



Content of Infant Safe Sleep Counseling and Maternal Reported Practices in an Urban Clinic

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ABSTRACT

OBJECTIVE: Sudden Infant Death Syndrome is a leading cause of mortality in infants, and pediatric providers can influence caregiver infant safe sleep practices. We described the content of safe sleep counseling by pediatric providers and examined pediatric provider and caregiver factors that may be related to the delivery of safe sleep counseling.

METHODS: A sample of mothers and providers enrolled in the Safe Start Study, a randomized controlled trial assessing a safe sleep intervention, were audio-recorded during the 2-week well child visits (WCV) at a large urban pediatric practice in Baltimore, Maryland from October 2015 to April 2017. Provider counseling content related to infant sleep was transcribed and coded based on American Academy of Pediatrics (AAP) policy statement Grade A recommendations. Maternal reported infant sleep practices were defined by items on an interviewer administered survey. Multivariate logistic regression analyses were used to examine the relation between maternal reported infant sleep practices and provider counseling.

RESULTS: Most, 92%, of WCVs included at least 1 safe sleep topic, but there was inconsistency in content delivered based on AAP recommendations. Yet, only 12% of WCVs included all 4 components of ABC counseling. Maternal report of infant sleeping with a person or an object in sleep space was associated with decreased odds of receiving counseling on alone no person, no objects (adjusted odds ratio: 0.34, 95% confidence interval: 0.13, 0.90).

CONCLUSIONS: Pediatric provider counseling on safe sleep is inconsistent across AAP recommendations demonstrating a need for enhanced provider education and a more standardized approach to assess infant sleep practices.

KEYWORDS: infant mortality; safe sleep; Sudden Infant Death Syndrome

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WHAT'S NEW

There is inconsistency in how American Academy of Pediatrics recommended safe sleep counseling is shared with mothers showing a need for a more systematic method of providing safe sleep counseling by pediatric providers, one tailored toward caregivers' infant sleep practices.

NOW, MORE THAN 2 decades after the first American Academy of Pediatrics (AAP) task force policy statement on Sudden Infant Death Syndrome (SIDS),¹ sudden unexpected infant death including SIDS remains the leading cause of death among infants 1 to 12 months in the United States.² The burden of SIDS-related infant mortality disproportionately affects Black infants compared to White

infants.³ SIDS is defined as “the sudden death of an infant less than 1 year of age which remains unexplained by a complete postmortem investigation, including an autopsy, review of the baby’s case history, and a scene investigation.”⁴ Infant sleep environment-related risk factors for SIDS include but are not limited to bed-sharing,⁵ prone and side sleep position,^{6,7} soft or loose bedding,^{7,8} and the sofa as an infant sleep location.⁹

Safe sleep educational campaign messaging is cited as a successful strategy to reduce SIDS.¹⁰ Public health campaigns have included the ABC message that corresponds to Level A AAP recommendations for infants to sleep alone (no bed-sharing or objects in infant sleep location), to be placed on their back for every sleep period by every caregiver, and use of a crib or other safe sleep device (pack-n-play, bassinet).¹⁰ Less consistently, campaigns

included other Level A AAP recommendations such as encouragement of breastfeeding, pacifier use, and reduction of tobacco smoke exposure.¹¹

Despite public health campaigns and AAP policy statements, many caregivers have not adopted the Level A AAP recommendations. Infant caregiver adherence to AAP recommendations differs by racial subgroups. In particular, Black caregivers report low adherence to some of the AAP recommendations more often than other racial subgroups due to perceived greater comfort to infant and aesthetics of soft bedding.^{12–16} Still, maternal receipt of counseling can increase adherence to infant safe sleep behaviors.¹⁷

Health care providers play an important role in maternal choice of infant sleep practices and tend to be a more influential resource in determining infant sleep position compared to reading materials.¹⁵ Unfortunately, up to 40% of mothers report not receiving any physician counseling on infant sleep position, and per maternal recall 25% report receiving recommendations inconsistent with the AAP policy statement.¹² Importantly, mothers who received counseling consistent with AAP recommendations were more likely to report safe infant sleep behaviors.¹² Yet, few studies elucidate the actual content of counseling delivered by pediatric providers.

