

The Impact of Asthma Health Education for Parents of Children Attending Head Start Centers

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Abstract Parents of children who attend Head Start Centers are key participants in the health promotion and care of their own children. This non-randomized, longitudinal study aimed to test the effectiveness of an educational intervention based on the asthma and healthy homes curriculum targeting parents of Head Start children with or without an asthma diagnosis. One hundred and fifteen parents of children in Head Start Centers received an

educational intervention at their corresponding sites, additionally pre- and post-test surveys were administered to measure educational intervention outcomes. A follow-up survey was conducted 6 months after the educational intervention was offered. Results showed a statistically significant increase in asthma and healthy home-knowledge ($p < 0.001$) in several areas. At 6 months post-intervention (54.4 %) (61 participants) were contacted and 98.4 % of made changes in their households as a result of their training. This study suggests that education can improve knowledge and change behaviors for the well-being of the residents of that household.

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Introduction

The Hidalgo County Head Start Program in Texas is a comprehensive child development initiative that serves children three to 5 years of age and their families. It serves the entire population of the County of Hidalgo, 774, 769 people reported in 2010 with 90.6 % of the population being Hispanic (US [11]). The Hidalgo Head Start Program has 43 centers with 115 children diagnosed with asthma. Services received by Head Start children include: educational, nutritional, dental, mental health, health, social, transitional and other special services. Eligible families receive Head Start services when they meet Federal Income Guidelines based on poverty data. In Hidalgo County, 34.4 % of the population is below poverty level and thus, eligible for Head Start Program services [11].

Asthma affects more children than any other chronic disease and is increasing in number each year [10]. Asthma

is one of the most frequent reasons for hospital admissions among young children [12]. The rate of asthma hospitalizations in children (18 years old and younger) in Hidalgo County is the highest in Texas (in 2009, 26.2 and 17.4 respectively) [9]. Asthma has a major impact on the health of the population and the burden falls disproportionately on some populations especially in children affected by the disease.

While different health promotion and disease prevention approaches are reported in the published literature [3, 7], environmental education targeting asthma triggers and home visitation show evidence of success [2, 4, 8].

The purpose of this study was to test the effectiveness of an educational intervention based on the asthma and healthy homes curriculum targeting parents of Head Start children with or without an asthma diagnosis. Outcomes assessed included knowledge and home environmental changes.

Methods

This was a longitudinal, non-randomized study that involved the delivery of an asthma and healthy homes curriculum to 115 parents in 8 Head Start sites in Hidalgo County. A pre- and post-test survey was utilized to measure knowledge-based outcomes at baseline. A follow-up survey was performed 6 months later to evaluate the degree to which participants made changes (self-report) to their household environment based upon their acquired knowledge.

The study was conducted between November 2011 and May 2012, in Hidalgo County, Texas. Eight Head Start sites were targeted due to having the highest number of current students with diagnosed asthma. Identification of potential study participants was possible because all children with a diagnosis of asthma are documented at registration. These children are required to have their control and rescue medications and their asthma action plan at the Head Start Centers in order to attend the first day of class.

Parents were asked complete a consent form and a survey before the training. A total of 114 individuals participated in the study, with 112 completing both the pre- and post-tests. Two participants were excluded from all analyses because they did not complete the post-test. The training was delivered in Spanish by a bilingual and bicultural public health professional or *promotora* (community health worker) in one session. This study was approved by the Texas A&M University Institutional Review Board (IRB).

Intervention

The curriculum used has been previously utilized to train *promotoras* and is certified by the Texas Department of

State Health Services. However, due to the time constraint of 45 min, the number of slides was decreased. Non-essential slides (i.e., those containing pictures) were eliminated but the full content/information of the curriculum was kept. The training focused on asthma education (information on the signs and symptoms of asthma, management of the disease, identification of common triggers, the adequate use of asthma medications, actions to take in case of an asthma attack, and basic components of an asthma action plan) and the Seven Principles of Healthy Homes (how to keep a home dry, clean, ventilated, pest-free, safe, contaminant-free, and improving the indoor environment and decreasing hazardous exposures within the home) developed by the National Healthy Homes Training Center and Network.

Measurements

Two instruments were used for the study: (1) A pre- and post-test assessment to measure knowledge changes among participants before and after the two-session curriculum, and (2) a follow-up survey administered to participants 6 months after the training.

