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## The Relationship between Planned and Reported Home Infant Sleep Locations among Mothers of Late Preterm and Term Infants

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### Abstract

**Objective**—To compare maternal report of planned and practiced home sleep locations of infants born late preterm (34 0/7 to 36 6/7 gestational weeks) with those infants born term ( 37 0/7 gestational weeks) over the first postpartum month.

**Methods**—Open-ended semi-structured maternal interviews were conducted in a U.S. hospital following birth and by phone at one month postpartum during 2010–2012. Participants were 56 mother-infant dyads: 26 late preterm and 30 term.

**Results**—Most women planned to room share at home with their infants and reported doing so for some or all of the first postpartum month. More women reported bed sharing during the first postpartum month than had planned to do so in both the late preterm and term groups. The primary reason for unplanned bed sharing was to soothe nighttime infant fussiness. Those participants who avoided bed sharing at home commonly discussed their fear for infant safety. A few parents reported their infants were sleeping propped on pillows and co-sleeping on a recliner. Some women in both the late preterm and term groups reported lack of opportunity to obtain a bassinet prior to childbirth.

**Conclusions**—The discrepancy between plans for infant sleep location at home and maternally reported practices were similar in late preterm and term groups. Close maternal proximity to their infants at night was derived from the need to assess infant well-being, caring for infants, and

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women's preferences. Bed sharing concerns related to infant safety and the establishment of an undesirable habit, and alternative arrangements included shared recliner sleep.

### Keywords

infant sleep; bed sharing; infant safety; late preterm infant; United States

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Parent-infant bed sharing is defined as an infant sleeping in an adult bed with one or more adults. Many American parents report at least occasional bed sharing with their infants [1,2], despite the recommendation of the American Academy of Pediatrics (AAP) against this arrangement [3]. Further, bed sharing has been positively associated with Sudden Infant Death Syndrome (SIDS) [4], although a recent study found no increased risk of SIDS when bed sharing in the absence of alcohol consumption or smoking and a protective effect of bed sharing against SIDS risk for infants over 3 months of age [5]. Yet the issue of where and with whom infants sleep is controversial in parenting, academic, and public health arenas [6–10].

In the United States, the delivery of safe infant sleep location messaging has largely focused on recommendations of physicians and other health professionals. American public education campaigns recommend parent-infant room sharing without bed sharing [11]. However, AAP physician guidelines do not mention the need to dialogue with families about infant sleep locations [3]. The Academy of Breastfeeding Medicine promotes individualized counseling by physicians to facilitate parental informed decision making regarding infant sleep locations [12], but the current AAP guidance addresses only infant medical conditions in weighing the risks and benefits of infant sleep environments [3]. Colson and colleagues [13] found that among parents who received bed sharing advice from their physician, only 21.3% reported that the information was neutral (72.6% of the physician guidance was classified as being against bed sharing).

Despite the predominant U.S. medical recommendation against bed sharing, the prevalence of at least occasional bed sharing among American families is estimated to be between 42–77% [2, 14–15]. Practical, evidence-based support is necessary for optimizing infant sleep environments because SIDS is a leading cause of infant mortality in the U.S. [16] and nighttime arrangements are a personal issue for families.

Recently, Ball and Volpe [6] framed infant sleep locations as a parenting behavior that is influenced by attitudes and beliefs. They suggested that bed sharing is practiced not only due to the spatial or financial constraints that may impede crib usage but also because families vary in their perceptions of infant developmental processes. Some parents may see themselves as maintaining close proximity and being emotionally responsive throughout their infants' high-needs 'fourth trimester' [17], whereas other parents may view physical separation from their infants as instilling independence in the infant [18].

Sleep locations also directly affect parent-infant interactions, such as nocturnal breastfeeding [19]. Additionally, the majority of new mothers in an American study reported getting insufficient sleep [20]. The fatigue associated with nighttime parenting can affect adult mental health, lead to relationship problems [21–22], and result in early introduction of solid

foods to the infant diet [23]. Therefore, solutions coproduced between health care professionals and families may be effective in promoting healthful infant sleep environments. However, the factors that contribute to decisions about infant sleep locations in the context of individual families' needs and preferences are currently unclear.

