Original Report:
DECIPHeR

Understanding Core Community Needs for School-Based Asthma Programming: A Qualitative Assessment in Colorado Communities

Sarah E. Brewer, PhD, MPA[1,2]; Julia Reedy, MA[1]; Danielle Maestas, MA[1]; Lisa Ross DeCamp, MD, MSPH[1,3]; Anowara Begum, MPH[1]; Michaela Brtnikova, PhD, MPH[1,3]; Lisa Cicutto, PhD, RN[4]; Stanley J. Szefler, MD[1,3,5]; Amy Huebschmann, MD, MSc[1,6,7]

Objectives: Asthma is one of the most prevalent chronic conditions affecting approximately 8.5% of children in Colorado. Our school-based asthma program (SBAP) has effectively improved asthma control and reduced asthma disparities among children but has been largely limited to the Denver area. We interviewed community stakeholders in 5 regions of Colorado to understand community needs for broader dissemination of SBAPs.

Methods: In-depth, semistructured key informant interviews were conducted with school nurses, parents, pediatric healthcare providers, public health professionals, and community resource organization representatives. Inductive and deductive analyses were informed by the practical, robust, implementation, and sustainability model, an implementation science framework.

Results: Participants (n=52) identified 6 types of needs for successful future implementation of our SBAP: (1) buy-in from stakeholders; (2) asthma prioritization; (3) improved relationships, communication, and coordination among school nurses, healthcare providers, and community organizations that address social determinants of health (SDOH) and children/families; (4) resources to address healthcare and SDOH needs and awareness of existing resources; (5) asthma education for children/families, school staff, and community members; and (6) improved coordination for School Asthma Care Plan completion. These needs mapped to a 3-tiered, progressive structure of foundational, relational, and functional needs for implementation success.

Conclusion: These 6 types of needs illuminate factors that will allow this SBAP to work well and program delivery approaches and implementation strategies that may need modification to be successful. Next steps should include tailoring implementation strategies to variations in local context to support fit, effectiveness, and sustainment. *Ethn Dis.* 2023;DECIPHeR:35–43; doi:10.18865/ed.DECIPHeR.35

Keywords: Asthma; Qualitative Research; Community-Based Participatory Research; Implementation Science; Health Services Research—Needs Assessment

[1] ACCORDS, University of Colorado Anschutz Medical Campus, Aurora, CO
[2] Department of Family Medicine, University of Colorado Anschutz Medical Campus, Aurora, CO
[3] Department of Pediatrics, University of Colorado School of Medicine, Anschutz Medical Campus, Aurora, CO
[4] National Jewish Health, Denver, CO
[5] Breathing Institute, Children's Hospital Colorado, Aurora, CO
[6] Division of General Internal Medicine, University of Colorado School of Medicine, Anschutz Medical Campus, Aurora, CO
[7] Ludeman Family Center for Women's Health Research, Anschutz Medical Campus, Aurora, CO

Address correspondence to Sarah E. Brewer, PhD, MPA; Department of Family Medicine, School of Medicine, University of Colorado Denver Anschutz Medical Campus, Aurora, CO. sarah.brewer@CUAnschutz.edu

Introduction

Asthma is a prevalent pediatric chronic condition that affects 8.5% of children in Colorado and 10.2% nationally.[1,2] Asthma disparities exist by race, socioeconomic status, rurality, and healthcare access[3] and are compounded by the fact that severe and poorly controlled asthma can cause absenteeism and poor sleep quality, thereby contributing to lower school performance.[4–6] Thus, asthma is an "educationally relevant health disparity" through which school leaders seek to mitigate the widening achievement gap between low-income and higher-income students.[7,8]

