

Reasons for Pacifier Use and Non-Use in African-Americans: Does Knowledge of Reduced SIDS Risk Change Parents' Minds?

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Abstract To investigate African-American parental reasons for pacifier use or non-use, and whether knowledge of the association with decreased SIDS risk changes decisions about pacifier use. We conducted focus groups and individual interviews with mothers. Grounded theory methodology was used. 83 mothers participated; 72.3 % of infants used pacifiers. Reasons for pacifier use included comfort/soothing, safety/SIDS, and preference over digit-sucking. Reasons for pacifier non-use included infant refusal, fear of attachment, nipple confusion, and germs. Many parents were unaware that pacifier use reduces SIDS risk; however, most parents of non-users did not think that this knowledge would have changed their decision. Reasons included skepticism about the pacifier-SIDS link. Many reasons underlie African-American parental decisions about pacifier use. Providers should provide information about the benefits of pacifiers. Establishing for parents any plausible link between the protective mechanism of pacifiers and SIDS pathophysiology may be important in promoting pacifier use.

Keywords SIDS · Pacifier · Parental decision · Decision-making · Racial disparity · Nipple confusion · Thumb sucking

Introduction

Despite the recent decline in rates, sudden infant death syndrome (SIDS) continues to be the leading cause of death for U.S. infants between 1 month and 1 year [1]. Furthermore, African-American infants die at four times the rate of Asian/Pacific Islander infants (who have the lowest SIDS rates) and more than twice the rate of white, non-Hispanic infants [2]. Although it is yet unclear why this disparity exists, biological and behavioral factors likely play a role [3–6].

Studies, including 2 meta-analyses [7, 8], have reported that pacifier use at sleep time is associated with a decreased risk of SIDS (odds ratios 0.39–0.48), and later studies have shown, with odds ratios as low as 0.10 [9, 10], that the risk of SIDS may be decreased as much as 90 %. Additionally, pacifier use may favorably modify the risk associated with other factors, such as prone positioning and bedsharing [9, 11]. The mechanisms by which pacifier use reduces the risk of SIDS are not fully understood, but increased arousability, changes in autonomic control, and maintenance of the airway during sleep are possibilities [12–16].

The American Academy of Pediatrics (AAP) recommends that parents consider pacifier use for their infants at naptime and bedtime [17]. However, there has been concern that widespread pacifier use may have detrimental effects with regards to breastfeeding duration, [18] dental malocclusion, [19] and infections [20–22]. One study has reported on reasons that parents change their mind about pacifier use [23], but no studies to date have investigated

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parental attitudes about pacifier use. Given that pacifier use may provide an additional SIDS risk reduction strategy for infants who are demographically at high risk and may have a positive impact on the current racial disparity seen in SIDS, we conducted a qualitative study of African-American parents to better understand factors influencing decisions regarding pacifier use, and explore whether knowledge that pacifier use reduces SIDS risk would affect parent decision-making.

Methods

A qualitative study of African-American parents, using grounded theory methodology, was conducted to examine factors influencing decisions regarding pacifier use. This was part of a larger, mixed-method study investigating parental decision-making processes about infant care practices pertinent to SIDS risk. Qualitative interviewing is frequently used to better understand motivations and perceptions underlying health decisions [24, 25] and relies on obtaining the widest possible range of perspectives [26] through systematic, purposeful sampling [27, 28]. We therefore selected two different qualitative interview formats. Focus groups provide participants in a group of people with similar backgrounds with a comfortable forum to express opinions; [29] however, socially sensitive topics might be more likely to be raised in individual, in-depth, semi-structured interviews [30]. In grounded theory methodology, the data (quotes from interviews) are used to generate concepts and categories (groups of similar concepts), which in turn are used to generate the theory; thus, the theory is grounded in the data [26]. Grounded theory methodology is helpful in understanding how beliefs and attitudes influence behavior and practice [26]. The institutional review boards at Children's National Medical Center, MedStar Research Institute, and Holy Cross Hospital approved this study.

Sample

We enrolled a cross-sectional sample of African-American parents with infants 0–6 months of age in Washington, DC and Maryland. We intentionally recruited parents of both lower and higher socioeconomic status (SES) to assure a broad range of experience, influences, and attitudes. SES was determined by parental educational attainment and eligibility for Medicaid and WIC (The Special Supplemental Nutrition Program for Women, Infants and Children). The latter two were used as proxies for family income, as they are easily verifiable and do not rely upon self-report.

