLWs or other Latino groups in the United States.^{36,38–41} Canino et al.⁴¹ found the prevalence of abridged somatization to be 19% in Puerto Rico (PR) compared with 11.6% in the United States.^{28,42} Conversely, Interian et al.⁴³ found no significant difference in Patient Health Questionnaire (PHQ-15) scores, a measure of somatic complaints, between Latinos and non-Latinos. No data exist regarding ethnic differences in children's somatic symptom reporting.

The purpose of this study was to investigate the relation between general (as opposed to asthma-specific) somatic symptom reporting and asthma outcomes in children with asthma and their parents. A second aim was to determine whether reporting of general somatic symptoms in children and their parents function differently in families from different cultural backgrounds in relation to asthma outcomes. We addressed five questions: What is the magnitude of congruence between child and parent somatic symptom reports, and do congruence levels vary as a function of ethnic background? Do children with asthma who report more general somatic symptoms have higher health care use and asthma functional morbidity? Do children of parents that report more somatic symptoms have more asthma health care use and functional morbidity? Do Latino children with asthma and their parents report more somatic symptoms than their NLW counterparts? Are there different patterns of association between somatic symptom reporting (child and parent) and asthma outcomes by ethnic background?

METHOD

Sample and Procedures

The data for this study were obtained as part of the Rhode Island–Puerto Rico Asthma Center study, which aimed to elucidate individual, family, and health care system factors underlying asthma disparities. A detailed discussion of the conceptual model and methods of the Rhode Island–Puerto Rico Asthma Center study appear elsewhere.⁴⁴ Subjects in this report were 786 children between 7 and 15 years of age diagnosed with asthma (403 Island Puerto Rican children, 383 Rhode Island [RI] children [148 NLW, 103 Puerto Rican, and 132 Dominican]) and their primary caregivers that were most often biological mothers

(95%) but were sometimes biological fathers (2%) or rarely other family members. Participants were recruited from primary care pediatric clinics, hospital-based ambulatory pediatric clinics, hospital-based asthma educational programs, schools, community events, and other grass-roots efforts. Institutional review boards at Rhode Island Hospital and the University of Puerto Rico approved the study.

Study questionnaires were administered by trained research assistants using protocols standardized between sites. All measures for which established Spanish translations were not available were translated and back-translated by a bilingual committee according to standard procedures.⁴⁵ Assessments were available in English or Spanish, according to respondents' choice.

For participants living in RI, at least one parent had to be of Puerto Rican or Dominican descent to be classified as Latino. In PR, all children and parents were Puerto Rican. *Socioeconomic status* was defined as falling above or below the U.S. federal poverty threshold as determined by per capita income level for different size households. Parental education was approximated by the mean level of education achieved by both parents or by the level of education achieved by the sole parent if no further information was available.

Measures

Child somatic symptom reporting was measured using the Child Somatization Inventory (CSI), a 35-item self-report measure of children's general somatic complaints.⁴⁶ Respondents indicated on a 5-point scale how often each of the 35 somatic symptoms, such as "headaches," was experienced in the previous 2 weeks. A CSI total score was calculated by summing the ratings, giving a possible range of 0 to 140, with higher scores indicating more frequent somatic symptoms. The CSI has been a valuable tool in the research of children's somatic complaints, with Cronbach internal consistency ranging from .90 to .94.^{3,46-49} There are three items in the CSI that are related to possible asthma symptoms (e.g., "Trouble getting your breath when you're not exercising"). To guard against artificially inflated scores in this sample of children with asthma, the CSI score was computed first with and then without including the three items. As the pattern of results did not change based on inclusion or exclusion of these items, for consistency with CSI data reported in other studies, we report results that include the full CSI scale.

Parent somatic symptom reporting was measured with the 15-Item Somatic Symptom Severity subscale of the Patient Health Questionnaire (PHQ-15).⁵⁰ Primary caretakers rated how much they had been bothered by 15 different somatic complaints during the previous 4 weeks, from 0 (not bothered at all) to 2 (bothered a lot). The PHQ-15 scores were derived by summing across items, with possible scores ranging from 0 to 30. The PHQ-15 scale has demonstrated adequate internal consistency (Cronbach $\alpha = .80$) in 2 separate large samples of adults in the United States.⁵⁰ The measure's validity (Cronbach $\alpha = .79$) has also been confirmed in Latinos.⁴³

Asthma severity was determined by study clinicians in RI and PR using Global Initiative for Asthma guidelines (2002) to rate the severity of each subject based on asthma symptom history in the previous 12 months, prealbuterol FEV₁, and prescribed asthma medications.⁵¹ Prebronchodilator FEV₁ was measured using the Koko pneumotachometer (nSpire Health, Longmont, Colo) following American Thoracic Society criteria.⁵²