School-based asthma programs (SBAPs) are one promising solution to address uncontrolled asthma and disparities in asthma by supporting children and families where they are—in schools.[9] For over 17 years, our Colorado SBAP has addressed asthma disparities for children in the Denver-Metropolitan area, where about 9% of children have asthma.[10] The Colorado SBAP program introduces an asthma navigator as a partner to the school nurse to provide case management and care coordination around 6 core functions to improve asthma outcomes: (1) identifying students with asthma, (2) completing an asthma assessment, (3) assuring student has a quick-acting reliever at school, (4) educating students to acquire self-management skills, (5) tailoring instruction by the asthma navigator to support asthma

case management and care coordination, and (6) assessing and managing social determinants of health (SDOH) needs through screening, referral, and follow-up with resource providers. This SBAP has reduced asthma hospitalizations and emergency department use, oral steroid use, and school absenteeism and has increased asthma knowledge and control, improved inhaler technique and self-management skills, and increased reported quality of life among students and their families.[10–12]

There is an opportunity and need for adapting and disseminating this successful grant-funded SBAP from the Denver area to sustainable, integrated programs in other communities with high asthma burdens and disparities. However, little is known about communities' needs, barriers, and facilitators for implementing such asthma programming. Indeed, implementing SBAPs successfully will require a deep and nuanced understanding of the context. Therefore, we sought to understand how the priorities, needs, and resources of local communities could inform our efforts to adapt our SBAP to other contexts.

Methods

In 5 regional communities, we explored priorities, perceived needs, and resources to implement and sustain this SBAP. With a focus on implementation and sustainment, we broadly considered needs and resources using the pragmatic robust implementation and sustainment model (PRISM).[12] PRISM captures organizational and patient perspectives on a program or intervention, external environment, implementation and sustainability infrastructure, and characteristics of both patient and organizational recipients of an intervention. Given that SBAP seeks to improve asthma disparities, we also sought to understand the local contextual factors that may influence asthma inequities, including SDOH screening and referral.

Setting and Participants

This study was conducted in 5 regions across Colorado: Colorado Springs, Lower Arkansas Valley, Weld/Morgan, Mesa/Delta, and southwest Colorado. A map of these regions is shown in Figure 1. Each region (not school district) had a high burden of childhood asthma based on use data and was characterized by factors associated with disparities in asthma outcomes, including high rates of students who qualify for free-reduced lunch (>30%) across the region, high proportions of students from nonwhite backgrounds (>50%), or their location in a rural area of Colorado. Finally, each region had key stakeholders who had expressed interest in implementing this SBAP.

Key informants included professionals and community members involved in supporting school-aged children with asthma locally or statewide. All had agreed to participate in community advisory boards (CABs) convened to support dissemination and implementation of our SBAP. CAB members were selected to ensure representation of the different types of stakeholders and partners needed to implement the proposed SBAP that would be involved in or impacted by the program. Sampling was purposive based on membership in regional or state CABs or professional role relevant to program implementation (e.g., pediatric provider and SDOH resources providers) with endorsement as a key informant by other community stakeholders. Interviewees included school nurses, pediatricians, public health professionals, parents, and representatives of community SDOH organizations. Additionally, 4 asthma navigators working in the Denver-based program were invited to provide the perspective from our existing program.

Data Collection

In-depth semistructured interviews were conducted between November 2020 and December 2021. Participants were invited by a member of the study team or by a CAB member referral. Interviews were conducted by PhD- and masters-level trained female researchers (SEB, JR, and DM) via online web conference (Zoom) or phone. Interviews lasted 60-90 minutes and were audio recorded. Participants received an electronic gift card. Interview topics included community health priorities and needs, burden of asthma in the community, experiences with asthma management, existing effective and successful asthma management strategies, perceptions of asthma navigators as a potential strategy, perceptions of core components of SBAP, current practices for SDOH screening and referral, the implementation climate and readiness for SBAP, and goals and visions for a future SBAP. This manuscript reports only the needs identified as crucial for implementation of the SBAP across all 5 regions. Findings on other topics will be reported elsewhere.

Analysis

Interview recordings were professionally transcribed and transferred into ATLAS.ti 9.0 (Scientific Software Development GmbH, Berlin, Germany) for coding and analysis. A preliminary codebook was created using PRISM,[12] which allowed our team to capture key factors that community stakeholders perceived as necessary to implement the SBAP. As our study goal was to support future implementation planning, we focused on implementation climate and readiness factors with an emphasis on the needs, priorities, and available/needed resources in each region.

