



Project  
**MUSE**<sup>®</sup>

*Today's Research. Tomorrow's Inspiration.*

---

## **A Qualitative Exploration of Asthma Self-Management Beliefs and Practices in Puerto Rican Families**

Molly Martin  
Jessie Beebe  
Lolita Lopez

Journal of Health Care for the Poor and Underserved, Volume 21, Number 2, May 2010, pp. 464-474 (Article)

Published by The Johns Hopkins University Press  
DOI: 10.1353/hpu.0.0285



For additional information about this article

<http://muse.jhu.edu/journals/hpu/summary/v021/21.2.martin.html>

## A Qualitative Exploration of Asthma Self-Management Beliefs and Practices in Puerto Rican Families

Molly Martin, MD, MAPP

Jessie Beebe

Lolita Lopez, MPH

Sandra Faux, PhD

*Abstract:* Puerto Rican children suffer higher asthma morbidity than children of any other racial/ethnic group in the U.S. This study was intended to describe asthma self-management behaviors in Puerto Rican youth. Key informant interviews (n=5) and focus groups (n=4) were conducted. Informants were community pediatricians and community-based organization employees. The focus groups included Puerto Rican parents of children with asthma, children with asthma in grades 4–8, and adolescents with asthma in grades 9–12 (32 participants total). Data were audio-recorded, transcribed, and translated. Two separate analysts performed theme extraction using naturalistic inquiry. Children were assuming asthma self-management responsibilities at very young ages. The adolescents felt they needed more parental assistance with their asthma. Asthma management techniques that involved manipulation of the environment or emotions were the most popular. Fear of asthma, need for more general education and smoking cessation resources, and community supports for asthma were discussed. These findings have important implications for future interventions.

*Key words:* Pediatric asthma, Puerto Rican, qualitative research, self-management behaviors, community-based participatory research.

Puerto Rican children nationally experience the highest asthma prevalence, morbidity, and mortality rates of children in any racial/ethnic group.<sup>1-2</sup> Chicago is home to one of the largest Puerto Rican populations in the continental United States.<sup>3</sup> A survey of Chicago in 2002 reported potential total asthma rates of 14% in Mexican children, 20% in White children, 25% in Black children, and 34% in Puerto Rican children.<sup>4</sup> These high rates have been attributed to a genetic disposition that interacts with environmental exposures.<sup>5</sup>

---

*DR. MARTIN* is an Assistant Professor in the Department of Preventive Medicine, Section of Social and Community Medicine, at Rush University Medical Center. *MS. BEEBE* is a research assistant in the Department of Preventive Medicine at Rush University Medical Center. *MS. LOPEZ*, an experienced community qualitative researcher, works with the Puerto Rican Cultural Center. *DR. FAUX* is a Professor in the Rush University College of Nursing. Please address correspondence to Molly Martin, Rush University Medical Center, Preventive Medicine, 1700 W. Van Buren St., Suite 470, Chicago, IL 60612; (312) 942-2540; molly\_a\_martin@rush.edu.

A way to reduce the burden of asthma immediately is to modify conditions that exacerbate it.<sup>6</sup> Two potentially modifiable conditions are indoor environmental exposures and adherence to inhaled corticosteroid medications. Indoor environmental exposures such as smoke, dust, cockroach, and mold, have been shown to correspond to higher asthma prevalence rates among Puerto Ricans<sup>7</sup> and contribute to exacerbations.<sup>8-10</sup> Inhaled corticosteroid medications reduce the rates and severity of asthma attacks,<sup>11</sup> but proper medication adherence is poor in Hispanics.<sup>12-13</sup> Previous asthma studies of Puerto Rican populations in the northeastern United States have demonstrated important associations between these two behavioral risk factors and social and cultural variables.<sup>14-18</sup>

The goal of the current study was to inform the design of a self-management intervention for Puerto Rican children with asthma. Asthma self-management was defined as the behaviors individuals engage in to control their asthma. This study implemented a qualitative approach to inform the intervention design, subsequently providing the first information on asthma for the Midwest Puerto Rican population and also allowing a rare exploration into the thoughts, feelings, and behaviors of Puerto Rican youth. Specifically, the study aimed 1) to describe variations in the types of asthma self-management behaviors typically performed by children, adolescents, and their caregivers; and 2) to identify the specific beliefs informing asthma self-management behaviors in Midwest Puerto Rican families.

