CHILDHOOD ASTHMA LINKAGES IN MISSOURI SCHOOLS (CALM 2)

Asthma outcomes from children and adolescents with asthma (N = 59) from six schools participating in the Childhood Asthma Linkages In Missouri – phase 2 (*CALM 2)* initiative for the school year 2017-2018 were assessed. The six schools included Center, Grandview, Mexico, Neosho, Poplar Bluff, and Potosi. The initiative implemented *Teaming Up for Asthma Control*, a work force development intervention to improve asthma control among children by increasing the competency of school nurses and other health professionals to deliver guideline-based education. Nurses (93.2%, n = 55) and registered respiratory therapists (6.8%, n = 4) delivered the intervention and participants completed three educational sessions. Findings indicate improved self-care measures and a significant reduction in overall symptoms.

Missouri Department of Health and Senior Services

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Project

Childhood Asthma Linkages in Missouri Schools (CALM 2)

Primary Evaluation Question(s)

1. What has been the impact on children enrolled in the CALM 2 initiative?

2. What percentage of enrolled children have regular access to clinical care?

3. Are enrolled children receiving high quality medication management?

For More Information

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Childhood Asthma Linkages in Missouri Schools (CALM 2)

ENHANCING ASTHMA OUTCOMES

CHILDHOOD ASTHMA

Childhood asthma in Missouri affects more than 115,000 children (8.6%) aged 0 to 17 years.[1] Teaching children and their families to manage asthma is critical to control symptoms and attacks.

CALM 2

Overall, 59 children with asthma from six schools participating in the CALM 2 initiative for the school year 2017-2018 were included in the analysis. The six schools included Center, Grandview, Mexico, Neosho, Poplar Bluff, and Potosi. The initiative used the *Teaming Up for Asthma Control* program and the educators were nurses (93.2%, n = 55) and registered respiratory therapists (6.8%, n = 4).

> **This grant has been instrumental in the way we look at our asthma students and their diagnosis. It has enabled us to be able to educate students, staff, and families, and has made a huge impact on not only students staying in school but also in their overall health at home and school. Two years ago we had 4 - 911 calls for asthma students. Last year we had 0. We feel this grant is a big contributor [to] this success.** *S. Talkington, RN*

METHODS

The school nurses participating in the CALM 2 initiative completed the Teaming Up for Asthma Control (TUAC) online or face-to-face training.[2,3] The nurses were trained and equipped to: 1) identify students with persistent asthma likely to benefit from the intervention; 2) deliver evidence-based self-care education; and 3) some conducted standardized assessments to: (a) assess airflow using a digital meter that measures forced expiratory volume in one second (FEV1); (b) assess impairment and environmental tobacco smoke exposure (ETS); c) confirm inhaler use; d) assess how children inhale their medicines before and after coaching, e) and communicated assessment findings to families and clinicians to improve asthma control. All the school nurses who completed training were given TUAC kits with equipment and tools to deliver the program. Each child participating in the program received three educational sessions and received two to three assessments or check-ups.

RESULTS

The majority of the children were aged 5 to 11 years (74.6%) and the participants were equally divided between male and females (Table 1).

Table 1. Characteristics of children participating in the CALM 2 school initiative, Missouri, 2017-2018

Characteristic	Number	Percent
Overall	59	100
Age		
5-11	44	74.6
12-17	15	25.4
Gender		
Male	29	50.0
Female	29	50.0
Missing	1	--

The number of children with asthma using an Aerochamber spacer increased from 67.8% to 72.9% - a 7.5% increase (Table 2). Although the use of a daily quick relief inhaler was reduced by almost one-half (from 31.6% to 17.5%), and daily inhaled corticosteroid medication use was increased (from 63.8% to 70.7%) among participating students, these were not statistically significant differences from pre- to post-intervention.

Four of the six symptoms measured showed a statistically significant improvement from pre- to post-intervention.

Table 2. Children with asthma utilizing a spacer and quick relief and control medications in the CALM 2 school initiative, Missouri, 2017-2018

Indicator	Response N = 59	Pre-Assessment		Post-Assessment		Significance p
		Number	Percent	Number	Percent	
Aerochamber	Yes	40	67.8	43	72.9	.453
	No	19	32.2	16	27.1	
Quick Relief Inhaler	PRN to < 3x week	25	43.9	29	50.9	.214
	3-5x week	14	24.6	18	31.6	
	1-2x Daily	18	31.6	10	17.5	
	Missing[a]	2	--	2	--	
ICS/Combo Inhaler [b]	1-2x Daily	37	63.8	41	70.7	.707
	Sometimes	7	12.1	5	8.6	
	Not using or not prescribed	14	24.1	12	20.7	
	Missing[a]	1	--	1	--	

ICS - Inhaled corticosteroids.

[a] Missing not included in calculations.

[b] Combination medication.

