

Vermont Infant Safe Sleep: Environmental Scan

Executive Summary

The purpose of this environmental scan is to provide an overview of research and efforts to promote infant safe sleep in order to inform an infant safe sleep campaign in Vermont.

John Snow Inc. (JSI) conducted a search for peer-reviewed articles and gray literature for this environmental scan in May 2017. Peer-reviewed research articles published since 2008 were identified by searching for the term “safe sleep” on PubMed. Additional peer-reviewed research articles using the same criteria were identified via Google Scholar. Literature sent from the Vermont Department of Health was also incorporated. To maintain the focus of this environmental scan, certain topics were excluded, such as information about classification of Sudden Infant Death Syndrome (SIDS), studies from non-English-speaking countries, content analyses of images online or in print materials, and opinion pieces in non-peer-reviewed sources. Information on current safe sleep campaign was identified by searching for “infant safe sleep campaign” on Google.com. Given the large breadth of existing materials, they were not all collected, but rather summarized in the text.

Key findings include:

1. From 2010-2014, there were 16 SUID deaths in Vermont, half of which were due to accidental suffocation and strangulation in bed. In Vermont, about one out of every four families report bed-sharing frequently. About four out of five babies are put on their backs to sleep.
2. Not all healthcare providers know the AAP guidelines or follow them. The consistency of safe sleep messaging, both in content and delivery to caregivers, is highly variable. Hospital-based safe sleep interventions can be effective in improving safe sleep practices in hospitals and at home.
3. Many parents know the AAP recommendations to put babies on their back to sleep and to not bed-share. Parents who bed-share often feel ambivalent about it; parents may try to minimize the risks of bed-sharing while in bed or opting to co-sleep in a chair or sofa. The largest current gap in knowledge appears to be keeping objects out of the crib.
4. Some safe sleep messages may not resonate with parents (e.g. the “A” for “Alone” may not align with parents’ desire to be close to their children). Parents also want to hear clear, consistent safe sleep information from trustworthy sources.
5. Since the 1994 Back to Sleep campaign, there has been little evidence on the effectiveness of public-facing safe sleep campaigns in reducing sleep-related infant deaths. Most safe sleep campaigns promote the “ABC” message, and offer a video with some print materials. Larger campaigns include many partnerships (e.g. with hospitals, social services, Cribs for Kids), community outreach, and a wide array of materials.



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Prevalence of Sleep-Related SUID and Associated Factors

In 2015, there were approximately 3,700 sudden unexpected infant deaths (SUID) in the US. Among these, 43% were classified as SIDS, 32% due to unknown cause, and 25% due to accidental suffocation and strangulation in bed (ASSB). The SUID rate has declined since the American Academy of Pediatrics safe sleep recommendations in 1992, from 130.3 deaths per 100,000 live births in 1990 to 39.4 deaths per 100,000 live births in 2015.

From 2010-2014, there were 16 SUID deaths in Vermont, half of which were due to ASSB. The rate of SUID cases in Vermont has been consistently lower than the US rate (e.g., 50 versus 87 per 100,000 live births from 2012-2014). The state of Vermont is largely on track to reach the Healthy Vermonters 2020 target value of 57 with regard to SUIDS per 1,000 live births.

There are many risk factors for sleep-related SUID. Sleep-related SUIDs often have one or more suffocation or SIDS risk factors, and often occur in an adult bed. Risk factors for SIDS include African American race, maternal smoking, maternal chronic hypertension, gestational hypertension, premature birth, small for gestational age, and being a twin.

Rates of ASSB have risen between the late 1990s to 2015, though it is unclear to what extent these are due to the factors of increased bed-sharing in this timeframe, changes in identifying cause of death, or other reasons. Most ASSB deaths occur before an infant reaches 4 months old. Maternal factors associated with ASSB include being younger, less educated, having more than one child, non-Hispanic African American or American Indian race, and smoking during pregnancy.