## Methods

**Study design.** The target community of Humboldt Park has a long history of political activism and remains a primary port of entry for new Puerto Rican migrants from the island. Forty-five percent of adults do not have a high school diploma and poverty rates range between 22–33%.<sup>19</sup>

The primary study method was naturalistic inquiry, where theory development emerges naturally from qualitative research methods in order to incorporate the influence of the research process.<sup>20</sup> The study began with key informant interviews and continued with focus groups.<sup>21-25</sup> The key informant interviews served to inform the topics and frame the questions discussed in the focus groups. Members of the target community participated from the study's inception.<sup>26-27</sup> The lead author (MAM) was a member of a community asthma task force made up of community leaders, researchers, community-based organization (CBO) representatives, school coordinators, and parents of children with asthma. This task force approved the study and recommended the sources for the key informant interviews. Several CBOs reviewed the interview and focus group guides and assisted with recruitment, study implementation, data interpretation, and manuscript preparation.

Written informed consent was obtained from parents and children in either English or Spanish. Local CBO representatives were present to ensure that participants understood the information presented as well as to help foster a supportive environment for questions. The study was approved by the Rush University Medical Center Institutional Review Board.

**Key informant interviews.** The key informants were recommended by local physicians

and the community asthma task force. The lead author interviewed five key informants for 30–60 minutes in August 2007. Interviews were performed in informants' language of choice (English) and were audio-recorded. A \$50 reimbursement was given to key informants.

**Focus groups.** Four focus groups were conducted between August 2007 and February 2008 in community schools. The first focus group consisted of Puerto Rican parents of children with asthma (13 participants). The second group contained Puerto Rican children with asthma in local elementary schools which run from kindergarten through 8th grade (three participants). Both groups were recruited by parent educators from a CBO. The third focus group of Puerto Rican adolescents with asthma were recruited by a CBO affiliated with an alternative high school (nine participants). A repeat focus group, recruited by a school clinic, was held for elementary school children (seven participants) due to a small turnout at the initial focus group. All focus groups were conducted by a Puerto Rican bilingual moderator (LL), with the exception of the final elementary school group, which was moderated by the lead author (MAM). The parent focus group was conducted in both English and Spanish, while the other groups were in English. Each group lasted one hour and was audio recorded. Participants were reimbursed \$25 for their time.

**Data analysis.** Audio recordings from the key informant interviews and focus groups were professionally transcribed and translated into English (when appropriate). Transcriptions were analyzed using naturalistic inquiry methods which include an initial data review for topical coding and a second analysis for exploring relationships among the coding categories.<sup>20,28</sup> (One key informant declined to be audio-recorded and the equipment malfunctioned during the initial elementary school focus group. Written notes were used for these two instances.) The lead author sorted the data into coding categories that had been developed based on the interview guide questions, and also into new categories that emerged during the analyses process. The coding was repeated by a second independent coder (JB) with agreement greater than 95%. Themes were then extracted in a group process led by a senior qualitative investigator (SF) during which time it was determined that theme saturation had been reached.

## Results

**Participant demographics.** The key informants included a local general pediatrician in private practice, a pediatrician from a mobile asthma van, two Puerto Rican parent educators from a CBO, and a Puerto Rican school organizer. Focus group parents (see Table 1) ranged in age from 17–46 years old and were mostly female (92%). Some of the parents were born in Puerto Rico, and the majority had less than a high school education. The adolescents and children ranged in age from 9 to 19 years old. All had been born in the mainland U.S.

**Asthma self-management behaviors of youth and caregivers.** Parents and informants alike agreed that children were assuming the management responsibilities for their asthma at younger ages than they ideally felt they should. However, they also agreed that children needed to be able to care for themselves in the absence of a parent. The adolescents discussed how developing asthma skills at a young age better prepared chil-

**Table 1.****FOCUS GROUP PARTICIPANT DEMOGRAPHICS**

	Parent Focus Group	High School Focus Group	Elementary School Focus Group <sup>a</sup>
Total participants	13	9	10
Age range in years	17–46	14–19	9–13
Female	12 (92%)	5 (56%)	4 (40%)
Place of birth			
Mainland U.S.	9 (69%)	9 (100%)	10 (100%)
Puerto Rico	4 (31%)	0	0
Completed high school/GED	6 (46%)	—	—
Current grade range	—	9–12	4–8 <sup>b</sup>

<sup>a</sup>Two elementary school focus groups combined.

<sup>b</sup>Elementary schools in this neighborhood run from kindergarten through 8th grade.

dren for the future. Despite this need for independence, parents felt asthma management was an unfair burden for young children. (See Box 1 for participant quotations.)