This study compared maternal report of planned and practiced home sleep locations of infants born late preterm with those plans and practices of infants born term over the first postpartum month. The objective was to better understand how nocturnal infant feeding and other nighttime needs affect decisions about infant sleep in the home. The study compares women who gave birth to late preterm (34 0/7 to 36 6/7 gestational weeks) infants with women who gave birth at term ( 37 0/7 gestational weeks) to determine the shared and unique challenges over the first postpartum month. Late preterm infants experience more health complications and feeding problems [24–25] and their mothers report more emotional distress [26] than term infants. However, because late preterm infants are born relatively near to term and they are often similar in size to term newborns, their risk for health problems over time is often unrecognized by parents and health professionals [27]. Although previous research found that American mothers of infants born prematurely were more likely to bed share than term mothers [13], how the circumstances accompanying late preterm birth affect infant sleep locations in the home is unknown. Therefore, this study described parent-infant sleep plans and reported practices of the late preterm and term dyads.

## Method

The sample in this analysis was a sub-sample of an ongoing observational study on maternal emotional well-being after late preterm and term childbirth conducted in the U.S. [26]. Data for this analysis was collected from 2010–2012. Women and their infants were recruited into the parent study from a regional referral birthing center of a southeastern academic medical center in the United States with approximately 3,300 births per year. Term participants were matched to late preterm participants on maternal race/ethnicity and mode of delivery. Exclusion criteria in the parent study were women who did not have custody of the infant and women whose situation would have affected their ability to participate (age less than 18; history of HIV, psychosis, or bipolar disease; or non-English speaking). Infants were singletons and their health was not an inclusion or exclusion criterion in the parent study or the subsample used in this analysis.

Following Institutional Review Board approval, a research team member confirmed potential eligibility and the appropriateness of potential participation with the nursing staff. Women were approached on the postnatal unit, the day after childbirth or later. Immediately after a mother provided written informed consent to participate in the study or at a time during postpartum hospitalization more convenient to the mother, questionnaires were administered and the semi-structured interview was conducted. Each participant was in the study for one month. Data were obtained while the mother-infant dyads were in the hospital at enrollment and discharge, and at home at one month postpartum. Participant responses were audio recorded, transcribed, and then checked for accuracy. One participant who

reported significant emotional distress during data collection was referred to a mental health professional.

## Measures

**Maternal and Infant Characteristics**—Demographic information and responses to the Edinburgh Postnatal Depression Scale (EPDS) [28] were recorded on a form by the mother. The infant's medical records were reviewed after enrollment and following hospital discharge to obtain data on obstetric history and medical course.

**Semi-Structured Interviews**—The maternal hospital interview focused on the mother's childbirth story and her infant's care. The interview began with a global statement asking the mother to tell her story about how she "came to deliver." Participants for this study were asked specific questions about infant sleep locations that were not included in the original parent study. These questions were added to the protocol of the ongoing parent study.

In the interviews, probes were asked to elicit greater detail when needed and to fill in predetermined areas not covered such as "what are you currently feeding your baby" and "where do you plan for your infant to sleep at home?" After a mother responded with her intended infant sleep location, she was asked if she "also planned to bed share." At one month postpartum, the interviews explored how things had been going with the mother and her infant since the previous interview. Once the mother told her story, probes were used to cover predetermined topics, which included feeding and sleep practices. After a mother responded to the sub-sample question "where is your baby currently sleeping at night," she was asked if she had "also slept with the baby in bed with you."

## Analysis

Between-group mean differences on continuous demographic variables and the EPDS total scores were tested using *t*-tests. Between-group differences in proportions of demographic variables, maternal milk provision, and infant sleep locations were tested using Cochran-Mantel-Haenzel, chi-square, or the Fisher's Exact Test, as appropriate. The transcripts were read in their entirety to get a sense of the mother's story as a whole [29]. Interviews were then read again to derive codes and their definitions [30]. Next, the codes were reviewed, refined, and then grouped into meaningful themes [31]. The responses were entered into a matrix format in response to the interview questions and by theme for ease of comparison. Codes derived from research questions, such as "what factors influenced where your baby currently sleeps at night" and refinements of the core issues that emerged, such as "not bed sharing due to fear for infant safety," which the authors identified through an iterative process.