Four of the six symptoms measured showed a statistically significant improvement from pre- to post-intervention (Table 3). These include: coughs or wheezes more than twice per week (p < .001), sleep interrupted more than a couple times per month (p = .013), missing school because of coughing, wheezing or respiratory infections (p = .001), and asthma attacks requiring urgent treatments (p < .001). Although there were some improvements in exercise-induced asthma symptoms and activity limitation, these were not statistically significant. Overall, the number of symptoms experienced by the children declined significantly (p < .001). Most of the children had health insurance and a primary care provider pre-intervention (8 in 10), but increased to 9 in 10 children following the intervention.

Table 3. Symptom experience and healthcare insurance and primary care providers for children with asthma in the CALM 2 school initiative, Missouri, 2017-2018

Overall	Response N = 59	Pre-Assessment		Post-Assessment		Difference	Significance p
		Number	Percent	Number	Percent		
Symptom							
Coughs or wheezes > 2x per week	Yes	47	81.0	32	55.2	-25.8	<.001*
	No	11	19.0	26	44.8	--	
	Missing[a]	1	1.7	1	1.7	--	
Sleep interrupted > 2x per month	Yes	31	56.4	20	36.4	-20.0	.013*
	No	24	43.6	35	63.6	--	
	Missing[a]	4	6.8	4	6.8	--	
Cough, wheeze, or breathing difficulty during or after exercise[b]	Yes	49	83.1	45	76.3	-6.8	.424
	No	10	16.9	14	23.7	--	
Missing school due to coughing, wheezing or respiratory infections[b]	Yes	28	47.5	14	23.7	-23.8	.001*
	No	31	52.5	45	76.3	--	
Asthma attacks requiring urgent treatments[b]	Yes	22	37.3	4	6.8	-30.5	< .001*
	No	37	62.7	55	93.2	--	
Asthma has limited activity at school or home in the past week[b]	Yes	26	44.1	19	32.2	-11.9	.143
	No	33	55.9	40	67.8	--	
Number of symptoms	0 to 2	15	25.4	33	55.9	30.5	
	3 to 4	31	52.5	21	35.6	-16.9	< .001*
	5 to 6	13	22.1	5	8.5	-13.6	

| Insurance and Primary Care Provider							
Insurance	Yes	53	89.8	55	93.2	--	
	No	6	10.2	4	6.8	-3.4	.500
Primary Care Provider	Yes	52	88.1	55	93.2	--	
	No	7	11.9	4	6.8	-5.1	.250

-- Difference in percentage points.
* Statistically significant.
a Not included in calculation.
b Missing = 0.

Almost one-half of the children (49.2%) had one to two fewer symptoms from pre- to post-assessment and an additional 15.3% had three to five fewer symptoms (Figure 1). A small proportion (8.5%) had an increase in the number of symptoms from pre- to post-intervention. Some children (10.2%) were free of symptoms at the post-intervention assessment.

FIGURE 1. CHANGE IN THE NUMBER OF SYMPTOMS FROM PRE- TO POST-ASSESSMENT AMONG CHILDREN WITH ASTHMA ENROLLED IN THE CALM 2 INITIATIVE, MISSOURI, 2017-2018
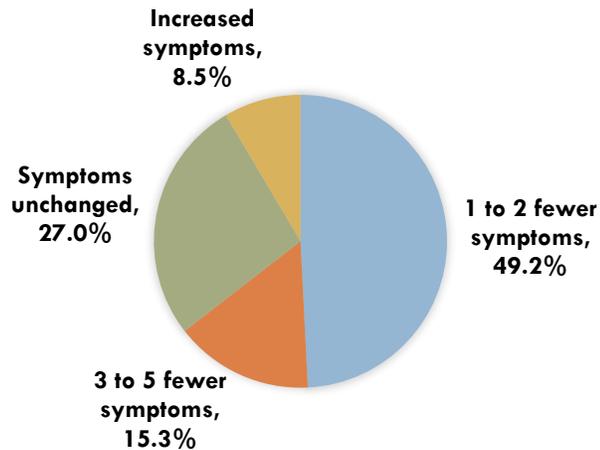
CONCLUSION

Improvements in asthma symptoms were the most significant outcomes noted in this evaluation. Of the six symptoms assessed, four showed statistically significant improvements. The two symptoms that did not substantially improve were exercise-induced asthma symptoms and activity limitation in the past week. Nevertheless, the overall number of symptoms declined so that the majority of children (55.9%) had 0 to 2 symptoms following the intervention. While the use of quick relief medication declined and the use of control medication improved, these results were not statistically significant. However, the large proportion of children receiving inhaled corticosteroid control medication (70.7% post-intervention) indicates high quality medication management. Insurance coverage and having a primary care provider increased so that 9 in 10 children had both, indicating almost all the children had access to clinical care. This initiative is reaching the goals of increasing school nurse competency to provide asthma education and care. The evaluation has demonstrated that this initiative has contributed substantially to improving asthma outcomes.

COLLABORATORS

This project and evaluation were made possible through a collaboration of the Missouri Asthma Prevention and Control program staff and partners. The following individuals made important contributions:

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