Each elementary and high school participant reported they typically self-administer their medication, with the elementary school children receiving more parental supervision. The high school group in general felt they did not control their asthma as well as when their parents helped, and several stated they wanted more parental help now. The key informants suggested that parents in this community often lack resources to optimally respond to their children's medical or developmental needs, such as learning to manage their asthma, which may translate into difficult transitions into adulthood.

**Beliefs influencing asthma self-management behaviors.** When discussing how to stop or prevent asthma, participants overwhelmingly focused on asthma management techniques that involved manipulation of the environment or emotions. Relaxation was consistently referred to across all focus groups as a primary treatment for asthma attacks triggered by exercise or emotion. Attempts to repair imbalances between hot and cold was another major strategy, as evidenced by statements relating to changing the temperature, going inside, and adding clothing.

Participants repeatedly mentioned avoidance of asthma medications. Fear of over-medication and side effects was described repeatedly. The adolescents complained about the taste of the medications. The parents discussed confusion with medications due to differences between their preparations in the mainland United States and in Puerto Rico. Other medication barriers described by parents concerned access to and administration of medication during school hours. Several parents agreed that it is horrible to have to force a child to sit, crying, with a mask on to administer the medication. A final challenge discussed by the parents was how the side effects the medications affect not only the child, but the family as well and sometimes force parents to make very difficult decisions.

**Box 1.**

**FOCUS GROUP RESULTS AND SUPPORTING PARTICIPANT QUOTATIONS**

---

**Asthma self-management behaviors of Puerto Rican youth and caregivers**

---

Children manage their own asthma at younger ages than ideal

*Parent:* “. . . imagine how it is for us . . . that she did have an asthma attack and no one was in the house, well, the child doesn't know what we do. I think that is good that she [another parent] leaves it to the child to know what to do in case.”

Children need to know how to manage asthma without an adult

*Adolescent:* “The younger you start taking care of it yourself, then the older you get the more you are going to know. Like your skills are going to be better, you know.”

Asthma management is an unfair burden for children.

*Parent:* “. . . Kids are active. They're always jumping around, moving, you know, like playing around, running around . . . they know they got asthma but they really don't pay no mind to it because they're kids. You know, they want to play. That's what, you know, they're here for now, to play around, you know, they don't take things serious.”

Adolescents receive less parental supervision which they feel leads to worse asthma control.

*Adolescent:* “I can't even tell when I'm wheezing. My sister notices. That's how normal it is for me . . . I think the older you get the more it's harder to figure out.”

*Adolescent:* “My mother used to be like you know you got to do your inhaler, use the machine before you go out and so she would prevent it from happening, but now I just kind of wait for it to happen . . .”

---

**Beliefs influencing asthma self-management behaviors**

---

Manipulate emotions to manage asthma

*Parent:* “Sit them down. Calming them down. That works. Letting them breathe in and out, that works.”

Fix imbalances in hot and cold

*Adolescent:* “He'll [my boyfriend] want to take me [to the hospital] but I'm like no, just put the fan in the window.”

Avoidance of medications due to fears of overmedication and side effects

*Adolescent:* “Every time I feel something I got to pull out the pump, you know, but that's not good though.” “I'm putting so much albuterol in my system.”

(Continued on p. 469)

**Box 1. (continued)**

*Adolescent:* “You can tell that you weren’t supposed to do that. I shouldn’t have done that last one, right? Damn, I might kill myself.”

*Child:* “My doctor says I’m supposed to take an asthma pump through the whole winter but . . . I only do it when I get sick like if I have a cold or the flu or something I’ll do that, but when I’m fine I feel that I’m just putting medication inside of me when I really don’t need it because I feel ok.”

*Parent:* One parent said: “Yes, you know, there’s times I think about it, man, I’m gonna give him this medicine right now, he’s gonna be climbing the walls, he’s not gonna listen ‘cause he won’t listen. He’ll just be on the go, you know, like running back and forth . . . I’m gonna give it to him and he’s gonna drive me nuts all day.”

**Fear of asthma-related death**

Children and parents fear dying from asthma

*Parent:* “My daughter completely stopped breathing and it was the most terrifying thing I went through my whole entire life.”

*Child:* “It’s like watching a scary movie, like you are in the movie.”

*Adolescent:* “I thought I was gonna die.”

**A need for more public education**

Education is needed for parents and youth affected by asthma

*Adolescent:* “Teach the parents too because I know my dad was smoking on me and stuff and I don’t want to tell him not to because you know he’s driving me to school. I want the ride.”