## Results

For this analysis, 56 women provided hospital interview data (26 late preterm and 30 term) and 45 of these participants (22 late preterm and 23 term) provided telephone interview data at one month postpartum. Eleven participants could not be reached at the one-month data collection point. In this study, late preterm infants had gestational ages at birth of 34.3 to

36.9 weeks and the term infants had gestational ages of 37.7 to 41.9 weeks. Further, the sample for this analysis was 52.7% White non-Hispanic, 32.7% Black non-Hispanic, and 14.5% English speaking Hispanic women.

Participant demographics in this study by late preterm and term status are provided in Table 1. The late preterm and term groups did not differ statistically on maternal race and ethnicity, marital status, public assistance, maternal age, pregnancy complications, childbirth mode, infant sex, or EPDS scores at enrollment or one month postpartum. More of the women with late preterm infants were first-time mothers and they were older than term mothers. The groups differed (because of the definition of late preterm and term infants) on infant gestational age at birth. Late preterm infants weighed less at birth than term infants, had lower Apgar scores at 5 minutes, were more likely to have been cared for in a hospital unit other than the well baby nursery, and stayed in the hospital longer than term infants. The late preterm and term women did not differ in the proportions who provided their breastmilk or of the number of depressive symptoms, during hospitalization or at one month postpartum.

### Room sharing

Most women planned to room share at home with their infants (50 of 56, 89.3%) and reported doing so for some or all of the first postpartum month (41 of 45, 91.1%). The late preterm and term groups did not differ in plans for room sharing (24 of 26 late preterm, 92.3%, and 25 of 30 term, 83.3%, Fisher's Exact Test,  $p=.43$ ) or in reported practice over the first month (20 of 22 late preterm, 90.9%, and 21 of 23 term, 91.3%, Fisher's Exact Test,  $p=.99$ ). Convenience in tending to infants was the most cited factor for parents and infants sleeping in the same room at night, followed by maternal ease in assessing infant well-being. No participant reported room sharing intent or practice was due to concern about Sudden Infant Death Syndrome protection. Reasons offered for separate room parent-infant sleep arrangements were to minimize maternal sleep disturbance so that bed sharing did not become an infant habit, concern that maternal anxiety about infant well-being would lead to the mother purposefully waking the infant up, and parental privacy.

Prenatally, one mother of a late preterm infant had intended for her baby to sleep in a separate room at home. However, in the hospital she was concerned about the infant's condition. Her feelings were conflicted about the sleep location decision and need for nighttime infant monitoring:

All along I wanted her to sleep in her own room, and I have felt very, very strongly that we need to maintain our relationship with the two of us [husband and wife]. I said I was perfectly okay getting up and going to her room in the middle of the night, but since this whole thing [late preterm birth] has happened...the feeding is an issue. Spitting up has been an issue with her. I now feel the need to have her in the room to keep an eye on her in the middle of the night. I might reconsider because she hasn't really spit up since her first day...I think maybe we need to reconsider to put her back in the room because I really like the idea of her being in her own room. I think the sooner they get used to that the better. They say that you as a couple sleep better and the baby sleeps better.

At one month postpartum, this mother said her infant had initially room shared then transitioned to nighttime sleep in her own room. The themes present in this example, of instilling independence in infants through separate sleep locations and better sleep equating to less nighttime parental ‘disturbances,’ were present in both the late preterm and term groups.

### Bed sharing

A few participants from both the late preterm and term groups planned to bed share (3 of 25 late preterm, 12.0%, and 3 of 30 term, 10.0%). The factor most often influencing this decision was maternal convenience for nighttime infant care. Other reasons were to facilitate infant sleep, maternal reassurance of infant well-being, and maternal preference. One mother of a late preterm infant reported that she would initially bed share because she did not have the opportunity to purchase a bassinet due to the early timing of childbirth. A mother of a term infant reported that she would have her infant sleep in a bassinet at home but that she had not obtained one yet. At one month, this woman said that they had bed shared throughout the first postpartum month.