Families were enrolled for the larger, mixed-method study from newborn nurseries, urban pediatric primary care centers, WIC sites, private pediatric practices, advertisements in newsletters, and on-hold messages played during calls to Children's National Medical Center. Parents who were at least 18 years old and a custodial parent of a child <6 months old were eligible to participate if they self-identified as African-American, and if their parents (i.e., the infant's grandparents) were both born in the United States. This criterion was designed to be highly specific so as to minimize cultural heterogeneity. A parent was also excluded if the infant was born prematurely (gestational age <36 weeks) or had any chronic illnesses requiring subspecialty or inpatient care.

After written informed consent was obtained, parents participated in a 15 min, staff-administered quantitative survey that asked about knowledge, attitudes, and practices regarding infant care, and family demographics. This survey has been validated by the authors and used previously [31–33]. Based on responses to this survey, a purposeful sample of parents who were predicted to have a wide range of opinions was asked to participate in either a focus group or individual interview.

Procedures

All interviews were conducted by trained facilitators (RPO, BLJ), who used the same interview guide for both interview formats. Questions asked about infant care and parental decision-making, including factors influencing parental decisions about pacifier use (Table 1). In both formats, broad, open-ended questions were followed by more specific, probing questions to elucidate responses.

We anticipated that a minimum of 10 focus groups and 10 individual interviews would be conducted, as we assumed that 3–4 semi-structured interviews and 3–4 focus groups with any one type of participant (e.g., lower or higher SES, breastfeeding or formula feeding, pacifier use or non-use) would be necessary [34] to allow for thematic saturation (the point at which no new themes are emerging) and for analysis across groups for themes and patterns.

Analysis

All interviews were recorded and transcribed by the authors. After initial transcription, the transcript was checked by two additional authors for accuracy. If there was disagreement about the transcription, all authors listened to the recordings to reach consensus. This multi-step process was used to maximize accuracy and eliminate bias from the transcription process.

Qualitative analysis software (NVivo 8) [35] was used to organize, sort and code the data (quotes). Using

Table 1 Pacifier use questions for focus groups and individual interviews

General questions	Probing questions
How do you feel about pacifiers?	Does your baby use a pacifier? Is using a pacifier a good thing or a bad thing?
Should there be an age requirement for pacifiers?	How young is too young to use a pacifier? Why do you feel that way?
When did your baby start using a pacifier?	Why did you allow your baby to use a pacifier? Why didn't you allow your baby to use a pacifier?
Has anyone ever talked to you about using a pacifier?	What did they say? Where did you receive the information?
What are the advantages to using a pacifier?	
What are the disadvantages to using a pacifier?	
If you were against pacifiers and were told that using a pacifier decreased the chances of your baby dying from SIDS, would that change your mind?	What would you need to hear to make you change your mind?

grounded theory methodology, codes were grouped into concepts, and concepts were grouped into categories; all of these were developed and revised in an iterative manner as patterns within the data became more apparent [26]. In weekly meetings, authors discussed emerging concepts, categories, and patterns in the data and reached consensus on the major concepts and categories. Individual interviews and focus group interviews were analyzed separately, after which emerging concepts and categories were compared. Concurrent triangulation, or use of multiple sources for verification of findings [36], of the focus group interviews and the individual interviews was used to confirm findings [37]. Our findings were additionally corroborated through peer review and feedback during presentations to community groups, pediatric and SIDS researchers, and maternal and child health professionals.

Results

Sample

Between July 2006 and December 2008, we conducted 13 focus groups and 10 individual interviews with 83 parents (73 participated in focus groups; 10 individual interviews) and reached thematic saturation. All participants were mothers. Focus group attendance averaged 4.9 (range, 3–7)

participants. Participant demographics are described in Table 2. At the time of the interview, the mean infant age was 5.4 months (range 1.1–9.3 months), and 60 (72.3 %) mothers reported routinely using a pacifier with their infant. 82 % of pacifier users started pacifier use in the first week of life (range 1–90 days). Participants ($n = 83$) and nonparticipants ($n = 302$) were statistically similar with regards to maternal age and marital status, infant age and gender, Medicaid status, or presence of older children, the other parent, or a senior caregiver in the home; they were also similar with regards to infant care practices, such as type of feeding, bedsharing, and sleep position. These variables were also statistically similar for pacifier users and non-users.

