SUPPLEMENT ARTICLE

Infant Sleeping Arrangements and Practices During the First Year of Life

Fern R. Hauck, MD, MS[a], Caroline Signore, MD, MPH[b], Sara B. Fein, PhD[c], Tonse N. K. Raju, MD[b]

[a]Departments of Family Medicine and Public Health Sciences, University of Virginia School of Medicine, Charlottesville, Virginia; [b]Pregnancy and Perinatology Branch, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services, Bethesda, Maryland; [c]Center for Food Safety and Applied Nutrition, Department of Health and Human Services, Food and Drug Administration, College Park, Maryland

The authors have indicated they have no financial relationships relevant to this article to disclose.

ABSTRACT

OBJECTIVES. Our goal was to examine the sleeping arrangements for infants from birth to 1 year of age and to assess the association between such arrangements and maternal characteristics.

METHODS. Responses to the 3-, 6-, 9-, and 12-month questionnaires from the Infant Feeding Practices Study II were analyzed to assess sleep arrangements, including bed sharing, the latter defined as mother ever (in a given time frame) slept with the infant on the same sleeping surface for nighttime sleep. Women were also asked about the reasons for bed sharing or not bed sharing.

RESULTS. Approximately 2300 women responded at 3 months, and 1800 at 12 months. At 3 months, 85% of the infants slept in the same room as their mother, and at 12 months that rate was 29%. At 3 months, 26% of the mothers did not use the recommended supine position for their infant's nighttime sleep. The rate of noncompliance increased to 29% by 6 months and 36% by 12 months. The bed-sharing rates were 42% at 2 weeks, 34% at 3 months, and 27% at 12 months. Approximately two thirds of those who bed shared with their infant also shared the bed with their husband or partner, and 5% to 15% shared it with other children. The major reasons for bed sharing were to calm a fussy infant, facilitate breastfeeding, and help the infant and/or mother sleep better. The major reasons for not lying down with the infant were safety concerns. Non-Hispanic black mothers were more likely than non-Hispanic white mothers to use nonsupine infant sleep positions and to bed share.

CONCLUSIONS. More than one third of the women in this cohort were noncompliant with safe-sleeping guidelines when their infant was 3 months old. Health care providers need to advise parents of current recommendations and discuss the risks and benefits of their choices for infant sleeping practices. *Pediatrics* 2008;122:S113–S120

www.pediatrics.org/cgi/doi/10.1542/peds.2008-1315

doi:10.1542/peds.2008-1315o

The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Food and Drug Administration or the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development.

Key Words
sleep, sudden infant death syndrome, SIDS, suffocation, infant mortality, risk reduction, health campaigns, breastfeeding

Abbreviations
SIDS—sudden infant death syndrome
AAP—American Academy of Pediatrics
IFPS—Infant Feeding Practices Study
aOR—adjusted odds ratio
CI— confidence interval
SES—socioeconomic status

Accepted for publication Jun 4, 2008

Address correspondence to Fern R. Hauck, MD, MS, University of Virginia, Department of Family Medicine, PO Box 800729, Charlottesville, VA 22908-0729. E-mail: frh8e@virginia.edu

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275); published in the public domain by the American Academy of Pediatrics

THE RATE OF sudden infant death syndrome (SIDS) in the United States was 5.4 in 10 000 live births in 2005.[1] This rate represents a significant decline over the past decade, which has been largely credited to more infants being placed to sleep in the supine position for all sleep periods.[2] The recommendation for nonprone sleep was first made by the American Academy of Pediatrics (AAP) in 1994 and then adopted and promoted by the national Back to Sleep campaign in 1996. The AAP has continued to publish additional guidelines for reducing the risk of SIDS and other sleep-related deaths on the basis of review of newly published studies. The most recent recommendations, published in 2005,[2] were also adopted by the Back to Sleep campaign.[3]

Parents often follow the advice to place their infant supine only during the immediate post–hospital-discharge period, changing to the less safe side or prone position when infants reach 2 to 3 months, which is the peak age for SIDS.[4,5] Thus, it is important to know the prevalence of parents' choices and practices related to infant sleep positions and to understand the factors that predict noncompliance with this important recommendation.

In the published literature, the terms "bed sharing" and "cosleeping" have often been used interchangeably[6] to describe a variety of sleeping arrangements. Overall, the practice of bed sharing is becoming more prevalent in the United States and in other industrialized countries.[7–9] Some organizations, researchers, and clinicians promote this practice to facilitate breastfeeding.[6,10–14] However, because of concerns about infant safety, other professional societies and researchers do not endorse this practice.[2,15] The current AAP guidelines for reducing the risk of SIDS recommend using a "separate but proximate sleeping environment" for infants.[2] The AAP also notes that it is appropriate to take

Downloaded from by guest on May 4, 2016

the infant to bed for nursing, comforting, and bonding but recommends that the infant should be returned to a separate crib or bassinet when the mother is ready to sleep.[2] In addition, the US Consumer Product Safety Commission recommends that infants sleep in cribs until they are 2 years old.[16]

