RALES HEALTH CENTER ASTHMA PROGRAMS

A population health approach to improving health and educational outcomes for students with asthma

RUTH AND NORMAN RALES
Rales Center for the Integration of Health and Education

JOHNS HOPKINS CHILDREN'S CENTER

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What did we do?

We utilized a population health framework to (1) understand the true burden of asthma in the KIPP Baltimore student population, (2) identify students with previously unidentified or uncontrolled asthma, and (3) implement comprehensive disease management programs to improve health and educational outcomes for students with asthma.

We utilized several sources of data, including an innovative screening approach, to determine the prevalence of asthma in the school population. We then utilized screening, school health, and absenteeism data to identify students in most need of support from the RHC team by applying the Rales Asthma Prioritization System (RAPS) [1]. Finally, we provided a menu of intensive disease management services including education, case management, school-based health center (SBHC) medical management, and directly observed asthma controller therapy (DOT). The DOT program was implemented in partnership with BREATHE (Baltimore Realizing Equity in Asthma Treatment, Healthcare, and Education), an initiative funded by the Robert Wood Johnson Clinical Scholars Program.

Rationale

Asthma is a common chronic condition of childhood affecting nearly 20% of children in Baltimore City and more than 30% of students at KIPP Baltimore (BCHD). It is a major contributor to pediatric morbidity, mortality, and healthcare cost, and a driver of health and educational inequity [2, 3]. Systematic, integrated, coordinated approaches to school-based asthma management are recommended to improve health and educational outcomes for students with asthma [4, 5].

One particularly important innovation in school-based asthma programs is school-based directly observed administration of asthma controller medications (DOT). Inhaled corticosteroids (ICS), also known as “controllers,” are the mainstay of therapy for persistent pediatric asthma. Adherence to daily ICS is often inadequate and poor adherence is associated with increased exacerbations, emergency department utilization, and hospitalizations [6]. A rigorous evaluation of DOT demonstrated improvements in school attendance, asthma symptoms scores, and asthma-related quality of life, as well as decreases in emergency department utilization and hospitalizations [6]. Asthma controller DOT has not been previously implemented in Maryland.

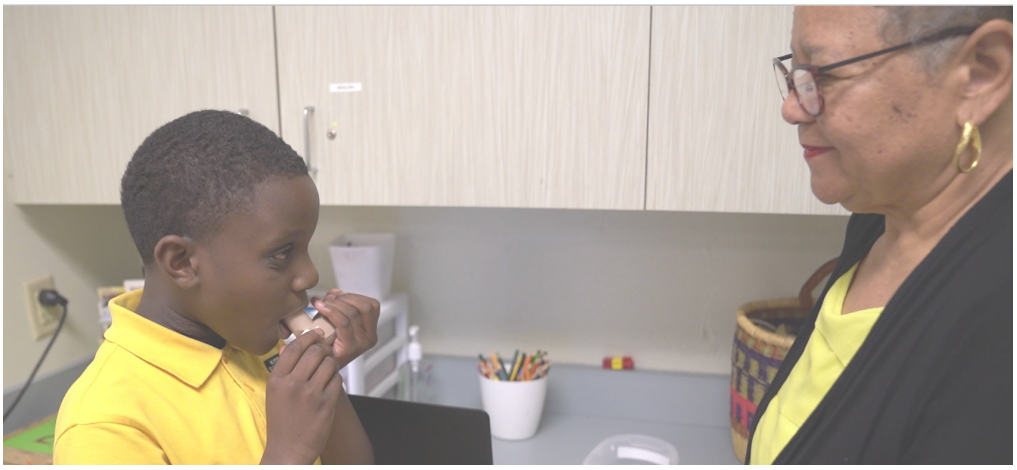
Summary of Implementation and Results

Student health background forms completed by parents and returned to the school during Year 1 suggested that 16% of students had asthma. In the RHC, nurses and clinicians frequently saw patients with severe asthma exacerbations whose health background forms either did not indicate an asthma diagnosis or were never completed. In response, in Years 2 through 4, we combined data from health background forms, school health services records, school-based health center records, and an innovative asthma screening approach. The screening incorporated a brief, 4-item student self-report questionnaire completed in school using less than five minutes of class time. Using this comprehensive approach, we consistently saw that approximately 30% of the school population had asthma.