SUID sometimes also occurs in sitting and carrying devices, such as car seats, swings, and slings. The AAP recommends against using these devices as routine sleeping areas. However, there were 47 deaths reported to the US Consumer Product Safety Commission involving sitting and carrying devices from 2004 to 2008. The majority of these deaths occurred in car seats (31), followed by slings (5), swings and bouncers (4 each), and in strollers (3). In all but one case, the cause of death was asphyxiation.

Deaths related to bed-sharing sometimes occur in hospitals. An unintended consequence of current breastfeeding initiatives may encourage exhausted or sedated postpartum mothers to breastfeed while they are not physically able to do so safely. Based on information collected from the CDC SUID listserv, one study found information on fifteen deaths and three near deaths of healthy infants while bed sharing in maternity wards. The majority or all of the cases were preventable. In ten cases, other individuals were present; in four cases, the mother was awake at the time of the incident. The author recommends teaching hospital personnel and parents about the potential hazards of skin-to-skin contact and bed-sharing, and perhaps electronic monitoring of infant heart rate or arterial saturation.



Prevalence of Safe Sleep Practices and Associated Factors

Bed-sharing

Studies have found that somewhere between 11% to 59% of American mother bed-share. The National Infant Sleep Position study found that 11.2% of mothers reported bed-sharing as a usual practice, though 46% of reported having bed-shared at least once; this study also found that bed-sharing increased between 1993 and 2010. Data from the national Survey of Mothers' Sleep and Fatigue, 2008-2009, found that 59% of mothers bed-share, and this rate is fairly steady throughout the first year of the baby's life. This study also found that a quarter of mothers reported falling asleep with their infants in dangerous sleep locations, such as chairs, sofas, or recliners. Data from the national Infant Feeding Study II showed that bed-sharing rates were 42% at 2 weeks, 34% at 3 months, and 27% at 12 months. Still another national survey, with data from 2011-2014, found that 21% of mothers reported bed-sharing, and 66% reported room sharing without bed-sharing. The marked difference in these rates could be affected by the context and way in which the questions were asked (e.g. in a survey that asks about advice received; "Where does your baby start the night" vs. "...end the night?"; the age of the infant).

Some studies focused on certain segments of the US population. A study of Hispanic mothers found that adherence to safe sleep recommendations varied widely by maternal birth country (e.g. mothers born in the Caribbean and Central/South America more likely to room share without bed sharing, compared to US-born mothers). A study of mothers who used WIC services found that 48.6% of them room-shared without bed-sharing, 32.5% bed-shared, and 18.9% slept in separate rooms.

Smaller studies on a state- or practice-level vary in bed-sharing rates and how bed-sharing is measured.

In Vermont, about one out of every four families report bed-sharing frequently. In the 2014 Vermont PRAMS, 23.6% of families reported bed-sharing always or often.

Other Sleep Locations

A popular sleeping spot is the Rock 'N Play Sleeper, which, despite its name, may not be a safe sleeping environment for babies. For instance, the cushioned sides are close to the infant's face, which may prevent airflow, and the product was recalled in 2013 for mold risk underneath the cushion. A product with a similar name, the Rock 'N Play Bassinet, on the other hand, is safe for babies to sleep in. Ascertaining the safety of these two similarly named yet different products can be confusing for caregivers.

Slings are also a popular device to carry infants while allowing the wearer's hands to remain free. In the 159 incidents that occurred in slings between 2003 and 2016, 17 were fatal, due most often to falls, followed by suffocation. The Consumer Product Safety Commission now requires sling products to have proper warning labels about the risk of suffocation and prevention measures necessary, as well as images that demonstrate safe positioning of the infant in the sling.

Finally, one of the more newly popular baby sleep products is the "baby box," which is modeled after a Finnish maternity package that includes baby care clothes and products inside a cardboard box, which



can then serve as the infant's first bed. The AAP Task Force on SIDS does not currently believe there is enough evidence to determine whether baby boxes are safe. Accordingly, the Vermont Department of Health Division of MCH currently advises VDH district offices against becoming involved in or supporting activities designed to purchase or distribute baby boxes.

