Behavioral Sleep Education in Pediatric Primary Care: Building Capacity Through the Extension for Community Healthcare Outcomes (ECHO) Model

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ABSTRACT

BACKGROUND: Sleep disorders are prevalent in children yet significantly underdiagnosed and undertreated in primary care. The Extension for Community Healthcare Outcomes ("Project ECHO©") is a telementoring model that connects healthcare specialists with generalists, combining brief didactic presentations and case-based learning. In this one-year project, the ECHO© model was employed to train primary care pediatricians in Rhode Island in behavioral sleep management strategies.

METHODS: Monthly teleconference sessions included a didactic presentation by a pediatric behavioral sleep expert, followed by a case presentation and discussion. Practices also designed and completed a Quality Improvement project, supported by monthly meetings with a facilitator. Six practices enrolled; 10 clinicians completed both pre- and post-program evaluations.

RESULTS: Providers reported increased knowledge about pediatric sleep, particularly in the areas of sleep training in infants, and addressing sleep in patients with Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder. Improvements in overall confidence and comfort to address sleep in primary care were reported. After the project, providers reported an increase in systematic tracking of sleep concerns, and an increase in frequency of follow-up visits to address sleep.

CONCLUSIONS: Project ECHO© is a promising model for diffusion of practice-based behavioral sleep knowledge to primary care pediatricians. An expanded clinical skillset helps primary care pediatricians feel empowered to identify and address sleep problems in their practices, which has the potential to improve sleep care and preserve healthcare resources.

KEYWORDS: pediatric sleep; pediatric primary care; provider education; Project ECHO

INTRODUCTION

Pediatric sleep disorders are highly prevalent, affecting approximately 25% to 30% of children and adolescents.[1] A large body of literature has linked poor sleep to a variety of negative consequences, including behavioral dysregulation,[2] impaired cognitive development and academic performance,[3] and health issues such as obesity and decreased immune function.[4] Despite the critical importance of sleep for optimal child and family functioning, pediatric sleep disorders remain underdiagnosed and undertreated.[5]

The primary care setting is considered an essential environment for the screening and management of sleep issues because nearly all children attend regularly scheduled well-child visits. However, a substantial "sleep-care gap" exists, in that high prevalence rates of sleep disorders contrast sharply with lower rates of clinical identification and treatment.[6] For example, a review of medical records in a large primary care network showed that only 3.7% of children received a sleep-related diagnosis.[5] This discrepancy is largely attributed to a pervasive lack of formal education in sleep medicine. Globally, medical schools dedicate an average of less than three hours to sleep-related topics, with only 17 minutes focused specifically on pediatric sleep.[7] Only 1.5% of pediatric residencies in the United States require a sleep medicine rotation.[8] Consequently, many pediatric residents complete their training with very limited dedicated sleep instruction.

This educational deficit can result in low provider knowledge and a lack of clinical confidence. In one community survey of primary care providers, respondents reported low levels of confidence in evaluating (34%) or treating (25%) pediatric sleep disorders.[9] Conversely, in another survey, primary care providers who had received training in pediatric sleep had higher knowledge scores, reported greater confidence in addressing sleep problems, and reported more regularly screening their patients for sleep disorders.[10] Beyond knowledge gaps, primary care teams face significant structural barriers, including demanding workloads and severe time constraints during consultations. Additionally, providers often rely on the assumption that parents will volunteer sleep concerns, yet parents frequently fail to report these issues because they lack the knowledge to recognize them or assume they are a normal part of development.[6] Therefore, a lack of systematic screening can miss sleep concerns. The International Pediatric Sleep Association has recently highlighted the urgent need for targeted, accessible sleep education programs to enhance provider competence.[11]

To address these barriers, innovative training models such as telementoring have been proposed to bridge the gap

between specialty sleep care and primary practice. Project Extension for Community Healthcare Outcomes (Project ECHO©) is a telementoring model established in 2003 at the University of New Mexico School of Medicine to improve access to specialized care for underserved populations.[12] It utilizes a "hub-and-spoke" structural design that connects an interprofessional team of specialists (the "hub") with community-based generalists (the "spokes") via a virtual videoconferencing platform to create virtual "communities of practice." A core feature of Project ECHO© is the "all teach, all learn" principle, which ensures that knowledge sharing is bidirectional and participatory. Sessions typically consist of two main components: a brief specialist-led didactic presentation on a specific clinical topic and case-based learning, where generalists present anonymized, complex patient cases for multidisciplinary discussion and telementoring. Both specialists and generalists contribute their unique expertise to clinical discussions.

The ECHO© framework has been used with a wide range of different health conditions and populations, often focusing on increasing the capacity of generalists to manage cases that would otherwise require long waiting times for specialists. The model has been successfully applied to sleep in adult veterans within the U.S. Department of Veterans Affairs healthcare system.[13,14] Providers in the Sleep VA-ECHO© program reported increased skills and comfort in managing common sleep complaints,[13] with nearly all reporting utilizing their new knowledge monthly to care for patients, and two-thirds reporting sharing their new knowledge with colleagues at least once a month.[14] The greatest increase in comfort was reported with non-pharmacologic (behavioral) management of insomnia and patient education,[14] suggesting a need for specific training in these areas.