Asthma functional morbidity was quantified with the Asthma Functional Severity Scale.⁵³ Items assess the functional limitation imposed by asthma in the previous 12 months, specifically frequency of asthma episodes, asthma symptoms between episodes, and intensity of impairment during and between episodes. The Asthma Functional Severity Scale

was initially validated in a large sample of Australian children with asthma⁵³ and has been shown to have adequate internal consistency with diverse demographic groups in the United States^{54,55} including NLWs and Latinos (Cronbach α 's = .72–.92).^{53,54}

Asthma-related limitation and health care use was obtained from parent-provided information about children's asthma-related missed school days, health care use, and ED visits in the previous 12 months.

Statistical Analysis

Congruence between child and parent somatic symptom scores (CSI and PHQ-15, respectively) was assessed using Fisher r to z transformations. The relations of child and parent somatic symptom scores to demographic and asthma-related variables were assessed using Pearson correlations for continuous variables and analyses of variance for categorical variables. Analyses of covariance were conducted to determine whether child/parent somatic symptom reports and ethnic background were independently related to asthma outcomes while controlling for asthma severity and covariates and whether ethnicity and somatic symptom reporting interacted to affect asthma outcomes. Pairwise comparisons of adjusted means were conducted with Bonferroni corrections for multiple tests. Statistical computations were performed with SPSS version 12.0. The significance level was set at .05 for all analyses.

RESULTS

Sample Descriptives

Table 1 contains summary statistics by ethnic group (island Puerto Rican, RI Latino, and RI NLW) for all study variables. Of the 983 families enrolled in the study, 20% ($n = 197$) were lost to follow up, actively withdrew before study completion, or were deemed ineligible to continue, leaving a final sample of 786 children with asthma and their primary caregivers. The majority (97%) of participating caregivers were the children's biological parents, adoptive/foster parents, or stepmothers. No differences were found between the RI Puerto Rican and the Dominican subsamples in child's age or sex, parent education, poverty threshold, or asthma severity; therefore, these participants were combined to form a RI Latino subgroup for all subsequent analyses.

Table 2 summarizes somatic symptom reporting and demographic variables. The children in families below the poverty threshold reported significantly more somatic symptoms relative to the children in families above the threshold. The same pattern of results emerged for parent somatic symptom scores. Parent education level was negatively related to both child and parent somatic symptom scores, such that higher rates of child and parent somatic symptom reports were related to lower educational attainment. There was a small but significant relation between child's age and CSI scores, suggesting that older children tended to report fewer symptoms. The PHQ-15 scores were unrelated to child's age. Neither child nor parent somatic symptom scores were related to child sex.

Congruence Between Child and Parent Somatic Symptom Reports

Across the entire sample, CSI and PHQ-15 scores were modestly related to each other ($r = 0.16, p < .001$). When correlations were stratified by ethnic group, no relation between child and parent somatic symptom scores was found in the Island Puerto Rican group ($r = 0.09$, not significant). In RI, scores for the Latino parents and children were modestly correlated with each other ($r = 0.16, p < .05$), and the NLW parent and child scores were the most strongly related ($r = 0.38, p < .001$). Fisher r to z transformations were applied to correlation coefficients to determine if measures of congruence differed statistically. The RI NLW

correlations were significantly greater than those of the Island Puerto Ricans ($z = 3.16, p < .001$) and RI Latinos ($z = 2.20, p < .05$). No difference was found between the Island PR and RI Latino groups ($z = -0.88$, not significant).

Child General Somatic Symptom Reporting and Asthma Functional Morbidity

Children reporting more general somatic symptoms had higher asthma functional morbidity scores ($r = 0.18, p < .001$). The CSI scores of the children who had been to the ED at least once in the previous 12 months were significantly higher than the children with no ED visits (mean = 16.41 and 13.78, $F_{1,780} = 6.36, p < .05$). There was no relation between child somatic symptom scores and missed school.

Parent General Somatic Symptom Reporting and Asthma Functional Morbidity

The parents who reported more general somatic complaints had children with higher asthma functional morbidity scores ($r = 0.19, p < .001$) and more missed school days ($r = 0.15, p < .001$). The PHQ-15 scores were higher for the parents whose children had been to the ED in the previous year when compared with the parents of children with no ED visits (mean = 10.23 versus 8.91, $F_{1,779} = 9.68, p < .01$). Parent and child general somatic symptom scores did not differ across asthma severity groups.

