UTILIZATION OF THE RALES HEALTH CENTER

An overview

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

JOHNS HOPKINS CHILDREN'S CENTER

MARCH 2021

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What did we do?

The Rales Health Center (RHC), launched in the 2015-16 school year, provides comprehensive pediatric care at KIPP Baltimore. School Health Services (SHS, i.e., school nursing) are provided by RHC nurses and are available to every student without enrollment. SHS also implements population health screening for all students. The school-based health center (SBHC) requires parental consent but allows RHC staff to provide a higher level of care. We summarize utilization as well as individual, condition, and environmental factors that are related to higher utilization. Robust staffing not only enhances available SHS and population health initiatives, it also places a clinician in the school daily – allowing just-in-time visits for urgent concerns.

What Factors Drive RHC Utilization?

RHC utilization is robust across the school year, but there is some seasonal variation. There are typically higher visit numbers in the fall and winter when respiratory viruses and asthma exacerbations are more common. On average, 75% of SHS visits are for illnesses (asthma, menstrual symptoms, and headaches were most common) and 25% are for injuries. The most common reasons for SBHC clinician visits are upper respiratory infections or pharyngitis, asthma, and attention deficit hyperactivity disorder (ADHD). Over time, an increasing proportion of visits have been scheduled encounters for chronic disease management, particularly SHS visits for asthma and ADHD medication administration (note increasing number of medication visits in Figure 1, next page).

Selected metrics of RHC engagement and utilization and their impact are summarized in Figure 1, next page.

> They just always go above and beyond. If Nurse Katherine or Dr. Kate find out something is going on in my personal life, they'll both reach to ask, "How can we support you?" It just doesn't end at school and they really care about us. I really care about them, and we're just so lucky to have them.
>
> - KIPP Staff Member

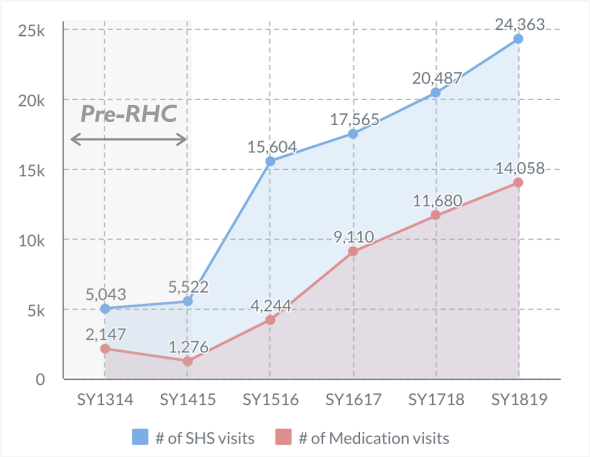
Figure 1.

