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Latino Caregivers' Beliefs about Asthma: Causes, Symptoms, and Practices

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Abstract

Background and Objective: This study examined belief systems of Latino caregivers who have children with asthma from Puerto Rican and Dominican backgrounds who resided on the Island of PR and the Mainland. The goal of this study was to document similarities and differences in beliefs about the causes, symptoms and treatments of asthma across two sites and two Latino ethnic sub-groups of children who remain the most at risk for asthma morbidity.

Methods: Participants included 100 primary caregivers of a child with asthma. Fifty caregivers from Island PR and fifty caregivers from mainland RI were interviewed (at each site, 25 caregivers were from Puerto Rican backgrounds and 25 caregivers were from Dominican backgrounds). The interview included an assessment of demographic information and beliefs about the causes and symptoms of asthma, and asthma practices.

Results: Results indicated more similarities in beliefs about the causes and symptoms of asthma across site and ethnic group. The majority of differences were among beliefs about asthma practices by site and ethnic group. For example, a higher proportion of caregivers from Island PR, particularly those of Dominican descent, endorsed that a range of home and botanical remedies are effective for treating asthma.

Conclusions: Results from this study point to several interesting directions for future research including larger samples of Latino caregivers with children who have asthma. A discussion of the importance of understanding cultural beliefs about asthma and asthma practices is also reviewed.

Keywords

Asthma; Latino Caregiver's Beliefs

Introduction

Asthma burden disproportionately affects Latino children in the United States. Latino children have higher prevalence and greater disease morbidity relative to non Latino Whites or African Americans. Among Latinos, Puerto Rican children appear to be the most affected.[1, 2] Level of asthma burden can also vary depending on region.[3, 4] Prevalence and morbidity rates of asthma among Latino children are more pronounced in Island PR than in the mainland US.[5]

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Although less frequently studied, children of Dominican descent also experience high rates of asthma prevalence and morbidity.[5]

Although a number of broad factors may explain the disparities in asthma outcomes (e.g., low-income status,[6] ethnic minority status/race,[8] language barriers, environmental triggers[9]), few studies have investigated cultural processes that have a bearing on asthma management practices. Cultural processes related to families' beliefs about asthma and medical treatment for the illness are important to understand, as this information can shed light on concerns or family strengths that may impede upon or enhance effective asthma control.[11, 12]

The objective of the current study is to examine the beliefs about the causes and symptoms of asthma and asthma practices of Latino caregivers who have a child with asthma from four different backgrounds: Puerto Rican and Dominican caregivers from urban environments in mainland RI (RI) and the island of PR (PR). Similarities and differences across specific beliefs will be explored by site (mainland RI and Island PR) and by ethnic group (caregivers from Puerto Rican and Dominican backgrounds). Approximately 91,000 Latino families currently reside in RI, and 80% of those families live in Providence and surrounding areas.[13] Over 10% of children in RI have asthma, and the rate of asthma is disproportionately present in ethnic minority children. Thus, Island PR and Mainland RI are unique regions to study processes (e.g., beliefs about asthma practices) that may contribute to asthma management behaviors among caregivers and children from specific Latino ethnic subgroups, given that factors related to residence as well as culture may be implicated.

Beliefs about Asthma: What is known and why is it important to learn more?

Cultural beliefs about the nature of asthma may influence treatment behaviors. Among Latino groups, it is a common belief that the disease of asthma results from an imbalance between hot and cold elements.[14,15] In a study of Latino caregivers who have children with asthma in Mexico, Guatemala, Texas (Mexican Americans), and Connecticut (Puerto Ricans), consensus among the groups was obtained regarding beliefs about common symptoms of asthma (wheezing).[14] However, variability across groups was observed with regard to beliefs about several asthma triggers. For example, Puerto Ricans, contrary to other groups, strongly believed that asthma can be prevented by having their children avoid strong emotions.

Studies including Latino caregivers have also shown associations among parents' concerns about their children's medications (e.g., the dangers of dependence or long term effects), the under-use of daily, preventative asthma medications [16-18] and lifetime history of asthma hospitalizations.[19, 20] Health beliefs and attitudes (e.g., concerns about the adverse effects of inhaled corticosteroid therapy) have been proposed as partial explanations for low adherence to medical therapy and the consequent high burden of morbidity.