Supine Sleep Position

Nationally, a quarter of mothers do not put their infants on their back to sleep. Data from the national Infant Feeding Study II found that about a quarter of mothers (26%) did not put their 3-month-old infants on their back to sleep. Rates for supine sleep position vary from state to state.

In Vermont, about four out of five babies are put on their backs to sleep. The back to sleep rate in Vermont, ranging from 80.7% to 86.3% between the years of 2007 and 2014, has been higher than the Healthy People 2020 target rate of 75.9%. The Vermont rate for supine sleep position exceeds the all-PRAMS rate across educational attainment, maternal age, insurance status, and WIC participation.

Use of Bedding and Infant Sleep Positioners

Bedding, such as pillows and blankets, can be potentially hazardous to infants by causing sleep-related suffocation. Nationally, bedding use has declined over time, from 85.9% in 1993-1995 to 54.7% in 2008-2010. However, this rate still remains high.

Infant sleep positioners (ISPs) are devices intended to keep infants in a specific position while sleeping, some of which have been approved by the FDA for management of reflux or asymmetrical skull, though many unapproved ISPs are marketed to the general public with claims of preventing SIDS. A Morbidity and Mortality Weekly Report examined 13 cases of infant deaths associated with infant sleep positioners in the past 13 years; all but one were 3 months or younger and most were placed on their side to sleep.

Associated Factors

The literature has identified many factors associated with bed-sharing and nonsupine sleep position. These factors include: non-White race, young maternal age, having more than one child, maternal smoking, less maternal education, financial stress, partner-related stress, use of WIC services, missing well-child visits, a grandparent being in the home, and infants born prematurely. Breastfeeding and breastfeeding duration, particularly, are positively associated with bed-sharing.

Multiple studies found that hearing about safe sleep guidelines from a healthcare professional was associated with adherence to those recommendations. Notably, a national study found that bed-sharing was positively associated with breastfeeding, and that receiving advice about sleep location improved adherence to safe sleep guidelines without affecting feeding practices.



Safe Sleep Recommendations

The decrease in SIDS has plateaued in recent years, and despite additional evidence pointing to genetic and physiological factors underlying SIDS, ensuring a safe sleep environment remains the mainstay of risk reduction. In 2016, the American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome expanded its recommendations from focusing only on SIDS to reducing all sleep-related infant deaths including SIDS. The Task Force's Policy Statement recommendations, categorized by strength of recommendation, are summarized therein as follows:

A-level recommendations

Back to sleep for every sleep.

Use a firm sleep surface.

Breastfeeding is recommended.

Room-sharing with the infant on a separate sleep surface is recommended.

Keep soft objects and loose bedding away from the infant's sleep area.

Consider offering a pacifier at naptime and bedtime.

Avoid smoke exposure during pregnancy and after birth.

Avoid alcohol and illicit drug use during pregnancy and after birth.

Avoid overheating.

Pregnant women should seek and obtain regular prenatal care.

Infants should be immunized in accordance with AAP and CDC recommendations.

Do not use home cardiorespiratory monitors as a strategy to reduce the risk of SIDS.

Health care providers, staff in newborn nurseries and NICUs, and child care providers should endorse and model the SIDS risk-reduction recommendations from birth.

Media and manufacturers should follow safe sleep guidelines in their messaging and advertising.

Continue the "Safe to Sleep" campaign, focusing on ways to reduce the risk of all sleep-related infant deaths, including SIDS, suffocation, and other unintentional deaths. Pediatricians and other primary care providers should actively participate in this campaign.

B-level recommendations

Avoid the use of commercial devices that are inconsistent with safe sleep recommendations.

Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly.

C-level recommendations

Continue research and surveillance on the risk factors, causes, and pathophysiologic mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely.

There is no evidence to recommend swaddling as a strategy to reduce the risk of SIDS.

Each of these Task Force recommendations is further elaborated upon in an accompanying technical report.



