

Primary Care Providers' Practices Regarding Patient Sleep: Impact of Integrated Behavioral Health

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Introduction: Adequate sleep is crucial for effective functioning. Although many children and adolescents have sleep issues, research indicates pediatric providers rarely address them. No research has examined whether primary care providers (PCPs) who practice within an Integrated Primary Care (IPC) model are more likely to assess sleep concerns than PCPs without IPC. The current study aimed to examine providers' current practices and knowledge regarding common sleep topics from clinics with and without IPC. **Method:** PCPs across a large health system were surveyed. Participants were 101 providers across 38 clinics, some within IPC clinics ($n = 67$), and others not ($n = 34$). Participants responded to questions regarding current sleep assessment and intervention practices, general sleep, and medications knowledge. **Results:** Providers reported moderate comfort with behavioral interventions and low comfort with medical interventions. IPC providers were more likely to screen for snoring. Regardless of integration status, PCPs had low medication knowledge scores. **Discussion:** IPC may enhance some areas of PCPs' knowledge and comfort with behavioral interventions. PCPs need further training in understanding and implementing interventions for sleep concerns. IPC behavioral health providers may facilitate such trainings and work collaboratively with PCPs to improve patient access to sleep interventions.

Public Significance Statement

This study highlights the benefits of having a behavioral health provider (BHP) integrated into primary care offices, especially regarding the assessment and treatment for sleep concerns. Specifically, this study demonstrates having an integrated BHP is associated with increased screening for snoring and patient access to interventions for obstructive sleep apnea (OSA).

Keywords: sleep, behavioral health, integrated primary care (IPC)

Sleep is critical for healthy growth and development (Faruqui et al., 2011; Meltzer & Mindell, 2006; Owens et al., 2003). Sleep issues can negatively impact a child's physical and emotional

health, behavior, attention, academic performance, and even impact family stress (Honaker & Saunders, 2018; Meltzer & Mindell, 2006; Owens et al., 2003). An alarming 25–40% of youth struggle with

This article was published Online First June 16, 2022.

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We have no known conflict of interest to disclose and no grant or other funding to disclose.

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sleep (Honaker & Saunders, 2018; Mindell & Meltzer, 2008). Specifically, bedtime problems, insomnia, and night waking are the most common complaints in pediatric practices (Faruqui et al., 2011; Owens et al., 2003, 2010). Further, up to 5% of youth can be diagnosed with Obstructive Sleep Apnea (OSA; Rosen et al., 2004). However, families often underreport sleep concerns; and given that medical providers often do not screen for, diagnose, and treat sleep concerns, it is likely many youth are not receiving adequate sleep care (Faruqui et al., 2011; Honaker & Saunders, 2018; Mindell & Meltzer, 2008; Owens, 2001; Owens et al., 2003).

Despite the importance of screening in primary care offices, surveys of pediatricians reveal knowledge gaps related to sleep disordered breathing, excessive daytime sleepiness, sleep-movement disorders, and parasomnias (Faruqui et al., 2011; Mindell et al., 1994). Faruqui et al. (2011) report from their survey of 700 pediatricians that medical residents only receive an average of 4.8 hr of instruction on sleep concerns and nearly 30% of medical schools reported no formalized instruction in sleep medicine. Unfortunately, this lack of training appears to translate to deficits in recognition and intervention. In a review of the literature, Honaker and Saunders (2018) found pediatricians initially reported fewer than 25% of their patients had sleep concerns. With further questioning, more than 50% of those patients presented with some sleep-related concern (Honaker & Saunders, 2018). The literature suggests 10–30% of PCPs do not regularly screen for sleep concerns (Faruqui et al., 2011; Owens, 2001). The National Sleep Foundation found 52% of parents reported PCPs did not regularly ask about their child's sleep (Meltzer et al., 2010). Concerningly, even when PCPs do screen, they often ask one question, rely on parental report, and rarely assess snoring (Honaker & Saunders, 2018). Faruqui et al. (2011) report 70% of PCPs who do screen, typically ask one question about routine sleep problems. Owens (2001) report fewer than half of PCPs surveyed asked youth directly about their own sleep. More than half of pediatricians report rarely or never ordering sleep studies to assess for OSA. Although an overwhelming majority (96%) of pediatricians reported believing it is their job to provide sleep recommendations, only 19% of providers answered more than half of the general sleep knowledge questions correctly (Faruqui et al., 2011).