Further, a focus on alternative medication use has been explored as a means to understand how cultural belief systems may affect specific asthma management practices.[21] For example, one study found that Dominican parents frequently use folk remedies (“zumos”) instead of their child's prescription medicines.[22] Other results showed that Puerto Ricans use home remedies less frequently than other Latino subgroups.[23] Research has also demonstrated considerable variability in the type of home remedies used by specific groups. For example, one study showed that the use of folk remedies that are ingested (e.g., herbs, teas, eucalyptus) was common among Latinos in their country of origin but not among US Latinos.[14]

Taken together, families' knowledge and practice of asthma may be influenced by salient traditional beliefs and practices (e.g., the use of folk remedies), which has numerous clinical implications. Health care providers should approach the clinical encounter with greater knowledge and appreciation of cultural practices, which may enhance the caregiver's comfort

level with the treatment plan. Further, providers may incorporate caregivers' interest in using specific asthma practices that may not be harmful, if used in conjunction with traditional aspects of asthma treatment.

The current study

For this study, we administered a questionnaire focusing on beliefs about the causes and symptoms of asthma and asthma practices to Latino parents of children with asthma in the mainland RI and Island PR. We also explored differences in beliefs by ethnic subgroup (among Puerto Rican and Dominican caregivers who reside in Island PR and mainland RI). Results from this analysis may highlight how ethnicity and place of residence are related to cultural beliefs about asthma and subsequent management practices.

Methods

Participants

One hundred primary caregivers (PCG), all of whom were biological mothers, were interviewed for this study. Fifty caregivers from Island PR and fifty caregivers from mainland RI were interviewed (at each site, 25 caregivers self-identified as Puerto Rican and 25 self-identified as Dominican). Demographic characteristics of the study sample are presented in Table I.

Design and Procedures—Data collection for this study occurred in two locations, PR and RI, across the course of the same year. All participating families received the same measures.

Eligibility criteria for the respective studies consisted of the following: 1) PCG had a child with asthma between the ages of one month to 18 years old; 2) PCG was the child's legal guardian; 3) child had been diagnosed with asthma by a physician and was currently obtaining asthma treatment; 4) child had lived in the same household as the PCG for at least six months, and 5) PCG's ethnic identity was either Puerto Rican or Dominican. Exclusion criteria included moderate to severe cognitive delay in the child as evidenced by school placement.

Approval for this study was obtained from the Institutional Review Board of the participating hospitals in Providence, RI and the University of PR. At both sites, families were recruited from hospital-based primary care clinics or asthma educational programs. Questionnaires were administered to PCG's either in interview format in the lab at both sites, the participants' home, or over the phone. Interviews were offered in Spanish or English, depending on participants' preference. Eighty-five percent of the caregivers in this sample elected to have the interview conducted in Spanish.

Measures

Demographic Questionnaire—A Demographic Interview assessed parent-report of key demographic variables (See Table I). Primary caregiver's report of ethnicity served as the index for the family.

Beliefs about Asthma—Beliefs about asthma were assessed by caregiver report using a structured questionnaire developed by Pachter and colleagues.[14] The original instrument consisted of 148 yes/no items assessing beliefs about the causes and symptoms of asthma, and asthma treatment practices. Details about the development of this instrument are presented elsewhere.[15] An additional thirteen items derived through focus groups and open-ended interviews with Puerto Rican and Dominican families from Island PR were added to this assessment by researchers at the Behavioral Medicine Institute, University of PR. The final assessment included 161 items. Thirty-four questions focused on beliefs about causes of asthma

(e.g., Can asthma be caused by cigarette smoke?). Forty-seven items focused on beliefs about symptoms of asthma (e.g., Is chest pain a symptom of asthma?). Sixty-four items focused on beliefs about asthma practices (e.g., Can drinking liquids help treat asthma?). Caregivers chose an either yes or no response and the interview took approximately one ½ hour to administer.

Analysis Plan

In order to examine potential differences and similarities in asthma beliefs by site and by ethnic group, frequency analyses were conducted on each item of each category (causes, symptoms, practices; Tables II-IV). A coding system was used to group conceptually similar items into specific sub-categories, for ease of description. For the 34 beliefs about the causes of asthma items, sub-categories followed those established in previous work by Pachter[14] (For examples of items see Table II). Items were organized in the following sub-categories: environmental allergens (e.g., air pollution), innate factors (e.g., weak lungs), and humoral etiologies (e.g., exposure to hot and cold elements).