Chronic absenteeism among students with asthma decreased by half and there was a 62% decrease in the proportion of SBHC visits that were for asthma exacerbations.

Given the very large number of students in the school, we worked to prioritize students with the greatest need. The Rales Asthma Prioritization System (RAPS) combined asthma screening data with existing school health and absenteeism data to categorize students as high, medium, or low priority for follow-up by the school nurse. A preliminary evaluation of RAPS utilizing school year 2016-17 data demonstrated that a large proportion of students in the high priority group (46.4%) had asthma diagnoses previously unknown to the school nurse and/or the child and family. Children in this group were identified as having asthma at a significantly higher rate than chance alone [1].

Students in the high-risk RAPS group underwent further evaluation of asthma severity and control. The school nurses conducted outreach, appraisal, assessment using asthma clinical guidelines and the Asthma Control Test (ACT). Based on these findings, students were connected with school or community-based clinicians to optimize asthma management and control.



DOT is offered to students with inadequate asthma control and barriers to adherence to their daily controller therapy. The RHC has offered school-based asthma controller DOT since its opening. In Year 3, a more systematic approach was implemented, allowing for more rigorous program evaluation. The program is targeted at students with the most poorly controlled disease - it serves on average 20% of students in the school with persistent asthma. During Year 4, there were 36 students in the DOT program. Adherence to medication doses for program participants was more than 80% across Year 4. Average unscheduled albuterol utilization declined by 70% for program participants.

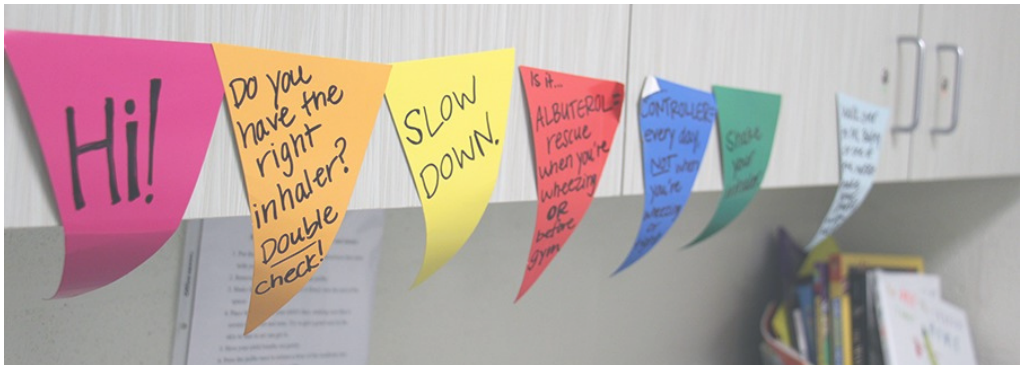
After implementation of comprehensive asthma programming, we saw a 50% decrease in chronic absenteeism among students with asthma between Years 1 and 3 and a 62% decrease in the proportion of SBHC asthma visits for exacerbation between Years 1 and 4.

Dissemination

- Baltimore Realizing Equity in Asthma Treatment, Healthcare, and Education (BREATHE) Toolkit and Implementation Guide. Expected Winter 2020.
- Baltimore Realizing Equity in Asthma Treatment, Healthcare, and Education (BREATHE) Website. Expected Winter 2020.
- Rabner M, Bissett K, Johnson SB, Connor KA. A Risk Stratification Algorithm for Asthma Identification and Prioritization in a Low-Income Urban School. J Sch Health. 2020;90:538-44.
- School-Based Asthma Screening and Student Obesity. Poster presented at the 2019 Pediatric Academic Societies Annual Meeting, Baltimore, MD.
- School Based Asthma Directly Observed Controller Therapy. Presented at the 2019 Academic Pediatric Association Region IV Annual Meeting, Charlottesville, VA and the 2019 Johns Hopkins Consortium for School Based Health Solutions Asthma Conference, Baltimore, MD.
- Baltimore Realizing Equity in Asthma Treatment, Healthcare, and Education. Poster presented at the 2019 Robert Wood Johnson Foundation Clinical Scholars Program Fall Retreat Poster Session.
- Building Healthy Futures in Baltimore: Integrating Health & Education at KIPP Baltimore. Presented at the 2019 Maryland Assembly on School Based Healthcare Annual Meeting.
- A risk stratification algorithm to identify and prioritize students with asthma in a low-income urban elementary/middle school. Poster presented at the 2017 National School-Based Health Care Convention in Long Beach, CA and at the Pediatric Academic Societies 2017 Annual Meeting in San Francisco, CA