Central Concepts

There were several concepts with regards to the parental decision to use or not use a pacifier for their infant (Table 3). Infant comfort, safety, preference over finger sucking, concerns about teeth and gums, and aesthetics were concepts for pacifier use. Infant refusal and concerns about attachment to the pacifier, growth, future dental problems, nipple confusion, and infection were concepts for pacifier non-use. Mothers also discussed pacifier use in the newborn nursery. Finally, mothers were asked about their knowledge of the association of pacifier use and SIDS risk, and how that knowledge might influence their decisions. Matrix analysis found that, regardless of SES or interview format, concepts were similar in all groups. However, as described below, infant comfort as a reason for pacifier use was a more prominent concept for mothers who were currently breastfeeding or who had breastfed. These concepts are described below, with illustrative verbatim quotes (Q) in the accompanying tables.

Reasons for Pacifier Use (Table 4)

One of the commonly cited reasons for pacifier use was infant comfort, which referred to calming and soothing of the infant. These mothers found that the pacifier helped their infant sleep, stopped the crying, and satisfied the need to suck (Q1, 2). Several mothers described how the calming and comforting qualities of the pacifier made caring for the infant easier, especially at night, when the mother wanted to sleep (Q3, 4). The concept of infant comfort was particularly prominent among mothers who were currently breastfeeding or who had breastfed. These mothers appreciated the fact that they could use the pacifier to console the infant when s/he wanted to suck but was not hungry (Q5).

Pacifiers were also used for safety reasons. Some mothers found that the sound of sucking allowed them to monitor their sleeping infants (Q6); others cited their

Table 2 Characteristics of focus group and individual interview participants (n = 83)

	N (%)
Maternal age: mean age 27.4 (range 18–42)	
18–24	27 (32.5 %)
25–29	27 (32.5 %)
30–34	17 (20.4 %)
35 or older	11 (13.3 %)
Did not answer	1 (1.2 %)
Maternal marital status	
Never married	62 (74.7 %)
Married	20 (24.1 %)
Divorced/separated	1 (1.2 %)
Maternal education	
Did not complete high school	9 (10.8 %)
Completed high school or GED	54 (65.1 %)
Completed 4 year college	20 (24.1 %)
Infant gender	
Female	39 (47.0 %)
Male	44 (53.0 %)
Older children in home	
No	28 (33.7 %)
Yes	55 (66.3 %)
Other parent in home	
No	35 (42.2 %)
Yes	48 (57.8 %)
Senior caregiver in home	
No	59 (71.1 %)
Yes	24 (28.9 %)
Maternal smoking	
No	76 (91.6 %)
Yes	7 (8.4 %)
Breastfeeding	
Never breastfed	28 (33.7 %)
Started breastfeeding but stopped	24 (28.9 %)
Still breastfeeding (partially) at time of initial survey	16 (19.3 %)
Still breastfeeding (exclusively) at time of initial survey	15 (18.1 %)
Pacifier use	
No	23 (27.7 %)
Yes	60 (72.3 %)
Roomsharing (parent–infant) night before initial survey	
No	8 (9.6 %)
Yes	75 (90.4 %)
Stated infant sleep position night before initial survey	
Supine	52 (62.6 %)
Supine/side	3 (3.6 %)
Side	14 (16.9 %)
Prone	14 (16.9 %)
Bedsharing (parent–infant) night before initial survey	
No	58 (69.9 %)

Table 2 continued

	N (%)
Bedsharing for part of night	13 (15.7 %)
Bedsharing for entire night	12 (14.4 %)
Medical insurance status	
Medicaid	55 (66.3 %)
Commercial insurance	28 (33.7 %)

knowledge that pacifier use is recommended to reduce the risk of SIDS and theorized about the mechanism through which pacifiers might be protective (Q7, 8).

A large proportion of mothers who chose to use pacifiers expressed preference of pacifier use over finger sucking. Some of these mothers preferred the pacifier because it was easier to clean than the fingers or because they were concerned about skin rashes from finger sucking. However, most of these mothers felt that it would be easier to stop pacifier use than finger sucking (Q9). Some mothers also believed that pacifier use would promote healthy teeth and gums, particularly if the pacifier was promoted as an “orthodontic pacifier” (Q10). Finally, several mothers thought that an infant using a pacifier was an appealing image (Q11).