The 47 beliefs about the symptoms of asthma items were categorized in sub-categories with the understanding that there may be overlap in some categories, such as those associated with upper and lower airway compromise.[14] These include; common asthma symptoms/lower respiratory (e.g., wheezing) and upper respiratory or symptoms associated with a common cold (e.g., red watery eyes). The remainder of the respiratory-related items were organized into the following sub- categories for ease of description: early warning signs of asthma (e.g., fatigue), severe symptoms (e.g., paleness), and behavioral changes (e.g., crankiness). Finally, we grouped remaining items into a “non-respiratory symptoms” sub-category (e.g., excessive thirst).[14] For examples of items see Table III.

For the 64 items on the beliefs about asthma practices, given that a previous categorization scheme did not exist, we implemented the following approach established by the National Center for Complementary and Alternative Medicine (NCCAM).[24] NCCAM groups complementary and alternative medicine categories into four domains: biologically based practices, involving substances found in nature that are ingested (e.g., herbs, vitamins); mind-body practices, including techniques to enhance the mind's capacity to affect bodily functions/ symptoms (e.g., patient support groups, prayer); and manipulative and body-based practices, including manipulation techniques or movement of the body (e.g., massage). Additional items were included in a separate sub-category: conventional/traditional practices (e.g., prescription medicines).

Frequencies analyses were then run for descriptive purposes, to record the percentage of caregivers from each ethnic group who endorsed a specific belief (for examples of items see Tables II- IV). Chi square analyses were also conducted on each conceptually-similar sub-category of items in order to examine potential differences and similarities in beliefs across site (Mainland RI and Island PR) and by ethnic group (caregivers from Dominican and Puerto Rican background across the two sites). Significant differences in the proportion of caregivers who endorsed specific items from conceptually similar categories are described below and presented in Tables II-IV). A consensus of similar responses across sub-categories will also be described.

Results

Results from the demographic questionnaire revealed that more Mainland RI caregivers had health insurance (Island PR: 50%; Mainland RI: 95%). Additionally, half of the caregivers from each site endorsed having asthma (Island PR: 48%; Mainland RI: 50%). These data are referred to later in the discussion.

Beliefs about Causes of Asthma: Island vs. Mainland

There appeared to be more similarities than differences between sites in caregivers' beliefs about the causes of asthma, as noted in Table II. One site difference was found among the 11 environmental causes items (e.g., air pollution). A higher proportion of Island Puerto Rican families believed that "having a dirty house" was a cause of asthma $\chi^2 = 5.26$, p= 02. Among the 13 Innate Factor items (e.g., strong emotions), a higher proportion of island Puerto Rican families endorsed strong emotions $\chi^2 = 6.25$, p=.01, fear $\chi^2 = 9.44$, p=.009, and untreated cold $\chi^2 = 4.17$, p=.04, as causes of asthma. With regard to believing asthma is caused by humoral etiologies (hot/cold) (10 items), a higher proportion of Island Puerto Rican caregivers endorsed getting wet while sweating $\chi^2 = 10.51$, p=.0001, bathing while sick $\chi^2 = 7.96$, p=.005, and very hot weather $\chi^2 = 8.47$, p= .037.

Puerto Rican vs. Dominican

With regard to ethnic group differences between Puerto Rican and Dominican caregivers across sites, beliefs about the causes of asthma yielded more similarities than differences across groups. However, more Puerto Rican caregivers endorsed the following environmental-related items: changes in climate or temperature $\chi^2 = 5.26$, p=.02 and being near birds/feathers $\chi^2 = 8.71$, p=.013. Within the innate factors subcategory, a higher proportion of Puerto Rican caregivers reported strong emotions $\chi^2 = 9.00$, p=.003, nervousness $\chi^2 = 6.83$, p=.0009, and fear $\chi^2 = 12.25$, p=.05 as causes of asthma, and Puerto Rican mothers from the island more frequently endorsed these items. Among the humoral etiologies items, more Puerto Rican caregivers endorsed excessive bathing $\chi^2 = 7.16$, p=.02 as a cause of asthma.