Co-Sleeping Controversy and Bridging the Divide

Not all professional guidance matches the AAP recommendations. The University of Notre Dame Mother-Baby Behavioral Sleep Laboratory, led by Dr. James McKenna, offers a different set of guidelines with regard to mother-infant co-sleeping. Recognizing that many mothers, especially those who breastfeed, may accidentally fall asleep while holding their infant at night, Dr. McKenna and others argue that hard stances against bed-sharing may have unintended adverse consequences such as more mothers falling asleep with their babies on sofas or armchairs. Dr. McKenna believes in varying levels of bed-sharing safety and recommending measures to prevent risks such as tying up long hair on the mother, while recommending against bed-sharing in certain cases such as if a person is taking sedatives or other substances that can make a person difficult to rouse from sleep.

Dr. McKenna has criticized public health messaging that emphasizes directives such as, “Babies sleep safest alone” and “Never sleep with your baby. Not even for a moment.” He argues that effective public health messaging should respect and dovetail with rather than contradict familial belief systems and cultural ideologies, with messaging such as “keep me close but keep me safe.”

One public health professional, hoping to unite the field on safe sleep messaging recommends, “Same Room, Safe Place.” She argues that this message is evidence-based, and using the term “safe place” instead of “alone or separate” matches the social values expressed in high-risk environments and allows many options for sleeping arrangements.



Safe Sleep Interventions for Professionals

Many interventions have been implemented to educate professionals on safe sleep practices, primarily with nurses in the hospital setting. Some other interventions in the literature have been implemented with childcare providers and first responders.

Hospital-based Quality Improvement Efforts

Not all healthcare providers know the AAP guidelines or follow them. The hospital is an important setting in which healthcare professionals have the opportunity to educate and model safe sleep practices. Importantly, not all healthcare providers know the AAP guidelines or follow them. In a review of 16 studies from 1999-2012, 13 studies found that some nurses continued to use nonsupine positioning and 11 studies found that some nurses were recommending incorrect sleep positions to mothers. In a survey of pediatricians, family practitioners, and obstetrician-gynecologists in New York State, nearly all respondents agreed that safe sleep practices were effective, and that it was important to discuss SIDS with patients. However, 30% failed to state that the safest sleep position was supine, and 30% admitted to not discussing safe sleep information with patients. There is clearly room for improvement in educating hospital staff about safe sleep practices and implementing them.

Hospital-based safe sleep interventions have been effective. Fortunately, safe sleep quality improvement initiatives in the hospital have demonstrated success in increasing staff knowledge and adherence to safe sleep practices. Many of these interventions have been multi-faceted, bundling together a safe sleep policy, staff training, audits, and education for caregivers. These interventions have most commonly been implemented in the NICU and/or children's hospitals. In some studies, the results were dramatic (e.g. in one study, overall compliance with safe sleep practices increased from 26% to 80%), and in others, less so (e.g. another study went from 25% to 58% of infants sleeping in a safe environment; in another, 5% to 31%). The biggest improvement in these studies was often the removal of unsafe items such as extra blankets (e.g. 32% to 72%).

Training Childcare Professionals and First Responders

Other interventions have focused on childcare professionals and first responders. A 60-minute educational in-service for childcare providers was successful in increasing the percentage of providers using the supine position exclusively and centers with written sleep position policies. A train-the trainer model for licensed child care centers and family child care homes was also successful.

A first responder-based intervention called DOSE:Direct On-Scene Education program in Florida trained first responders to assess homes, give Safe to Sleep Survival Kits, and link families to free cribs, successfully driving down the number of sleep-related infant deaths in the county.



Caregiver Safe Sleep Knowledge and Attitudes

It is unclear as to what parents know about safe sleep. In this environmental scan, there were no studies that used a nationally representative sample to examine parental knowledge of safe sleep practices, nor any that studied parental knowledge in Vermont. Studies on parental knowledge of safe sleep practices vary with regard to samples and findings, and found a wide range in how many parents knew the supine position to be the safest for infant sleep (e.g. 46% in a study by Hackett and Simons, 2013; 85% in a study by Chung-Park) and safe sleep practices more broadly. Some studies found that the largest gap in knowledge has to do with keeping items out of the crib.