Ethnic Differences in General Somatic Symptom Reporting

We examined child and parent somatic symptom reports by ethnic group, controlling for demographic and asthma variables that were significantly related both to somatic symptom scores (child or parent) and ethnic group in preliminary analyses, namely, asthma severity ratings, functional morbidity, missed school days, ED visits, child's age, poverty threshold, and parent education. Results are shown in Table 3. Significant ethnic group differences in child somatic symptom scores remained after accounting for covariates, with post hoc assessment of adjusted mean CSI scores indicating that the RI Latino children had higher somatic symptom scores than the Island PR children, whereas the NLW children's scores did not significantly differ from either Latino group. Group differences also emerged for parent somatic symptom reports, indicating the RI Latinos to have higher adjusted mean scores than the NLW. Island Puerto Rican parent symptom reports did not differ from either RI subgroup after adjusting for covariates.

Association Between General Somatic Symptom Reporting and Asthma Outcomes by Ethnic Background

Next, we examined whether child and/or parent general somatic symptom reports and ethnicity were independently related to asthma outcomes and whether there were symptom report by ethnicity interactions. These analyses controlled for asthma severity and other covariates (child's age, poverty threshold, and parent education). Asthma outcome variables (functional asthma morbidity, missed school, and ED visits) were each examined in separate analyses of covariance for child and for parent somatic symptom scores, resulting in six distinct analyses. Results are shown in Tables 4 and 5.

There were significant main effects for child and parent general somatic symptom reporting on asthma functional morbidity when asthma severity and other covariates were controlled. There was no main effect for ethnicity in models that included the CSI or PHQ-15; hence, when covariates were included, ethnic differences in asthma functional morbidity diminished.

Interestingly, there was a main effect for parent somatic symptoms but not for child somatic symptoms on school days missed because of asthma. Ethnic group differences in missed school days also remained after controlling for covariates in analyses assessing either child

or parent somatic symptom scores. Neither child somatic symptoms nor parent somatic symptoms interacted significantly with child ethnicity to affect school attendance in the previous 12 months.

There were no significant main effects for either child or parent somatic symptom reporting on either ED visits for asthma in the previous year. Ethnic differences in ED visits remained significant in analyses that controlled for child or parent somatic symptom scores, with significantly more Island Puerto Ricans reporting at least one ED visit in the previous year, relative to RI Latinos and NLWs. No significant interactions emerged between ethnicity and child or parent somatic symptom reports in predicting ED use in the previous year.

DISCUSSION

In a large sample of Latino and NLW children with asthma, both the Latino children and their parents had higher scores on standardized somatization inventories than their NLW counterparts. Increased general somatic symptom reporting in children and/or parents predicted asthma functional morbidity in the children but was minimally predictive of health care use. Specifically, for the RI groups, only parent somatic symptom scores were related to asthma functional morbidity, whereas among Island Puerto Ricans, both parent and child somatic symptom scores were associated with morbidity.

All children in this study had asthma diagnosed and characterized by a pediatric asthma specialist using a rigorous research protocol; other chronic physical illnesses constituted study exclusionary criteria. Thus, the study avoided the problem of lack of knowledge of underlying illness that confounds the interpretation of somatic complaints in most other studies of childhood somatization.⁵

This study replicates the less rigorously obtained findings that Latino adults report more general physical symptoms than NLW adults and extends them to children. Interestingly, the RI Latino children reported significantly more somatic symptoms than the Island Puerto Rican children. One possible explanation is that the RI Latinos report more somatic symptoms because they experience more acculturative stress as a result of the immigration process. Furthermore, it is plausible that in the face of social barriers (i.e., language), the RI Latinos express more somatic symptoms as a means of communicating with the medical establishment.

Medical and mental health professionals need to be aware of culturally determined differences in the way the Latinos and the NLWs report physical symptoms. Cultural competence requires familiarity with the language of physical symptoms and the culturally influenced affect accompanying them to appropriately judge the level of treatment required. If every physical symptom reported were to be treated without consideration for its cultural context, the risk for overtreatment and associated iatrogenic problems would be heightened for the Latino patient population. Conversely, there is also the risk for undertreatment if negative stereotyping (e.g., via the perception that Latinos more adamantly express pain) causes clinicians to discount symptoms without adequate evaluation.

Results regarding congruence between child and parent somatic symptom scores are also noteworthy. We expected that, because Latino families typically experience higher degrees of family cohesion,⁵⁶ this would translate into higher rates of agreement between child and parent somatic symptom scores. We found the opposite pattern: Island PR and mainland Latino families showed lower levels of child–parent congruence than the RI NLW families. One explanation may be ethnic group differences in family composition: Latino children have larger support systems with more alternative caregivers,⁵⁷ meaning the influence of the

primary caregiver on the child in terms of modeling somatization might be mitigated by time spent with other caregivers.