We used a mixed inductive and deductive strategy, drawing from concepts known before data collection,

Figure 1. Geographical location of DECIPHeR School-Based Asthma Program study sites. Reprinted from reference[17]. Copyright (2022) by Elsevier.

such as PRISM domains/constructs, and concepts drawn from participants. At least 2 trained analysts (SEB, JR, DM, AB, or DB) double coded an initial 6 transcripts to compare, reconcile, and reach a consensus on code use, and definitions and emergent codes were discussed and added. Then, using a final codebook, each analyst coded transcripts independently until all transcripts were coded. Code queries were used to summarize and explore the data. The analytic team met regularly during coding and analysis to discuss impressions of the data and emerging topics. Preliminary findings were presented to CABs as a form of participant validation. CABs discussed the findings and provided feedback and refinement of topics and themes and endorsed the overall results.

Results

Fifty-two out of 59 invited key informants consented and participated in interviews (88%; Table 1). A minimum of 7 stakeholders, including at least 1 provider and 1 school nurse, participated from each region and the statewide CAB. The primary reason for declining was lack of time due to competing demands during the coronavirus disease 2019 (COVID-19) pandemic.

Overview of Themes

Participants across regions identified 6 categories of common needs, including buy-in from all stakeholders, resources, improved relationships and coordination, prioritization of asthma as a health concern, improved asthma education, and better systems for coordinating and completing students' asthma care plans for the school. Themes are described in Table 2 along with illustrative quotations.

Buy-In of Stakeholders

The collaborative care structure of SBAPs requires buy-in from multiple stakeholder roles, including parents/families, school staff (including school nurses, leadership, teachers, and coaches), healthcare providers (including primary care providers, pediatricians, and pulmonary specialists), and local SDOH and community needs organizations. Participants felt that buy-in of these partners hinged on communicating the benefits of SBAPs, such as the reductions in school absenteeism observed in the Denver Area SBAP. Potential challenges to receiving buy-in from community members include perceived increases in workload and demands on already limited time. However, involvement of the asthma navigator seeks to alleviate this burden. As 1 rural school representative shared, the buy-in of the school districts is especially important:

> I think [. . .] the program would need to be well defined so that all districts can understand it and understand what it will provide for them and how it will help their students because, once the districts buy in, then they're powerful.

Similarly, participants discussed the need for parents, school nurses, and primary care and specialty providers to see the value of the program and commit to being involved in fostering a context for SBAP success.

Asthma Prioritization

Participants recognized how our SBAP intersects with other community health priorities, given that there are always competing health priorities. When questioned on health priorities within their respective communities, participants typically identified conditions and structural challenges that create

Table 1. Characteristics of key informants interviewed (n = 52) between November 2020 and December 2021

Characteristic	n (%)
Community Role	
Parent/family	3 (6%)
Provider/pediatric practice representative	13 (25%)
Public health	7 (13%)
School nurse	14 (26%)
Specialist	6 (12%)
Community organization	4 (8%)
Other (asthma navigator, BOCES)	5 (10%)
Gender	
Female	47 (90%)
Male	5 (10%)
Region	
Greeley/Weld/Morgan	8 (15%)
Lower Arkansas Valley	8 (15%)
Mesa/Delta	7 (13%)
Montezuma/Cortez	7 (13%)
Colorado Springs	9 (17%)
Statewide Stakeholders	13 (25%)

BOCES, board of cooperative education services.

widespread disruptions to care. Even when asthma was not raised as a top priority, it was recognized as important and intersecting with other priorities. Important contextually, key informant interviews were conducted during the COVID-19 pandemic; therefore, key health priorities were often directly related to the pandemic response. These priorities included the overburdening of healthcare systems, COVID-19 quarantines, keeping kids in school, and youth mental health crises exacerbated by ongoing social isolation. Because asthma is recognized as one of the most prevalent chronic health conditions affecting children in Colorado, it was prioritized by providers and school nurses. These healthcare professionals aim to help patients and students achieve asthma control so children are not limited by their asthma symptoms. One rural school representative felt that the implementation of an SBAP would "be a great place to start" in addressing school health priorities and allow others to "see the value of it" and offer the potential to "grow or at least replicate that process in other areas." The implementation of an SBAP would provide additional resources to support school nurses and bolster relationships between schools and clinics. In turn, strengthening school nurse relationships with clinic teams will both support effective asthma management and provide new opportunities to support the management of other childhood health priorities.