Although a number of studies have shown that bed-sharing rates are high, neither the longitudinal trends in bed sharing nor the reasons mothers chose to bed share or not to bed share have been well studied. Therefore, this study was conducted to examine the sleeping arrangements for infants from birth to 1 year of age, including the manner in which infants were placed to sleep (prone, side, or supine), the place where infants slept, and the reasons mothers gave for choosing to take or not take their infant to bed with them. In addition, we assessed the associations between social and behavioral characteristics, including breastfeeding status, and specific sleeping arrangements for infants. As explained below, we chose a strict definition for bed sharing for this study: "mother ever (in a given time frame) sleeps when lying with the infant on the same sleeping surface for nighttime sleep."

METHODS

Data-collection methods for the Infant Feeding Practices Study II (IFPS II) are described in detail elsewhere in this supplement.[17] Questions about infant sleeping arrangements were asked in the postnatal questionnaires administered at 3, 6, 9, and 12 months; data items from these 4 assessments were included in this analysis. On the 3-month postnatal questionnaire, participants were asked to report infant sleeping arrangements for 4 distinct time periods: at infant ages 2 weeks, 1 month, and 2 months, and "now" (ie, at 3 months of age). On the 6-, 9-, and 12-month questionnaires, participants were asked to report arrangements "in the past 4 weeks." Questionnaires that were returned outside of the predetermined age ranges were excluded to minimize misclassification of responses according to infant age. Acceptable age ranges were 11 to 21 weeks for 3 months, 22 to 33 weeks for 6 months, 34 to 46 weeks for 9 months, and 47 to 62 weeks for 12 months. Fifty-six responses that were out of the acceptable age range were excluded from the analyses.

For certain items on each of the 4 questionnaires, participants were asked to report sleeping arrangements during the night. If night was not the mother's "major time for sleeping," they were asked to report sleeping arrangements "during your major sleep period." Data on infant sleeping habits, sleep position, sleep location, and sleeping surface were collected with identical questions on the 3-, 6-, 9-, and 12-month questionnaires covering the 7 specific infant age ranges as described above. Women who reported that they "ever lie down or sleep with [the] baby at night" were asked to report whether they usually slept with the infant or stayed awake until the infant was asleep and then put the infant in a different place; the location and frequency of lying or sleeping with the infant; and whether other people also usually lay down or slept with her and the infant. At 3, 6, 9, and 12 months, all women were also asked why they did or did not bring the infant to bed with them.

Bed-sharing mother-infant dyads were identified on the basis of answers to several questions as described below. All women were asked if they "ever lie down or sleep with your baby at night" in each time frame, as noted earlier. The response choices for this question were "Yes, with the baby in a co-sleeper," "Yes, in a bed (standard mattress)," "Yes, in a waterbed," "Yes, on a mattress on the floor," "Yes, on a couch or other place that is not a bed," and "No." Multiple responses were allowed. Contradictory responses (eg, both "yes" and "no" answers) were assigned as missing and not included in the analyses. (The contradictory response rate was 2% at 2 weeks and gradually decreased to 0.3% at 12 months.) All women who responded "no" were considered to be "non–bed sharers," and they were asked to skip additional questions about sleeping arrangements. The women who answered "yes" were asked, "When you and your baby lay down or slept together, did you usually: 'Stay with the baby and also sleep' or 'Keep awake until the baby was asleep, or finished feeding and then put the baby somewhere else while you slept?'" Only 1 response was allowed. Women who reported that they "usually stay with the baby and also sleep" formed the group defined as bed sharers in this study. Finally, women who reported that they lay down or slept with the infant in a cosleeper were excluded from the bed-sharing group. We excluded this group because we believe that some mothers might consider using cosleepers as being compliant with safe-sleeping recommendations of the AAP Taskforce on Sudden Infant Death Syndrome, which stated: "Cosleepers (infant beds that attach to the mother's bed) provide easy access for the mother to the infant, especially for breastfeeding, but the safety standards for these devices have not yet been established by the Consumer Product Safety Commission."[2] As noted above, bed sharing was defined as mother sleeping when lying with the infant on the same bed or other sleeping surfaces (excluding cosleepers) for her nighttime sleep or during the major sleep period.