This study has several limitations. The sample, although large and well characterized, was a convenience sample and therefore should not be seen as epidemiologically representative of either RI or PR. Generalizability of our results regarding adult symptom reporting is limited to women, because 98% of the caregivers participating were female.

Although our analyses failed to find important demographic or psychosocial differences between Dominicans and Puerto Rican participants in RI, our sample should not be seen as reflective of all Latinos. Previous studies have shown important genetic and cultural differences relevant to asthma among Latino subgroups. Also, although the children in our study had no other illnesses than asthma, our study did not include comprehensive data regarding caregiver health status, which may influence caregiver somatic symptom reporting.

Given the correlational nature of the relations between somatic symptom reporting and asthma morbidity, the direction of causality cannot be determined. It is equally possible that frequent asthma morbidity leads to heightened reporting of other physical symptoms in both children and parents as it is that parent or child somatizing tendency predisposes a child with a chronic illness to greater functional morbidity.

From a clinical perspective, our study points to the potential usefulness of providing families and clinicians with easy access to objective measures of the child's pulmonary functioning to reduce symptom reporting inaccuracies that may be influenced by somatization tendencies or stereotypes. Home spirometry or peak flow meter monitoring holds particular promise in this realm, given the degree to which this technology has evolved.

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TABLE 1

Study Variables by Ethnic Group

	Island PR (a)	RI Latino (b)	RI NLW (c)	p^a	SNK Post Hoc Test
<i>n</i> (<i>N</i> = 786)	403	235	148	—	—
% Female	44	48	36	NS	—
Child's age, y, mean (SD)	10.7 (2.5)	10.6 (2.4)	10.6 (2.4)	NS	—
Poverty threshold (% below)	65.8	58.3	14.2	<.001	—
Parent education (years completed)	12.86 (2.71)	11.69 (2.49)	14.26 (2.17)	<.001	b < a < c
Asthma severity, %					
Mild intermittent	32.5	15.3	19.6	<.001	
Mild persistent	31.8	23.0	25.7		
Moderate persistent	26.6	31.1	33.8		
Severe persistent	9.2	30.6	20.9		
CSI scores, mean (SD)	14.35 (14.72)	17.73 (15.30)	12.82 (12.40)	<.01	b > a,c
PHQ-15 scores, mean (SD)	9.81 (6.03)	10.31 (6.06)	7.62 (4.99)	<.001	a, b > c
Asthma Morbidity Score, mean (SD)	1.49 (0.78)	1.63 (0.74)	1.45 (0.74)	<.05	b > c
Hospitalizations, mean (SD)	0.55 (1.45)	0.22 (1.02)	0.09 (0.33)	<.001	b, c < a
One or more ED visits previous 12 months, %	63.03	37.45	26.35	<.001	a > b > c
Missed school days, mean (SD)	7.61 (9.92)	4.76 (6.93)	3.64 (5.73)	<.001	b, c < a

Note: CSI = Child Somatization Inventory; PHQ-15 = Patient Health Questionnaire (parent report); PR = Puerto Rico; RI-L = Rhode Island Latino; RI-NLW = Rhode Island non-Latino white; SNK = Student-Neuman-Keuls.

^a χ^2 or *F* test.

TABLE 2

Child and Parent Somatic Symptom Scores by Demographic and Asthma Variables

Measure	Child Somatic Symptom Scores (CSI)		Parent Somatic Symptom Scores (PHQ-15)	
	Mean (SD)	Test	Mean (SD)	Test
Child sex				
Female	15.68 (14.66)	$F_{1,779} = 1.19$	9.91 (5.78)	$F_{1,779} = 2.24$
Male	14.54 (14.53)		9.27 (6.03)	
Child age	—	$r = -0.08^*$	—	$r = 0.06$
Poverty threshold				
below	16.76 (15.41)	$F_{1,780} = 12.74^{***}$	10.39 (6.16)	$F_{1,779} = 18.57^{***}$
above	13.05 (13.29)		8.57 (5.49)	
Parent education (years completed)	—	$r = -0.14^{***}$	—	$r = -0.17$
Asthma severity ratings				
Mild intermittent	14.68 (14.33)	$F_{3,778} = 1.26$	9.38 (6.02)	$F_{3,777} < 1.00$
Mild persistent	13.98 (13.39)		9.38 (5.93)	
Moderate persistent	15.25 (15.45)		9.59 (5.84)	
Severe	16.98 (15.23)		9.99 (5.84)	
Asthma Functional Morbidity Score	—	$r = 0.18^{***}$	—	$r = 0.19^{***}$
ED visits previous 12 months, %				
0 visit	13.78 (13.84)	$F_{1,780} = 6.36^*$	8.91 (5.82)	$F_{1,779} = 9.68^{**}$
1 or more visits	16.41 (15.23)		10.23 (5.98)	
Missed school days	—	$r = 0.05$	—	$r = 0.15^{***}$

Note: ED = emergency department; PHQ-15 = Patient Health Questionnaire (parent report).