Evidence-based behavioral interventions such as graduated extinction or stimulus control are the gold standard for treating insomnia and other sleep problems in children and adults, yet many primary care providers feel ill-equipped to provide behavioral strategies.[6] To our knowledge, ECHO© programs specifically addressing pediatric sleep have not previously been described in the literature, though management of sleep problems was a dedicated didactic topic in a broader ECHO© program focused on childhood autism spectrum disorder (ASD).[15]

In this project, we aimed to implement and assess a novel pediatric sleep Project ECHO© program for primary care providers in Rhode Island. The curriculum focused on behavioral sleep medicine principles to equip frontline providers with the tools necessary to effectively screen, diagnose, and treat the most common sleep challenges encountered in pediatric primary care, in order to expand capacity to treat pediatric sleep problems.

METHODS

"Optimizing a Behavioral Health Approach for Children's Sleep in Pediatrics" was a year–long ECHO© telementoring program developed by the Care Transformation Collaborative of Rhode Island (CTC-RI), which is an ECHO© hub. CTC-RI has previously successfully leveraged this training model to other pediatric behavioral health topics. Any primary care practice in Rhode Island serving pediatric patients (age 0–22) was eligible to apply to participate in this initiative. The project was advertised on the CTC-RI website and newsletter, and by outreach to practices. Interested practices completed an application requesting practice-level information (e.g., size of panel, payor mix) and how they would benefit from participation.

This project focused on increasing knowledge about sleep across childhood, developing skills in provision of developmentally targeted guidance to families on healthy sleep using behavioral health principles, facilitating exchange of information and ideas on how to improve sleep problems in pediatric patients, sharing empirically supported behavioral treatments for sleep problems, and improving comfort and confidence in treating sleep problems among non-specialty providers. The curriculum was developmentally structured and focused on specific skills to implement with patients (i.e., "clinical pearls") at each developmental stage. Although the focus was on pediatric behavioral sleep principles, sessions also covered screening and preliminary testing (e.g., labwork) for common organic sleep disorders, use of medication, and when to consider referring to a specialist. Based on feedback from participants about common challenges in their practices, the curriculum also covered topics such as sleep in children with ASD, Attention Deficit Hyperactivity Disorder (ADHD), and managing electronics use at night.

The program was comprised of 10 monthly, 60-minute teleconference sessions, combining a 25-minute didactic presentation by a pediatric sleep expert, followed by a challenging case presentation by one of the practices (related to the topic of the month), and discussion by the entire group. Didactics were presented by psychologists with expertise in pediatric behavioral sleep medicine, and a physician board-certified in sleep medicine. Sessions were recorded and available to participants and their practices on an online platform. Resources such as handouts were provided for practices to use with their patients as appropriate, and were available on the online platform.

Participating practices were also expected to complete a Quality Improvement (QI) project, with the support of a psychologist who served as the practice facilitator and met with practice representatives monthly. Practices presented the results of their QI projects, as well as a patient success story at the final two monthly meetings of the year.

Each practice identified a provider champion, a nurse care manager/care coordinator, a behavioral health clinician (if applicable to the practice), and a practice/office manager to

participate. A stipend was provided at the practice level to account for staff participation time. CME credit was also available. After each session, participants were sent a link to an electronic survey assessing their satisfaction with the program. In addition, before the first and after the last session, participants were sent a link to an electronic survey, assessing their knowledge, comfort, and confidence in addressing specific aspects of pediatric sleep problems. To analyze the survey results, we calculated descriptive statistics and compared pre-post changes using paired samples t-tests.

RESULTS

CTC-RI was able to enroll all six practices that applied. Participating practices were all community-based primary care pediatrics practices (i.e., serving pediatric patients only). Practice size ranged from a solo practice to a large practice of eight providers (mean=4.8 providers). Practices had between 1200 and 7903 active pediatric patients in their panels (mean=3723.5). The percentage of patients served by Medicaid ranged from 16% to 72% (mean=33.3%). All practices had Primary Care Medical Home certification.

Sixteen clinical team members participated in the program, attending an average of 8.6 sessions (range 3 to 12 sessions). Participants included 11 pediatricians, three nurse practitioners, and two integrated behavioral health (IBH) clinicians embedded in these practices. Ten of the clinical team members (63%) completed both the pre- and post-program surveys; all practices were represented. Respondents were seven pediatricians (70%), one nurse practitioner (10%), and two IBH clinicians (20%). Prior to the project, no participants rated themselves as very confident in their overall ability to effectively address sleep disorders and other sleep challenges in children; 38% reported moderate confidence in their ability. Participants also answered an open-ended question about barriers they encountered in addressing sleep. The most commonly reported barriers fell into the following categories: limited parental or teen receptivity to sleep recommendations (n = 9), lack of time (n = 4), lack of resources (e.g., reliable assessment and tracking tools, n = 6), comorbid diagnoses (e.g., ADHD, anxiety, n = 3), and sleep hygiene issues (e.g., electronics, napping, n = 2).