Beliefs about the Symptoms of Asthma: Mainland vs. Island

Among the 47 symptoms of asthma items, more similarities were noted across sites among all of the sub-categories (See Table III). Among the common asthma symptom items (10 items), a higher proportion of Mainland RI families endorsed coughing $\chi^2 = 6.02$, p=04 and chest pain $\chi^2 = 19.844$, p=0001. Among the severe symptom items (5 items), more island Puerto Rican caregivers reported asphyxiation $\chi^2 = 7.53$, p=.02, and among the 12 upper respiratory symptoms, runny nose $\chi^2 = 3.93$, p=.04 and chest congestion $\chi^2 = 10.70$, p=.001 was more often endorsed by Island Puerto Rican caregivers. Many families across subgroups endorsed upper respiratory items as symptoms. No site differences were noted in early warning signs and emotional changes. A higher proportion of Island Puerto Rican caregivers, however, endorsed the following non-respiratory symptom items: excessive thirst $\chi^2 = 6.00$, p=.014, yellow skin $\chi^2 = 4.32$, p=.03, and being weak $\chi^2 = 5.698$, p=05.

Puerto Rican vs. Dominican

With regard to ethnic group differences between Puerto Rican and Dominican caregivers across the beliefs about asthma symptoms, there were few noted. Only two differences emerged with more Dominican caregivers endorsing common symptom (coughing; $\chi^2 = 6.04$, p=.04) and severe asthma symptom items (red face; $\chi^2 = 8.278$, p=.01).

Beliefs about Asthma Practices: Mainland vs. Island

Among the 64 items included in the beliefs about asthma practices category, many site differences were noted (See Table IV). Among the biologically-based practice items (24 items), a higher proportion of Island Puerto Rican caregivers believed that drinking liquids = 4.76, p=. 02, homemade remedies χ^2 (2, N = 60) = 17.99, p=.001, and botanical remedies $\chi^2 = 34.54$, p= .0001 are effective for helping to treat asthma. A higher proportion of Island Puerto Rican caregivers also endorsed single teas (6 items) (e.g., eucalyptus $\chi^2 = 16.37$, p=.0001). Among the other single-item practices (15 items; syrups, juices, etc), more Island Puerto Rican caregivers endorsed 9 of these substances (e.g., siete jarabes (seven syrups) $\chi^2 = 5.97$, p=.05).

Among the 16 combination home remedy items, as noted in Table IV, more island Puerto Rican caregivers endorsed that three remedies were useful for treating asthma (e.g., aloe vera with lemon and butter; $\chi^2 = 23.76$, p=.0001). However, within the Island Puerto Rican group, a higher proportion of the Dominican caregivers endorsed these items more than any other ethnic subgroup.

Among the 9 mind-body based items, a higher proportion of Mainland RI caregiver's endorsed that they believed calming down ($\chi^2 = 11.94$, p=.001) and resting ($\chi^2 = 8.57$, p=.005) were effective treatment strategies. Among the 11 questions related to the manipulative and body-based practices, as noted in Table IV, more Island Puerto Rican caregivers endorsed five of these practices as effective strategies for treating asthma (e.g., rubbing the chest and back $\chi^2 = 15.55$, p=.001).

Caregivers endorsed a number of “traditional or conventional” items; however, several site differences were noted. More Mainland RI caregivers believed that prescriptions $\chi^2 = 3.84$, p=.05 and going to the hospital $\chi^2 = 15.29$, p=.0001 were effective treatments for asthma, while more Island Puerto Rican caregivers thought that “medications against asthma” $\chi^2 = 7.11$, p=008 were helpful in treating asthma.

Puerto Rican vs. Dominican

As noted in Table IV, a higher proportion of Dominican caregivers endorsed biological based remedies such as single remedies (e.g., aloe vera juice; $\chi^2 = 8.92$, p=.03), botanical remedies $\chi^2 = 6.098$, p=.04, and homemade remedies $\chi^2 = 6.89$, p=.009. A higher proportion of Dominican caregivers also endorsed 8 out of 16 combination remedy items (e.g., aloe vera with honey and lemon; $\chi^2 = 7.345$, p=.02), 2 out of 9 mind-body (e.g., stop exercising; $\chi^2 = 5.08$, p=.02) items, and 2 out of 11 manipulative body based items (e.g., rubbing vicks on feet and cover them with socks; $\chi^2 = 10.48$, p=.005).