Reasons for Pacifier Non-Use (Table 5)

One of the most commonly cited reasons for pacifier non-use was infant refusal. These mothers wished that their infant would use a pacifier and had offered the pacifier to their infants multiple times without success (Q1, 2).

For mothers who did not want their infant to use the pacifier, fear of attachment to the pacifier was frequently discussed. Parents described their own experiences or experiences of others with the difficulties of weaning the child from pacifier use (Q3, 4). Some mothers specified an age at which they no longer thought that the pacifier was appropriate.

For breastfeeding mothers, a reason for pacifier non-use was the concern that the infant would begin to refuse the breast if the pacifier was introduced. Some mothers did not believe that pacifier use was compatible with breastfeeding (Q5, 6). Other reasons for pacifier non-use included concerns about germs, dental problems, and growth (Q7–9).

Pacifier Use in the Newborn Nursery (Table 6)

Although the interview instrument did not specifically ask about pacifier use in newborn nursery settings, when mothers were asked if anyone ever talked to them about using a pacifier, the discussion almost invariably turned to

Table 3 Categories and concepts about pacifiers

Categories	Concepts
Reasons for pacifier use	Comfort/soothing
	Aesthetics
	Safety/SIDS
	Promotion of healthy teeth/ gums/jaws
	Preference over finger sucking
Reasons for pacifier non-use	Infant refusal
	Fear of attachment
	Worry about growth
	Nipple confusion
	Dental problems
	Germs
If told pacifiers reduce the risk of SIDS, would it matter?	Link between SIDS and pacifier use is implausible
	Need to understand the mechanism
	Disadvantages outweigh advantages

this. Mothers in all interviews reported that their infant had been given a pacifier by newborn nursery staff, sometimes without the parents' knowledge and/or consent (Q1). While some mothers were not bothered by this, others considered this to be an affront to the parent's authority and believed that the parent should be asked before the pacifier was offered to the infant (Q2, 3). Many mothers felt that, once the infant had been given the pacifier, they could not take it away if the infant liked it (Q4).

Knowledge of Association of Pacifier Use and Decreased SIDS Risk and Potential Impact on Maternal Behavior (Table 7)

Mothers were specifically asked, "If you were against pacifiers, and were told that using a pacifier decreased the chances of your baby dying from SIDS, would that change your mind?" For mothers who chose not to use a pacifier for a specific reason (as opposed to the mothers who unsuccessfully attempted pacifier use), many expressed skepticism about the association of pacifiers and SIDS. Because SIDS is defined as death from an unknown cause, the idea that pacifiers could reduce the risk of an entity for which the cause is unknown was often described as being implausible (Q1, 2). Other mothers stated that they would weigh this potential benefit against other perceived advantages and disadvantages before making a decision about pacifier use. Some mothers expressed the need to understand the mechanism by which pacifier use was protective against SIDS in order to be convinced (Q3). For several

Table 4 Reasons for pacifier use

1. "To me it's a comfort thing... as long as they are comfortable and they are not hollering and screaming, they can have it"
2. "It soothes her between feedings. When she's sleepy, she uses it sometimes to help her doze off"
3. "Well, initially I didn't have one but when she first came home, she was a little too fussy, especially at night when it was time to sleep. So I went out and purchased one"
4. "I mean if your baby is crying and you know a paci works for her and you have to get up in the morning; you're probably going to reach for the paci, you know?"
5. "For me it was because my son likes to suck a lot, and I'm nursing so I don't want him always to be on [my] breast all day long. He not hungry, you know, he just wants to suck on something"
6. "As long as she has the pacifier at night she is constantly sucking on it... I hear it, see it, so that's the biggest advantage right there... I'm like, 'ok, she's breathing; I can hear her'"
7. "I heard that the baby would, while they're asleep, stay more alert because they have to, you know, stay kind of awake to keep it in their mouths"
8. "...They think babies, when they sleep, they fall into a deep sleep and they can't wake back up, and they was telling me that the suction keeps them alert. When it comes out, they're looking for it. But when they don't have nothing to suck on, they slip into a deep sleep, and they might not wake back up"
9. "I really didn't want my children sucking their fingers, so when I saw him sucking his fingers... I was like, well I'll do the pacifier versus the finger, because I felt like at one point I could take the pacifier"
10. "And now that she is teething a lot... I want her to have it, because they come out with these pacifiers now that are orthodontic that promote healthy teeth and gums"
11. "I think they be cute with the pacifier in"

mothers, the disadvantages of pacifier use outweighed the advantage of using a pacifier to reduce the risk of SIDS (Q4).