Improved Relationships and Coordination

Effective asthma management "takes a village to help some of our kids with asthma" (suburban school nurse), often requiring a large degree of coordination, communication, and collaboration between providers, nurses, and families. In each of the 5 regions, participants identified gaps in communication and care coordination that negatively impact asthma management. School nurses described having difficulties connecting with providers who, likewise, felt they had limited time to engage with school nurses. Pulmonary specialists noted a lack of continuity between primary care clinics and specialized care and inadequate follow-up from both families and providers. Providers and nurses described communication challenges when contacting families, including parents screening their calls, listing a nonworking phone number, running out of cellular minutes, and work schedules that limit communication.

Participants from 3 regions reported that they face challenges with understaffing and shortages in healthcare personnel; thus, staff took on additional responsibilities to meet the needs of their communities. In 2 other regions, participants reported sufficient personnel in the healthcare delivery system; however, gaps in communication and documentation were identified, such as information being spread and stored across different systems. Despite differences between the regions, gaps in communication, coordination, and collaboration create fragmentation among those responsible for the delivery and maintenance of asthma management. One rural provider described how they hoped the asthma navigator role could alleviate this challenge:

> I think if the [asthma navigator] is able to communicate and connect people better, that might be good. Just have access to all the important pieces, and with school being the center of the model, that'd be good. Just really connect the school nurses to the clinics and just making sure that everything being implemented is communicated to all the key people in the web would be helpful.

Participants were not only identifying the need for improving these relationships but also recognizing that the asthma navigator, a core aspect of the SBAP, might help build and improve relationships for better-coordinated asthma care.

Resource Needs

Participants described the existence of many resources to support children with asthma and their families with their SDOH needs. However, in every

Table 2. Six themes of program implementation needs with descriptions and illustrative quotes

Tier/Theme	Description	Illustrative Quotations
Foundational		
Buy-in from stakeholders	It will be necessary to build broad buy-in and support from stakeholders: families, school nurses, school staff, primary care providers, specialists, and SDOH providers	• "You have to have engagement of all aspects of the kid's life. You have to have their family [and] the school engaged. [. . .] somebody there who's able to plug these kiddos in with the resources that they need, and then [. . .] an outpatient specialty team [. . .] I just feel like you have to have all these different team members that you all need to be engaged and working together." -Suburban specialist • "I think [you need] really clear understanding from the people who you need input from and collaboration with on what the goal of the program is [. . .] I'm thinking of the school nurses, families, providers [. . .] I think a lot of it is giving people time, like building rapport, building trust." -Rural school nurse
Asthma prioritization	Asthma prioritization: recognition of how our SBAP intersects with other key community health priorities	• "It's probably diabetes. That's the one I worry about probably the most. As I've been here for 14 years, and every year we're having more kids diagnosed with type 1. [. . .] They get dangerously low. It's life-threatening. Of course, asthma is, too. I always tell people if you can't breathe, you can't live. Don't take asthma very lightly. Sometimes people do because it's a very common diagnosis, even in this community. Lots of kids have asthma." -Suburban school nurse • "I do. I think it aligns with the health priorities. Asthma, I'd say, is 1 of the big 4. In fact, I was looking over—sometimes, this year hasn't done such a good job of it, but health stats and everything. I know that it was over 220-something kids." -Suburban school nurse
Relational		
Improved relationships, communication, and coordination	Improved relationships, communication, and coordination between school nurses, healthcare providers, SDOH agencies, and children/families	• "There needs to be someone that is the hub and spoke. We need a hub. [. . .] There's a lot of spokes but they don't always connect. There's definitely an opportunity there." -Rural public health professional • "I like to just say, people don't care what you know until they know that you care. One of the first things that I try to establish with families is that I truly care, and I want your child to be healthy and safe in school, and be successful, and have their asthma under control." -Suburban school nurse • Interviewer: "What are some of the barriers [. . .] that exist to address [SDOH] needs?" • Participant: "Probably the lack of a centralized entity, kind of a common denominator for every primary care, subspecialty provider, school nurse, social worker. I view it—although it's a tight knit community [...] it's also very patchwork, where there are a bunch of islands that each take on patient care, but there's less of a centralized structure." -Suburban specialist
Functional		
Asthma education	Asthma education for parents, children, school staff, and community members	• "It's striking that some of the patients that I've seen who have been diagnosed with asthma before I see them or have not—some of the misconceptions they have. Of course, some of that could be their referring provider said 1 thing and they heard another or forgot." -Suburban specialist • "If families understood what asthma is and how it impacts their lives, they could maybe have a different priority and be more open and receptive to all the resources that we have. I feel like families—and the lack of education could be just because they don't have access, they don't have the time." -Urban school nurse on statewide CAB • "The number one issue I see [. . .] is they don't have a good understanding about their rescue versus controller inhalers, how to use them properly, and [. . .] inadequate preventive management [. . .] causing them to have more exacerbations and end up in the hospital." -Suburban provider