Discussion

Findings suggest commonalities with the overall belief system about asthma by site and by ethnic subgroup, as reflected by caregivers' beliefs about the causes and symptoms of asthma. The majority of site differences appeared to be in the area of beliefs about asthma practices. Island Puerto Rican caregivers endorsed that remedies and home treatments, as well as manipulative body-based practices were effective treatments for asthma. This was particularly true for Dominican caregivers residing in PR. Our data do not include the migration history of this Dominican sample, which could shed light on whether beliefs about asthma practices are affected by the exposure to a more mainland emphasis for the use of traditional medications. Mainland RI caregivers endorsed more mind-body items (e.g., relaxing). These practices may be more valued or prescribed on the Mainland, or the socioeconomic circumstances and educational level of caregivers may influence the beliefs in these practices.

Many families endorsed items that were not actually causes of asthma. As noted in Pachter's work,[14] families may be confused about symptoms related to upper respiratory infections and asthma, although there is some overlap between the two conditions. The majority of families across sites and ethnic groups correctly identified the major respiratory signs and symptoms that are associated with an asthma exacerbation. However, affirmative responses to non-respiratory items as symptoms of asthma (nightsweats and headache) were also salient. Such inaccuracies may reflect a need for further asthma education.

Moreover, consistent with results from previous studies,[14, 25] the similarities noted in beliefs about the causes and symptoms of asthma may reflect a shared belief system among caregivers from both sites and ethnic groups. The biomedical model is shown to be a part of the explanatory

model of caregivers, which may be affected by the fact that a majority of the caregivers in this sample also had asthma and were currently seeking care for their children who have asthma. The belief in humoral ("hot/cold") aspects of health and illness is also evident from caregivers' responses. Finally, Puerto Rican caregivers were more likely to endorse strong emotions and nervousness as causes of asthma.

There are few studies exploring beliefs about health and illness in the pediatric asthma research, particularly in the Latino ethnic subgroups with the highest asthma morbidity rates. This study is an important step in understanding cultural beliefs that may guide asthma management behaviors, which can ultimately affect asthma morbidity in Latino children.

Although preliminary in nature, several limitations of this study must be considered. Although we focus on results that emphasize statistically significant differences, we realize our analysis may not capture clinically meaningful differences in the proportion of families who endorse specific beliefs. It is unclear to what extent beliefs may affect specific management behaviors enough to make a difference on actual rates of morbidity. Although the goal of this small study was to explore differences and similarities in beliefs about asthma among Latino caregivers who have children with asthma, we realize that our analyses include many comparisons. The significant results from chi-square analyses appear to be consistent with the proportion of affirmative responses endorsed by caregivers from each site or ethnic group. Still, we look forward to replicating these findings in larger studies with Latino caregivers. Our study also did not collect information on the severity levels of the children and acculturation experiences, two important processes that may have influenced caregivers' responses to our questions.

This study raised several interesting questions to pursue in our future research. It is not clear to what extent families use and/or substitute alternative treatment practices for traditional asthma management behaviors or medication use, and what factors are associated with frequency of use (e.g., access to specific remedies). It is also unclear to what extent health care system factors, such as insurance status, impact caregiver's and provider's belief systems and behaviors. The amount of asthma education that is provided in health care settings may also impact families understanding of asthma, and caregivers' beliefs concerning the effectiveness of asthma medications.

These results also raise questions regarding the origins of the use of specific alternative practices. Results showed that more Dominican caregivers who reside in PR tend to believe that biologically-based practices (e.g., combination remedies) are useful for treating asthma. Further information regarding how families became exposed to such remedies is needed. In other words, to what extent is the use of these practices related to the availability of the actual items in specific locations (e.g., specific remedies), or historical or familial knowledge of these practices? Certain practices may also be valued more by specific providers, which may increase families' tendency to use them.

It has been argued that asthma interventions need to acknowledge families' cultural belief systems and incorporate these beliefs into the asthma treatment plan.[14, 25, 26] Families may ascribe to certain aspects of the biomedical model, yet also carry traditional ethnomedical beliefs about health and illness. As a result, it is generally recommended that interventions should not replace home remedies, but rather address parental concerns about medications, encourage appropriate use of medications, and only discourage use of home remedies that may cause harm. Understanding the cultural differences that arise from beliefs shared within ethnic groups, as well as local practices and traditions, has the potential to inform our understanding of health care disparities and improve our clinical care of children with asthma.