RALES HEALTH CENTER Year 1 -Year 4

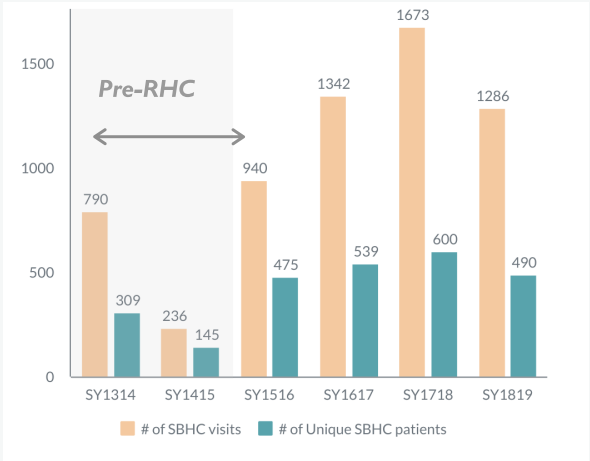
Utilization Overview

SBHC ENROLLMENT	RETURN TO CLASS RATE	ED VISITS ADVERTED	HEALTHCARE COST SAVINGS
77%	94%	263	$420, 800

School Health Services Utilization

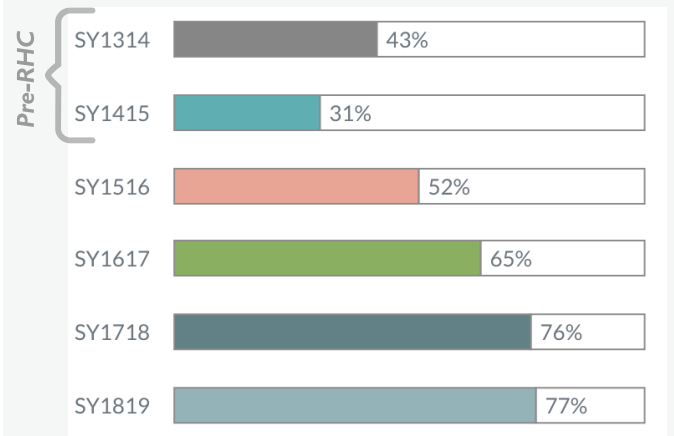


School-Based Health Center Utilization



MENTAL HEALTH REFERRALS	SBHC INITIAL ADHD EVALUATIONS
190	96

Enrollment in the School-Based Health Center



Better asthma control over time contributed to decrease in utilization in Year 4.
Year 4 SBHC utilization declined 23% from Year 3 due to a substantial decrease in acute asthma visits. This suggests that comprehensive asthma programs resulted in better asthma control. In Year 4 there was a 54% decrease in SBHC acute asthma exacerbation visits compared to Year 3.

Asthma Care and Acute RHC Utilization

Asthma has consistently been one of the top reasons for RHC visits. Comprehensive asthma programming (see Asthma report for further details), including an innovative screening approach, intensive case management, and school-based directly observed asthma controller therapy (DOT) was implemented in response to this need. As a result, the proportion of RHC asthma visits for acute asthma exacerbation declined from 63% in Year 1 to 24% in Year 4. The DOT program was optimized during Year 3. Subsequently, in Year 4, we saw a 54% decrease in SBHC clinician visits for asthma exacerbation. There was a corresponding drop in overall SBHC visits during Year 4. Taken together, these findings suggests that our intensive asthma programming is successfully flipping utilization from acute to preventive.

Obesity and School-Based Healthcare Utilization

Previous research shows that children with overweight and obesity seek care for acute illnesses in the community more often than normal weight peers; however, little is known about school-based healthcare use by children with overweight status and obesity. We compared RHC utilization by student weight status and investigated whether students with overweight and obesity sought care for different reasons than their normal weight peers. To do this, we performed a retrospective analysis of students in grades K-8 who were enrolled in the RHC in both Years 2 and 3. We tested the independent association between BMI category as defined by BMI percentile (normal weight vs. overweight/obese) and the number of visits (total, SHS, and SBHC visits) for the 2-year interval. The top five diagnoses were compared by weight category. We found that students with overweight/obesity had 1.45 times the total visit rate of their normal weight peers [1.45 (95% CI 1.02–2.07)]. Regardless of BMI category, students sought care for similar reasons (e.g., headache, dysmenorrhea, asthma, pharyngitis, ADHD). The results of this analysis were published in the journal *Childhood Obesity* [2].

School Temperatures and Utilization

KIPP Baltimore had significant issues with its heating and cooling system, which lead to temperature extremes and ultimately contributed to the decision to move the school in Year 5. Outdoor temperature extremes have previously been linked with asthma exacerbations [3]. However, no studies have evaluated school temperature and asthma outcomes. We investigated the relationship between average classroom temperature and the likelihood of an asthma-related visit to the RHC SHS or SBHC in Years 2 and 3 accounting for sex, grade, outdoor temperature, and non-asthma-related visits to the RHC. We probed several time intervals between temperature exposure and RHC visit to allow for potential lagged effects of extreme temperature on asthma symptoms.

We found that classroom temperatures ranged from 48.0°F-100.6°F. Exposure to temperatures above 72°F was correlated with increased probability of an asthma visit to the SBHC and to the nurse on the same day, as well as 5, 10, and 15 days later (see Figure 2). A 10°F increase above 72°F was associated with a 2.29 percentage point increase (95% CI: 1.01, 3.57) in the probability of a SBHC asthma visit within 10 days. Cold classroom temperatures were not significantly associated with asthma visits. The results of this study show how environmental factors such as school temperature can drive day-to-day variation in healthcare utilization [1].