Safe sleep knowledge is not always associated with practice. Notably, parental knowledge of safe sleep recommendations was sometimes, but not always associated with implementing safe sleep practice. Factors associated with safe sleep practice were: agreement that the supine position prevented SIDS, higher perception of infant vulnerability, and more confidence in ability to implement safe sleep behaviors. Factors associated with not following safe sleep practice were: indicating family as the primary source of advice, low perceived risk of suffocation when bed-sharing.

There are many reasons for bed-sharing. A 2015 systematic review of studies around the world identified 10 main reasons for mother-infant bed-sharing: 1) to make breastfeeding more convenient, 2) comfort for the mother or infant, 3) more or better sleep, 4) to more closely monitor the infant, 5) promoting bonding or attachment, 6) environmental reasons (i.e. no crib, for protection, for warmth), 7) to stop crying, 8) cultural or familial tradition (e.g. among Pacific Islander, Indian, Mexican families), 9) disagreement about the danger of it, and 10) maternal instinct. A cross-cutting theme was ambivalence about the decision to bed-share, with many parents expressing guilt and anxiety about bed-sharing. Parents would attempt to reduce the risk of death by arranging or removing bedding around the infant, and would also keep quiet about the details about their sleeping arrangements with healthcare providers, family, or friends.

Vermonters

In Vermont, some informal qualitative information has been collected from parents on bed-sharing and safe sleep messaging.

Many parents in Vermont seem to be aware that bed-sharing is not a preferable sleeping arrangement, and therefore try to minimize the risks involved in bed-sharing or share other sleep surfaces. Parents take measures to try to reduce risks (e.g. placing infant to sleep up near adult's head), and/or use bed-sharing as a nonoptimal method of getting a sick or fussy baby to sleep. "Near misses" sometimes help parents realize that the risk of suffocation more concretely. Safe sleep messages may also contradict with other parenting choices, such as breastfeeding or attachment parenting, which often require the infant to be in close proximity to the mother day and night. To fulfill the apparently contradictory guidelines of staying with the infant without bed-sharing, parents may choose to sleep with the baby on the couch or in a chair instead.

Some safe sleep messages do not resonate with some Vermont parents. With the ABCD safe sleep message, the "A" for "Alone" may not align with parents' desire to be close to their children; for the "D" as in "drowsy/drugged/drinking," all parents are often tired, and the drugged/drinking description may



not be applicable for many parents. In response to the Chittenden Unit for Special Investigations safe sleep video, which features a mother who lost her baby to sleep-related SUID, some parents did not identify with the mother, and some also found it unclear that the baby had died.

Parents want to hear clear, consistent safe sleep information from trustworthy sources. Some parents expressed the need to hear healthcare providers offer safe sleep information clearly, confidently, and consistently. They also mentioned that modeling by hospital staff can be helpful. Some parents also want to hear safe sleep information from trusted peers, and this may be particularly important for refugee populations.

African American Mothers

Because African American infants are at greater risk of SIDS and are more likely to bed-share with their parents, a fair amount of literature on understanding parental decision-making with regard to safe sleep practices has been conducted with African American parents and caregivers. The seven studies found for this environmental scan can be summarized into the following key findings:

- Most African American mothers know the safe sleep recommendation to put infants in a supine position to sleep, but they may not be aware of the rationale for it. One study had many participants that believed SIDS could not be prevented through sleep position, but only through vigilance.
- Most common reasons for bed-sharing included: promoting comfort, closeness, and safety; better quality of sleep for parent and baby; and convenience. Reasons for not bed-sharing included: privacy; concern about attachment to parents' bed; fears about suffocation.
- One study found that African American mothers mistook "firm sleep surface" to mean "taut." This study also found that soft bedding was used for comfort, aesthetics, and to prevent infant rollover and falls, particularly for infants sleeping on a bed or sofa.
- African American mothers used multiple sources of information about SIDS, including personal experience, hospital education, extended family, and television. They were interested in getting accurate information about SIDS and safe sleep practices from healthcare professionals, but were willing to go against doctor's recommendations if their instincts said otherwise.