Since patients may be more likely to divulge sleep concerns to a medical provider, and sleep

issues often require lifestyle changes, sleep is an area where collaboration between behavioral health and medicine could enhance care. Coordinated treatment between medical and behavioral health providers would ultimately benefit patients. This is precisely how the integration of a Behavioral Health Provider (BHP) into primary care can help both patients and PCPs. BHPs are specifically trained to help assess and address areas in life that can impact health, such as sleep, often with behavioral interventions. Through collaboration with a PCP, a BHP can help patients make recommended medical changes and help provide more supportive and tailored interventions than most PCPs have the skill set or time to deliver in their fast-paced schedules within primary care.

Many sleep-related disorders can be managed with behavioral and/or medical interventions (Felt & Chervin, 2014). Even though behavioral interventions are commonly cited as first-line treatments and have received the most research with pediatric patients, they are underutilized by PCPs (Mindell & Meltzer, 2008; Owens et al., 2003). BHPs trained in child development, cognitive behavioral therapy (CBT), and behavioral management strategies can serve as an asset to primary care teams who seek to assess and address sleep problems in their patients. BHPs not only work with the PCP to deliver an integrated care plan; they can implement needed behavioral and/or cognitive interventions right in the PCP's practice without the need to refer patients out.

The underutilization of behavioral interventions in primary care settings is not surprising given the gaps in PCP knowledge and underassessment of sleep-related issues. In one study reviewed by Honaker and Meltzer (2016), only 8% of patients with a sleep disorder and 2% with a sleep problem received documented recommendations provided by their PCP. Further, many PCPs report using medications to address sleep concerns (Felt & Chervin, 2014; Owens et al., 2010). This is another aspect in treating sleep concerns where an integrated medical and behavioral approach would benefit patients. A BHP would be able to offer needed behavioral interventions, continue to consult with PCPs, and possibly mitigate the need for medications to address common pediatric sleep concerns.

In a survey of 671 PCPs, Owens et al. (2003) found that over 75% of PCPs recommended over-the-counter medications and more than 50% of PCPs prescribed a medication for sleep problems. The results of this survey suggest PCPs commonly recommend medications for sleep concerns among children. Although medications can sometimes be helpful in addressing sleep concerns, they are often

used off-label within the pediatric population (Felt & Chervin, 2014).

A goal of integrating BHPs into primary care is to enhance the patient experience and increase access to behavioral health (BH) interventions (Talen & Valeras, 2013). This can be done through a collaborative team approach where the PCP partners with BHPs to deliver coordinated and evidence-based medical and behavioral care. To our knowledge, no research has examined whether IPC is associated with enhanced PCP sleep-related practices. The present study was conducted to examine this potential relationship by assessing the current intervention knowledge using surveys sent to all PCPs in a large health system in rural Pennsylvania. We investigated whether PCPs within IPC offices would score higher on (a) comfort/confidence in screening practices, (b) medical and behavioral knowledge, and (c) screening more for sleep concerns; and commonly reported barriers to providing sleep-related care to inform future efforts in this area.

Method

Participants

Participants were 101 PCPs in a large health system in rural Pennsylvania who worked in either

pediatric or family medicine offices. Surveys were sent to 145 PCPs practicing in integrated primary care (IPC) clinics and 108 PCPs practicing in clinics without integrated behavioral health (IBH; non-IPC). IPC sites had at least one BHP (e.g., clinical psychologist) working in the office at least part time for at least 1 year; non-IPC clinics had no behavioral health providers on site. More PCPs from IPC clinics completed and returned surveys (66%; $n = 67$) compared to non-IPC clinics (33%; $n = 34$).

Most participants identified as White females. Most participants' training was as MDs or DOs. Providers were mostly in their 30s and were either 20+ years post residency or had completed their residency in the past 5 years. See Table 1 for participant demographics.