Women in both groups said that they planned not to bed share at home due to fear for infant safety (2 of 26 late preterm, 7.7%, and 4 of 30 term, 13.3%). One woman said she needed her infant “in a container” at night because she was “too scared” that she might otherwise “throw her across the room” or “smash her.” Another participant said she was concerned that “people who sleep with babies in their beds can easily roll on them” or “kick them off the bed.” Further, the idea of bed sharing becoming an undesirable habit and/or spoiling the baby was present in both the late preterm (3 of 26, 11.5%) and term groups (3 of 30, 10.0%).

Significantly more women reported that they bed shared with their infant during the first postpartum month (21 of 44, 47.7%) than said that they had planned to do so (6 of 56, 10.7%),  $X^2=15.3$ ,  $df=1$ ,  $p<.0001$ . Late preterm and term groups did not differ in unplanned bed sharing. Further, the proportions of any parent-infant bed sharing by one month postpartum, regardless of intentions, did not differ by childbirth group (9 of 21 late preterm, 42.9%, and 12 of 23 term, 52.2%,  $X^2=.10$ ,  $df=1$ ,  $p=.75$ ). All women who planned on bed sharing reported doing so. Women in the late preterm and term groups offered similar reasons for bed sharing, with nighttime infant fussiness being the primary factor. Other reasons for bed sharing were maternal preference/emotional closeness, reassurance of infant well-being, convenience with nighttime feeds, early morning rest, daytime naps, and lack of a bassinet (term mother). One of the women who bed shared did so because she was told the baby (born late preterm) had to be upright for a prolonged period after feeding. This positioning was accomplished by propping the baby with pillows in the adult bed alongside the mother who returned to sleep.

Among mothers who did not bed share, some women added that they did not do so because they were afraid for infant safety. One of the term mothers who did not bed share routinely co-slept with her infant on a recliner. She would feed the baby in the reclining armchair in the living room at night, fall asleep, and then wake up for the next feed there:

It's not an ideal situation. But, when we have that growth spurt issue, I don't get any rest. It has become a bad habit [that] I'm going to start breaking him of and myself of. I heard about squashing him, [but] if I thought he were in any danger of that I would lay him back down [in his bassinet].

## Discussion

This study followed late preterm and term infants and their mothers from the postpartum hospitalization to the first postpartum month. Strengths of this study include the prospective design in which home infant sleep location intentions were asked on the postnatal unit and then reported at one month postpartum, matching late preterm and term participants on maternal race, ethnicity, and childbirth mode, and probing for whether women's sleep plans and practice included bed sharing. We found that some women's understanding of bed sharing as inappropriate conflicted with their needs for nighttime proximity to infants. Women bed shared with their infants out of preference, for convenience in assessing the babies' well-being, and for ease of tending to them. Professional guidance that works with mothers, acknowledges their challenges around infant sleep locations and provides evidence-based guidance on potential hazards may help to enable both safe infant environments and maternal rest.

Most late preterm and term women planned to room share with their infants at home and reported doing so in the first postpartum month. This high proportion of room sharing plans and practice is consistent with previous findings from a Canadian sample [32]. No participant in our study said that protection against the risk of SIDS was a factor in room sharing, even though this practice is a part of recommended safe infant sleep environments in the U.S. [3]. We did not probe for data on whether women knew of this SIDS guidance. Those women who did not room share at home, or did so minimally, may have been aware that rooming-in was the medically ideal scenario, but perceived the risk of SIDS to be too low to impact their infant sleep location decision making. Alternatively, parents may not be adequately informed about the value of room sharing in preventing SIDS. Moon, Oden, Joyner, and Ajao [33] found that most African American mothers, whose infants have one of the highest SIDS rates in the U.S. [16], did not understand that infant sleep location or sleep positioning might affect SIDS risk. Further, these researchers found that maternal concern about infant sleep duration was more prominent than their concern about SIDS. Families of both late preterm and term infants may benefit from greater awareness of the association of room sharing with reduced infant mortality from SIDS, particularly because covered infant airways and non-supine sleep position are more likely to occur in solitary infant sleep environments [34]. Better parental understanding of infant developmental processes can move the infant sleep conversation towards healthful nighttime family interactions and away from the desire to instill 'independence' in neonates that contributed to nighttime arrangements in our study.