Table 2. Continued

Tier/Theme	Description	Illustrative Quotations
School Asthma Care Plan coordination	School Asthma Care Plan Coordination: improved processes for collecting and managing asthma care plans among schools, healthcare providers, and families	• "Before the end of the school year, I give blank care plans to the families that currently have a care plan on file because it expires at the end of the school year in hopes that if they saw the physician over the summer that they would get that completed, and then be able to bring that in day 1 of the fall semester, so we would have that on file. That's my dream that that happens, but it doesn't always. In fact, it never happens that way where everyone does it. I'm contacting offices. I'm contacting parents trying to get that in place." -Rural school nurse • "We'll hand them their care plan and ask them to go the doctor 'cause this is done 2 weeks before school starts that we have registration, so we ask them for this. We give them time, and just ask them to send it back to school with the inhaler with their child on the first day of school. I'd say we get maybe 25% of that done, maybe. . .[we] will make a phone call home again and ask them to get the care plan filled out. A lot of times, parents be like, "Oh, I lost the paper. Can you send it home again?" We do that, and a lot of times, we still don't get it back." -Rural school nurse
Resources	Resources to address healthcare and SDOH needs as well as to improve community knowledge of existing resources	• "I think [the program]'s incredible. I would give anything to have that down here. I think we could do so much more if we had more of that connection. **We're just limited by our bandwidth.** We can do this much, but I wish we could do *this* much. I think a navigator—a community navigator would be that person who could take us so much further." -Suburban specialist • "For some people, it might be really hard getting into [specialist] appointments and how they're gonna—just the transportation and getting your kid there. . .we have a lot of Spanish-speaking—a pretty good population here and the school that I work at too. I don't know what kind of advocates we have or educators that could be helping the Spanish population have access." -Suburban parent

CAB, community advisory boards; SBAP, school-based asthma program; SDOH, social determinants of health

region, participants also discussed how these resources were insufficient and how there needed to be both more and better coordinated use of existing resources to maximize impact in general and specifically around childhood asthma. The 2 resource areas participants identified as most in need for incorporation in SBAPs were school resources and SDOH resources. Participants in less-resourced, more rural areas reported a need for more transportation options than in urban and suburban areas.

School Resources

Resources to support program implementation, social needs, and asthma management exist in different but insufficient degrees within each region. School nurses often support multiple schools with limited assistance from unlicensed assistive personnel, creating capacity challenges to balance the multitude of demands placed on them. One school nurse in the Lower Arkansas Valley said, "there's 3 of us school nurses for about 5 or 6 schools, and we don't have but 1 health aide who's here doing just the paperwork stuff, so we're handing out meds, taking care of diabetic students, dealing with mental health crises." Additional support from an SBAP would "lift a lot off [nurse's] shoulders," said 1 rural school nurse. Schools and local clinics (especially those that serve uninsured/underinsured populations) are seen as valuable resources within each community.

