Home-Based Asthma Self-Management Education for Inner City Children

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ABSTRACT Optimal home self-management in young children with asthma includes accurate symptom identification followed by timely and appropriate treatment. The objective of this study was to evaluate a home-based asthma educational intervention targeting symptom identification for parents of children with asthma. Two hundred twenty-one children with asthma were enrolled into an ongoing home-based clinical trial and randomized into either a standard asthma education (SAE) or a symptom/nebulizer education intervention (SNEI). Data included home visit records and parents self-report on questionnaires. Symptom identification and self-management skills significantly improved from preintervention to postintervention for parents in both groups with the exception of checking medications for expiration dates and the frequency of cleaning nebulizer device and equipment. However, significantly more parents of children in the SNEI group reported treating cough symptoms as compared with the SAE group \((p = 0.05)\). Of concern is that only 38\% of all parents reported having an asthma action plan in the home. A targeted home-based asthma education intervention can be effective for improving symptom identification and appropriate use of medications in children with asthma. Home asthma educational programs should address accurate symptom identification and a demonstration of asthma medication delivery devices.

Key words: asthma, children, self-management, symptom identification.

Background

Low-income, minority children have disproportionately high morbidity and mortality rates for asthma when compared with nonminority children. Low-income children with decreased access to outpatient care, as compared with children with private health insurance, tend to rely on hospital emergency rooms as their primary source of asthma care and are more likely to incur a hospital admission (Halfon & Newacheck, 1993; Lieu et al., 1997). Early and accurate identification of asthma symptoms, when linked to timely and appropriate asthma medication use, is associated with a decrease in emergency room and hospital admissions. The parent or child’s ability to accurately identify or perceive symptoms and pulmonary function compromise is critical for optimal asthma management in the home and necessary for clinicians to prescribe appropriate asthma medication therapy (Yoos, Kitzman, McMullen, & Sidora, 2003).

In a study of children with persistent asthma, significant errors in accurately perceiving the child’s asthma severity were made by one third of parents possibly resulting in treatment errors (Yoos et al., 2003). Studies of home-based asthma...
educational programs reinforcing appropriate parental self-management decisions have been shown to improve adherence to asthma medication use and reduce asthma morbidity in children (Bendefy, 1991; Nides et al., 1993; Zimo, Gaspar, & Akhter, 1989).

Home asthma medication use in young children often includes administering medications via a nebulizer device. Prevalence of nebulizer use in young children with chronic asthma ranges from 33 to 71% (Butz et al., 2000; Dawson, Jandera, & Penna, 1992; Zach & Karner, 1989). Current recommendations for asthma home management encourage early initiation of nebulizer therapy for children with moderate to severe asthma (Barry & O’Callaghan, 1997), because nebulizer therapy provides a portal of entry and direct delivery to the respiratory system for both rescue and controller asthma medications (Barry & O’Callaghan, 1997).

Home nebulizer use is favored over use of metered dose inhalers (MDIs) by many parents because the nebulizer does not require young children to coordinate respiration with aerosol delivery (Canny & Levison, 1988). This preference is contrary to studies indicating MDIs with spacers are as effective as nebulizers in administering medications to young children with asthma (Chou, Cunningham, & Cramer, 1995; Kerem et al., 1993; Lewis & Fleming, 1985; Schuh et al., 1999), and nebulizer devices continue to be prescribed at high rates (33%) for young children with asthma (Butz et al., 2000). Although appropriate nebulizer use has been associated with a decrease in emergency department (ED) care and hospitalizations (Zimo et al., 1989), many asthma educational programs fail to address correct home nebulizer use. We hypothesized that appropriate home asthma management in young children can be improved or supplemented by a home-based intervention addressing accurate symptom identification and appropriate nebulizer use in a group of children with primarily persistent asthma and who use a nebulizer to administer their asthma medications.