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REFERENCES

1. Ortega A, McQuaid EL, Canino G, Ramirez R, Fritz GK, Klein RB. Association of psychiatric disorders and different measures of asthma in island Puerto Rican children. Soc Psychiatry Psychiatr Epidemiol 2003;38(4):220–226. [PubMed: 12664233]
2. Ortega A, Huertas SE, Canino G, Ramirez R, Rubio-Stipec M. Childhood asthma, chronic illness, and psychiatric disorders. J Nerv Ment Dis 2002;190(5):275–281. [PubMed: 12011605]
3. Crain EF, Kercsmar C, Weiss KB, Mitchell H, Lynn H. Reported difficulties in access to quality care for children with asthma in the inner city. Arch Pediatr Adolesc Med 1998;151:333–339. [PubMed: 9559707]
4. Beckett W, Belanger K, Gent J, Holford T, Leaderer B. Asthma among Puerto Rican Hispanics: a multi-ethnic comparison study of risk factors. Am J Respir Crit Care Med Care and Critical Care Medicine 1996;154:894–899.
5. Lara M, Akinbami LJ, Flores G, Morgenstern H. Heterogeneity of childhood asthma among HIspanic children: Puerto Rican children bear a disproportionate burden. Pediatrics 2006;117:43–53. [PubMed: 16396859]
6. Miller JE. The effects of race/ethnicity and income on early childhood asthma prevalence and health care issues. Am J Public Health 2000;90:428–430. [PubMed: 10705865]
7. Grant EN, Lyttle CS, Weiss KB. The relation of socioeconomic factors an racial/ethnic differences in US asthma mortality. Am J Public Health 2000;90(12):1923–1925. [PubMed: 11111268]
8. Lieu TA, Lozano P, Finkelstein JA, et al. Racial/ethnic variation in asthma status and management practices among children in managed medicaid. Pediatrics 2002;109(5):857–865. [PubMed: 11986447]
9. Brugge DV, Vallarino J, Ascolillo L, Osgood ND, Steinback S, Spengler J. Comparison of multiple environmental factors for asthmatic children in public housing. Indoor Air 2003;13(1):18–27. [PubMed: 12608922]
10. Wallace LA, Mitchell H, O'connor GT, et al. Particle concentrations in inner-city homes of children with asthma: The effect of smoking, cooking, and outdoor pollution. Environ Health Perspect 2003;111(9):1265–1272. [PubMed: 12842784]
11. Flores G. Culture, ethnicity, and linguistic issues in pediatric care: urgent priiorities and unanswered questions. Ambulatory Pediatrics 2004;4:276–282. [PubMed: 15264952]
12. Koinis Mitchell D, McQuaid EL, Seifer, et al. Multiple urban and asthma-related risks and their association with asthma morbidity in children. J Pediatr Psychol. 2007In press
13. Uriarte, M.; Carrion, ME.; Jones, C.; Carithers, N.; Gorlier, JC.; Garcia, JF. RI Latinos: A scan of issues affecting the Latino population of RI. Mauricio Gaston Institute; Boston, MA: 2002.
14. Pachter LM, Weller SC, Baer RD, et al. Variation in asthma beliefs and practices among mainland Puerto Ricans, Mexican-Americans, Mexicans, and Guatemalans. J Asthma 2002;39(2):119–134. [PubMed: 11995676]
15. Guarnaccia P, Parra P. Ethnicity, social status, and families' experiences of caring for a mentally ill family member. Community Ment Health J 1996;32:243–260. [PubMed: 8790967]
16. Butz AM, Eggleston P, Huss K, Kolodner K, Rand C. Nebulizer use in inner-city children with asthma: morbidity, medication use, and asthma management practices. Arch Pediatr Adolesc Med 2000;154 (10):984–990. [PubMed: 11030849]
17. Horne R, Weinman R. Patients' beliefs about prescribed medicines and their role in adherence to treatment in chronic physical illness. J Psychosom Res 1999;47(6):555–567. [PubMed: 10661603]
18. Riekert KA, Butz AM, Eggleston PA, Huss K, Winkelstein M, Rand CS. Caregive-physician medication concordance and undertreatment in asthma among inner-city children. Pediatrics 2003;111:214–220.