Cross-sectional data on infant sleeping arrangements were analyzed in frequency tables stratified according to infant age. With the responses to 3-month data, multivariable logistic regression models were used to test the associations between social and behavioral characteristics and specific sleeping arrangements. We chose data from 3-month questionnaires for multivariable regression analyses because 2 to 4 months remains the peak age for SIDS.[2]

The covariates included in the models were maternal age (<20 or ≥20 years), education (≤12 or >12 years), self-reported race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, Asian, or other), marital status (married or unmarried), poverty level (<185% or ≥185% of the federal poverty level), parity (nulliparous or multiparous), postnatal smoking status (ever or never), and current breastfeeding status (any or none). Adjusted odds ratios (aORs) and 95% confidence intervals (CIs) were estimated for the following outcomes in all 3-month respondents: laying the infant down in a

Downloaded from by guest on May 4, 2016

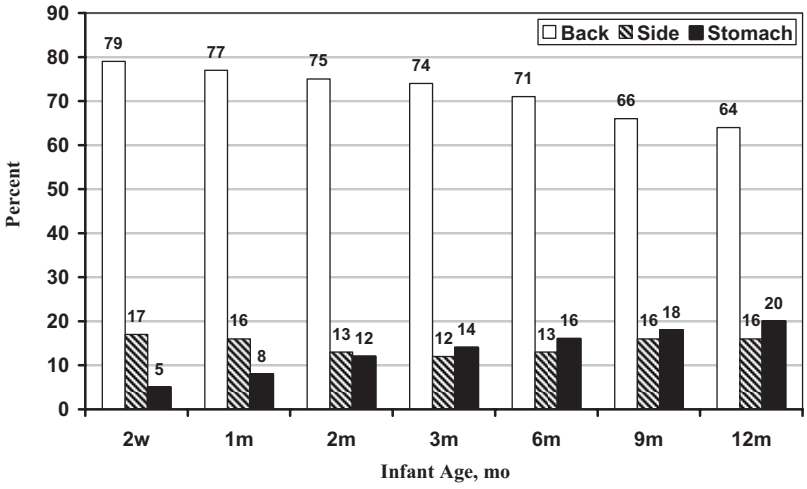

FIGURE 1
Infant positioning for nighttime sleep from infant age 2 weeks to 12 months: IFPS II.

nonsupine position; sleeping in a separate room from the infant; and bed sharing. Among bed sharers, we modeled predictors of lying or sleeping with the infant on "a couch or other place that is not a bed" and predictors of lying or sleeping with the infant and other children in the same bed. All the covariates were entered in each regression model simultaneously, and all were retained, with the exception of maternal age in the other children model, because its results were statistically unstable. All analyses were conducted with SAS 9.1 (SAS Institute, Inc, Cary, NC).

RESULTS

The demographic features of this subset of respondents were not significantly different from those of the entire study, which are described elsewhere in this supplement.[17] For this analysis, >2300 participants answered questions concerning infant sleeping arrangements for the 2-week to 3-month time periods; the number decreased to almost 1800 for the 12-month questionnaire.

Nearly 80% of the mothers of young infants chose the recommended supine position for placing their infant for nighttime sleep, whereas a significant minority (>20%) did not follow this recommendation (Fig 1). Noncompliance rates increased with infant age so that by 12 months, 36% were not placing their infant supine. Infant positioning frequencies for daytime naps were similar to those for nighttime sleep at each age (data not shown).

Cross-sectional frequencies on the duration of infant sleep, sleep location, and infant sleeping surface are presented in Table 1. A majority of infants slept <4 hours at night during the first month of postnatal age. By 3 months, >80% of the infants were sleeping for ≥5 hours each night. During the first 3 months, a majority (85%) of the infants slept in the same room as their mother, and this frequency declined to 29% by 12 months.

Most infants slept in bassinets in the first month, and the greatest percentages were in cribs thereafter. The frequency of sleeping in a cosleeper was very low throughout the first year, ranging from 3% to <1%.

During the first 3 months, 59% to 65% of the mothers lay down or slept with their infant at night. The most common location for the mother to lie down or sleep with the infant was a bed followed by a "couch or other place that is not a bed." Approximately 1% of the mothers stated that they lay down or slept with their infant on a waterbed.

More than three fourths of the women who ever (in each time period) lay down or slept with their infant usually slept when lying with the infant (Table 1). Among all women, the rates of bed sharing, as defined previously, ranged from 42% at 2 weeks of age to 27% at 12 months of age.

Additional sleeping arrangements among bed-sharing mother-infant pairs are presented in Table 2. Bed-sharing mothers who slept with their infants only part of the night were more likely to do so during the last part of the night or several short periods than during the first part of the night. Among the women who bed shared, approximately half of them slept with their infant 7 nights per week at each infant age. Approximately 30% to 40% of bed-sharing dyads slept together all night, every night of the week.

More than two thirds of the bed-sharing mother-infant pairs also bed shared with the mother's partner. Approximately 5% of the mothers and infants slept with other children at 2 weeks, and this frequency steadily increased to nearly 15% at 12 months (Table 2).