Fathers and Grandmothers

A set of focus groups conducted in Arkansas with stay-at-home and working fathers found that most were involved in putting their babies down for nighttime sleep and providing middle of the night relief. Most knew that they should put their babies on their backs to sleep on a firm surface, and how to dress them appropriately. However, most lacked knowledge about keeping soft objects away, the potential hazards of co-sleeping, and the science behind the safe sleep recommendations. Co-sleeping, particularly, was perceived as convenient, and something the infant preferred for comfort. Many did not perceive susceptibility to sleep-related deaths, and had received conflicted messages from experts and family about what was safe.

A convenience sample survey of grandmothers found that 45% placed infants to sleep on their backs in their own home, and 58% when at the mother's house. Respondents were less likely to adhere to recommended guidelines when they believed that the supine position increased choking risk or believed the baby would be more comfortable or sleep longer when prone



Safe Sleep Campaigns for Caregivers

The Safe to Sleep campaign, previously known as the Back to Sleep campaign, led by the National Institutes of Health, National Institute of Child Health and Human Development, helped to decrease the US SIDS rate by more than 50% since 1994. Since the SIDS rate has since plateaued, and other sleep-related causes of death such as ASSB, have been on the rise. Additional safe interventions have been implemented to continue reducing the rates of sleep-related infant deaths.

Evidence for the effectiveness of safe sleep campaigns is limited due to a number of challenges: the lack of randomized controlled trials, the nature of SIDS/SUIDS as a low frequency event, the difficulty of measuring safe sleep practices, and the lack of data for many public-facing efforts. Moon et al. provide an overview of these challenges, as well as helpful overview of interventions to date with examples in “Safe Sleep Interventions: What is the Evidence for Successful Behavior Change?”

This section offers an overview of safe sleep campaigns directed towards caregivers in the US. It then describes what little peer-reviewed research that has been conducted to date, along with preliminary data from presentations, where possible.

Campaigns

This environmental scan identified 5 national campaigns, 7 state campaigns, and 3 local campaigns. They ranged in breadth from a single video PSA with some brochures, to many components, including hospital-based programs, many partnerships (e.g. Cribs for Kids), safe sleep ambassadors in the community, and a wide array of materials (e.g. bus wraps, billboards, multiple languages). The “ABC” message of “Alone, Back, Crib” was common in these campaigns, sometimes singly or in combination with other recommendations (e.g. ABCD/ABCS were a common variant; using a pacifier). Other campaigns would offer longer lists of safe sleep recommendations without any mnemonic device. The content of these campaigns was generally the same, with most messaging differences due to style (e.g. pastel, friendly tone versus dark colors and serious tone). A couple of campaigns took a very different approach, such as Milwaukee’s controversial fear-based ads. However, the greatest variation was in the extent to which the messages were disseminated, how, and with whom. The following table offers an overview of these campaigns based on information available online, and may miss unpublicized efforts such as partnerships and outdated/unlaunched campaign activities or materials.