We found that during hospitalization, one woman changed from her intention to have her infant sleep in a separate room to nighttime room sharing because of unexpected health complications of her late preterm infant. Consistent with this behavior is Teti and Crosby's [35] finding that women's worry about infant nighttime needs were positively associated

with maternal presence with infants during the night and with the amount of time mothers spent in close physical contact with their infants during the night. We similarly found a theme of maternal concern that their anxiety about infant well-being would lead to purposefully waking the infant. Stremler et al. [32] found that routine bed sharing was associated with shorter maternal sleep bouts and more maternal night wakings compared to women sleeping in a separate room. Women may be best supported by ensuring they are aware of safe infant sleep guidelines and self care techniques.

The need for individualized parent sleep guidance, as endorsed by Fetherston and Leach [7], was highlighted in our example of a mother who reactively bed shared with a late preterm infant propped on pillows. She did this to comply with the pediatrician's advice to position the baby upright for an extended period after feedings and her need to achieve this arrangement in a way that permitted maternal sleep. Maternal decision making for high-needs infants may be impaired by fatigue from managing health challenges over time. Whether the late preterm woman in our study received advice on the various contexts in which that infant propping would likely occur is unknown. Although public health guidance recommends against the use of pillows in infant sleep environments [3, 11–12], our participant did not describe this aspect of her nighttime parenting as being problematic.

Maternal convenience in nighttime infant care was the primary reason for women intending to bed share. Bed sharing has been found to promote nighttime breastfeeding frequency in observational studies [18, 36] and is associated with greater breastfeeding duration [37–41]. In order to have the safest infant sleep environments possible, families may benefit from health care providers facilitating non-judgmental discussions about nighttime dynamics [e.g., 42]. Many more families said that they bed shared during the first postpartum month than planned to do so. Deviation from infant sleep location plans during postpartum hospitalization towards more home bed sharing in the first month occurred, and about half of participants reported some amount of bed sharing. A similar pattern was also found by Stremler et al. [32]. The discrepancy we found between bed sharing plans and practice suggests that maternal expectations for nighttime parenting and infant sleep did not match their experiences in both first-time and experienced mothers.

The primary reason for unplanned bed sharing in our study was to soothe nighttime infant fussiness. Anticipatory guidance on infant sleep and responses to infant cues could include evidence-based information on infant behavior that is written for popular audiences [e.g., 43]. Caregiver habits tend to cluster together, whether the parenting behaviors are developmentally appropriate or not [44]. Infants perceived to be 'fussy' by their mothers have also been found to receive developmentally inappropriate foods, in the form of solids and juice, in the early months [45].

Fear for infant safety was commonly discussed among participants who avoided home bed sharing, which may stem from U.S. public education campaigns that focus on the hazards of bed sharing [e.g., 46]. Observational studies with healthy breastfeeding dyads suggest these mother-infant pairs largely sleep and wake in synchrony [19], face each other and maintain close proximity for most of the night, and that these women adopt a protective sleep position around their sleeping infants [47–48]. Bottle feeding mothers, on the other hand, have been



observed sleeping with infants more ‘like an adult’ in the bed, with the babies’ positioned higher than breast level and the women turned away from the infants [48]. Further, any infant sleep location can become hazardous with inappropriate bedding, clothing, bottle propping, and/or positioning [49]. Nighttime infant feedings are often accompanied by mother-infant sleep in the feeding locations, including beds, chairs, sofas, and recliners [50]. Kendall-Tackett et al. [50] found that women who slept with their infants in the feeding locations were more likely to have high incomes and have more education. These researchers suggested that this otherwise ‘low-risk’ group engaged in high-risk behavior in an attempt to avoid bed sharing, which is consistent with our finding about the woman who coslept with her infant on a recliner. Parent-infant cosleeping on chairs or sofas is a highly risky environment [5]. Conversations among health care providers and families may advance understanding of infant sleep location recommendations away from the ‘letter of the law’ to the ‘spirit.’