The 3 most common reasons for bringing the infant into bed cited by the mothers were to calm a fussy infant, to help the infant and/or the mother sleep, and to facilitate breastfeeding (Table 3). The frequencies for the first and third reasons were similar at each age for mothers who slept with their infant and those who stayed awake, whereas the second reason was more common among the mothers who slept with their infant. Only 1% of the mothers stated that doctors or nurses advised them to bring the infant to bed. The most frequently cited reasons for not lying down or sleeping with their infant were safety concerns, perceived difficulty in later placing the infant in a crib, and that it is "not commonly done in my family" (Table 4). A small number (10%–15%)

Downloaded from by guest on May 4, 2016

TABLE 1 **Infant Sleeping Habits and Locations and Maternal Sleeping Practices, From Infant Age 2 Weeks to 12 Months: IFPS II**

Variable	2 wk (n = 2353)	1 mo (n = 2353)	2 mo (n = 2353)	3 mo (n = 2353)	6 mo (n = 2078)	9 mo (n = 1933)	12 mo (n = 1778)
Longest period of sleep at night							
≤2 h	44.0	14.6	2.9	1.0	0.5	0.4	0.5
3–4 h	47.4	55.5	30.0	14.1	11.3	9.7	6.6
5–6 h	6.9	23.8	41.8	35.9	24.0	21.3	16.4
7–8 h	1.4	4.9	17.8	24.8	23.5	19.9	16.3
≥8 h	0.5	1.3	7.5	24.3	40.7	48.7	60.3
Infant sleep location at night							
In mother's room	85.3	81.1	71.0	63.0	45.1	34.0	28.6
In a different room	14.7	18.9	29.0	37.0	55.0	66.0	71.4
For nighttime sleep, infant sleeps in							
Bassinet	50.0	43.6	34.2	27.1	8.1	1.5	0.5
Bed or other place with mother	20.6	21.2	18.9	16.8	14.4	13.9	13.1
Crib	19.5	25.2	37.1	47.4	71.9	80.9	82.7
Something else	6.8	7.0	7.3	6.1	4.1	2.8	3.1
Attached cosleeper	3.1	3.0	2.5	2.5	1.5	0.9	0.6
Did the mother ever lie down or sleep with infant at night?							
Never lay down or slept with infant	34.8	34.4	38.5	40.5	58.4	59.3	63.4
Yes, lay down or slept with infant[a]	65.2	65.4	61.5	59.5	41.6	40.7	36.6
Yes, in bed with infant	49.3	52.3	49.5	47.4	36.7	35.5	31.3
Yes with infant on a couch	17.8	16.8	14.1	12.3	6.1	6.3	5.6
Yes, in cosleeper	5.1	4.2	3.5	3.3	1.8	1.2	0.9
Yes with infant on mattress on the floor	1.0	1.2	1.4	1.2	1.6	2.4	1.7
Yes, with infant on waterbed	1.2	1.0	0.9	1.0	0.7	0.6	0.7
Among mothers who ever lay down or slept with infant							
Mother slept with infant when lying down	73.5	74.3	68.8	65.6	76.2	71.7	76.7
Mother stayed awake until infant was asleep then put infant elsewhere	26.5	25.7	31.2	34.5	23.9	28.3	23.3
Bed-sharing rate among all mothers[b]	41.5	42.5	36.9	34.0	30.7	28.1	27.0

Values shown are percentages.

[a] Multiple responses were permitted for surface; thus, the total is >100%.

[b] Bed sharing was defined as sleeping when lying with the infant on the same bed or other sleeping surfaces (excluding cosleepers) for nighttime sleep.

noted that doctors or nurses advised them not to bring the infant to bed with them.

Regression models estimating the independent associations between social and behavioral factors and infant sleeping arrangements at the infant age of 3 months are listed in Table 5. Non-Hispanic black mothers were less likely to use the recommended supine infant sleeping position, and nulliparous women were more likely to use the recommended sleeping position. Mothers with more than a high school education, those who were married, and nulliparous mothers were more likely to place the infant to sleep in a different room, independent of other factors. Women at <185% of the federal poverty level, those who breastfed at 3 months, and non-Hispanic black, Hispanic, and Asian women were less likely to place the infant in a different room. Bed sharing was significantly more likely among lower-income women, breastfeeders, smokers, and non-Hispanic black women but less likely among married women. Among bed-sharing women, sleeping with the infant on a couch or other place that was not a bed was less likely for breastfeeding women and non-Hispanic black mothers. Also among bed-sharing mother-infant dyads, sleeping with other children was more likely by those from a race/ethnicity other than non-Hispanic black or white, Hispanic, or Asian.

DISCUSSION

In this study we found that despite the Back to Sleep recommendation to place infants supine for all sleep periods,[3] 1 of 4 mothers used nonsupine positions when placing their infants to sleep at 3 months of age. Because SIDS incidence peaks at 2 to 4 months of age, this finding is concerning. Black ethnicity was a predictor of noncompliance with the supine recommendation, as has been shown in other studies.[2,4,18]

Our cohort was not nationally representative and, in particular, it underrepresented ethnic minorities and mothers of low socioeconomic status (SES), among whom rates of SIDS are higher.[19] Thus, the high rates of noncompliance with this supine-position recommendation noted in our study (in a cohort with relatively high SES) should be of greater concern, because the actual rates may be even higher in a general US population.[4,5] Furthermore, high rates of noncompliance were found at the peak ages for SIDS incidence. These findings emphasize the need for both general and focused educational interventions to reduce noncompliance with this important recommendation.