Organizing Framework

The study was based on the conceptual framework adapted from the model of symptom management (University of California, San Francisco School of Nursing Symptom Management Faculty Group, 1994). The goal of symptom management is to avoid or delay negative outcomes of an illness or disease. Early and accurate identification of asthma symptoms (symptom experience), if allied with appropriate treatment and accurate use of asthma medications including administering medications via a nebulizer device (symptom management), is hypothesized to improve outcomes defined as a decrease in frequency of asthma symptoms and decrease in number of ED visits. This model is the clinical basis for long-term asthma self-management for young children (Fritz, Klein, & Overholser, 1990). Specific components of the asthma symptom educational intervention, in this study, targeted symptom experience, that is, how parents evaluated the intensity, location, temporal nature, and frequency of asthma symptoms. Symptom management strategies include teaching parents appropriate decision-making strategies regarding what symptoms require administering asthma medications via a nebulizer or MDI and when to seek ED care. Several child and parent characteristics such as the child’s age, ethnicity, asthma severity, type of medical insurance, current symptom frequency, and parent educational level may influence the association between the home symptom education intervention and the symptom and ER use outcomes. These child and parent factors were taken into consideration when the community health nurses delivered the educational intervention. This article describes the process and content involved in teaching parents and children (a) asthma symptom identification and (b) appropriate use of a nebulizer device to administer asthma medications as reported by the community health nurses.

Methods

This is a cross-sectional analysis of parents and children enrolled in an ongoing randomized clinical trial of an asthma educational intervention, comparing the frequency of asthma home management skills, that is, asthma symptom identification skills, appropriate use of a nebulizer, and asthma symptoms used to decide to administer medication. The educational intervention was delivered by community health nurses to the parents during home visits. Home visit data presented in this article were collected by
four community health nurses between October 2001 and December 2003. Parents’ self-reports of symptoms, ED visits, and medication use preintervention were collected by trained interviewers during the same time period. Institutional Review Board (IRB) approval was obtained from the Johns Hopkins University School of Medicine Institutions and the University of Maryland School of Medicine. Informed consent was obtained from all participating parents, and assent was obtained from all children aged 7 years and above.

**Study population and randomization.**
Two hundred twenty-one families (child/parent families) with children aged 2–8 years who have asthma were recruited into an ongoing intervention study testing the effectiveness of a home-based asthma educational intervention. The mother was primarily the parent in 92% of the families; thus, she was targeted to receive the intervention. Child/parent families were recruited from university-affiliated pediatric practices including pulmonary/allergy specialty (50%), pediatric emergency room (20%), and community pediatric practices (30%), all serving inner city children in Baltimore, Maryland. Inclusion criteria were (a) having a diagnosis of mild, moderate, or severe persistent asthma, based on national guidelines (National Asthma Education Prevention Program [NAEPP], 1997, 2002) and (b) use of a nebulizer for administration of at least one asthma medication. Asthma severity was based on national guidelines (NAEPP, 1997) using day and night symptom reports and current asthma medication use.

Data are presented for the 210 (95%) child/parent families who completed the home visit educational intervention study. Child/parent families were randomized into one of two educational groups: (a) the standard asthma education (SAE) intervention (n = 105) or (b) the symptom/nebulizer education intervention (SNEI) (n = 105) based on even or odd digits from a random digit list.

**Description of standard asthma education.**
The SAE intervention, delivered during three home visits, was designed to assist families in establishing regular primary care for their child’s asthma and understanding basic asthma management principles. SAE included facilitating access to preventive and acute asthma care, encouraging parents to obtain an asthma action plan from their child’s health care provider, and teaching use of a peak flow meter (PFM) to children over 5 years of age. The SAE intervention did not include any symptom identification or nebulizer-use education.

**Description of the symptom identification/nebulizer educational intervention.**
The focus and goal of the SNEI was to teach accurate symptom identification, that is, persistent cough, wheeze, intercostal retractions, and appropriate treatment of these symptoms including the use of a home nebulizer device. The SNEI intervention was delivered during six home visits over a 6-month period. The intervention was based on the WEE Wheezers Program (Wilson et al., 1996), the A+ Asthma Club Program (Schneider et al., 1997), teaching pediatric symptom identification in children with asthma (Yoos & McMullen, 1999), and recommendations for nebulizer therapy (Barry & O’Callaghan, 1997; Canny & Levison, 1988). Initially, parents were taught accurate asthma symptom identification including review of early (cough) and late (intercostal retractions, inability to talk) symptoms. The specific care plan addressing asthma symptoms requiring treatment and the home medication protocol were verified by the community health nurses with each child’s primary care provider when possible. The parent component of the educational intervention included teaching comparison of a child’s normal breathing to breathing patterns noted during an acute asthma episode. Parents were taught to recognize each asthma symptom, that is, cough, wheeze, inability to talk, and signs including intercostal retractions, counting the child’s respiratory rate, and use of a PFM in children over 5 years of age, so that they could make accurate treatment decisions. Specific nebulizer-use education targeted accurate medication dispensing including measuring accurate amount of medication, pouring medication in nebulizer cup, the frequency of changing nebulizer mask and tubing, and the cleaning and maintenance of the nebulizer device.