Thus, the primary aim of our study is to describe the content of safe sleep counseling by pediatric providers in an urban pediatric practice that serves a population at elevated risk for infant sleep-related deaths. Secondarily, we aim to compare maternal reported infant sleep practices with safe sleep counseling content delivered by pediatric providers, on the assumption that providers' counseling should address the parent's specific risky infant sleep practices. Finally, we will examine the relationship between pediatric provider and maternal characteristics and delivery of key AAP safe sleep counseling recommendations.

METHODS

STUDY DESIGN

The Safe Start study was a randomized controlled trial (RCT) to examine the impact of a safe sleep intervention on maternal knowledge, beliefs, and practices to create and maintain a safe sleep environment for infants. Details of this RCT are published elsewhere.¹⁸ This analysis is of a subset of audio-recorded encounters at the 1 to 2 week well child visit (WCV) and baseline survey data from mothers enrolled in Safe Start. Recruitment occurred in an urban pediatric primary care practice that serves as the main residency training site at the Johns Hopkins School of Medicine. The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

PARTICIPANTS

Pediatric primary care providers were enrolled including residents at all levels of training in the categorical pediatrics or combined pediatrics track in the

residency program. These residents provide well child care to newborns during a required 4-week ambulatory care block and in their one-half day per week continuity clinic. A pediatric nurse practitioner was also enrolled in the study. Pediatric resident providers had access to an on-line training module with material on infant safe sleep practices as part of their primary care training curriculum.

Mothers of newborn patients attending the clinic were approached to participate if their child's pediatric provider was also enrolled in the study and deemed the child healthy enough for participation. Inclusion criteria also included 1) being an English-speaking parent or legal guardian of a newborn being seen at the pediatric practice for a newborn visit; 2) having no suspicion of child abuse/neglect noted by clinical staff; 3) residing within Baltimore city or county, and 4) not being homeless or living in a shelter, or in an established transitional housing facility.

DATA SOURCES

Pediatric providers completed a baseline survey to collect demographic characteristics and level of training at the time of enrollment. Maternal demographics and maternal infant sleep practices were collected from a baseline survey assessing knowledge, attitudes, and practices on infant sleep at the 1 to 2 week WCV, which was administered in the clinic by a research coordinator for the RCT. Content of provider counseling on infant safe sleep was determined based on audio-recordings of the 1 to 2 week WCV, which occurred on the same day as the research interview. Audio-recordings of the visits were transcribed and coded on the 4 key components of safe sleep described below. The transcript was double coded by 2 members of the research team (P.M., E.M.) and any discrepancies were resolved by a discussion between the 2 authors.

MEASURES

The primary outcome was delivery of pediatric provider infant safe sleep counseling, defined as receiving counseling on Level A AAP recommendations of safe sleep, including each of the following: 1) Alone, no people in the infant sleep space, no bed-sharing; 2) Alone, no other objects in the infant sleep space; 3) placement of the infant on his or her Back for sleep; and 4) in a Crib or other safe sleep location, including firm mattress and absence of soft bedding. Each was coded as a yes/no variable. A combined variable was created for "Alone," which was coded as "yes" if counseling was provided on no people and no objects; otherwise it was coded as "no." Other Level A AAP recommendations mentioned were also coded. For topic discussions considered as meeting the Level A AAP recommendation, the provider needed to 1) ask about or respond to the mother's question or statement on the topic and 2) give a verbal statement indicating support for the Level A AAP recommendation.

Secondary outcomes include maternal self-reported infant sleep practices from the baseline survey. Infant

sleep practices were defined by responses to survey items inquiring if the infant “has ever slept in any of the following ways, even once.”

Bed-sharing was defined as “yes” if participants reported that the baby ever slept with an adult or a child in any of the following locations: a crib, pack-n-play, bassinet, adult bed, or couch.

Object in sleep space was defined as “yes” if participants reported the baby ever slept with any of the following items: blanket, comforter or quilt, toys, cushions, or pillows (including nursing pillows), sleep positioners, or crib bumper pads. If the only item reported was a receiving blanket and that blanket was used for swaddling the baby, object in sleep space remained “no.”

Infant sleeps on side or belly position was defined as “yes” response if participants reported having placed the baby to sleep on his/her belly or his/her side.

Infant sleeps in a bed or couch location was defined as “yes” response if participants reported that the baby slept on an adult bed, a child’s bed, or a couch/sofa.