General community education needed

*Adolescent:* “I went to places where they are throwing activities and stuff and people were smoking around me. It’s kind of like they don’t want you to be in there . . .”

**Other important themes.** *Fear of asthma-related death.* Key informants and focus group participants emphasized the constant fear with which parents and asthmatic children live. Parents described living with the fear that their child could die and related a myriad of past fearful experiences. In response to this fear, parents and children described behavior modifications such as learning your triggers and ensuring that you have your medicine with you.

*A need for more public education.* Key informants and focus group participants unanimously agreed that more education was needed not only for parents and youth affected by asthma, but also for teachers and the general community. Children and parents emphasized the importance of support from people in their community without asthma who could recognize and help when they are ill. Participants specifically identified a need for smoking cessation education and resources, as well as a general reduction of environmental tobacco smoke.

*Community supports for asthma management.* Key informants and focus group participants identified multiple areas of strength and support in their community. The primary assets identified by these groups were family and the schools.

## Discussion

In 2001, the National Heart, Lung, and Blood Institute (NHLBI) stated, “The greatest problem in reaching minority populations is not lack of effectiveness but lack of understanding about how to establish patient programs in different settings and how to encourage patients to become engaged in the education process.”<sup>29(p.230)</sup> To prevent this common limitation, our study of the asthma self-management needs, assets, and beliefs of the target population was conducted before implementing an intervention. These data give the first description of the specific asthma management behaviors, beliefs, and challenges faced by Midwest Puerto Rican children.

Information about different age-related self-management practices and their consequences for child health has not previously been reported for Puerto Rican populations. The skills and parental support needed by children to manage asthma varies by age and individual maturity level. Our results suggest that adolescents may experience worse asthma morbidity due to less parental supervision and inadequate self-management skills. These are similar to results from other youth populations<sup>30</sup> and reflect a common pattern in adolescence where family-based routines decrease and influences outside the family play a larger role in structuring behavioral practices.<sup>31</sup> In our study, the elementary school children felt comfortable with the parental supervision they received and the parents were comfortable giving it. Conversely, the high school participants had less parental intervention and worse control of their asthma; they wanted more parental supervision; however, they also knew they needed to be able to manage their asthma independently. Several informants suggested that parents needed more resources and assistance to help their children develop the asthma self-management skills necessary for adulthood.

The mind-body asthma management techniques described in this study are similar to those held by other Puerto Rican populations in the Northeastern United States and the island of Puerto Rico.<sup>17,32–33</sup> These findings are consistent with the concept of “balance”—either internal, emotional, or social—commonly found in the traditional Puerto Rican ethnomedical belief system.<sup>33</sup> Our study sample did not contain non-Puerto Ricans to determine if these beliefs are unique to Puerto Ricans, but other studies suggest they are not.<sup>34–35</sup>

The fears of overmedication and medication side effects found in this sample are

similar to those reported from Puerto Rican focus groups in New York State,<sup>18</sup> although our focus group design provided more poignant examples of the difficult challenges related to medications. Several parents reported that the medications made their children hyperactive, putting those parents in situations where they must weigh the risks of not administering the medication with the burdens the side effects impose on the child and the rest of the family. In addition, administering the medications to children who resist can be very distressing.

Several other important themes were raised. Fear was mentioned frequently, which is consistent with other studies in Puerto Ricans.<sup>36</sup> Additionally, all participants in our study described a need for more asthma education, which suggests there is still a large gap in asthma knowledge in this community. The children and adolescents in particular mentioned that they could better prevent and manage attacks if more people without asthma understood asthma triggers and the associated dangers they pose.

This study has several strengths. The first is its participatory design which involved multiple community partnerships. Developing these partnerships took one year, but the result was rapid recruitment, good attendance in groups, and engaged participants. Another strength is the qualitative design, which provides a unique look into the perceived world of the participants. Instead of relying on second-hand information from parents and teachers, children and adolescents contributed directly to the study. The final strength is the strong desire of the community partners to build local capacity for both research and asthma management; these results and the research process informed several new locally-driven research studies.

Because of the qualitative nature of the study, these results are intended only to generate hypotheses and stimulate further investigation. The statements made by participants cannot be applied to all Puerto Ricans. The data generated within a specific social situation like a focus group are highly contextualized—it cannot be assumed that what people say in a focus group is the same as what they would say in another situation.<sup>23</sup> The sample size was not large although theme saturation was reached. Individual asthma severity was not formally assessed; it is possible that perceptions of asthma could vary depending on severity or level of control. A final limitation is that the study included only Puerto Rican participants.