We also found that a large percentage of the infants slept in the same room as their mothers, which is recommended by the AAP to lower the risk of SIDS.[2] However, a substantial number of infants slept in a separate

Downloaded from by guest on May 4, 2016

TABLE 2 **Sleeping Practices Among Bed-Sharing Mother-Infant Pairs From Infant Age 2 Weeks to 12 Months: IFPS II**

Variable	2 wk (n = 976)	1 mo (n = 1001)	2 mo (n = 867)	3 mo (n = 801)	6 mo (n = 637)	9 mo (n = 544)	12 mo (n = 481)
Surface(s) on which mother and infant lie down or sleep together							
Bed only	67.9	69.2	73.3	76.0	80.8	79.3	80.0
Waterbed only	1.5	1.2	1.1	1.3	1.8	1.7	2.1
Mattress on floor only	0.7	1.0	0.8	1.0	1.8	4.6	2.9
Couch only	12.0	9.8	7.1	6.9	5.7	2.8	6.7
Bed and couch[a]	15.8	16.9	15.2	12.7	8.7	10.0	6.9
Bed and mattress on floor	0.3	0.5	0.5	0.5	0.8	0.9	1.3
Other combination[a]	1.8	1.3	2.1	1.7	0.5	0.7	0.2
Extent of sleeping with infant at night							
All night	53.3	45.2	41.1	40.8	43.2	42.7	42.2
First part only	6.6	8.3	6.7	6.0	4.6	7.5	7.1
Last part only	22.2	30.2	40.2	42.8	46.5	44.5	43.2
Several short times	17.9	16.3	12.0	10.4	5.8	5.3	7.5
No. of nights per week infant and mother sleep together							
Only occasionally	2.7	2.9	3.4	4.2	4.6	5.0	6.2
<1	5.9	8.2	10.4	14.4	9.0	8.6	11.4
1–2	11.1	13.5	13.9	12.0	15.9	16.5	14.4
3–4	12.9	14.0	11.3	9.1	12.6	13.8	11.4
5–6	12.7	10.9	11.1	9.9	10.1	9.6	8.1
7	54.8	50.5	49.9	50.4	48.0	46.5	48.4
Mother and infant sleep together all night, every night	43.1	37.8	35.6	35.1	33.1	33.1	34.3
Additional person(s) lying or sleeping with mother and infant							
Husband or partner	67.4	67.2	66.1	66.4	67.0	66.9	68.0
Other child or children	5.5	7.1	10.3	10.8	13.7	13.9	14.6
Other people	0.5	0.8	0.6	0.5	0.3	0.6	0.8
No additional person	30.5	29.6	29.6	29.2	29.4	28.1	27.2

Values shown are percentages. Bed sharing was defined as sleeping when lying with the infant on the same bed or other sleeping surfaces (excluding cosleepers) for nighttime sleep.

[a] Because mothers were asked on what surface they lay down or slept with the infant, mothers who chose 2 surfaces could have been sleeping on only 1 but lying down and staying awake on the other.

room. Some researchers have shown that sleeping in the parents' room without bed sharing is associated with an approximate one-third lower risk for SIDS compared with sleeping in a separate room.[20–23] Thus, the AAP recommends room sharing with the infant placed in a separate crib or bassinet for sleep.[2] A majority of the mothers chose either bassinets or cribs for their infant, and despite being a relatively high-SES cohort, <3% of the women used a cosleeper for their infant.

The high rate of bed sharing found in our study, between 42% at 2 weeks and 27% at 12 months, is another practice not in compliance with the AAP recommendations.[2] The rates were highest during younger infant ages. Sleeping with infants on particularly unsafe sleeping surfaces (ie, couches or waterbeds) was also prevalent (29% at infant age 2 weeks and declining to 17% by 12 months). Of the bed sharers, 5% to 15% also slept with another child or children for nighttime sleep, a practice that has been shown to be an important risk factor for SIDS.[24]

To our knowledge, this is the first study to document the reasons that mothers choose or not choose to bring their infant to bed with them throughout the first year of life. One of the 3 major reasons for bed sharing was breastfeeding. The facilitative role of bed sharing on breastfeeding has been noted by other studies and expert groups.[6,25] The balancing of such benefits against the potential risks of SIDS or infant suffocation remains the crux of the ongoing debate on bed sharing and breastfeeding. Calming a fussy infant was another important reason for bed sharing; thus, educational interventions should include information about how these practices can be successfully accomplished without sleeping with the infant. One such method is placing the infant's crib or bassinet close to the parents' bed to facilitate breastfeeding and contact with the infant, as recommended by the AAP and others.[2]

We also found that the reasons for lying down with the infant were similar between those who stayed awake and those who slept with their infant. It is noteworthy that 14% of the women who bed shared felt that the practice was safer than not bringing the infant to bed with them. This study did not ask questions about how or why they held this belief. In a study of primarily black, low-income women, 29% of the mothers believed that having their infant sleep with an adult helps to prevent SIDS.[26]