Social Determinants Resources

Organizations exist in each community to help support and address SDOH needs; however, more resources and improved coordination between existing resources are needed. Social needs organizations support their communities by addressing food insecurity, healthcare access, and transportation. Participants felt that resources were underutilized because of a lack of community knowledge of existing resources and challenges with accessibility (location and transportation). Transportation needs and resources look different

by region, with the rural regions needing more reimbursement for travel to access resources and suburban/semiurban regions needing improved public transportation infrastructure. The rural regions tended to have more resource needs than participating suburban/semiurban regions, but all regions emphasized the desire for more resources to address the needs within their communities.

Asthma Education

School nurses reported feeling that they have an adequate understanding of asthma management and are confident and comfortable working with students to provide additional education when time and opportunity allow. However, they highlighted that sufficient education and training are lacking among external providers and staff with whom they coordinate care, inhibiting effective asthma management in schools. Similarly, participants highlighted a need for additional asthma-related education for children, parents, school staff, and community members. For children with asthma and their families, there needs to be more education on asthma and its effective management, proper inhaler usage and technique, recognition of asthma triggers, and early signs of worsening asthma. A "huge, huge problem is inadequate education. Kids and adults, because of the lack of education, they don't use their medications properly," reported a rural provider. Providers often have limited time to educate patients and their families about asthma and its management, a large amount of information that can leave families overwhelmed and confused. Asthma education among school staff and community members supporting children with asthma (e.g., afterschool programming and coaches) is also lacking and should, at a minimum, include symptom recognition and guidance on what to do if a child experiences an asthma exacerbation.

School Asthma Care Plan Completion

Across the regions, school nurses and providers complete asthma care plans for students to guide asthma care at school and allow administration of asthma medications. School nurse participants described variable difficulties in getting forms returned either from providers or parents and spend significant time on this process. As 1 rural school nurse described, "we get the care plan and the order form from the providers. A lot of times, that's hard for us to obtain, and that's not really the provider. I would say that's probably more parents." Standardized and consistent workflow around asthma care plans can help to facilitate this process. Some nurses reported getting creative with strategies to try and collect these (see Table 2), but all reported that it was an essential function that needed a smooth workflow to prepare for implementation of a SBAP.

Tiers of Needs

Conceptually, the common needs described by participants to support this SBAP to improve asthma outcomes fit into 3 tiers (Figure 2). The first tier includes foundational needs: buy-in from relevant stakeholders to the program and prioritization of asthma and/or the SDOH screening/referral aspect of this SBAP as 1 of many community health concerns. These needs were discussed as core and essential to program implementation. The second tier is relational and focuses on the need for improved relationships, communication, and coordination among key players, especially school nurses, healthcare providers, and community organizations providing resources to address SDOH. These relational needs build on the commitment and buy-in identified in the foundational tier. The third tier is a set of working collaborations addressing functional needs: effective use of resources, community asthma education, and school asthma care plan coordination. Our data suggest that implementation of the SBAP would be more feasible and impactful if the local context meets the optimal states illustrated in these tiers.

Discussion

In this qualitative study, we interviewed 52 key informants from across 5 regions of Colorado to identify their needs, priorities, and available/needed resources to plan for implementation of a SBAP. Our analyses revealed 6 major categories of perceived needs for implementation and a 3-tiered progressive structure of these as foundational, relational, and functional needs to achieve implementation success. As successful implementation of this evidence-based SBAP should ultimately improve asthma care and outcomes, these tiers of needs are critical to address. Our findings suggest the foundational importance of first fostering community engagement and interest in an SBAP to leverage community support for developing the relationships, processes, and coordination that will support eventual SBAP implementation. This community engagement has been a core component of our dissemination planning to date via CABs, and we will continue engaging these boards throughout the project and perhaps beyond.