While much has been done to describe the disproportionate prevalence and morbidity rates of asthma in Puerto Rican children, very few intervention studies have been conducted to date.<sup>37–38</sup> The descriptive design of this study provides illustrations that may be of use to both intervention researchers and clinicians. This study describes the management roles of Puerto Rican children at different ages which is critical for the design of pediatric self-management interventions, especially among adolescents who need to gain adequate self-management skills for adulthood.<sup>30–31</sup> Our study results suggest that health care providers serving Puerto Rican children should strive to recognize and incorporate families' views about the environment, emotions, and hot/cold imbalances in order to generate successful partnerships. Interventions should have a strong focus on medications, including how to minimize side effects and how medications can be a source of control when emotions and environment cannot be controlled. Individual and community-wide education is needed that encourages leadership and

has a strong emphasis on smoking cessation. Finally, interventions should involve the family whenever possible and capitalize on the knowledge and motivation already present in the community.

## Acknowledgments

The authors would like to thank the following organizations and individuals who contributed to the generation of these data: The Greater Humboldt Park Community of Wellness Asthma Task Force; Tunji Ladipo, MD, at Norwegian American Hospital; Rose de Jesus and Lucia Tellado and the Near Northwest Neighborhood Network; The Puerto Rican Cultural Center; Von Humboldt Elementary School; De Diego Elementary Community Academy; Debbie Sontag, RN, and the Erie Family Health Center; Stephanie Whyte, MD; Jack Leong, MD; Idida Perez; Steven Whitman, PhD; and Steven Rothschild, MD. This project was supported by an internal grant from the Rush University Department of Preventive Medicine, under the leadership of Chairperson Lynda H. Powell, PhD.

## Notes

1. Lara M, Akinbami L, Flores G, et al. Heterogeneity of childhood asthma among Hispanic children: Puerto Rican children bear a disproportionate burden. *Pediatrics*. 2006 Jan;117(1):43–53.
2. Homa DM, Mannino DM, Lara M. Asthma mortality in U.S. Hispanics of Mexican, Puerto Rican, and Cuban heritage, 1990–1995. *Am J Respir Crit Care Med*. 2000 Feb;161(2 Pt 1):504–9.
3. U.S. Census Bureau. Census 2000 Demographic Profile Highlights. Spanish Fork, UT: U.S. Census Bureau, 2006.
4. Whitman S, Williams C, Shah AM. Sinai Health System's improving community health survey: report 1 (ten key findings). Chicago, IL: Sinai Health System, 2004.
5. Miller RL, Ho SM. Environmental epigenetics and asthma: current concepts and call for studies. *Am J Respir Crit Care Med*. 2008 Mar 15;177(6):567–73. Epub 2008 Jan 10.
6. McNabb WL, Wilson-Pessano SR, Jacobs AM. Critical self-management competencies for children with asthma. *J Pediatr Psychol*. 1986 Mar;11(1):103–17.
7. Freeman NC, Schneider D, McGarvey P. Household exposure factors, asthma, and school absenteeism in a predominantly Hispanic community. *J Expo Anal Environ Epidemiol*. 2003 May;13(3):169–76.
8. Huss K, Rand CS, Butz AM, et al. Home environmental risk factors in urban minority asthmatic children. *Ann Allergy*. 1994 Feb;72(2):173–7.
9. Infante-Rivard C. Childhood asthma and indoor environmental risk factors. *Am J Epidemiol*. 1993 Apr 15;137(8):834–44.
10. Gruchalla RS, Pongratic J, Plaut M, et al. Inner city asthma study: relationships among sensitivity, allergen exposure, and asthma morbidity. *J Allergy Clin Immunol*. 2005 Mar;115(3):478–85.
11. Agertoft L, Pedersen S. Effects of long-term treatment with an inhaled corticosteroid on growth and pulmonary function in asthmatic children. *Respir Med*. 1994 May; 88(5):373–81.