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$.

TABLE 3Ethnic Differences in Child and Parent Somatic Symptom Scores, Adjusted for Covariates^a

	Child Somatic Symptom Scores (CSI)	Parent Somatic Symptom Scores (PHQ-15)
Adjusted means (SE) ^a		
Island PR	13.99 (0.76)	9.60 (0.31)
RI-L	17.15 (1.01)	10.11 (0.40)
RI-NLW	14.37 (1.29)	8.44 (0.52)
ANCOVA results		
Ethnicity	$F_{2,765} = 3.10^*$	$F_{2,767} = 3.26^*$
Post hoc comparison of adjusted means	Island PR < RI-L ($p = .05$)	RI-NLW < RI-L *

Note: ANCOVA = analysis of covariance; CSI = Child Somatization Inventory; PHQ-15 = Patient Health Questionnaire (parent report); PR = Puerto Rico; RI-L = Rhode Island Latino; RI-NLW = Rhode Island non-Latino white.

^a Covariates: asthma severity, functional morbidity, missed school days, emergency department visits, child's age, poverty threshold, and parent education.

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$.

TABLE 4

Child Somatic Symptom Reporting, Ethnicity, and Asthma Outcomes

	Functional Morbidity	Missed School	ED Visits (% With at Least 1 in Previous 12 Months)
Adjusted means (SE) ^a			
Island PR	1.56 (0.04)	8.23 (0.42)	63%
RI-L	1.48 (0.05)	3.77 (0.57)	38%
RI-NLW	1.48 (0.06)	2.99 (0.73)	27%
ANCOVA results			
Ethnicity	$F_{2,767} < 1.0$	$F_{2,767} = 10.97^{***}$	$F_{2,769} = 19.43^{***}$
CSI	$F_{1,767} = 13.74^{***}$	$F_{1,767} < 1.0$	$F_{1,769} = 2.13$
CSI × ethnicity	$F_{2,767} < 1.0$	$F_{2,767} < 1.0$	$F_{2,769} < 1.0$
Post hoc comparison of adjusted means	—	Island PR > RI-L, RI-NLW	Island PR > RI-L, RI-NLW

Note: ANCOVA = analysis of covariance; CSI = Child Somatization Inventory; ED = emergency department; PR = Puerto Rico; RI-L = Rhode Island Latino; RI-NLW = Rhode Island non-Latino white.

^a Covariates: asthma severity, child's age, poverty threshold, and parent education.

 $p < .001$.

TABLE 5

Parent Somatic Symptom Reporting, Ethnicity, and Asthma Outcomes

	Functional Morbidity	Missed School	ED Visits (% With at Least 1 in Previous 12 Months)
Adjusted means (SE) ^a			
Island PR	1.55 (0.04)	8.14 (0.42)	65%
RI-L	1.52 (0.07)	3.85 (0.56)	31%
RI-NLW	1.49 (0.05)	3.22 (0.76)	31%
ANCOVA results			
Ethnicity	$F_{2,769} = 1.78$	$F_{2,767} = 4.64^*$	$F_{2,769} = 16.01^{***}$
PHQ-15	$F_{1,769} = 23.13^{***}$	$F_{1,767} = 7.98^{**}$	$F_{1,769} = 3.04$
PHQ-15 × ethnicity	$F_{2,769} = 1.35$	$F_{2,767} < 1.0$	$F_{2,769} < 1.0$
Post hoc comparison of adjusted means	—	Island PR > RI-L, RI-NLW	Island PR > RI-L, RI-NLW

Note: ANCOVA = analysis of covariance; ED = emergency department; PHQ-15 = Patient Health Questionnaire, Somatic Symptom Severity subscale (parent measure); PR = Puerto Rico; RI-L = Rhode Island Latino; RI-NLW = Rhode Island non-Latino white.

^a Covariates: asthma severity, child's age, poverty threshold, and parent education.

* $p < .05$;

** $p < .01$;

*** $p < .001$.