**Procedures.**
Following each home visit, the community health nurse completed the SAE Home Visit Checklist (Table 1) or the SNEI Home Visit Checklist (Table 2)
to document the specific teaching material imparted during each session with the family. Home visits for each educational group were conducted by four community health nurses adept in working with inner city populations and specifically trained in teaching symptom identification and nebulizer use in families of children diagnosed with persistent asthma. Both educational interventions were delivered by all four community health nurses to control for differences in teaching style of each community health nurse. Training for the community health nurses occurred over a 3-day period and included (a) pathophysiology of asthma, (b) appropriate asthma treatment, (c) update on current medications, (d) asthma symptom identification including PFM use, setting each child’s “personal best,” and (e) nebulizer use and care, that is, mechanics of several nebulizer brand devices, care of nebulizer tubing, mouthpieces, and masks, checking air flow rate, changing filter, appropriate cleaning and maintenance of a nebulizer, and accurate medication dispensing into nebulizer medication cup. Monthly supervision of the community health nurses was conducted by a pediatric nurse specialist in asthma, in addition to a pediatric allergy nurse. Both nurses were available to the community health nurses by beeper 24 hr a day for immediate problems or questions.

### Evaluation of the home asthma educational interventions.

Parents were tested for their ability to recognize symptoms and their nebulizer-use technique by the community health nurses after the midpoint of the educational sessions (home visit number two for SAE and visit number four for SNEI groups) using a structured questionnaire (Home Asthma Educational Intervention form) and demonstration of nebulizer use. Additionally, parents answered the following questions in the subsequent order. What symptoms do you use to decide when your child needs to use a nebulizer? Do you count the number of times your child is breathing when he/she is coughing or wheezing? Do you give your child asthma medication when he or she starts to cough? Do you give your child asthma medication when your child starts to wheeze? Do you make an appointment for your child with their pediatric health care provider for asthma care even if your child is not sick, that is, preventive asthma care? Do you check the expiration dates of your child’s asthma medications? How often do you usually clean the mouthpiece and cup that holds the medicine for your child’s nebulizer? At the end of the evaluation session, each parent was rated on an 8-point checklist for demonstrating the setup of a nebulizer treatment.
### TABLE 2. Symptom/Nebulizer Educational Intervention (SNEI) Home Visit Checklist

<table>
<thead>
<tr>
<th>Child’s name</th>
<th>ID</th>
<th>Date of visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse’s name</td>
<td></td>
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</tbody>
</table>

**Introduction**
- Review purpose of home visit.
- Review patient’s information sheet (address, phone, and contact list).

**Current asthma management using nebulizer**
- Review all asthma medications in home that child is currently using (type of medication, dosage, and frequency of administration).
- Review how each medication works (controller or rescue medication) and how administered (oral, metered dose inhaler, diskus, and nebulizer).

**Nebulizer administration techniques:**
- Measure correct amount of medication and put in the nebulizer cup.
- Attach the mouthpiece to the T-piece and then attach this unit to the cup OR attach the mask to the cup.
- Turn on air compressor machine.
- Put the mouthpiece into the child’s mouth. Seal the lips tightly around the mouthpiece OR place the mask on the child’s face.
- Take slow deep breaths holding breath for 1–2 seconds before breathing out.
- Continue breathing with mouthpiece or mask until the medicine is gone from the nebulizer cup. This usually will take 10–12 min.
- Store the medicine in a safe place after each use.

**Check flow rate of nebulizer machine: use flow meter. If flow rate is low, assist family in obtaining new nebulizer.**

**Nebulizer cleaning and maintenance (ask parent to demonstrate how they clean the child’s nebulizer after each use or once a day)**
- Remove mask or mouthpiece and T-piece from the cup; and rinse the mask or mouthpiece and T-piece in warm running water for 30 seconds. Remind parent that tubing should not be washed or rinsed.
- Shake off excess water and air dry on clean cloth or towel.
- Put mask or mouthpiece and T-piece, cup, and tubing back together and connect to compressor. Run compressor for 10–20 seconds to dry inside of tubing.
- Disconnect tubing from compressor, store in nebulizer machine, and place cover on compressor.