Procedure

Surveys were sent through interoffice mail and included a message requesting the provider's participation, the researchers' email address to ask questions, and address to return the completed survey. If a provider did not respond within a month, a second survey was sent. Surveys with less than one quarter completed were returned. The present study was exempt from IRB review because surveys were anonymous.

Table 1
Participant Characteristics

Gender ^a	Male ($n = 37$); 36.67%	Female ($n = 62$); 61.39%
Race ^b	White ($n = 79$)	78.22%
	Asian/Pacific Islander ($n = 13$)	12.88%
	Hispanic ($n = 1$)	0.99%
Training ^c	CRNP ($n = 8$)	7.92%
	Current resident ($n = 1$)	0.99%
	DO ($n = 33$)	32.67%
	MD ($n = 47$)	46.53%
Age range ^d	PA-C ($n = 11$)	10.89%
	20–29 ($n = 6$)	5.94%
	30–39 ($n = 34$)	33.66%
	40–49 ($n = 21$)	20.79%
	50–59 ($n = 19$)	18.81%
	60–69 ($n = 14$)	13.86%
Years since residency ^e	70–79 ($n = 2$)	1.98%
	<5 years ($n = 25$)	24.75%
	6–10 years ($n = 19$)	18.81%
	11–15 years ($n = 19$)	18.81%
	16–20 years ($n = 6$)	5.94%
	20+ years ($n = 28$)	27.72%

^aTwo participants did not report gender. ^bEight participants did not report race. ^cOne provider did not report their training. ^dFive participants did not report age. ^eFour did not report.

Measures

The survey used in this study was adapted from Faruqui et al. (2011) to create a two-page, 48 question measure (see Figure 1). The first seven questions included demographic information. Providers answered three yes/no questions about whether they routinely screen for sleep problems, ask about snoring, and if they routinely use the BEARS screening tool (a brief 5-item screening tool for sleep concerns; Owens & Dalzell, 2005). Providers also answered three forced-choice questions pertaining to what percent of their patients they prescribe various medications for sleep concerns (e.g., 1–25%, 26–50%). One question assessed barriers to screening. Providers read nine possible barriers and selected as many, if any, are personal barriers to screening for sleep concerns.

Confidence and Comfort With Screening

Providers responded to six questions regarding confidence and comfort with diagnosing sleep disorders, providing behavioral interventions, and providing medical interventions on a 0 (*not at all*) to 10 (*most comfortable*) Likert scale. Each question assessed confidence and comfort with these three areas separately (e.g., “What is your confidence level with diagnosing pediatric sleep disorders?”; “What is your comfort level providing medical interventions for pediatric sleep disorders?”). These six questions were combined to create a Confidence and Comfort composite ($\alpha = .97$).

Medication Knowledge

Providers answered nine true/false questions regarding facts about medications used for sleep. Providers had the option to select “do not know.” Answers were summed and divided by 100 to yield a total medication score, ranging from 0–100%, with higher scores indicating higher medication knowledge ($\alpha = .76$).

Behavioral Knowledge

Providers answered twelve true/false questions regarding facts about sleep. Providers had the option to select “do not know” as an answer as well. Answers to these questions were summed and divided by 100 to yield a total knowledge score, ranging from 0–100%, with higher scores indicating higher sleep knowledge ($\alpha = .69$).

Data Analysis Plan

We first examined descriptive data for our primary outcome variables. We then computed three logistic regression analyses to assess whether provider location (IPC or non-IPC) was associated with an increased likelihood that providers: (a) screen for sleep problems, (b) use the BEARS to screen, and (c) ask about snoring. Finally, to examine whether there were differences in how providers in IPC or non-IPC settings reported general and medication knowledge, we computed one MANOVA model.

Results

Comfort and Confidence in Screening Practices

Providers reported moderate comfort with behavioral interventions ($M_{IPC} = 5.16$, $SD = 2.64$; $M_{Non-IPC} = 6.56$, $SD = 3.24$) and low comfort with medication interventions ($M_{IPC} = 3.86$, $SD = 2.68$; $M_{Non-IPC} = 3.67$, $SD = 2.51$). See Table 2 for descriptive statistics for providers' comfort and confidence with screening.