Paired samples t-tests comparing responses before and after the program indicated that participants reported significantly increased knowledge about pediatric sleep in all domains measured, with greatest improvement in knowledge about sleep training in infants (t=–4.44, p<.01), children with ADHD (t=–3.41, p<.01), and children with ASD (t=–4.91, p<.01). Significant improvement in overall confidence in their ability to address sleep problems was reported (t=–3.59, p<.01), as well as specific improvement in confidence to address sleep in infants (t=–3.59, p<.01) and children with ASD (t=–4.60, p<.01). After the program, providers reported significantly greater comfort in all domains of addressing pediatric sleep problems, with the greatest gains in conducting a sleep assessment and/or using a sleep screening tool (t=–7.23, p<.001), providing guidance about healthy sleep habits across developmental stages (t=–5.25, p<.001), empowering parents to play an active role in addressing their child's sleep (t=–4.13, p<.01), and identifying risk factors for organic sleep disorders (e.g., Obstructive Sleep Apnea, Restless Legs Syndrome) (t=–3.81, p<.01). The project did not increase self-reported frequency of referrals to sleep specialists, but rather increased the frequency of offering a follow-up visit with the provider to address sleep disorders or problems (t=–4.58, p<.01). Providers also reported an increased frequency of using a system for tracking sleep concerns by their practices (t=–5.01, p<.001).

QI projects developed by the practices were practice-centered and ranged from improving detection of sleep problems in a particular age group (by integrating sleep screening instruments into the regular clinic workflow), to creating an automated clinical decision support tool for sleep within the electronic health record to improve quality of sleep care and improve provider efficiency. Qualitative comments suggested that the QI projects helped participants disseminate resources and information learned to the rest of the providers in their practices.

DISCUSSION

This paper describes the content and evaluation of a novel Project ECHO© to train pediatric primary care providers in behavioral sleep management strategies. The project was well-received by clinicians. Data from two time points were examined to compare change in provider knowledge, comfort, and confidence in addressing pediatric sleep problems. Prior to the program, only 38% of participants rated themselves as moderately or very confident in their overall ability to effectively address sleep challenges in children; in contrast, after the program, 100% rated themselves as moderately or very confident. Providers reported increased knowledge about pediatric sleep, particularly in the areas of sleep training strategies in infants, and behavioral sleep strategies for patients with ASD and ADHD. Sleep issues that are comorbid with neurodevelopmental disorders are often complex to manage, and providers appreciated specific tools and behavioral strategies to use with patients. Many of the skills the providers developed helped them address common challenging sleep behaviors across childhood development. After the project, providers reported an increase in systematic tracking of sleep concerns, and an increase in frequency of follow-up visits to address sleep. Importantly, participating providers reported sharing their knowledge with colleagues, thereby increasing the reach of the project. Providers were also able to benefit from other practice's QI projects, given that lessons learned were shared within the community of learners.

Limitations of this project included a small sample size that might not represent providers outside of Rhode Island, or providers practicing in other settings such as hospital-based clinics or community health centers. Because the participating sites were community-based, primary care pediatrics practices, the generalizability (and therefore the upper limit of the project's impact) may be constrained. At the same time, it is important to note that the ECHO model has been implemented successfully across a wide range of practice types and geographic locations, suggesting broader applicability beyond this sample. Respondent bias was possible, as individuals who chose to participate likely had greater interest or motivation related to sleep health. Another possible issue is that self-assessed confidence or comfort does not necessarily translate to knowledge gains or consistent application in clinical practice. Finally, it would have been beneficial to survey participants again at a later time, to assess whether positive impacts of the project were durable.

In conclusion, Project ECHO© demonstrated high efficacy in improving clinicians' knowledge, confidence, and comfort in addressing behavioral sleep concerns in primary care. Project ECHO© is a valuable model for diffusion of practice-based knowledge of pediatric sleep for primary care pediatricians and could be scaled to other locations. Its telementoring format is accessible, engaging, and leads to increases in knowledge, which is anticipated to improve identification and behavioral management of sleep problems in children. ECHO© also enhances collaboration and communication between pediatricians and sleep specialists, creating a more coordinated care system. Lastly, improving pediatrician comfort and competence with management of sleep problems has the potential to reduce unnecessary referrals to sleep specialists, saving healthcare resources.

Upcoming ECHO series

Given the positive feedback on the ECHO model as a valuable education and learning format for primary care providers, CTC-RI has undertaken other pediatric-focused ECHO topics such as anxiety, ASD, and perinatal mental health. An upcoming ECHO series on managing complex ADHD in pediatrics will launch in Spring 2026. For future offerings, visit https://ctc-ri.org/news-events/pcmh-news-and-articles.

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