**Nebulizer cleaning and maintenance (ask parent to demonstrate how they clean the child’s nebulizer once or twice a week)**
- Remove mask or mouthpiece and T-piece from the cup.
- Wash the mask or mouthpiece and T-piece with a mild dishwashing soap and warm water.
- Rinse under a strong stream of water for 30 seconds.
- Soak for 30 min in solution of one part white vinegar and two parts distilled water and throw out vinegar water solution after use. Teach parent NOT TO REUSE VINEGAR SOLUTION.
- Rinse nebulizer parts, excluding tubing under warm running water for 1 min.
- Shake off excess water and air dry on clean cloth or towel.
- Put mask, mouthpiece, T-piece, cup, and tubing back together and connect to compressor. Run machine for 10–20 seconds to dry inside of nebulizer.
- Disconnect tubing from compressor, store in ziplock bag.
- Clean surface of compressor with well-wrung, soapy cloth or sponge.
- May use alcohol or disinfectant wipe. Teach parent that NEVER PUT COMPRESSOR IN WATER.
- Place cover on compressor.
- Call the telephone number on the nebulizer machine to schedule a delivery for new tubing and masks when needed.
**Statistical analysis.**

The evaluation data, obtained from the Home Asthma Educational Intervention forms, were analyzed using SPSS PC version 11.5 statistical program (Statistical Package for Social Scientists, 2000). Initially, frequency distributions were examined for all sociodemographic, health, asthma management, and treatment variables included in the conceptual model. We then used the chi-square test to compare the distribution of categorical variables and the t test for comparisons of continuous variables, that is, symptom identification, decision to treat, and nebulizer use, by the asthma educational group (SAE versus SNEI). For severity level, children were categorized into two groups based on frequency distributions of asthma severity: mild intermittent and mild persistent ($n = 137$) versus moderate to severe persistent ($n = 73$). Asthma management variables were then compared between the two severity groups using chi-square test and t test.

**Findings**

**Sociodemographic and health characteristics of the child sample.**

As summarized in Table 3, children enrolled in this study and receiving all home visits ($n = 210$) were young, and primarily male, African American and reported medical assistance as their type of health insurance. Overall, the asthma morbidity was high in this group of inner city children, in that most children were categorized under mild to severe persistent asthma and reported a mean of almost three courses of oral steroid use during the past year. After enrollment, six children were classified under mild intermittent asthma and were included in the analysis. Nebulizer use had been low to moderate during the past month for each child. Of note is that less than half of the families reported having an asthma action plan for their child’s asthma in the home. There were no significant differences in any sociodemographic or health characteristics between the two educational groups (SAE and SNEI).
Asthma symptom management practices by educational group.

Most families completed all assigned educational home visits with a mean of 2.86 (SD 0.5, range 0–3) out of three visits for the SAE group and a mean of 5.6 (SD 1.2, range 0–6) out of six visits for the SNEI group. As summarized in Table 4, overall, symptom identification and self-management skills significantly improved from preintervention to postintervention for all variables (give child asthma medication when child starts to have cough, wheeze, and inability to talk; count child respirations when child is coughing or wheezing; and make an appointment with child’s physician for asthma care even when child is not sick). The two asthma management skills that were not different between preintervention and postintervention were (a) checking their child’s medications for expiration dates and (b) cleaning the nebulizer medicine cup and mouthpiece after each use, both endorsed by the majority of parents. Rates of parents reporting “yes” to symptom identification skills, for example, giving children medication for wheeze, giving children medication for cough, and counting the child’s respirations when he/she is coughing or wheezing were all significantly higher at postintervention as compared with preintervention rates. Of note is that significantly more children in the post-SNEI group reported they would treat cough symptoms than those in the post-SAE group (post-SAE: 75% versus post-SNEI: 84%, p = 0.05).
In general, most parents demonstrated appropriate nebulizer use at postintervention. Measurement of parent nebulizer-use technique was not collected at preintervention. Mean scores for both educational groups were 7 on the 8-point checklist indicating appropriate technique when using the nebulizer. There were no significant differences in the nebulizer-cleaning frequency by educational group or between preintervention and postintervention time periods. Only one family reported it had never cleaned their child’s nebulizer.

**Asthma symptom management practices by severity level.**

There were no significant differences by asthma severity group (mild intermittent to mild persistent versus moderate to severe persistent) related to having an asthma action plan in the home, administering asthma medication for asthma symptoms, counting the number of times the child breathes when he/she is coughing or wheezing, making an appointment with the child’s physician for asthma care even if the child is not sick, and checking if the child’s medications are outdated.