Impact

- When compared to student health forms, schoolwide screening found double the number of students with asthma. On average, approximately a third of the students enrolled at KIPP Baltimore in a given school year have asthma.
- Approximately 20% of students with persistent asthma are served by our most intensive asthma program, controller DOT. Adherence to medication doses for program participants was more than 80% in Year 4. Average unscheduled albuterol utilization declined by 70% for program participants.
- Students with asthma had decreased chronic absenteeism and decreased visits for asthma exacerbations after implementation of our comprehensive programs. The RHC also averted at least 263 emergency department visits in Years 1-4, mostly for asthma exacerbations.



LESSONS LEARNED

- *Student health forms may significantly underestimate the proportion of students in a school with asthma. In populations with low form return rates and/or high community prevalence of asthma, additional methods such as school-wide screening may be needed to identify students in need of services.*
- *Asthma screening is a relatively low-cost intervention that uses minimal classroom time. Dedicated school nursing time is needed to administer the program and follow-up with students.*
- *Asthma controller DOT can be implemented in a large school with high asthma prevalence. Designated space for medication administration, collaboration with insurance companies for coverage of needed medications, pharmacy delivery, and close coordination and communication with the school are needed.*
- *Adequately funded and robustly staffed school health services and school-based health centers allow for the delivery of enhanced asthma services. In high needs, high prevalence populations, such services can improve health and educational outcomes.*

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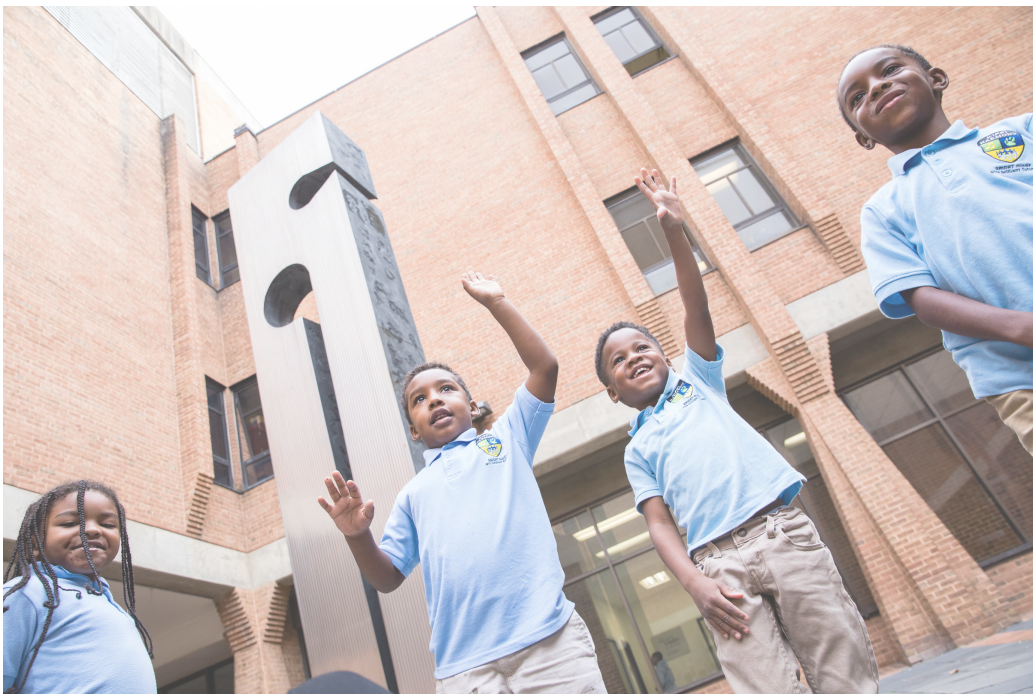

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To Our Loyal Supporters

We are grateful to all those who have joined us in our mission to create models of school health that help every child to achieve their full health and academic potential. Special thanks to the Norman and Ruth Rales Foundation and our partners at KIPP Baltimore; without them this work would not be possible.

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