To examine whether there were differences in confidence and comfort by integration status, a composite was created (due to issues of multicollinearity) of an average of providers' responses to questions about comfort and confidence. Then, a *t*-test was conducted to examine whether any differences existed by integration status. There were no statistically significant differences in comfort and confidence by clinic location, $t(99) = -1.31$, $p = .19$.

Medication and Behavioral Knowledge

Regarding medication knowledge, scores were low ($M_{IPC} = 43.43\%$, $SD = 19.99$; $M_{Non-IPC} = 41.44\%$, $SD = 24.82$). Importantly, most providers know typically developing children should not have 20 mg of melatonin. However, many providers do not know whether Clonidine and Trazadone are effective, approved treatments for insomnia in children. In terms of behavioral knowledge, PCPs' general sleep knowledge scores were moderate ($M_{IPC} = 66.25\%$, $SD = 15.21$; $M_{Non-IPC} = 60.12\%$, $SD = 19.05$). Every IPC and non-IPC provider knows poor sleep affects socioemotional functioning. For average scores on knowledge questions, see Tables 3 and 4.

Figure 1
Adapted Pediatric Sleep Survey for PCPs

Pediatric Sleep Survey for Primary Care Providers: The purpose of this survey is to gather data on pediatric sleep screening practices. Please check the box that best reflects you and your practices for each question. This survey is voluntary and if you do not feel comfortable answering a question, please do not. This survey is anonymous. Thank you in advance for your cooperation.

Sex:	<input type="checkbox"/> Male	<input type="checkbox"/> Female	<input type="checkbox"/> Prefer not to say	<input type="checkbox"/> Other: _____			
Age:	<input type="checkbox"/> 20-29	<input type="checkbox"/> 30-39	<input type="checkbox"/> 40-49	<input type="checkbox"/> 50-59	<input type="checkbox"/> 60-69	<input type="checkbox"/> 70-79	<input type="checkbox"/> 80+
Race/Ethnicity:	<input type="checkbox"/> White	<input type="checkbox"/> Hispanic	<input type="checkbox"/> Asian/Pacific Islander	<input type="checkbox"/> Black/African American	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Prefer not to say	
Training:	<input type="checkbox"/> MD	<input type="checkbox"/> DO	<input type="checkbox"/> PA-C	<input type="checkbox"/> CRNP	<input type="checkbox"/> Other: _____		
Years since residency:	<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 6-10 years	<input type="checkbox"/> 11-15 years	<input type="checkbox"/> 16-20 years	<input type="checkbox"/> More than 20 years		
Practice Type	<input type="checkbox"/> Family/Internal Medicine		<input type="checkbox"/> Pediatrics		<input type="checkbox"/> Other: _____		
Clinic Name:	_____						

What is your comfort level with diagnosing pediatric sleep disorders? 0 = Not at all to 10 = most comfortable	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
What is your comfort level in providing behavioral interventions for pediatric sleep disorders? 0 = Not at all to 10 = most comfortable	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
What is your comfort level in providing medical interventions for pediatric sleep disorders? 0 = Not at all to 10 = most comfortable	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
What is your confidence level with diagnosing pediatric sleep disorders? 0 = Not at all to 10 = most confident	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
What is your confidence level in providing behavioral interventions for pediatric sleep disorders? 0 = Not at all to 10 = most confident	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
What is your confidence level in providing medical interventions for pediatric sleep disorders? 0 = Not at all to 10 = most confident	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
What is the importance of addressing pediatric sleep concerns in primary care? 0 = not at all to 10 = most important	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10