COVARIATES

Provider demographic covariates used in the analyses included age (<27 years, 27–29 years, ≥30 years), level of training (first, second, or third or more years including those in combined residency programs and a nurse practitioner), race (White, Black, Asian, other), ethnicity (Hispanic or non-Hispanic), and sex (male and female). Study registration data provided maternal sociodemographic covariates. Maternal covariates included maternal age (≤21 years, 22–29 years, ≥30 years), insurance (Medicaid and non-Medicaid), race (White, Black, and other), ethnicity (Hispanic, Non-Hispanic), education (≤HS, >HS), number of children (1, 2, ≥3), and tobacco use (any, none).

STATISTICAL ANALYSIS

Provider and maternal characteristics were represented by frequency distribution and percentages. We compared delivery of Level A AAP recommended infant safe sleep counseling by the pediatric provider using frequency distributions, followed by multivariable logistic regression analyses for each ABC counseling topic. Mixed effects logistic regression models were performed for clustering of mothers within provider. All analyses were conducted using STATA, version 13 (StataCorp LP, College Station, Tex). Significance was defined by a 2-tailed P value ≤ .05.

RESULTS

STUDY SAMPLE

All pediatric providers approached to be audio-recorded during the 1 to 2 week WCV enrolled and consented ($n = 55$). Nearly half of pediatric providers were between the ages of 27 and 29 years and were most often in the first year of training (60%), White, non-Hispanic (67%), and female (71%; [Table 1](#)).

Of the 213 mothers consented for the RCT at the first newborn visit, 197 (92%) returned for the maternal

baseline survey assessing maternal knowledge, attitudes, and practices of infant sleep behaviors. Of mothers who completed the baseline survey, 107 (54 %) were consented for audiotaping the 1 to 2 week WCV. Some mothers were unable to consent for the audiotape recording of the 1 to 2 week WCV for the following reasons: lack of research staff availability, baseline survey was conducted by telephone, or specifically opted out of the audiotape component. Sensitivity analyses showed that mothers who were not consented for audiotapes did not differ from those who were audio-recorded by demographic characteristics.

Of the mothers who consented to be audio-recorded, half were within the ages of 22 to 29, [Table 1](#). The majority of mothers self-identified as Black, non-Hispanic (93%), with equal to or lower than a high school education (58%), using Medicaid insurance for their infant (89%), having more than 1 child (61%), and nonsmokers (89%).

PEDIATRIC PROVIDER SAFE SLEEP COUNSELING

In 92% of audio-recorded WCVs, providers included at least one of the safe sleep counseling topics ([Table 2](#)).

Table 1. Characteristics of Study Population: Safe Start Pediatric Providers

Characteristics	N (%)
Provider characteristics (N = 55)	
Age	
<27 years	11 (20%)
27–29 years	27 (49%)
≥ 30 years	17 (31%)
Level of training	
1st	34 (60%)
2nd	6 (11%)
3+	17 (30%)
Race/Ethnicity	
White	37 (67%)
Black	5 (9%)
Asian	13 (24%)
Sex	
Male	16 (29%)
Female	39 (71%)
Maternal characteristics (N = 107)	
Age	
≤21 years	23 (21%)
22–29 years	53 (50%)
≥30 years	31 (29%)
Insurance	
Medicaid	95 (89%)
Race/Ethnicity	
Black, NH	99 (93%)
Education	
≤HS	62 (58%)
>HS	44 (41%)
Number of children	
1	42 (39%)
2	30 (28%)
≥3	35 (33%)
Smoking	
No	95 (89%)
Yes	12 (11%)

*Note: Total frequency varies as 2 providers were reflected in different levels of training within the study, N = 57.

Table 2. Presence or Absence of Provider Safe Sleep Counseling During 1–2 week well child visits (N = 107)

Pediatric Counseling	Yes N (%)
Any safe sleep counseling	98 (92%)
Alone	
Alone, no other people	16 (15%)
Every time	4 (4%)
Alone, no objects	70 (65%)
No blankets	45 (42%)
No bumpers	12 (11%)
Either alone	
Alone, no other people or no objects	72 (67%)
Back to sleep	
Back to Sleep	89 (83%)
Every time	21 (20%)
Use a Crib or other safe sleep environment	
Crib, Bassinet, or PNP	89 (83%)
Every time	9 (8%)
Mentions mattress	18 (17%)
Firm sleep surface	16 (15%)
All ABC counseling	
Alone, no other people and no objects, and Back to sleep, and use a Crib	12 (11%)
Smoking related to SIDS	
“Don’t smoke” message	6 (6%)
Sleep dangers	
Suffocation or Respiratory distress from sleep dangers	44 (41%)
Overheating	
Avoiding overheating during sleep	6 (6%)
Swaddling	
Infant clothing or swaddling during sleep	30 (28%)
Room sharing promotion	
Room sharing during sleep is promoted	8 (8%)
Pacifier use related to SIDS	
Pacifier use mentioned	5 (5%)
Breastfeeding related to SIDS	
Breastfeeding is promoted in relation to SIDS	1 (1%)