### Discussion and Implications

Overall, this group of inner city children with persistent asthma experienced a high rate of asthma morbidity and reported some deficient asthma self-management practices. The goal of symptom management, the clinical foundation for this study, is to avoid and delay negative outcomes of asthma including wheeze and cough symptoms. One component of the model of symptom management targets symptom experience, including how parents evaluate when to treat their child’s asthma symptoms. Despite most families reporting that they would treat symptoms of wheeze and inability to talk while breathing, at postintervention, over 20% still reported they would not treat cough symptoms. Treating cough

<table>
<thead>
<tr>
<th>Home symptom management characteristic</th>
<th>Total sample preintervention ( n = 221 )</th>
<th>SAE postintervention ( n = 99 )</th>
<th>SNEI postintervention ( n = 93 )</th>
<th>Total sample postintervention ( n = 192 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom identification and self-management variables</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Give child asthma medication when child starts to cough (yes)</td>
<td>96 (43.4)</td>
<td>74 (74.7)</td>
<td>78 (83.9)</td>
<td>152 (78.8) ( ^a,b )</td>
</tr>
<tr>
<td>Give child asthma medication when child starts to wheeze (yes)</td>
<td>204 (93.2)</td>
<td>99 (100)</td>
<td>88 (94.6)</td>
<td>187 (98.4) ( ^a )</td>
</tr>
<tr>
<td>Give asthma medicine for “Child Unable to Talk” (yes)</td>
<td>188 (85.8)</td>
<td>94 (97.9)</td>
<td>89 (97.8)</td>
<td>183 (97.9) ( ^a )</td>
</tr>
<tr>
<td>Count child respirations when child is coughing or wheezing (yes)</td>
<td>75 (33.9)</td>
<td>68 (70.8)</td>
<td>59 (65.6)</td>
<td>127 (68.3) ( ^a )</td>
</tr>
<tr>
<td>Make an appointment with child’s physician for asthma care even if child is not sick (yes)</td>
<td>153 (69)</td>
<td>88 (88.9)</td>
<td>86 (92.5)</td>
<td>174 (90.6) ( ^a )</td>
</tr>
<tr>
<td>Check child’s medications to make sure not outdated (yes)</td>
<td>217 (98.2)</td>
<td>98 (99)</td>
<td>91 (97.8)</td>
<td>189 (98.4)</td>
</tr>
<tr>
<td>Nebulizer-use variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nebulizer-use checklist—range 1–8 (mean, SD)</td>
<td>6.97 (1.6)</td>
<td>7.14 (1.7)</td>
<td>7.05 (1.6)</td>
<td></td>
</tr>
<tr>
<td>How often clean medicine cup and mouthpiece/mask of nebulizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After each use</td>
<td>167 (75.9)</td>
<td>75 (80.6)</td>
<td>77 (85.6)</td>
<td>152 (83.1)</td>
</tr>
<tr>
<td>Every 2–3 days</td>
<td>22 (10)</td>
<td>9 (9.7)</td>
<td>3 (3.3)</td>
<td>12 (6.6)</td>
</tr>
<tr>
<td>Weekly</td>
<td>9 (4.1)</td>
<td>6 (6.4)</td>
<td>6 (6.7)</td>
<td>12 (6.6)</td>
</tr>
<tr>
<td>Monthly/when dirty/never</td>
<td>22 (10)</td>
<td>3 (3.3)</td>
<td>2 (2.3)</td>
<td>5 (2.4)</td>
</tr>
</tbody>
</table>

**Note:** SAE, standard asthma education; SNEI, symptom/nebulizer education intervention.  

\( ^a \) \( p < 0.01 \) between baseline, SAE, and SNEI groups.  

\( ^b \) \( \chi^2 = 4.02, \ df = 1, \ p = 0.045 \) between SAE and SNEI groups.
symptoms with asthma medication was the only significant educational content associated with receiving the symptom management/nebulizer intervention educational program. This is significant because cough is thought to be a marker of airway inflammation and increased cough frequency may be a sensitive clinical marker of airway inflammation (Li et al., 2003; Wamboldt, 1998). Underestimation of symptom severity and delay in treatment of symptoms are associated with increased asthma morbidity and mortality (Halterman, Aligne, Auinger, McBride, & Szilagyi, 2000; Halterman et al., 2002; Lieu et al., 1997). Furthermore, cough was the most prevalent asthma symptom reported by children during an acute asthma episode (Burkhart & Ward, 2003; Yoos & McMullen, 1999). Appreciation of cough as an early asthma symptom is often not emphasized in asthma self-management or clinic educational programs (Burkhart & Ward, 2003). Moreover, accurate symptom identification by the parent is critical information for the child’s health care provider to accurately determine the child’s asthma severity level and prescribe appropriate therapy (Yoos et al., 2003).