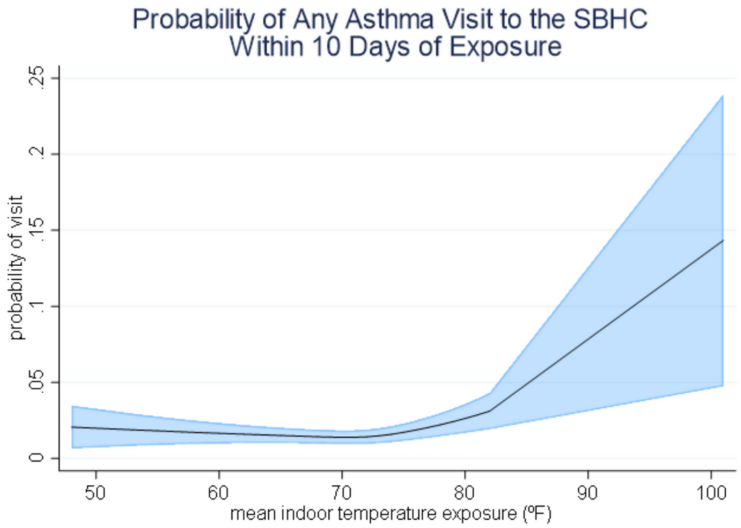


Figure 2. Probability of a visit to the SBHC for any asthma visit within 10 day of temperature exposure by average classroom temperature (blue shading is 95% confidence interval) [1].

Dissemination

- Higher Child Body Mass Index Is Associated with Greater School-Based Health Center Utilization; poster presented at the 2019 Pediatric Academic Societies Meeting, Baltimore, MD.
- Higher Child Body Mass Index Is Associated with Greater School-Based Health Center Utilization; platform presentation at the 2019 Academic Pediatrics Association Annual Meeting, Charlottesville, VA.
- Smith BM, Spin PJ, Johnson SB, Connor KA. Higher child body mass index is associated with greater school-based health center utilization. Childhood Obesity. 2020;16(7):527-33.
- Elevated indoor school temperatures are associated with increased asthma healthcare visits among urban schoolchildren; poster presented at the 2019 Pediatric Academic Societies Meeting, Baltimore, MD.
- Plott C, Spin P, Connor K, Johnson S. High classroom temperatures are associated with increased school-based healthcare utilization for asthma. Manuscript under review.

Impact

- In all, RHC had more than 78,000 school health services visits in Years 1-4, an average of 113 visits per school day. This is nearly four times as many visits as the year before RHC launched.
- The Rales Health Center saw an average of 1310 SBHC visits/year. This is a 155% increase in average annual visits compared to the two years prior to our opening.
- The proportion of SHS visits for medication administration more than doubled between Year 1 and Year 4, reflecting a shift to proactive disease management.
- The proportion of SBHC asthma visits for exacerbation decreased by 62% between Years 1 and 4.

LESSONS LEARNED

- *The need for SHS and SBHC services was greater than anticipated based on pre-RHC utilization numbers. Therefore, utilization alone may not be the best measure of need for health services in schools. Engagement with school stakeholders and community pediatricians, as well as compilation of population health data, allowed us to plan a service delivery model that met the true need. A leaner staffing model would not have accommodated the volume of visits generated by 1,500 students, 60% of whom had one or more chronic conditions.*
- *A focus on ensuring that students get their asthma controller medications as prescribed can have a substantial impact on acute healthcare utilization, further justifying a focus on prevention.*
- *Students with overweight and obesity used more SBHC services than their normal/underweight peers but sought care for similar reasons. This higher utilization may provide an important opportunity to expand school-based obesity prevention and management in schools.*
- *High classroom temperatures may play a small but significant role in pediatric asthma symptoms and avoidable healthcare utilization. Schools serving low-income students are more likely to lack funding for infrastructure, which may result in indoor temperature extremes. At the population level, maintaining moderate school temperatures may benefit student health, reduce healthcare costs, and reduce disparities.*

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REFERENCES

1. Plott C, Spin P, Connor K, Johnson S. High classroom temperatures are associated with increased school-based healthcare utilization for asthma. Under review.
2. Smith BM, Spin PJ, Johnson SB, Connor KA. Higher child body mass index is associated with greater school-based health center utilization. Childhood Obesity. 2020;16(7):527-33.
3. Soneja S, Jiang C, Fisher J, Upperman CR, Mitchell C, Sapkota A. Exposure to extreme heat and precipitation events associated with increased risk of hospitalization for asthma in Maryland,USA. Environmental Health. 2016;15:57.

THANK YOU FOR YOUR SUPPORT

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.

To learn more, please visit https://ralescenter.hopkinschildrens.org/

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