Providers’ safe sleep counseling varied by Level A AAP recommendation. Counseling on no bed-sharing occurred in 15% of WCVs. Among WCVs that included counseling against bed-sharing only one-quarter incorporated “every time” into the counseling message (4%). Counseling on alone with no objects in the sleep space occurred in 65% of WCVs. Approximately two-thirds (67%) of WCVs included a message on either alone no person or no object.

Recommendations for placing the infant on their back to sleep occurred in 83% of WCVs. However, a message emphasizing back to sleep for every sleep was mentioned in less than one-quarter of these visits. Confirming a safe sleep location was noted in 83% of WCVs. Among these visits, only 20% mentioned a mattress, and 18% specifically promoted a firm sleep surface. Further, only 12% of WCVs included all ABC counseling (Alone, no person,

Alone no object, Back to sleep, and confirmed Crib or other safe sleep location).

In addition to these 4 components of the ABC message, providers counseled on other Level A AAP recommendations with less frequency. Considering tobacco cessation counseling related to reducing the risk of SIDS was relayed in 6% of visits and breastfeeding promotion to reduce SIDS risk was mentioned in only 1% of visits.

MATERNAL-REPORTED INFANT SLEEP PRACTICES AND DELIVERY OF PEDIATRIC PROVIDER COUNSELING

The Figure shows that 31 (29%) mothers reported ever bed-sharing and 25 (23%) reported ever placing an object in the infant sleep location. Thirty-three mothers (31%) ever placed their infant to sleep on their belly or side position, and the same number reported ever placing their infant on the bed or couch. The Figure also shows the relationship between mothers’ reports of not following infant sleep practices and receiving pediatric provider counseling. Of the 31 mothers who reported bed-sharing on the survey, 26 (84%) did not receive counseling about bed-sharing. Of the 25 mothers who reported ever placing an object in the sleep space, 11 (44%) did not receive counseling about objects in sleep location. This disparity was less striking among mothers who reported ever placing their infant on the belly or side; of these 33 mothers, 7 (21%) did not receive counseling on infant sleep position. Of 33 mothers reporting ever placing their infant on a bed or couch, 10 (30%) did not receive counseling on infant sleep location.

MULTIVARIATE ANALYSES OF THE DELIVERY OF PEDIATRIC PROVIDER COUNSELING

Few provider characteristics were associated with delivery of each of the ABC counseling topics in multivariate logistic regression models including all provider and maternal characteristics along with maternal-reported infant sleep practices (Table 3). Asian providers were less likely than Black providers to counsel on infant sleeping either alone no person or with no object (adjusted odds ratio [aOR] = 0.13, $P = .05$). Maternal age, education, number of children, and smoking status were not associated with provider delivery of safe sleep counseling on any of the ABC topics.

Mothers who reported their infant does not sleep alone (either with a person or with object in sleep location) had lower likelihood of receiving counseling on having the infant sleep alone (aOR = 0.36, $P = .040$). Mothers reporting ever placing their infant on a bed or sofa had lower odds of receiving counseling on using a crib or other safe sleep location compared to mothers who reported never doing so (aOR = 0.25, $P = .05$).

DISCUSSION

This study describes pediatric provider safe sleep counseling in a practice serving a population most at risk for unsafe infant sleep practices and SIDS mortality. Although a majority of WCVs, 83%, included counseling of sleep on the back and in a crib or other safe location,