Pre- and Post-test

The pre-test consisted of six questions on participant background and demographics and 12 true-false questions that covered asthma triggers, household chemicals, and pests. The pre-test was conducted as a face-to-face interview with the parent before the training. The post-test covered the same questions as the pre-test and was applied after the educational intervention was completed.

Follow-up Survey

A follow-up survey was conducted to assess the effects of the Healthy Homes training on participant lifestyle. The follow-up survey consisted of 33 questions regarding household changes and 10 questions regarding changes in the following home-related issues: water and mold, cleaning, air, trash, safety, hazards, paint and lead as well as the health of the participant's asthmatic child. The follow-up was conducted 6 months after delivery of the intervention via telephone by either a *promotora* or a graduate research assistant.

Data Analysis

Pre- and Post-test

The data were analyzed using IBM SPSS Statistics 19 and SAS 9.3. To assess the impact of the Healthy Homes

training on participants' knowledge we compared the frequencies of correct responses for each question from the pre-test to the results from the post-test. Differences in frequencies were examined using the McNemar test. Missing values were excluded from the analysis.

In addition to individual analysis of each question, we also compared mean test scores before and after the training. A participant's test score was computed by summing the number of correct responses to each of the 12 true-false questions (maximum score = 12). Differences in mean test scores were analyzed using a paired *t* test. Missing values were assigned a score of 0.

Follow-up Survey

The data were analyzed using SAS 9.3. Frequencies of responses were evaluated for each question.

Results

As shown in Table 1, the majority of participants were female (91 %). Ninety-three percent of participants were Hispanic, followed by 4 % White, 1 % African American, and 3 % other non-specified ethnic group. Forty-six

Table 1 Participant demographics and background

	Count	(%)
Gender		
Male	10	9.1
Female	100	90.9
Race		
White	4	3.7
African American	1	0.9
Hispanic	100	92.6
Other	3	2.8
Medical insurance		
Yes-unspecified	20	18.3
Medicare only	4	3.7
Both medicare and medicaid	2	1.8
Medicaid only	17	15.6
Private pay	3	2.8
Other	4	3.7
No	59	54.1
Son/daughter with asthma		
Yes	16	14.4
No	95	85.6
Know child who has asthma		
Yes	37	33.9
No	72	66.1

percent of participants had some form of medical insurance, while 54 % were uninsured. Approximately 14 % of participants had a son or daughter with asthma while 34 % knew a child with asthma. Sixteen percent had received asthma education in the past.

Pre- and Post-test Results

Table 2 shows test results with a statistically significant improvement in participants' knowledge in four areas: mold causing asthma attacks ($p < 0.001$), home as a shelter from asthma triggers ($p < 0.001$), second hand smoke being linked to asthma ($p = 0.006$), and pesticide exposure inside the home ($p < 0.001$).

Another topic for which participants showed a statistically significant improvement in knowledge from the pre-test to the post-test was "A home as a shelter from the wind, animals or insects, sun, cold or hot air, and dust" ($p < 0.001$).

Participant Test Scores

Table 3 shows that there was a significant ($p < 0.001$) improvement between pre- and post-test scores. The mean test score for the pre-test was 10.04 (SD = 1.71) and increased to 11.12 (SD = 1.36) after the training (maximum score = 12).

Follow-up Survey

Of the 114 individuals who participated in the Healthy Homes Training, 62 (54.4 %) were contacted by phone for the follow-up survey. Thirty-four did not answer the phone call (29.8 %), 6 (5.3 %) cell phones were disconnected, 4 (3.5 %) reached a wrong number, and 8 (7.0 %) participants did not provide a phone number.

Table 4 shows that sixty-one of the follow-up participants (98.4 %) made changes to their household as a result of the asthma and healthy homes training. The most important changes were: keep my home free of clutter (95.1 %), open my windows to ventilate my home (93.4 %), do not keep food uncovered or out in the open (91.8 %), do not allow trash to accumulate in my home (91.8 %), keep children away from the stove when cooking (91.8 %), do not allow smoking in my home (91.8 %). Home environmental changes rarely implemented, as reported by participants, were related to repairs of peeled or chipped paint and roof and window leaks, and may be attributed to the financial cost involved in such repairs.