Average total time spend on well-child checks (WCC)	<input type="checkbox"/> 0-9 min	<input type="checkbox"/> 10-20 min	<input type="checkbox"/> 21-30 min	<input type="checkbox"/> 31+ min	
Average time discussing sleep during WCC for 0-23-month-olds	<input type="checkbox"/> 0	<input type="checkbox"/> 1-5 min	<input type="checkbox"/> 6-10 min	<input type="checkbox"/> 11-14 min	<input type="checkbox"/> 15+ min
Average time discussing sleep during WCC for 2-5-year-olds	<input type="checkbox"/> 0	<input type="checkbox"/> 1-5 min	<input type="checkbox"/> 6-10 min	<input type="checkbox"/> 11-14 min	<input type="checkbox"/> 15+ min
Average time discussing sleep during WCC for 6-12-year-olds	<input type="checkbox"/> 0	<input type="checkbox"/> 1-5 min	<input type="checkbox"/> 6-10 min	<input type="checkbox"/> 11-14 min	<input type="checkbox"/> 15+ min
Average time discussing sleep during WCC for 13-18-year-olds	<input type="checkbox"/> 0	<input type="checkbox"/> 1-5 min	<input type="checkbox"/> 6-10 min	<input type="checkbox"/> 11-14 min	<input type="checkbox"/> 15+ min
Do you routinely screen patients for sleep problems?	<input type="checkbox"/> Yes			<input type="checkbox"/> No	

Do you routinely use the BEARS?	<input type="checkbox"/> Yes				<input type="checkbox"/> No			
What % of peds patients do you screen for sleep concerns?	<input type="checkbox"/> 0	<input type="checkbox"/> 1-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 76+%			
What % peds patients do you recommend the use of melatonin for sleep concerns	<input type="checkbox"/> 0	<input type="checkbox"/> 1-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 76+%			
What % peds patients do you recommend the use of Benadryl for sleep concerns	<input type="checkbox"/> 0	<input type="checkbox"/> 1-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 76+%			
What % peds patients do you recommend the use of Clonidine for sleep concerns	<input type="checkbox"/> 0	<input type="checkbox"/> 1-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 76+%			

If you do not routinely screen for sleep problems, please indicate the reasons below (check all that apply):

<input type="checkbox"/> If there is a concern, the parent will bring it up	<input type="checkbox"/> Lack of reimbursement	<input type="checkbox"/> Do not feel comfortable giving sleep recs
<input type="checkbox"/> Sleep is not as important as other health concerns	<input type="checkbox"/> Not necessary, low incidence of problems	<input type="checkbox"/> Do not have adequate resources to intervene
<input type="checkbox"/> Do not feel knowledgeable about sleep	<input type="checkbox"/> Do not have enough time to address	<input type="checkbox"/> Do not have access to screener

General Sleep Knowledge Questions

1. Poor sleep can affect social and emotional functioning.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
2. Children with delayed sleep onset may present with bedtime resistance.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
3. The incidence of obstructive sleep apnea is less than 1% in preschoolers.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
4. Night terrors and sleep walking often have a familial component.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
5. Bright light phototherapy with a light box may be helpful for children with a delayed sleep phase.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
6. Children with ADHD seldom have sleep onset differences, unless they are on a psychostimulant.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
7. It is normal for school-aged children to take daytime naps several times a week.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
8. Hyperactivity is a common presenting factor in pediatric OSA.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
9. Children with severe developmental delays have an increased risk of developing sleep disturbances.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
10. Average 24-hour sleep duration for a three- year-old is 8 hours.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
11. Nocturnal enuresis (bedwetting) occurs almost exclusively during deep or slow-way sleep.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
12. Bruxism (teeth grinding) is common in children.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know

Medication Knowledge Questions

1. Typically developing children can have 20 mg of melatonin.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
2. Clonidine should not be used to treat insomnia.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
3. Trazadone has been approved for the treatment of insomnia in adolescents.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
4. Antihistamines are effective in reducing the amount of time it takes to fall asleep.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
5. Melatonin given in smaller doses 5-6 hours before bedtime regulates sleep-wake pattern.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
6. Medication should not be the first treatment choice or the sole strategy.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
7. Medication can be effective even without the use of sleep hygiene practices.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
8. Melatonin is universally accepted as a safe medication for children.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know
9. Depakote is related to increased daytime sleepiness; however, there are no reported major direct effects on sleep.	<input type="checkbox"/> True	<input type="checkbox"/> False	<input type="checkbox"/> Don't Know

To examine whether there were differences in knowledge about sleep and medication by clinic integration, one MANOVA was computed. The outcome variables included general knowledge

scores and medication scores. There was not a statistically significant difference on these outcomes based on integration status, $F(2, 98) = 1.58, p = .210$.