Overall, the common needs and resources that we identified, if addressed with implementation strategies, can be facilitators to dissemination of the program; however, some may also present as barriers to implementation and program effectiveness. Our theme of asthma prioritization highlights a key barrier; although asthma is 1 priority, there are other major (sometimes higher) priorities for children's health in these communities. This raises questions about the core program components, their importance

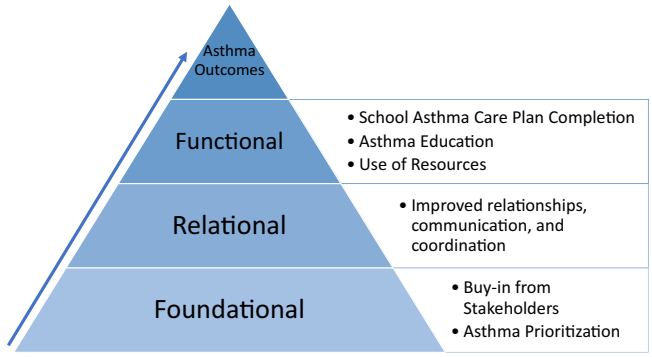

Figure 2. Tiers of needs to implement a school-based asthma program and improve asthma outcomes

for the effectiveness of the SBAP during dissemination, and the strategies available to SBAP implementers to influence the level of asthma prioritization in community contexts. Although the core components of the program, as we specified, were perceived to have good fit, the capacity of communities to implement these core components and how our implementation strategies may support communities facing challenges at 1 or more of these 3 tiers remains unclear. For example, SDOH needs were highlighted as important, but the time and lack of resources to address these were of concern. Given the finding that asthma was 1 of many community/school priorities and was viewed as relatively undersupported in some regions, successful implementation and effectiveness may require focusing more on other core components that also align with other priorities and resources in communities. This speaks to the necessity of understanding distinct community needs and tailoring the program to those needs through implementation strategies and preparatory work to build a welcoming context.

The future dissemination trial (for which this study aimed to inform planning and strategies) will ultimately provide important information on which contextual factors are necessary and sufficient for successful program implementation.[13,14] In addition, we expect to find that certain contextual needs/resources will respond well to our implementation strategies, whereas others may be more challenging.[14,15] For example, regarding the foundational tier of context, if a new challenge emerges to lower the priority for asthma locally, that could limit successful implementation despite our strong community engagement efforts. In contrast, our implementation strategies targeting the relational tier may prove more successful in some schools/regions than others, owing to variability in other factors, such as the availability of staff in local clinics to serve as champions. Given the entrenched asthma disparities and limited attention to asthma in the communities we have engaged to date, program dissemination, even if imperfect, could still meaningfully improve the health of children with asthma and provide a model for addressing asthma disparities elsewhere. As recommended by Baumann and Cabassa,[16] tailoring our implementation strategies to these tiers of need with a focus on equitable reach to students will be important. This article summarizes common contextual needs across our 5 regions; however, additional work needs to be done to further tailor program implementation to local contexts and to accommodate resource limitations to assure success. Additionally, our sample included a small number of parents, no children, and no school administrators. As such, we plan to expand our understanding of the perceptions of the program from these perspectives as part of the future trial.

Conclusion

Communities have some common needs regarding laying the groundwork for SBAP implementation, including stakeholder buy-in, strong relationships between partners, and functional processes and resources available to both families and service providers. These categories of needs can help to inform where the SBAP can work well with our current community-engaged approach to implementation planning and where program implementation may need modification to be successful. We anticipate that the answer will lie in tailoring SBAP implementation strategies to unique local contexts.

Acknowledgments

Research reported in this brief report was supported by the National Heart, Lung, And Blood Institute of the National Institutes of Health under Disparities Elimination through Coordinated Interventions to Prevent and Control Heart and Lung Disease Risk (DECIPHeR) Award (UG3HL151297).

Conflict of Interest

Sarah Brewer has served on advisory boards for Merck. Stanley J. Szefler has consulted for Astra Zeneca, Boehringer-Ingelheim, Eli Lilly, GlaxoSmithKline, Moderna, OM Pharma, Propeller Health, Regeneron, and Sanofi. All other authors have no financial interests to declare.

