The Impact of Community-based Interventions on Childhood Asthma

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Conflict of Interest

• I confirm that I have no conflicts of interest within this presentation.
Objectives

1. Identify 3 approaches used as interventions with asthma in school-aged children.
2. Review the significance of the family and community with home asthma management.
3. Demonstrate the techniques for a biomarker, FeNO (measurements).
4. Interpret signs and symptoms representing uncontrolled asthma.
Childhood Asthma

• Most common childhood chronic condition
  • Prevalence - 11% of US children
  • $1.9 billion annual health expenditures for inadequate asthma control (Bloom et al., 2014)

• Health disparities
  • Minority status, Ethnic diversity
  • Low-income populations (Akinbami et al., 2012)
On average, 3 children in a classroom of 30 are likely to have asthma. *

Despite strict guidelines and considerable efforts to educate patients and families on childhood asthma,

- **asthma prevalence** continues to increase (CDC, 2014) and
- children **repeatedly** miss school days and require emergency department visits and hospitalizations.
Significance

- Multidisciplinary approach used in interventions
  - to **educate** children on asthma,
  - implement and evaluate fraction of exhaled nitric oxide (FeNO)
    - as measure of inflammation, and
  - to evaluate the **feasibility** of a home education technology
- Compare peak flow meter (PFM) monitoring
Purpose

• To address community-based asthma interventions implemented in non-traditional settings:
  • summer camp
  • home
Community-based Interventions

1. Implementing an educational intervention with children attending asthma camp.

2. Testing FeNO within camp and PFM as in-home asthma management interventions

1. Examining feasibility with home intervention and interaction with technology
Methods

Studies were implemented in a summer asthma camp in a southern state with children ages 5-12 years.

More than 50 participants were recruited and 23 campers participated in all camp sessions, and home assessments.
Data Collection

Demographics
  Home access to technology
Family Management Measure
Asthma Morbidity
  asthma symptoms
  Types of admissions
Asthma Knowledge- pre and post education
Family Management of Asthma
Asthma Education
  Disciplines providing
Asthma Action plan
30-day readmission
FeNO- daily measures
PFM
Technology
Family Management

• Behaviors families use in management of chronic conditions (Knafl & Deatrick, 2006)
  - Ability
  - Effort

• Measured by Family Management Measure
  - 16 items
  - Evaluates family caregiver perceptions, how the family incorporates the regimen into everyday family life (Knafl et al., 2009)
Asthma Camp

- Community-based partnerships
- Engaging families and providers
- Inner-city day camp, 4 days

Multiple partners:
- Local Children’s Hospital
- American Lung Association
- Boys and Girls Club
23 campers ages 6-12 with moderate to severe persistent asthma

14 males
9 females

19 families participated in Family Asthma Education Day

15 Hispanic

All children received Open Airways for School curriculum
Into the home...
Results

Knowledge:
Families' increased asthma knowledge was associated with families verbalizing an increase in understanding of condition management ($r = .34$, $p > .05$)

Child asthma knowledge scores improved during camp with knowledge scores increasing from pretest ($M = 2.92$, $SD = .67$) to posttest ($M = 3.08$, $SD = .78$, $p = .062$).
Asthma Knowledge

• Total scores for the and an asthma knowledge questionnaire developed for parents of children with asthma correlated strongly, 0.72.

• Test-retest reproducibility: the Spearman rank correlation for the test-retest score was 0.72 (P < 0.02),
Asthma Education

Three themes of best practices with asthma education:

1. frequency of education,

2. transdisciplinary approach, and

3. written asthma plans.
FeNO

- Daily FeNO measures were examined with asthma symptoms and findings correlated on daily entries.
- When inflammation present, asthma symptoms were reported.
Managing Asthma: 
Peak Flow Chart

People with moderate or severe asthma should take readings:
- Every morning
- Every evening
- After an exacerbation
- Before inhaling certain medications

Source: "You and Your Family Can Do About Asthma" by the Global Initiative For Asthma. Created and funded by NIH/NHLBI.
Technology

- Home technology was not a feasible option for this population.

- We had few log on to the technology provided as a home asthma education approach (8%, n=23)

Family Management
Clinical significance for family management ability and effort
Discussion

• It is clear that the data support the finding that **asthma camp interventions** are an important tool in improving knowledge, asthma action plan, and asthma control among the sampled cohort.

• This study found that when children were diagnosed with asthma at a younger age, they reported that their asthma control was worse.

• This may indicate the **value of early intervention** to educate younger children on the tools for asthma management.
Implications

• Despite economic challenges, more than 80% of the families actively participated in a Family Asthma Education Day plus Question/Answer session.

• Family caregivers noticed a difference in children following their asthma action plan and in asthma morbidity after the asthma interventions in the camp experience.

• Shows engagement in families with chronic asthma through interventions such as asthma summer camps may be a way to provide early education.

• Home technology was not utilized with the population and not found as appropriate for interventions in this setting.
What does this mean?

- Asthma Education Implementation
- Train 3 levels of educators:
  - Asthma Resource
  - Hospital Asthma Educator
  - Nationally, certified asthma educator
- Build upon and initiate state asthma camps
- Implement Summer 2017
Next steps

- Locate families affected by asthma
- Initiate meetings with Alabama Asthma Coalition
- Create childhood asthma network
- Explore foundational partnerships
- Prepare extramural funding
- Build research team
Resources

• Centers for Disease Control and Prevention, Vital Signs, May 2014.

• Akinbami, et al. (2012). Trends in Asthma Prevalence, Health Care, and Mortality in the United States,


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