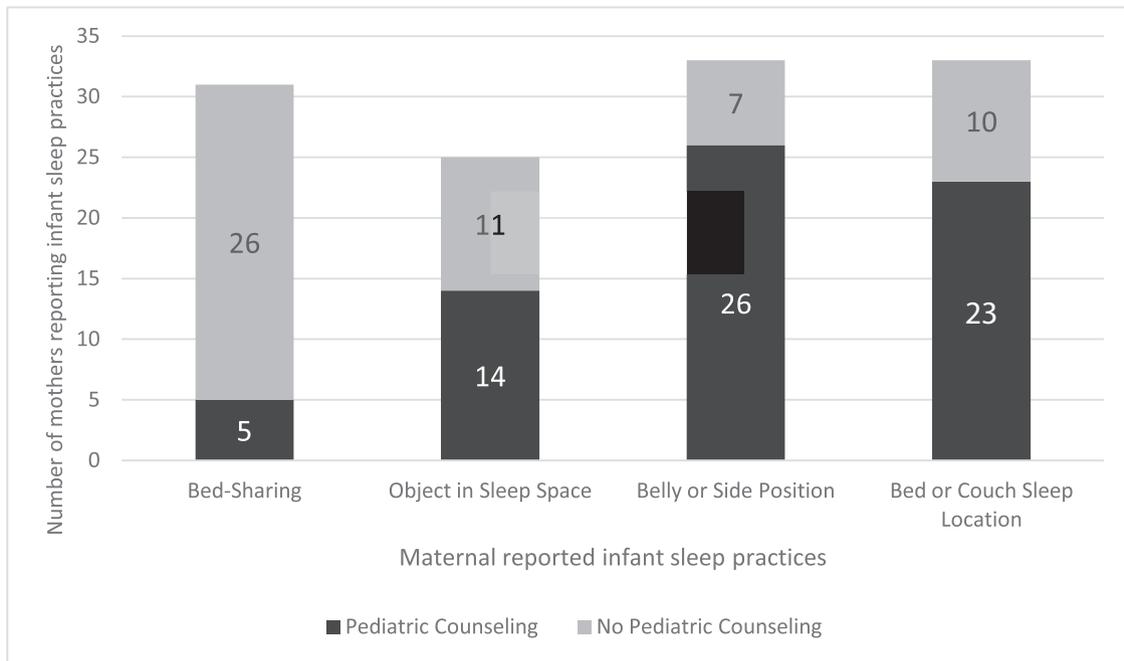


Figure. Maternal-reported infant sleep practices and delivery of pediatric provider counseling (N = 107).

only two-thirds included counseling on the infant sleeping Alone (15% no other people, 65% no objects), and overall only 12% included all 4 components of the ABC message.

To our knowledge, this is the first study to use audio-tape recordings to describe the content of pediatric providers' counseling on infant safe sleep. This data collection method adds detailed insight to survey-based studies describing providers' infant safe sleep counseling. Our findings suggest that over 90% of WCVs included at least 1 safe sleep counseling topic. This is a higher estimate than previously reported in maternal survey data.³ Differences could be attributed to a better measurement tool, eliminating recall bias. Alternatively, the advent of the electronic medical record with embedded prompts in the provider note to discuss infant sleep location could also contribute to estimate differences, available for providers in this study.

We found pediatric providers' safe sleep counseling inconsistent across the various AAP recommendations. Few WCVs included counseling against bed-sharing compared to a majority where counseling on back to sleep was discussed. Our findings are consistent with prior work that reports a range in consistency of coverage across the AAP recommendations.^{19,20} Several factors could account for a sparse number of visits including counseling on bed-sharing. Qualitative research suggests that pediatricians who do not advise against bed-sharing carry beliefs contrary to AAP recommendations including: bed-sharing could be practiced safely, facilitates breastfeeding, promotes parental personal choice, and supports acceptable cultural practices.¹⁹ Alternatively, pediatric providers may be unaware of the AAP recommendation to discourage bed-sharing. Our findings can inform better training tools and/or reminders for providers to help standardize safe sleep counseling to include AAP safe sleep recommendations.

From our survey of mothers, we found that a substantial proportion have already placed their infant in unsafe sleep positions during the first 1 to 2 weeks of life. Despite national campaigns and AAP recommendations on SIDS prevention, more than one-quarter of mothers reported ever bed-sharing or placing other objects in the infant sleep area. Our estimates are lower than national survey data reporting that 38% of Black mothers bed-share.²¹ Estimates could be inconsistent because our survey measured infant sleep practices at an earlier time frame, within 1 to 2 weeks of life compared to 2 to 6 months of life.²¹

In addition, we examined maternal characteristics and behaviors that may be associated with delivery of pediatric provider counseling. Interestingly, after adjusting for provider and maternal characteristics, mothers reporting that their infant sleeps with other people or objects on the survey were less likely to receive safe sleep counseling on those topics by their providers during the WCV. Providers may prioritize delivery of counseling topics based on maternal self-reported interest, which may vary from infant risk of morbidity and mortality.