19. Chen E, Bloomberg GR, Fisher EGJ, Strunk RC. Predictors of repeat hospitalizations in children with asthma: the role of psychosocial and socioenvironmental factors. Health Psychol 2003;22:12–18. [PubMed: 12558197]

20. Conn KM, Halterman JS, Fisher SG, Yoos HL, Chin NP, Szilagyi PG. Parental beliefs about medicaitons and medication adherence among urban children with ashtma. Ambulatory Pediatrics September-October;2005 5(5):306–310. [PubMed: 16167856]

21. Mosnaim G, Kohrman C, Sharp LK, et al. Coping with asthma in immigrant Hispanic families: A focus group study. Ann Allergy Asthma Immunol October;2006 97(4):477–483. [PubMed: 17069102]

22. Bearison DJ, Minian N, Granowetter L. Medical management of asthma and folk medicine in a Hispanic community. J Pediatr Psychol 2002;27:385–392. [PubMed: 11986361]

23. Ledogar R, Penchascadeh A, Iglesias Garden C, Acosta L. Asthma and Latino cultures: different prevalence reported among groups sharing the same environment. Am J Public Health 2000;90:929–935. [PubMed: 10846511]

24. National Center for Complementary and Alternative Medicine (NCCAM). What is CAM?. National Institutes of Health. [Web Site]. Available at: http://nccam.nih.gov/health/whatiscam/. Accessed March 8, 2007

25. Flores G, Fuentes-Afflick E, Barbot O, et al. The health of Latino children: urgent priorities, unanswered questions and a research agenda. JAMA 2002;288(1):82–90. [PubMed: 12090866]

26. Flores G, Abreu M, Olivar M, Kastner B. Access barriers to health care for Latino children. Arch Pediatr Adolesc Med 1998;152:1119–1125. [PubMed: 9811291]

Table I

Demographic Characteristics of Participants

Variable	% of sample	Mean	SD	Range
Child Characteristics				
Child's age Island PR		7.4 years	2.0 years	1 - 15.0 years
Child's age Mainland RI		8.2 years	1.0 years	2 – 13 years
Child's gender				
Island PR: Female	42%			
Mainland RI: Female	40%			
Primary Caregiver's Characteristics				
Mainland RI Spanish Language Preference	40% of the sample elected to hear the questions in Spanish			
Number of years of education				
Island PR		14.04 years	2.8	4-16 years
Mainland RI		15.00 years	3.2	2-16 years
Family's annual income[b]				
Island PR				$10,000-$30,000
Mainland RI				$5,000- $25,000

[a] Primary caregivers were asked an open-ended question regarding the ethnic and racial group(s) with which they primarily identified themselves.

[b] Family's total annual income from all sources. The majority of families total income fell within this range.

Table II

Significant Differences in Proportion of Caregivers Endorsing Beliefs About Asthma Causes

Causes	Frequency				Significant Difference by Site/Ethnicity	
	Mainland RI (ML)		Island PR (IS)			
	RIPR	RIDR	PRPR	PRDR		
Environmental Allergens					Site	Ethnicity
Being Near Birds/Feathers	92%	72%	96%	72%		PR*
Living in an Unclean House	96%	84%	100%	100%	IS*	
Change in Climate/Temperature	100%	88%	100%	92%		PR*
Innate Factors						
Untreated Cold/Flu	92%	92%	100%	100%	IS*	
Nerves	64%	28%	72%	56%		PR**
Being Afraid	44%	40%	76%	68%		PR*
Strong Emotions (Good or Bad)	88%	52%	96%	84%	IS*	PR*
Humoral Etiologies						
Hot Weather	76%	48%	36%	52%	IS*	
Getting Wet While Sweating	44%	40%	84%	64%	IS**	
Taking a Bath While Having a Cold/Flu	24%	36%	52%	64%	IS*	
Excessive Bathing	8%	8%	4%	40%		PR*

Table III

Significant Differences in Proportion of Caregivers Endorsing Beliefs About Asthma Symptoms