Table 2
Descriptive Statistics Providers' Assessment, Comfort, and Confidence With Sleep

Content assessed	IPC <i>M</i> (<i>SD</i>)	Non-IPC <i>M</i> (<i>SD</i>)
Importance of sleep-related concerns ^a	8.00 (2.14)	6.56 (3.24)
Comfort diagnosing sleep disorders ^a	4.99 (2.51)	4.29 (2.34)
Comfort with behavioral interventions ^a	5.16 (2.64)	4.03 (2.47)
Comfort with medication interventions ^a	3.86 (2.68)	3.67 (2.51)
Confidence with diagnosing sleep disorders ^a	4.76 (2.68)	4.08 (2.30)
Confidence with behavioral interventions ^a	4.92 (2.60)	3.82 (2.46)
Sleep knowledge ^b	66.25 (15.21)	60.12 (19.05)
Medication knowledge ^b	43.43 (19.99)	41.44 (24.82)

^aRange of scores 0-10, with higher scores reflecting higher importance, comfort, or confidence. ^bRange of scores 0-100, with higher scores reflecting higher knowledge.

Screening for Sleep Concerns

In both settings, providers report sleep-related concerns as important to address ($M_{IPC} = 8.00$, $SD = 2.14$; $M_{Non-IPC} = 6.56$, $SD = 3.24$). Logistic regressions were performed to determine if clinic integration status affected providers' screening behaviors. Likelihood of screening by integration status was not statistically significant, $\chi^2(1) = .36$, $p = .55$. Integration status also did not affect the likelihood that providers used the BEARS as a screening tool, $\chi^2(1) = .20$, $p = .66$. Integration status did affect the likelihood that providers asked about snoring, $\chi^2(1) = 8.42$, $p = .004$. The model explained 11.2% of the variance in asking about snoring and correctly classified 67.7% of cases. Those in IPC clinics were 3.58 times more likely to ask about snoring than those in non-IPC clinics.

Barriers to Screening

Providers most often reported that they believed patients would bring up the concern if one existed (19.8%) or that they do not have enough time to address sleep concerns in their visits (18.81%). Several providers also reported not feeling knowledgeable about sleep as a barrier to not routinely screening for sleep problems (12.87%). Only one provider recognized lack of reimbursement as a possible barrier (.99%). For a summary of identified barriers, see Table 5.

Discussion

This study explored PCPs comfort and confidence in screening and intervening with patients'

Table 3
Differences Between IPC and Non-IPC Provider Scores on General Knowledge Questions

Questions	IPC % correct; % incorrect	Non-IPC % correct; % incorrect
Poor sleep can affect social and emotional functioning	100; 0	100; 0
Children with delayed sleep onset may present with bedtime resistance	92.5; 3	91.2; 0
The incidence of obstructive sleep apnea is less than 1% in preschoolers	47.8; 7.5	44.1; 0
Night terrors and sleep walking often have a familial component	74.6; 3	76.5; 0
Bright light phototherapy with a lightbox may be helpful for children with a delayed sleep phase	22.4; 7.5	26.5; 14.7
Children w/ADHD seldom have sleep onset difficulties unless on a psychostimulant medication	85.1; 6	70.6; 5.9
It is normal for school-aged children to take daytime naps several times a week	76.1; 20.9	47.1; 38.2
Hyperactivity is a common presenting factor in pediatric OSA	61.1; 10.4	50; 8.8
Children w/severe developmental delays have an increased risk of sleep schedule disturbances	83.6; 4.5	91.2; 0
Average 24-hour sleep duration for a 3-year-old is 8 hours	83.6; 6.0	76.5; 14.7
Nocturnal bedwetting occurs almost exclusively during deep or slow-wave sleep	41.8; 20.9	26.5; 29.4
Bruxism (teeth grinding) is common in children	26.9; 53.7	14.7; 58.8

Table 4*Differences Between IPC and Non-IPC Provider Scores on Medication Questions*