We found that a majority of women who chose not to bed share did so for the reason provided by current AAP guidelines, namely, that they considered the practice

Downloaded from by guest on May 4, 2016

TABLE 3 **Among Women Who Lay Down With Their Infant in Each Time Frame, Reasons for Bringing the Infant to Bed According to Whether the Mother Slept or Stayed Awake and Infant Age: IFPS II**

Reason	3 mo		6 mo		9 mo		12 mo	
	Mothers Who Slept With the Infant (n = 801)[a]	Mothers Who Stayed Awake Lying With Infant (n = 451)	Mothers Who Slept With the Infant (n = 637)[a]	Mothers Who Stayed Awake Lying With Infant (n = 207)	Mothers Who Slept With the Infant (n = 544)[a]	Mothers Who Stayed Awake Lying With Infant (n = 220)	Mothers Who Slept With the Infant (n = 481)[a]	Mothers Who Stayed Awake Lying With Infant (n = 149)
To calm when fussy	65.4	68.0	57.5	54.9	60.4	67.1	56.8	62.4
Sleeping with the baby helps me or us to sleep better	64.8	41.2	54.2	25.2	60.2	31.5	55.1	26.2
To breastfeed	62.1	62.0	52.6	54.4	46.8	47.0	31.6	26.2
To be close/bond	47.9	39.6	42.5	25.7	42.5	27.4	32.4	28.2
To calm when sick	26.4	24.4	24.5	22.3	32.4	35.2	34.1	36.2
It is commonly done in my family	17.3	7.6	14.1	11.7	16.6	11.4	17.7	9.4
I think it is safer if my baby sleeps with me	13.6	6.9	13.2	3.9	13.8	2.7	13.5	5.4
To bottle feed	9.6	12.1	7.4	9.7	5.5	10.1	2.7	7.4
To help with a blocked milk duct or other breastfeeding problem	2.4	3.6	1.1	1.5	1.1	0	0.8	1.3
Doctor/nurse advised sleeping with baby	1.5	0.5	0.9	0	0.6	0.5	1.7	0

Values shown are percentages.

[a] As defined in this article, bed-sharing mother-infant pairs.

unsafe for their infant. The pragmatic reasons for not bed sharing included interference with the mother's sleep and perceived difficulty in transitioning the infant's sleeping location to a crib later.

It has been shown that physicians had a strong influence on caregivers in reducing prone placement of infants for sleep[18]; no published studies, to our knowledge, have examined the influence of health care providers on mothers' decisions to bed share. We found that only 10% to 15% of the mothers responded that a doctor or nurse had advised them not to take the infant to bed with them. It is possible that the actual frequency for this variable may be higher, because those who answered that they considered the practice to be unsafe might have received such information through their doctor or nurse. However, if this percentage is an accurate reflection of the involvement of physicians or nurses in providing advice, then it is necessary to direct increased educational efforts toward clinicians. Because this is a newer recommendation from the AAP, practitioners may be either less familiar with this recommendation or less comfortable in discussing it with patients, particularly while it remains controversial whether bed sharing is unsafe for all mother-infant pairs or only under certain circumstances.

The strengths of this study include that it used a large cohort, had a high response rate, and had other features noted in the IFPS II methods article.[17] The limitations of the study were that the cohort was not a probability sample of the US population, and the percentage estimates cannot be fully generalized.

Despite these limitations, the findings provide an important template for developing general and focused interventions to reduce noncompliance with current safe-sleeping recommendations. Health providers need to engage in discussions with their patients to better understand the reasons for the choices they are making with regard to sleeping practices and to ensure that they

TABLE 4 **Among Women Who Did Not Lie Down or Sleep With Their Infant in Each Time Frame, Reasons for Not Bringing Infant to Bed at 3 Infant Age Periods: IFPS II**

Reason	3 mo (n = 640)	6 mo (n = 1204)	9 mo (n = 1134)	12 mo (n = 1116)
I think it is safer if my baby does not sleep with me or us	86.9	78.5	78.0	74.7
I think it will be too hard to get my baby to sleep in a crib when he or she is older	53.0	55.7	57.1	56.5
It is not commonly done in my family	28.8	30.2	34.5	38.3
Sleeping with my baby interferes with my or our sleep	21.9	33.6	44.6	48.5
Doctor/nurse advised not sleeping with baby	15.6	10.8	9.4	10.7
Mother smokes/takes sedative	1.3	2.3	1.7	1.8

Values shown are percentages.