Nine (14.5 %) participants reported having a child in their home with asthma. Seven (77.8 %) of those participants noticed a change in the health of their child due to the changes they made. Household changes resulted in less

Table 2 Comparison of correct responses to individual questions on pre- and post-tests

Question	Correct response		McNemar test (<i>p</i> value)
	Pre-test (%)	Post-test (%)	
Mold can cause asthma attacks	86.1	99.1	0.000*
A home is a shelter from the wind, animals or insects, sun, cold or hot air, and dust	58.3	83.5	0.000*
The 7 principles of healthy homes are: dry, clean, ventilated, pest-free, safe, contaminant free	93.6	99.1	0.070
Dust and moisture are normal and do not cause any health problems	87.5	92.9	0.210
The use of chemical products in the home can be dangerous	92.9	95.5	0.508
Second hand smoke is directly linked to asthma	88.3	97.3	0.006*
Mold does not cause any health problems	86.1	92.6	0.143
Having fresh air circulate in the home is not important	84.5	81.8	0.690
Eco-friendly products are healthier for cleaning purposes	87.0	94.4	0.096
Dust mites live in carpets, mattresses, clothing and stuffed toys	96.3	99.1	0.250
80 % of human exposure to pesticides occurs inside the home	68.3	92.3	0.000*
Paint that contains lead can cause neurological damage and learning problems	97.2	100.0	0.250

Correct responses: T, T, T, F, T, T, F, F, T, T, T, T

* Statistically significant

Table 3 Comparison of participants' test scores on pre- and post-tests

Test	<i>N</i>	Mean score ^a	SD	<i>p</i> value
Pre-test	112	10.04	1.71	0.000
Post-test		11.12	1.36	

^a Maximum score = 12

missed school due to asthma ($n = 6$, 85.7 %), less visits to the emergency room due to asthma ($n = 6$, 85.7 %), able to play more ($n = 5$, 71.4 %), less use of emergency medication for asthma ($n = 6$, 85.7 %), less visits to the doctor or clinic due to asthma ($n = 6$, 85.7 %), less hospitalization due to asthma ($n = 7$, 100.0 %), and better grades in school ($n = 4$, 57.1 %).

Discussion

This study assessed an intervention education for parents of children attending Head Start Centers with or without asthma diagnosis using the asthma and healthy homes curriculum. Our findings show that the educational intervention improved the knowledge of participants and also show that after 6 months those participants reported that due to the education and knowledge acquired, they decided to make household environmental changes and improvements for the health benefit of the entire family. Home environmental changes made were often the easiest

Table 4 Environmental household changes reported by participants at 6 months follow-up

	Yes [<i>n</i> (%)]	No [<i>n</i> (%)]
Have you made any change in your household as a result of the training you received?	61 (98.4)	1 (1.6)
Keep my home free of clutter	58 (95.1)	3 (4.9)
Open my windows to ventilate my home	57 (93.4)	4 (6.6)
Do not keep food uncovered or out in the open	56 (91.8)	5 (8.2)
Do not allow trash to accumulate in my home	56 (91.8)	5 (8.2)
Keep children away from the stove when cooking	56 (91.8)	5 (8.2)
Do not allow smoking in my home	56 (91.8)	5 (8.2)

and least expensive to complete such as “open the windows to ventilate the home, cleaning the household more frequently, throwing away trash,” etc.), while those that were more expensive were completed in lower percentages (such as “fixing roof and holes in the walls,” etc.).

Participants were engaged and extremely interested in the curriculum and asked questions throughout the educational intervention. Previous research reports that parent's knowledge to control asthma triggers helps reduce the risks associated with asthma in children [1, 5, 6]. Parent's change of behavior towards a healthier household impacts the entire family, especially children with asthma. Our findings indicate that the education of Head Start Program parents was effective for several topics covered as evidenced by statistically significant findings.

Study Limitations

A limitation of the study was the use of self-reported instruments that could cause bias, and the 6 month follow-up via telephone. The latter proved to be complex due to difficulties in reaching participants as a result of changes in cell phone numbers, disconnected cell phones, voice mail answering service and other unexpected limitations. However, in spite of the difficulties observed during the follow-up, the collaboration and interest of those parents of Head Start children was reassuring and motivating.

Conclusion

This study shows that a brief educational intervention on asthma and healthy homes can produce positive changes in parents who have the interest and opportunity to participate. The intervention increased participants' general and asthma-specific knowledge and assisted parents in implementing suggested environmental changes in their households. Head Start Programs are an excellent venue to reach parents with educational sessions; attendance is normally high and in the case of Hidalgo County, all children diagnosed with asthma had their respective Asthma Action Plan and their medications available at their corresponding center.

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