Although our sample was diverse and reflective of the community from which it was drawn, the exclusion of families with multiple births and of non-English speaking women limits the generalizability. Further, other than psychosis or bipolar disorder, prenatal maternal mental health was not examined. This history may influence maternal emotional well-being and infant feeding outcomes in the postpartum period. The dynamics of nighttime parenting with infants from a multiple birth set likely differs from the care of singletons. Also, the culture of parenting may vary between English and non-English speaking Hispanic women. Colson et al. [13] found that U.S. bed sharing systematically varies by maternal race, ethnicity, education level, socioeconomic status, and other factors. Our study grouped participants by late preterm and term childbirth status to focus on the role of infant medical needs and maternal perinatal experiences on home sleep location decisions. The within group variations we found in maternal attitudes regarding infant sleep location likely reflect maternal characteristics. Future research on factors that influence home infant sleep locations would benefit from documenting the experiences among multiple birth sets and non-English speaking dyads.

Additionally, we identify several next steps for research based on our findings. A naturalistic, overnight filming project in the home setting could assess parental responses to infant night waking and the sequence of events contributing to the infant sleep locations during the observation periods. Further, documentation of trajectories of maternal fatigue and emotional well-being in relation to infant sleep locations are needed to better understand new mothers’ needs.

## Conclusions

The discrepancy between planned and reported home infant sleep locations indicates that women’s expectations are not consistent with their postnatal experiences and needs. Both the late preterm and term groups experienced variability in their home infant sleep locations and women within the groups had differing feelings about bed sharing. Therefore, active acknowledgement of families’ individualized challenges to consistently implementing recommended infant sleep practices may be helpful to promote constructive dialogue instead of the health message exclusively stating what not to do. Parents’ needs and values are likely

critical to the success of reducing risks in infant sleep environments. Thus, effective implementation of safe sleep locations requires understanding the factors affecting maternal decision-making about sleep locations.

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**Table 1**

Participant Demographics, by Late Preterm and Term Groups

	Late Preterm <i>n</i> =26	Term <i>n</i> =30
	Mean (SD) or % ( <i>n</i> )	Mean (SD) or % ( <i>n</i> )
Maternal race and ethnicity:		
% White non-Hispanic	56.0 (14)	50.0 (15)
% Black non-Hispanic	32.0 (8)	33.3 (10)
% Hispanic and Other	12.0 (3)	16.7 (5)
% Married	69.2 (18)	43.3 (13)
% Public assistance	38.5 (10)	43.4 (13)
% First-time mother*	11.5 (3)	40.0 (12)
Maternal age in years*	31.0 (6.5)	26.8 (5.0)
% Had any pregnancy complications	61.5 (16)	36.7 (11)
Gestational age in weeks***	35.9 (.8)	40.0 (.9)
Infant sex: % female	57.7 (15)	43.3 (13)
% Cesarean birth	46.2 (12)	36.7 (11)
Birthweight in grams	2693.3 (470.2)	3408.8 (446.7)
Apgar at 1 minute	7.6 (2.1)	8.0 (1.6)
Apgar at 5 minutes*	8.7 (.7)	9.0 (.3)
% Only in well baby nursery*	73.1 (19)	93.3 (28)
Length of hospital stay in days*	4.9 (5.5)	2.3 (.7)
% Provided breastmilk:		
Postpartum hospitalization	76.9 (20)	93.3 (28)
One month postpartum	65.2 (15)	74.1 (20)
Edinburgh Postnatal Depression Scale:		
Postpartum hospitalization	6.3 (5.7)	4.8 (5.5)
One month postpartum	3.8 (4.3)	2.2 (2.2)

*Note.* Between-group mean differences on continuous variables were tested using *t*-tests, except for length of infant hospital stay that was tested with a non-parametric Wilcoxon Two Sample Test due to non-normal distribution. Between-group differences in proportions were tested using Cochran-Mantel-Haenzel, chi-square, or the Fisher's Exact Test, as appropriate.

\*  $p < .05$  for group differences;

\*\*\*  $p < .0001$