Downloaded from by guest on May 4, 2016

TABLE 5 **Multivariable Analyses of Demographic and Behavioral Characteristics Associated With Specific Groups' Sleeping Arrangements at Infant Age 3 Months: IFPS II**

	aOR	95% CI
Among all women ($N = 2353$)		
Mother places infant in nonsupine position for nighttime sleep		
Parity		
Nulliparous	0.67	0.52–0.86
Multiparous	Referent	—
Race/ethnicity		
Non-Hispanic white	Referent	—
Non-Hispanic black	2.41	1.50–3.88
Hispanic	1.00	0.63–1.59
Asian	0.73	0.36–1.47
Other	2.02	0.96–4.26
Infant sleeps in different room		
Poverty level, % of federal poverty level		
<185	0.57	0.46–0.70
≥185	Referent	—
Education, y		
≤12	Referent	—
>12	1.45	1.10–1.91
Current breastfeeding		
None	Referent	—
Any	0.61	0.50–0.74
Marital status		
Unmarried	Referent	—
Married	1.75	1.30–2.35
Parity		
Nulliparous	1.56	1.26–1.94
Multiparous	Referent	—
Race/ethnicity		
Non-Hispanic white	Referent	—
Non-Hispanic black	0.15	0.06–0.34
Hispanic	0.62	0.39–0.97
Asian	0.36	0.19–0.69
Other	0.98	0.46–2.09
Mother and infant bed share		
Poverty level, % of federal poverty level		
<185	1.46	1.19–1.80
≥185	Referent	—
Current breastfeeding		
None	Referent	—
Any	2.13	1.72–2.65
Postnatal smoking		
Never	Referent	—
Ever	1.41	1.04–1.91
Marital status		
Unmarried	Referent	
Married	0.60	0.45–0.79
Race/ethnicity		
Non-Hispanic white	Referent	—
Non-Hispanic black	2.27	1.39–3.68
Hispanic	1.30	0.85–1.99
Asian	1.65	0.95–2.89
Other	1.69	0.80–3.58
Among bed-sharing mother-infant pairs ($n = 801$)		
Mother lies down or sleeps with infant on a couch or other place that is not a bed		
Current breastfeeding		
None	Referent	—
Any	0.57	0.38–0.88
Race/ethnicity		
Non-Hispanic white	Referent	—
Non-Hispanic black	0.24	0.07–0.81
Hispanic	0.91	0.41–2.03
Asian	0.80	0.27–2.43
Other	0.60	0.13–2.78
Other child (children) usually lies down or sleeps with mother and infant (multiparous women only, $n = 561$)[a]		
Race/ethnicity		
Non-Hispanic white	Referent	—
Non-Hispanic black	1.62	0.63–4.15
Hispanic	1.33	0.52–3.41
Asian	3.01	0.87–10.36
Other	5.78	1.47–22.73

Only variables with significant findings are displayed. Variables included in all models (except where noted) were maternal age (<20 or ≥20 years), education (≤12 or >12 years), self-reported race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, Asian, or other), marital status (married or unmarried), poverty level (<185% or ≥185% of the federal poverty level), parity (nulliparous or multiparous), postnatal smoking status (ever or never), and current breastfeeding status (any or none).

[a] Maternal age was excluded from this model, because small numbers produced statistical instability.

understand the risks and benefits associated with these practices. Research is needed to assess the effects of such interventions on both sleeping practices and breastfeeding outcomes, as well as on reducing the rates of SIDS and other infant deaths that occur as a result of unsafe sleeping arrangements.

ACKNOWLEDGMENTS

This study was funded by the Food and Drug Administration, Centers for Disease Control and Prevention, Office of Women's Health, National Institutes of Health, and Maternal and Child Health Bureau in the US Department of Health and Human Services.

REFERENCES

1. Kung HC, Hoyert DL, Xu JQ, Murphy SL. Deaths: final data for 2005. *Natl Vital Stat Rep.* 2008;56(10):1–120
2. American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics.* 2005;116(5):1245–1255
3. National Institutes of Health, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development. Safe sleep for your baby: 10 ways to reduce the risk of SIDS. Available at: www.nichd.nih.gov/publications/pubs/safe_sleep_gen.cfm#risk. Accessed March 24, 2008
4. Lesko SM, Corwin MJ, Vezina RM, et al. Changes in sleep position during infancy: a prospective longitudinal assessment. *JAMA.* 1998;280(4):336–340
5. Willinger M, Hoffman HJ, Wu KT, et al. Factors associated with the transition to non-prone sleep positions of infants in the United States: the National Infant Sleep Position Study. *JAMA.* 1998;280(4):329–335
6. Academy of Breastfeeding Medicine Protocol Committee. ABM clinical protocol #6: guideline on co-sleeping and breastfeeding. Revision, March 2008. *Breastfeed Med.* 2008;3(1):38–43