Inaccurate symptom identification, noted in this study, did not occur at levels reported in previous studies. In a study of children diagnosed with mild to moderate asthma, one third of their parents made clinically significant errors in judging the severity of their child’s asthma symptoms including both overestimating and underestimating the symptom severity (Yoos et al., 2003). Families at risk for inaccurately identifying asthma symptoms included children with the greatest asthma severity (Yoos et al., 2003), a finding not supported by our data. This may be explained in that our child sample included over one third of children with moderate to severe persistent asthma.

The primary educational content presented to the parent in this study included symptom identification, home self-management skills, and accurate use of a nebulizer device. Traditional home asthma educational interventions often do not adequately address symptom identification, when to initiate self-management strategies, or when to seek medical care. This suggests that parents of young children with persistent asthma may require more targeted, interactive asthma education on a regular basis rather than brief review of symptoms and medication use during an acute episode or well-child visit. While we acknowledge that most families may have received adequate information regarding appropriate nebulizer use during office or clinic visits, we found that many families did not know how to obtain new nebulizer tubing or masks and frequently requested these supplies from the community health nurse. Furthermore, in our study, one out of six children did not report cleaning the nebulizer medication cup or mask after each use as recommended by nebulizer device companies.

Despite the high morbidity noted in these children, only one third of the families reported having an asthma action plan in the home to direct parents what, when, and how to treat symptoms at home. Although written asthma action plans may not directly improve asthma outcomes (Lefevre et al., 2002), families are more likely to treat early symptoms of asthma with clear instructions on an asthma action plan. Initiation of an asthma action plan in the home and encouraging families to review the plan with the child’s health care provider at each clinic and emergency room visit theoretically should improve appropriate self-management of asthma in the home and prevent progression to more serious episodes. On the other hand, we may have underestimated the presence of asthma action plans in the home because some families did not recognize the asthma action plan when shown the form. In either case, teaching parents to post the asthma action plan in common areas such as the refrigerator provides clear instructions as to how to treat the child’s acute asthma episodes at home.

Of note is the high completion rate of the home visits. Ninety-five percent of families were located, and most children received a complete course of the educational intervention for each group. The high home visit completion rates are attributed to experienced community health nurses with flexible schedules and excellent tracking skills and educational content that was novel to most families. Parents were not compensated for the home visits as a condition of enrolling in the study. While both interventions were delivered by all of the community health nurses, this may have resulted in the SAE group receiving more than basic asthma education and account for the lack of significant difference between the two educational groups for most symptom management characteristics. We attempted to control for this with monthly review of the separate educational protocols with each community health nurse.

Several issues may limit the generalizability of this study’s findings beyond inner city children with mild to severe persistent asthma. Home asthma management practices including symptom identification were based on parent’s self-report rather than
objective measures of cough, wheeze, and shortness of breath symptoms. In addition, our data may underestimate asthma symptom and health care utilization. However, a previous report indicates that parental self-reports of children’s urgent care visits for asthma were in high agreement (91%) with medical record data (Pless & Pless, 1995). Nonetheless, even if we underestimated symptom reports, other measures of symptoms including use of a nebulizer for a mean of 3 days in last month suggest that the children in this sample are symptomatic and perhaps their parents are underestimating their asthma symptoms. One additional caveat with this study is that we are unable to determine if the improvement in parent knowledge was due to the specific educational content delivered in the home, the dose of the educational intervention, or simply having a nurse conduct a home visit. Last, we were unable to measure appropriate nebulizer use preintervention for comparison with postintervention behavior.

When working with parents of children with persistent asthma, nurses routinely need to teach early identification and treatment of both cough and wheeze symptoms. In addition, home asthma educational programs should address accurate symptom identification, address when to initiate appropriate treatment for symptoms, and provide a demonstration of the various asthma medication delivery devices including MDIs, nebulizers, and diskus.

In summary, this group of inner city children with persistent asthma experienced a high rate of asthma morbidity and reported some deficient asthma self-management practices. Despite most families reporting that they would treat late symptoms of asthma, that is, wheeze and inability to talk, over 20% reported they would not treat cough symptoms at postintervention. Despite the high morbidity noted in these children, only one third of the families reported having an asthma action plan in the home to direct parents what, when, and how to treat symptoms. Initiation of an asthma action plan in the home and reviewing the plan with the child’s health care provider may promote appropriate self-management of asthma in the home.

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References