Overview of US Infant Safe Sleep Campaigns

	Campaign Name	Organization	Description
National	Safe to Sleep	National Institutes of Health, National Institute of Child Health and Human Development	Formerly the Back to Sleep campaign that began in 1994; many ongoing collaborative efforts particularly to reach African American and American Indian populations; many video and print materials; twin campaign called Healthy Child Care America geared towards child care providers
	ABCs of Infant Sleep	Cribs for Kids	Partnership-driven model focused on providing portable cribs along with educational materials about the ABCs
	Bedtime Basics for Baby	CJ First Candle	Fact sheets and brochures in English and Spanish promoting the ABCs
	Bare is Best	US Consumer Product Safety Commission	Part of an online portal for news and information on infant safe sleep; 12min video; crib safety standards; recalled products; safe sleep environment checklist
	Share Your Room, Not Your Bed	Center for Infant and Child Loss, University of Maryland	ABC messaging; poster and brochure
State	Alaska Infant Safe Sleep	Alaska	Facility assessment; position statement; pamphlet and poster
	Sisters United	Arkansas	Train-the-trainer model targeting African American women in community; community baby shower; awareness walks
	N/A	Kansas	ABC messaging; video; booklet; magnet
	N/A	Michigan	Michigan-specific videos; safe sleep communications toolkit available
	N/A	Nebraska	Video; print materials
	Sleep Right, Sleep Tight	Florida	11min video for use by healthcare providers; 30sec PSA for TV and radio; print materials
	N/A	Tennessee	ABC messaging; videos; bus wrap, magnets, print materials; hospital partnerships; WIC partnership
	Room to Breathe	Texas	Video and animations with messages focused on preventing suffocation
	Say YES to Safe Sleep for Babies	West Virginia	Checklist-focused messaging; video PSAs; 1.5hr webinar; paired with shaken baby prevention information
	Local	B'more for Healthy Babies	Baltimore
Cradle Cincinnati		Cincinnati	ABC messaging; testimonial videos; affordable crib assistance
CelebrateOne		Columbus	Safe sleep recommendations are part of larger initiative for infant health ("Every baby deserves to celebrate his or her first birthday")
N/A		Milwaukee	Controversial fear-based campaign with materials promoting babies sleeping in cribs rather than adult beds

Research on Safe Sleep Messaging

Hospital-based educational programs have generally been successful. Hospital-based educational programs have shown increased safe sleep knowledge both while in the hospital and 4 months later, and increased likelihood of using supine positioning and using a separate sleep surface. B'more for Healthy Babies, which promoted the message "SLEEP SAFE: Alone, Back, Crib. No Exceptions" showed mothers in the hospital a video of mothers who had lost their babies while bed-sharing; viewers were less likely to intend to place babies on their side than non-viewers (7.1% versus 23.9%, $p < .05$).

Books may be more effective than brochures. One study found that board books were more effective than brochures in improving adherence to exclusive crib use and avoiding bed-sharing. This difference may be due to repeated exposure to the messaging, enhanced dialogue, readability, and emotional engagement.

The evidence on suffocation prevention messaging is unclear. A set of articles examined a randomized controlled trial with African American mothers that tested 'conventional' messaging that recommended the AAP guidelines versus 'enhanced' messaging that emphasized safe sleep practices for both SIDS risk reduction and suffocation prevention. The enhanced messaging had no effect on bed-sharing, but decreased the use of soft bedding.

Online dissemination may be a cost-effective outreach method. Finally, in New Zealand, an online-accessible 24-slide presentation was used to disseminate safe sleep practices to mainstream audiences for a blitz-style intervention across the country. This tool was promoted through safe sleep champions. The tool achieved broad participation and helped to increase users' confidence in discussing infant sleep safety with others.

Research on Safe Sleep Materials

Several interventions such as Cribs for Kids and Bedtime Basics have offered free or reduced cost cribs to low-income parents, along with safe sleep educational materials (e.g. brochure, refrigerator magnet, DVD) and associated items (e.g. fitted sheet, wearable blanket, pacifier). These efforts have been successful in improving safe sleep knowledge and reducing bed-sharing. Community safe sleep-themed baby showers have been a helpful means of distributing knowledge, cribs, and baby care items to mothers in high-risk (largely African-American) communities.

To date, studies that have examined the distribution of individual safe-sleep items, such as "This Side Up" t-shirts and wearable blankets, have not demonstrated statistically significant differences.

Though there is still a lack of evidence on the efficacy of Finnish-style baby boxes, New Zealand has reintroduced and promoted the wahakura and pepi-pod – low-sided, portable infant beds traditionally used in Maori communities – to improve safe sleep in their indigenous populations. These 'infant safe sleep devices' allow Maori parents to bring their baby into the adult bed safely, reducing death rates by 29%. Offering these beds is tied to the expectation that recipients will help disseminate information about safe sleep with others in their community.

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