12. Halterman JS, Aligne CA, Auinger P, et al. Inadequate therapy for asthma among children in the United States. *Pediatrics*. 2000 Jan;105(1 Pt 3):272–6.
13. Bearison DJ, Minian N, Granowetter L. Medical management of asthma and folk medicine in a Hispanic community. *J Pediatr Psychol*. 2002 Jun;27(4):385–92.
14. Beckett WS, Belanger K, Gent JF, et al. Asthma among Puerto Rican Hispanics: a multi-ethnic comparison study of risk factors. *Am J Respir Crit Care Med*. 1996 Oct;154(4 Pt 1):894–9.
15. Ledogar RJ, Penchaszadeh A, Garden CC, et al. Asthma and Latino cultures: different prevalence reported among groups sharing the same environment. *Am J Public Health*. 2000 Jun;90(6):929–35.
16. Pachter LM, Weller SC. Acculturation and compliance with medical therapy. *J Dev Behav Pediatr*. 1993 Jun;14(3):163–8.
17. 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 Apr;39(2):119–34.
18. Tumiel-Berhalter L, Zayas LE. Lay experiences and concerns with asthma in an urban Hispanic community. *J Natl Med Assoc*. 2006 Jun;98(6):875–80.
19. American Fact Finder. Data on City of Chicago. Washington, DC: U.S. Census Bureau, 2003.
20. Lincoln YS, Guba EG. *Naturalistic inquiry*. Newbury Park, CA: Sage Publications, Inc., 1985.
21. Fontana A, Frey JH. The interview: from structured questions to negotiated text (Chapter 24). In: Denzin NK, Lincoln YS, eds. *Handbook of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc., 2000.
22. Horner SD. Using focus group methods with middle school children. *Res Nurs Health*. 2000 Dec;23(6):510–7.
23. Sim J. Collecting and analysing qualitative data: issues raised by the focus group. *J Adv Nurs*. 1998 Aug;28(2):345–52.
24. Reed J, Payton VR. Focus groups: issues of analysis and interpretation. *J Adv Nurs*. 1997 Oct;26(4):765–71.
25. Esposito N. From meaning to meaning: the influence of translation techniques on non-English focus group research. *Qual Health Res*. 2001 Jul;11(4):568–79.
26. Minkler M, Wallerstein N. *Community-based participatory research for health*. San Francisco, CA: John Wiley & Sons, Inc., 2003.
27. Israel BA, Eng E, Schulz AJ, et al. *Methods in community-based participatory research for health*. San Francisco, CA: John Wiley & Sons, Inc., 2005.
28. Ryan GW, Bernard HR. Data management and analysis methods (Chapter 29). In: Denzin NK, Lincoln YS, eds. *Handbook of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc., 2000.
29. Strunk RC, Ford JG, Taggart V. Reducing disparities in asthma care: priorities for research—National Heart, Lung, and Blood Institute workshop report. *J Allergy Clin Immunol*. 2002 Feb;109(2):229–37.
30. McQuaid EL, Kopel SJ, Klein RB, et al. Medication adherence in pediatric asthma: reasoning, responsibility, and behavior. *J Pediatr Psychol*. 2003 Jul–Aug;28(5):323–33.
31. Fiese BH, Wamboldt FS, Anbar RD. Family asthma management routines: connections to medical adherence and quality of life. *J Pediatr*. 2005 Feb;146(2):171–6.
32. Koinis-Mitchell D, McQuaid EL, Friedman D, et al. Latino caregivers' beliefs about asthma: causes, symptoms, and practices. *J Asthma*. 2008 Apr;45(3):205–10.

33. Pachter LM, Cloutier MM, Bernstein BA. Ethnomedical (folk) remedies for childhood asthma in a mainland Puerto Rican community. *Arch Pediatr Adolesc Med.* 1995 Sep;149(9):982-8.
34. Pachter LM, Sumner T, Fontan A, et al. Home-based therapies for the common cold among European American and ethnic minority families: the interface between alternative/complementary and folk medicine. *Arch Pediatr Adolesc Med.* 1998 Nov; 152(11):1083-8.
35. Bender BG, Bender SE. Patient-identified barriers to asthma treatment adherence: responses to interviews, focus groups, and questionnaires. *Immunol Allergy Clin North Am.* 2005 Feb;25(1):107-30.
36. Zayas LE, Jaen CR, Kane M. Exploring lay definitions of asthma and interpersonal barriers to care in a predominantly Puerto Rican, inner-city community. *J Asthma.* 1999 Sep;36(6):527-37.
37. Cloutier MM, Jones GA, Hinckson V, et al. Effectiveness of an asthma management program in reducing disparities in care in urban children. *Ann Allergy Asthma Immunol.* 2008 Jun;100(6):545-50.
38. Canino G, Vila D, Normand SL, et al. Reducing asthma health disparities in poor Puerto Rican children: the effectiveness of a culturally tailored family intervention. *J Allergy Clin Immunol.* 2008 Mar;121(3):665-70. Epub 2007 Dec 3.