References

1. Centers for Disease Control and Prevention. *2021 National Health Interview Survey (NHIS) Data*. Last accessed September 7, 2023 from https://www.cdc.gov/asthma/nhis/2021/table2-1.htm
2. Centers for Disease Control and Prevention. *Asthma in Children*. Published May 10, 2018. Last accessed January 26, 2023 from https://

www.cdc.gov/vitalsigns/childhood-asthma/index.html
3. Pappalardo AA, Martin MA, Mahdavinia M. Asthma health disparities. In: *Health Disparities in Allergic Diseases: An Evidence-Based Look at Causes, Conditions, and Outcomes*. 2020: pp. 145-179. Cham, Switzerland: Springer.
4. Diette GB, Markson L, Skinner EA, Nguyen TT, Algatt-Bergstrom P, Wu AW. Nocturnal asthma in children affects school attendance, school performance, and parents' work attendance. *Arch Pediatr Adolesc Med*. 2000; 154(9):923. https://doi.org/10.1001/archpedi.154.9.923
5. Moonie SA, Sterling DA, Figgs L, Castro M. Asthma status and severity affects missed school days. *J Sch Health*. 2006;76(1):18-24. https://doi.org/10.1111/j.1746-1561.2006.00062.x
6. Daniel LC, Boergers J, Kopel SJ, Koinis-Mitchell D. Missed sleep and asthma morbidity in urban children. *Ann Allergy Asthma Immunol*. 2012; 109(1):41-46. https://doi.org/10.1016/j.anai.2012.05.015
7. Basch CE. Asthma and the achievement gap among urban minority youth. *J Sch Health*. 2011;81(10):606-613. https://doi.org/10.1111/j.1746-1561.2011.00634.x
8. Basch CE. Healthier students are better learners: High-quality, strategically planned, and effectively coordinated school health programs must be a fundamental mission of schools to help close the Achievement Gap. *J Sch Health*. 2011; 81(10):650-662. https://doi.org/10.1111/j.1746-1561.2011.00640.x
9. Janevic MR, Stoll S, Wilkin M, et al. Pediatric asthma care coordination in underserved communities: A quasiexperimental study. *Am J Public Health*. 2016;106(11):2012-2018. https://doi.org/10.2105/ajph.2016.303373
10. Cicutto L, Gleason M, Haas-Howard C, et al. Building Bridges for Asthma Care Program: A school-centered program connecting schools, families, and community health-care providers. *J Sch Nurs*. 2018;36(3):168-180. https://doi.org/10.1177/1059840518805824
11. Liptzin DR, Gleason MC, Cicutto LC, et al. Developing, implementing, and evaluating a school-centered asthma program: Step-up asthma program. *J Allergy Clin Immunol Pract*. 2016; 4(5):972-979. https://doi.org/10.1016/j.jaip.2016.04.016
12. Szefler SJ, Cloutier MM, Villarreal M, et al. Building Bridges for Asthma Care: Reducing school absence for inner-city children with health disparities. *J Allergy Clin Immunol*. 2019; 143(2):746-754. https://doi.org/10.1016/j.jaci.2018.05.041
13. Feldstein AC, Glasgow RE. A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice. *Jt Comm J Qual Patient Saf*. 2008; 34(4):228-243. https://doi.org/10.1016/s1553-7250(08)34030-6
14. Nilsen P, Bernhardsson S. Context matters in implementation science: A scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC Health Serv Res*. 2019;19(1):189. https://doi.org/10.1186/s12913-019-4015-3
15. Waltz TJ, Powell BJ, Fernández ME, Abadie B, Damschroder LJ. Choosing implementation strategies to address contextual barriers: Diversity in recommendations and future directions. *Implementation Sci*. 2019;14(1):42. https://doi.org/10.1186/s13012-019-0892-4
16. Baumann AA, Cabassa LJ. Reframing implementation science to address inequities in healthcare delivery. *BMC Health Serv Res*. 2020;20(1):190. https://doi.org/10.1186/s12913-020-4975-3
17. Szefler S, Cicutto L, Brewer SE, Gleason M. Applying dissemination and implementation research methods to translate a school-based asthma program. *J Allergy Clin Immunol*. 2022; 150(3):535-548.