Discussion

There is increasing literature about the protective association of pacifier use and SIDS [7–11, 18, 38–44]. Pacifier use may be particularly important in mitigating risk associated with factors such as prone positioning and bed-sharing [9, 11], both of which are more prevalent in African-Americans [5, 45–54]. However, although one Norwegian study has described reasons that parents change their minds about pacifier use [23], no studies have explored reasons why parents choose to use pacifiers or not. Our interviews with African-American mothers have found that multiple factors, including concerns about infant comfort, infant safety, attachment to the pacifier, dental problems, nipple confusion, and infection, may impact on parental decision to use or not use a pacifier. Furthermore,

Table 5 Reasons for pacifier non-use

1. “I wish [he] would take it...he realizes there’s no milk coming out of it and spits it out”
2. “He won’t take the pacifier at all. I have tried every pacifier; I done went out and bought every pacifier”
3. “I mean, well, the baby can be hooked on the pacifier and 5 years from now she’s still sucking on the pacifier”
4. “I got a 18 year old sister that still has a pacifier. So no”
5. “They recommend using pacifiers and they recommend breastfeeding, but the two don’t go hand in hand”
6. “So, you know I didn’t introduce it cause I didn’t want to have problems... having her latch on and that type of thing”
7. “I just would rather her to suck on her finger because I don’t want to be running every 5 s to go sterilize the paci”
8. “[My mother] used to always tell me the pacifiers would like push your teeth out and all of that kind of stuff”
9. “That’s my other reason for not liking to give pacifiers... they don’t grow as rapidly as they grow in those first few months when they don’t have pacifiers”

Table 6 Pacifier use in the newborn nursery

1. “When they come in they’re all wrapped up; they already have it in their mouth”
2. “It should be the parent’s option. They should be able to ask you, ‘do you want your child to have a pacifier?’”
3. “Well we had this episode in the hospital... they had taken the baby for a check-up because I was getting ready to get discharged and when [the baby] came back she had the pacifier in her mouth. Yeah, and I don’t do pacifiers at all, so I was not happy. Because the nurse didn’t ask me, no one at the hospital asked me, ‘Is it ok to give her the pacifier?’”
4. “If it was up to me she would probably have never got it”

many parents are unaware of or skeptical of the recommendations to use a pacifier for SIDS risk reduction.

Frequently cited reasons for pacifier use were infant calming and preference over finger sucking. Many mothers perceived that it would be less difficult to wean the infant off of the pacifier than to stop the finger sucking. Pacifiers were originally designed to soothe cranky or colicky infants, promote and continue restful sleep, and reduce the pain of teething [55]. Pacifier use may frequently be initiated in an attempt to get the infant to sleep, so that the parent can sleep. In addition, the habit of pacifier usage is easier to stop than thumb sucking [56].

A commonly cited reason for pacifier non-use was fear of attachment to the pacifier. The longer the duration of pacifier use, the more difficult it can be to discontinue use [57]. For some parents, this concern about attachment related to dental concerns. All forms of sucking (pacifier, digit, bottle nipple) pose a risk to the growth and formation of the teeth and jaws [58]. The longer the duration of pacifier use, the greater the potential for deleterious effects

Table 7 Knowledge of association of pacifier use and decreased SIDS risk and potential impact on maternal behavior

1. “It would not make me do it because I still don’t know what SIDS is. So if you were to tell me to do this thing about this thing that you really don’t know what that thing really is. So it’s like, you’re not too sure about SIDS, so then how can you be so sure that this is going to stop it?”
2. “It wouldn’t just make me turn around and say, ‘oh yeah, let me give you the pacifier’”
3. “They’d have to tell me more. They would have to connect that for me...”
4. “I don’t think so, that sanitary thing, that’s a big thing for me; I still don’t; no. Uh uh”

on the dentition [59]. However, dental malocclusions secondary to pacifier use generally resolve after pacifier use is stopped [19]. The American Academy of Pediatric Dentistry, in its policy statement about non-nutritive sucking, recognizes that this is common and developmentally normal behavior and states that there is little danger of permanent harm to the teeth if the pacifier is discontinued by 3 years of age [60].