Questions	IPC % correct; % incorrect	Non-IPC % correct; % incorrect
Typically developing children can have 20 mg of melatonin	73.1; 4.5	79.4; 0
Clonidine should not be used to treat insomnia	25.4; 26.9	20.6; 23.5
Trazadone has been approved for the treatment of insomnia in adolescents	17.9; 10.4	29.4; 5.9
Antihistamines are effective to help reduce the amount of time it takes to fall asleep	32.8; 37.3	35.3; 50
Melatonin given in smaller doses 5–6 hours before bedtime regulates sleep–wake patterns	34.3; 29.9	23.5; 14.7
Medication should not be the first treatment choice or the sole strategy	85.1; 9.0	85.3; 8.8
Medication can be effective even without the use of sleep hygiene practice	74.6; 14.9	67.6; 14.7
Melatonin is universally accepted as a safe medication for children	32.8; 53.7	20.6; 41.2
Depakote is related to increased daytime sleepiness; but, no reported major direct effects on sleep	17.9; 10.4	29.4; 11.8

sleep-related concerns, sleep knowledge, and examined whether PCPs differed in their screening habits based on integration status. PCP confidence in assessing sleep concerns and comfort in providing interventions is critical to offering effective sleep care. In this study, providers reported moderate comfort with behavioral interventions and low comfort with medication interventions. These scores were consistent regardless of integration status. Thus, the simple presence of BHPs in primary care offices is insufficient to change PCPs comfort with screening and intervention for sleep-related issues. Possible explanations for this could be different levels of integration, exposure to BHP, or differences in BHPs education topics and styles.

As BHPs work alongside medical providers, they can provide training to improve PCP comfort and confidence and offer an in-office opportunity to provide ongoing behavioral sleep recommendations as needed. This gap points to the need for team trainings on sleep (and other lifestyle issues such as eating/feeding, physical activity) and the need to collect data on

how focused trainings could benefit the PCP's knowledge and utilization of BHPs within a practice.

PCPs must have foundational knowledge about sleep. Findings from the present study indicate medication knowledge was low and did not differ between providers at IPC or non-IPC sites. Interestingly, medical providers knew less about medication interventions than BH interventions. This is somewhat surprising given their medical background and training. Further, both IPC and non-IPC providers are relatively low in their knowledge of commonly prescribed sleep medications, suggesting both groups would benefit from more formal training. This highlights a significant need to improve training and enhance PCPs' knowledge about treating sleep concerns, including the use of medications.

Many providers reported routinely screening for sleep, which is an important first step. Further, PCPs within integrated clinics were more likely to screen for OSA (i.e., ask about snoring). However, most providers report not using the BEARS, which suggests the need to explore how PCPs are screening for

Table 5*Summary of PCP-Reported Barriers to Screening for Sleep Concerns*

Barrier to screening for sleep concerns	# of IPC PCPs endorsing barrier (n)	# of Non-IPC PCPs endorsing barrier (n)
Parent will bring it up	11 (16.4%)	9 (26.47%)
Sleep is not as important as other concerns	0 (0%)	0 (0%)
Do not feel knowledgeable about sleep	9 (13.43%)	4 (11.76%)
Lack of reimbursement	0 (0%)	1 (2.94%)
Not necessary	1 (1.49%)	1 (2.94%)
Not enough time	10 (14.93%)	9 (2.65%)
Do not feel comfortable giving sleep recs	8 (11.94%)	1 (2.94%)
Do not have adequate sources to intervene	2 (2.99%)	6 (1.76%)
Do not have access to a screener	6 (8.96%)	4 (11.76%)

sleep issues. Thus, medical providers need to know how to effectively screen and feel comfortable screening for sleep concerns as the first step in delivering sleep-related interventions.

Given the findings that PCPs' general knowledge about sleep concerns was moderate, and knowledge about medication was low, increasing PCP knowledge about sleep concerns and effective treatments is another important point of intervention. If PCPs had a stronger foundation of medical and behavioral health interventions, along with improved screening practices, they could more effectively deliver evidence-based care to a wide range of patients within their practices. Efforts to increase screening of sleep problems have been suggested to potentially increase treatment and intervention efforts (Moturi & Avis, 2010; Williams et al., 2016).