Symptoms	Frequency Mainland RI (ML) RIPR	Mainland RI (ML) RIDR	Island PR (IS) PRPR	Island PR (IS) PRDR	Significant Differences by Site/Ethnicity: Site	Ethnicity
Common Asthma Symptoms, Lower Respiratory						
Chest Pain	84%	100%	48%	56%	ML**	
Cough	96%	100%	72%	96%	ML*	DR*
Severe Asthma Symptoms						
Choking/Axphyxiation	84%	88%	100%	100%	IS*	
Red Face	36%	80%	52%	64%		DR*
Upper Respiratory Symptoms						
Chest Congestion	96%	100%	72%	80%	IS*	
Runny Nose	60%	64%	76%	84%	IS*	
Non-Respiratory						
Excessive Thirst	44%	52%	72%	72%	IS*	
Yellow Skin (Jaundice)	28%	40%	8%	24%	IS*	
Weakness	80%	68%	52%	52%	IS*	

Table IV

Significant Differences in Proportion of Caregivers Endorsing Beliefs About Asthma Treatments

Treatments	Frequency: Mainland RI (ML) RIPR	Mainland RI (ML) RIDR	Island PR (IS) PRPR	Island PR (IS) PRDR	Significant Differences by Site/Ethnicity: Site	Ethnicity
Biologically Based Practices					Site	Ethnicity
General Categories						
Homemade Remedies	24%	48%	64%	92%	IS**	DR**
Botanical Remedies	4%	24%	60%	76%	IS**	DR*
Single Teas						
Eucalyptus Tea	28%	32%	64%	76%	IS**	
Orange or Lemon Tea	28%	24%	4%	4%	IS*	
Bitter Verbena Tea	4%	8%	16%	48%	IS*	DR*
Chamomile Tea	12%	20%	28%	40%	IS*	
Syrups						
Seven Syrups/Herbal Syrup (Siete Jarabes)	16%	16%	28%	44%	IS*	
Single Coffees						
Black Coffee	8%	4%	48%	36%	IS**	
Single Milks						
Donkey Milk	4%	4%	56%	64%	IS**	
Single Juices						
Aloe Vera or Nopal Juice	28%	40%	44%	80%	IS*	DR*
Single Oils						
Shark Oil	32%	36%	8%	52%	IS*	DR*
Cod Liver/Shark Oil	52%	48%	32%	76%	IS*	DR*
Single Item Remedies						
A Spoonful of Honey	20%	20%	52%	44%	IS**	
Milk of Magnesia/Pepto Bismol	4%	0%	32%	40%	IS**	
Garlic	8%	24%	20%	40%		DR*
Leaves of Beach Grapes	4%	4%	16%	48%	IS**	
Onion Tea with Cinnamon	4%	32%	12%	16%		DR*
Radish Tea with Watercress	16%	44%	0%	52%		DR**
Castor Oil with Snake and Shark Oils	16%	32%	0%	32%	IS*	DR**
Coconut Oil with Natural Brown Sugar	4%	24%	24%	64%	IS*	DR**
Shark Oil, Honey, Aloe Vera, Witch Hazel	20%	24%	12%	76%		DR**
Aloe Vera with Honey and Lemon	32%	52%	32%	60%	IS**	DR*
Witch Hazel with Honey and Onion	12%	20%	4%	64%		DR**
Watercress with Onion, Garlic, and Honey	24%	56%	4%	28%		DR*
Mind-Body Based Practices						
Calming Down	80%	72%	36%	48%	ML*	
Remaining Calm	76%	92%	76%	88%		DR*
Rest	72%	100%	44%	76%	ML*	DR**
Manipulative and Body-Based Practices						
Stop Exercising	36%	60%	20%	40%	IS*	DR*
Rub Chest and Back	52%	72%	92%	92%	IS**	
Rub Vicks on Feet and Cover with Socks	24%	36%	12%	56%	IS*	DR*
Putting Hot Water on the Chest	4%	8%	4%	56%	IS**	
A Compress of Hot Coffee on the Head	4%	4%	40%	44%	IS**	
Conventional Treatments					Site	Ethnicity
Going to the Hospital	96%	92%	60%	72%	ML**	
Prescription Medication	100%	96%	88%	88%	ML*	
Medications Against Asthma	72%	92%	100%	96%	IS**	