Conversely, several mothers chose to use pacifiers, specifically “orthodontic” pacifiers, to promote healthy teeth and gums. Orthodontic pacifiers are specially designed to support the development of the shape of the palate and upper jaws and claim to encourage a natural suckling that compliments jaw development [61]. However, there is little evidence in the literature to suggest that “orthodontic” pacifiers have any statistically significant benefit over “normal” pacifiers [61].

There was a great deal of uncertainty among mothers regarding the compatibility of pacifier use and breastfeeding. Nipple confusion was a term familiar to the mothers and a phenomenon that they wanted to avoid. However, when the pacifier is introduced after breastfeeding has been established, there is little risk for nipple confusion [62], and pacifier use does not impact on the duration of breastfeeding [62–64]. Both the AAP Task Force on SIDS and the AAP Section on Breastfeeding state that pacifier use for breastfed infants should be postponed until breastfeeding is well established [17, 65–67].

Although some mothers described the association of pacifier use and a reduced risk for SIDS, this knowledge was not universal. In addition, even for some mothers who were knowledgeable, the mechanism of protection was not clear. Researchers have hypothesized that the protective effect of pacifiers may be due to increased arousability, changes in autonomic control, or maintenance of the airway during sleep [12–16]. However, the protective effect conferred by pacifier use persists even if the pacifier falls out of the mouth, which it frequently does within minutes after the infant falls asleep; [12, 68] this makes the possible

mechanism of protection even less clear. It is possible that pacifier use is itself not protective, but a marker for some yet unidentified protective factor or factors. Nonetheless, for many mothers, this lack of certainty about the mechanism of protection may create skepticism of the recommendation. For many parents, plausibility of the link between a risk or protective factor and SIDS may be important in their decisions about adopting safe sleep recommendations [32].

There were strong opinions expressed about the perceived inappropriateness of newborn nursery staff offering pacifiers to the infant without parental knowledge and/or consent. Pacifiers may be used for several reasons by nursery staff, including calming after a painful procedure (such as blood drawing or circumcision) [69, 70], calming of the infant, and SIDS risk reduction. However, it may be advisable for nursery staff to inform the parents about the reasons for offering the pacifier before doing so, such that parents are able to make an informed decision about pacifier use.

We acknowledge that the population for the study was limited to African American mothers within the Washington DC area, and thus these findings may not be generalizable. Further, the demographic and behavioral characteristics of our sample were slightly different from those of African-Americans nationally. Our breastfeeding rates were higher (66.3 % ever breastfed, 37.4 % still breastfeeding) than national breastfeeding rates for black infants (58.9 % ever breastfed and 30.1 % still breastfeeding at 6 months) [71]. Almost one quarter (24.1 %) of our sample had at least a bachelor's degree, compared with 19 % of African-American adults nationally [72]. In addition, because this is a qualitative study, these findings cannot determine prevalence of specific opinions or beliefs. However, other findings about sleep position and sleep location from these focus groups have been consistent with other studies in both African-American and European populations.[73–78]. Nonetheless, it will be important to include other racial/ethnic groups and geographic areas to determine how prevalent these beliefs are in the society as a whole.

Conclusion

As with all infant care practices, there may be multiple factors influencing the parental decision to use or not use a pacifier for the infant. Some of these factors (e.g., concerns about nipple confusion, dental concerns) may be the result of misinformation. As pacifier use has been associated with a reduced risk for SIDS, it is important for health care providers to understand and be able to address the concerns that parents may have about pacifier use. In the hospital

setting, providers should be aware that parents may have strong preferences about knowing about and consenting to pacifier use, even for medical purposes, but in soliciting parental preferences regarding pacifier use, providers can use this opportunity to provide information regarding the benefits of pacifier use with regards to SIDS risk reduction to better inform parental decisions. Finally, establishing for parents any plausible link between the protective mechanism of pacifiers and SIDS pathophysiology may be important in promoting pacifier use for infants.

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