Respondents in this survey reported time and knowledge were two barriers to screening. They also reportedly thought if sleep issues were a concern, parents/caregivers would initiate that conversation. Knowing where to appropriately refer patients could be another barrier to spending time assessing sleep concerns. BHP within the IPC clinics in this study did have the ability to order a sleep study and may have contributed to the increased screening for OSA among PCPs within IPC.

Limitations

We surveyed PCPs to assess their knowledge, comfort, and confidence with managing sleep concerns; current practices; and barriers to assessing sleep concerns. Several limitations are noted. PCPs from IPC clinics comprised a significant portion of the sample (66%) compared to PCPs from non-IPC clinics (33%). This could be because several of these authors were located at clinics with PCPs who received surveys. Differences in the demographics and training, as well as possible differences between survey responders compared to nonresponders, could be a threat to the internal validity of this study. However, it is outside the scope of the current study to examine such possible differences.

Additionally, we did not assess providers' previous sleep-related training. It is possible some medical providers had extensive sleep training experience while others had little; this is an important area for future research to address. Much like Faruqui et al. (2011) noted, PCPs provided self-reported responses to this survey which could be impacted by recall bias. Additionally, the sampling of questions regarding behavioral interventions and medication

questions were not exhaustive and may not have captured every important issue within sleep interventions. This limitation could have also impacted the internal validity of these findings.

Finally, this survey captured responses from 38 clinics, all within a large rural health system. These results may not generalize to other systems with different patient and provider populations and different IPC models in place.

Future Directions

Future research on barriers to screening for sleep issues, how IPC impacts screening, and ways to further address stated barriers would be beneficial to understand and assess the value of IPC in primary care practices. As reported by Honaker and Meltzer (2016), few families reported or identified sleep concerns in a previsit questionnaire, suggesting families may not always recognize and/or report sleep concerns. If families and providers are each waiting for the other party to discuss sleep, this important topic may not be discussed. Another provider-reported barrier to screening for sleep problems was not feeling knowledgeable about sleep. Future studies can assess the best ways to increase provider knowledge and evaluate if that increased knowledge impacts routine screenings. Not having enough time to screen for sleep problems was also cited as a barrier. Future studies can investigate whether IBH providers help reduce the time needed to address sleep in medical visits (e.g., by pulling in IBH providers for warm hand-offs, providing brief intervention in the assessment, or increasing provider knowledge to efficiently deliver interventions) and enhance patient access to evidence-based care (IPC BHPs with training in sleep interventions can help guide PCPs in their selection of most appropriate interventions and join with the PCPs to deliver evidence-based care and recommendations).

Overall, more formal training for PCPs is needed and future studies should explore the relationship between increased knowledge and routine screenings and delivery of interventions. IBH providers can offer education and lead trainings for PCPs. Future studies could explore the impact of trainings, not only on sleep-related topics, but additional healthy habits for PCPs and BHPs to target. Survey data such as that collected in this study could serve as a baseline for PCP and BHP knowledge on medication and behavioral screening and intervention recommendations. IPC PCPs are more comfortable with behavioral interventions and it would be

valuable to investigate how BHPs can also help increase knowledge and comfort with medication interventions. Future research should explore the most effective methods for teaching PCPs about sleep concerns and interventions.

Finally, additional information is needed to truly understand the value of BHPs in primary care settings. This survey suggests that IPC PCPs more consistently screen for sleep issues, specifically snoring. More research is needed to understand how increased PCP knowledge and screenings impact patient well-being and access to care, how BHP providers integrated into primary care can improve PCP and patient satisfaction, time needed by PCPs in appointments, and the overall financial impact for a practice when PCPs have a partner in delivering sleep interventions.

Conclusion

Sleep is a vital part of healthy growth and development and BHP can enhance the assessment and treatment for sleep concerns. Having BHP integrated into primary care offices was associated with higher reported rates of screening for snoring and patient access to evidence-based interventions for OSA. Survey results suggest that providers in both IPC and non-IPC clinics have room for improvement in knowledge of effective behavioral and medication interventions. Further training regarding sleep-related concerns and collaborative partnerships between PCPs and BHPs may further benefit these efforts.

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Received May 28, 2021

Revision received January 14, 2022

Accepted February 6, 2022 ■