Downloaded from by guest on May 4, 2016

7. Willinger M, Ko CW, Hoffman HJ, Kessler RC, Corwin MJ; National Infant Sleep Position study. Trends in infant bed sharing in the United States, 1993–2000:the National Infant Sleep Position Study. *Arch Pediatr Adolesc Med.* 2003;157(1):43–49
8. Rigda RS, McMillen IC, Buckley P. Bed sharing patterns in a cohort of Australian infants during the first six months after birth. *J Paediatr Child Health.* 2000;36(2):117–121
9. Blair PS, Ball HL. The prevalence and characteristics associated with parent-infant bed-sharing in England. *Arch Dis Child.* 2004;89(12):1106–1110
10. Protecting, promoting and supporting breastfeeding: the special role of maternity services. A joint WHO/UNICEF statement. *Int J Gynaecol Obstet.* 1990;31(suppl 1):171–183
11. McKenna JJ, Mosko SS, Richard CA. Bedsharing promotes breastfeeding. *Pediatrics.* 1997;100(2 pt 1):214–219
12. McKenna JJ, McDade T. Why babies should never sleep alone: a review of the co-sleeping controversy in relation to SIDS, bedsharing and breast feeding. *Paediatr Respir Rev.* 2005;6(2): 134–152
13. La Leche League International. Media release: LLLI responds to AAP policy statement on sudden infant death syndrome [press release]. Available at: www.llli.org/Release/sids.html. Accessed September 3, 2006
14. Ball HL. Breastfeeding, bed-sharing, and infant sleep. *Birth.* 2003;30(3):181–188
15. Nakamura S, Wind M, Danello MA. Review of hazards associated with children placed in adult beds. *Arch Pediatr Adolesc Med.* 1999;153(10):1019–1023
16. US Consumer Products Safety Commission. *CPSC Warns Against Placing Babies in Adult Beds*. Washington, DC: US Consumer Product Safety Commission; 1999. Report SPSC, Document 5091
17. Fein SB, Labiner-Wolfe J, Shealy KR, Li R, Chen J, Grummer-Strawn LM. Infant Feeding Practices Study II: study methods. *Pediatrics.* 2008;122(suppl 2):S28–S35
18. Willinger M, Ko CW, Hoffman HJ, Kessler RC, Corwin MJ. Factors associated with caregivers' choice of infant sleep position, 1994–1998: the National Infant Sleep Position Study. *JAMA.* 2000;283(16):2135–2142
19. Hunt CE, Hauck FR. Sudden infant death syndrome. *CMAJ.* 2006;174(13):1861–1869
20. Carpenter RG, Irgens LM, Blair PS, et al. Sudden unexplained infant death in 20 regions in Europe: case control study. *Lancet.* 2004;363(9404):185–191
21. Blair PS, Fleming PJ, Smith IJ, et al. Babies sleeping with parents: case-control study of factors influencing the risk of the sudden infant death syndrome. *BMJ.* 1999;319(7223): 1457–1462
22. Tappin D, Ecob R. Brooke H. Bedsharing, room sharing and sudden infant death syndrome in Scotland: a case-control study. *J Pediatr.* 2005;147(1):32–37
23. Mitchell EA, Thompson JMD. Co-sleeping increases the risk of SIDS, but sleeping in the parents' room lowers it. In: Rognum TO, ed. *Sudden Infant Death Syndrome: New Trends in the Nineties*. Oslo, Norway: Scandinavian University Press; 1995:266–269
24. Hauck FR, Herman SM, Donovan M, et al. Sleep environment and the risk of sudden infant death syndrome in an urban population: the Chicago Infant Mortality Study. *Pediatrics.* 2003;111(5 pt 2):1207–1214
25. Lawrence RA. Co-sleeping and breastfeeding: is it safe? *Breastfeed Med.* 2008;3(1):1–2
26. Colson ER, Levenson S, Rybin D, et al. Barriers to following the supine sleep recommendation among mothers at four centers for the Women, Infants, and Children Program. *Pediatrics.* 2006;118(2). Available at: www.pediatrics.org/cgi/content/full/118/2/e243

Downloaded from by guest on May 4, 2016

Infant Sleeping Arrangements and Practices During the First Year of Life

Fern R. Hauck, Caroline Signore, Sara B. Fein and Tonse N.K. Raju

Pediatrics 2008;122;S113
DOI: 10.1542/peds.2008-1315o

Updated Information & Services	including high resolution figures, can be found at: /content/122/Supplement_2/S113.full.html
References	This article cites 21 articles, 6 of which can be accessed free at: /content/122/Supplement_2/S113.full.html#ref-list-1
Citations	This article has been cited by 8 HighWire-hosted articles: /content/122/Supplement_2/S113.full.html#related-urls
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): **SIDS** /cgi/collection/sids_sub **Nutrition** /cgi/collection/nutrition_sub **Breastfeeding** /cgi/collection/breastfeeding_sub
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: /site/misc/Permissions.xhtml
Reprints	Information about ordering reprints can be found online: /site/misc/reprints.xhtml

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Downloaded from by guest on May 4, 2016

PEDIATRICS®
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Infant Sleeping Arrangements and Practices During the First Year of Life

Fern R. Hauck, Caroline Signore, Sara B. Fein and Tonse N.K. Raju

Pediatrics 2008;122;S113
DOI: 10.1542/peds.2008-1315o

The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/122/Supplement_2/S113.full.html

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Downloaded from by guest on May 4, 2016