This highlights another important finding: providers did not deliver counseling specific to risky infant sleep practices, likely due to the method of inquiry about sleep practices. During the WCV, sleep practices are one of many topics being addressed, and providers asked questions about infant sleep in a general manner rather than a specific manner. Thus, safe sleep counseling by pediatric providers should assess risky infant sleep practices and provide targeted counseling. Pediatric provider counseling is 1 strategy that can be utilized in a multipronged integrated approach with other community-based strategies to reduce infant sleep-related deaths, including public health campaigns, mobile health applications, and health educators.²²⁻²⁴

Table 3. Multivariate Logistic Regression Models of the Delivery of Pediatric Provider Counseling for Each of the ABC Topics by Provider and Maternal Characteristics and Maternal-Reported Infant Sleep Practices

	Adjusted OR (95% CI)*		
	A Alone No Person, or No Object	B Back to Sleep	C Crib or Other Safe Sleep Location
Provider characteristics			
Age			
<27 years	Ref	Ref	Ref
27–29 years	1.06 (0.28, 3.97)	0.29 (0.03, 2.45)	0.81 (0.10, 6.43)
≥30 years	0.99 (0.24, 3.93)	0.22 (0.03, 1.74)	1.14 (0.17, 7.68)
Level of training			
1st	Ref	Ref	Ref
2nd	2.11 (0.30, 14.92)	1.30 (0.09, 18.23)	0.33 (0.34, 3.20)
3rd or more	1.28 (0.40, 4.08)	0.19 (0.47, 0.76)*	0.24 (0.05, 1.01)
Race/Ethnicity			
Black	Ref	Ref	Ref
White	0.25 (0.04, 1.67)	0.55 (0.08, 3.73)	–
Asian	0.13 (0.02, 1.00)*	0.22 (0.03, 1.50)	–
Sex			
Female	Ref	Ref	Ref
Male	0.66 (0.22, 1.96)	0.95 (0.22, 4.04)	0.24 (0.06, 1.01)
Maternal characteristics			
Age			
≤21 years	Ref	Ref	Ref
22–29 years	0.73 (0.15, 3.45)	0.34 (0.05, 2.28)	1.15 (0.13, 10.43)
≥30 years	0.57 (0.10, 3.16)	0.58 (0.07, 4.68)	0.54 (0.06, 4.68)
Education			
≤HS	Ref	Ref	Ref
>HS	1.14 (0.41, 3.12)	0.75 (0.23, 2.43)	0.88 (0.22, 3.50)
Number of children			
1	Ref	Ref	Ref
2	0.32 (0.10, 1.08)	0.80 (0.18, 3.53)	0.82 (0.14, 4.81)
≥3	0.76 (0.20, 2.82)	1.23 (0.22, 6.95)	0.80 (0.14, 4.71)
Smoking			
No	Ref	Ref	Ref
Yes	1.20 (0.26, 5.53)	2.44 (0.36, 16.45)	0.78 (0.11, 5.70)
Infant sleep practices			
Bed-sharing or object in sleep space (not alone)			
No	Ref		
Yes	0.37 (0.14, 0.96)*		
Infant on belly or side position (not on back)			
No		Ref	
Yes		0.44 (0.12, 1.58)	
Infant on bed or sofa location (not in Crib or other safe location)			
No			Ref
Yes			0.25 (0.06, 1.02)

*Adjusted for provider and maternal characteristics, *P* value ≤ .05.

These results should be interpreted with their limitations. Our findings were from a single site study with primarily Black mothers with low levels of education and who use Medicaid, limiting their generalizability. However, this population represents a demographic most vulnerable to SIDS mortality.²¹ Maternal infant sleep practices were self-reported and susceptible to reporting bias. A third limitation is that all infant caregivers were mothers. Patterns of infant sleep practices might have differed if other caregivers important for focusing safe sleep messaging were included.

CONCLUSIONS

Our study results suggest that while most 1 to 2 week WCVs included infant safe sleep counseling, many do not cover all AAP recommendations. In addition, the content of counseling is often neither uniform nor specific toward the patient population practicing unsafe infant sleep practices. Efforts to standardize and provide greater specificity in targeting infant sleep counseling can provide greater value to improve pediatric provider infant sleep counseling. With advancing integrative health systems, it is important to investigate means of

optimizing electronic medical record platforms to enhance provider compliance in delivering evidence-based infant safe sleep recommendations.

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