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Knowledge, Attitudes, and Beliefs About Safe Sleep Among Preconception Adolescents

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Abstract

Background–To protect against SUID/SIDS, the American Academy of Pediatrics (AAP) released recommendations on creating a safe sleep environment. Studies about teen parents indicate gaps in knowledge regarding infant safe sleep practices, however there are no published studies about adolescents who are preconception.

Objective–To investigate adolescents’ knowledge, attitudes, and beliefs regarding infant safe sleep practices prior to conceiving.

Methods–This was a cross-sectional study of adolescents aged 14-22 years recruited from two outpatient primary care pediatric sites in southern NJ. Following consent, participants completed a 27-question survey about infant safe sleep practices. For analysis, a knowledge score was calculated on a scale of 1-100% and differences by ethnicity, race, age, gender, and caregiver experience were evaluated.

Results–A total of 147 subjects were enrolled. Forty-three participants (27.9%) self-identified as Hispanic or Latino, 53 (39.0%) as Black or African American, and 65 (47.8%) as Caucasian. The mean knowledge scores were 47.25%, 55%, and 53.33% for Blacks, Caucasians, and other races, respectively ($p=.009$). There were no significant differences in knowledge scores between gender, age group, Hispanic ethnicity, or caregiver experience. Eighty-two subjects (55%) identified preconception as an ideal time period to learn about safe sleep practices.

Conclusion–A significant knowledge gap was observed among subjects, and Black subjects had the lowest knowledge scores. Most adolescents identified preconception as an ideal time period to learn about infant safe sleep practices. Safe sleep promotion may be enhanced through SUID/SIDS education in high schools, or conversations during adolescent well visits.

INTRODUCTION

Sudden unexpected infant death (SUID), which encompasses all sudden infant deaths including sudden infant death syndrome (SIDS), unknown causes, and accidental suffocation and strangulation, remains one of the leading causes of death in infants 1 month to 1 year of age.¹ To reduce the rate of SUID, the “Back-to-Sleep,” now known as “Safe to Sleep,” campaign was initiated in the 1990s as a collaboration between the National Institute of Child Health and Development, the American Academy of Pediatrics (AAP), the Maternal and Child Health Bureau of Health Resources and Services Administration, and SIDS groups.¹ The focus of this campaign was to raise awareness about safe sleep practices among caregivers--parents, grandparents, childcare providers, health care providers, and others. As a result, the incidence of SIDS declined from 130.3 deaths per 100,000 live births in 1990 to 35.4 deaths per 100,000 live births in 2017.²

Although the number of infant deaths has plateaued in recent years, deaths classified as accidental suffocation and strangulation have increased.^{1,2} In 2017, the rate of accidental suffocation and strangulation was 24.6 deaths per 100,000 live births, compared to 0.2 deaths per 100,000 live births in 1990,² partially due to a diagnostic shift.³ In addition, significant disparities continue to exist between racial/ethnic groups, with SUID rates being consistently higher in non-Hispanic Blacks (NHB) and American Indian/Alaska Native (AI/AN) groups.² One study suggested NHB mothers may have lower self-efficacy to prevent accidental suffocation compared to whites, regardless of socio-demographics.⁴

Researchers have sought reasons to explain higher rates of SUID among NHB and AI/AN by examining barriers to adherence to safe sleep recommendations. One study found that although NHB and AI/AN parents are aware of safe sleep recommendations their health care providers did not address their individual concerns. This resulted in their reliance on what they perceived to be safe and comfortable for their child.⁵ Another study found that Pakistani mothers in the U.K. often favored their traditional practices, such as using pillows, regarding infant safe sleep when SIDS-reduction guidance conflicted with their beliefs.⁶

While maternal age <20 years is associated with a higher risk of SUID,¹ studies about safe sleep recommendations among adolescents have focused on adolescents who are already mothers. In one such study, most knew about the AAP recommendations but implemented practices contradictory to the recommendations.⁷ While some mothers relied on their instincts rather than professional advice, others sought advice from family members.⁷ There are no published studies about adolescents' awareness or beliefs regarding safe sleep practices in those who have not yet become pregnant or are parenting, "preconception" adolescents. Therefore, the aim of this study was to ascertain knowledge and attitudes about safe sleep among preconception adolescents and explore whether there was a difference based on race/ethnicity. We hypothesized that there would be gaps in knowledge and attitudes, as well as disparities in these gaps, that could be identified to target future educational opportunities.

METHODS

This was a cross-sectional study of preconception adolescents aged 14-22 years recruited from

two outpatient primary care pediatric sites in Southern NJ, a convenience sample. Participants aged 14 to 16 were considered younger adolescents, while participants 17 and older were considered older adolescents, with more mature cognitive functioning and more likely to conceive within a few years of study. After written assent and parental and/or legal guardian consent was obtained, a 27-question survey about safe sleep recommendations and demographics was completed. Participants self-identified as Hispanic or Latino, Black/African-American, Caucasian, and American Indian/Alaska Native, or Hawaiian, the last two categories were combined for analysis. Participants were excluded if their primary language was not English or if they suffered from a condition rendering them unable to complete the survey, such as an intellectual disability.

Participants who met inclusion criteria were identified using the Cooper University Hospital EPIC software system. Subjects were in the clinics for general health maintenance visits, follow-up visits, or consultation visits. Research team members entered individual patient rooms either before or after their doctor's visit, introduced the study, purpose of the study, and asked whether they would volunteer to complete the safe sleep survey. After signing consent and assent, each survey was completed in the patient room and took approximately 15 minutes to complete. Upon completion of the survey, research team members collected the survey and provided each participant with a two-page safe infant sleep education brochure.

Knowledge scores were calculated on a scale of 1-100%, and differences by race and ethnicity, age, gender, and prior caregiver experience were evaluated using a chi-square, Fisher's exact, and one-way ANOVA. Prior caregiver experience was defined as babysitting or caring for a

sibling who is an infant. Attitudes and beliefs were assessed using specific questions about perception of danger, such as prone sleeping, using Likert scales that were dichotomized into dangerous or not. Attitudes and beliefs were analyzed based on race/ethnicity using logistic regression.

The STROBE guidelines were utilized to ensure an accurate report of the study design and details.⁸ This study received approval from the Cooper University Hospital Institutional Review Board.

RESULTS

A total of 154 subjects aged 14-22 years were enrolled from Cooper Pediatrics in Camden, NJ, and Voorhees, NJ. Knowledge scores were calculated for 147 participants. Forty-three participants (27.9%) self-identified as Hispanic or Latino, 53 (39.0%) as Black or African American, sixty-five (47.8%) as Caucasian, and 18 (13.2%) as another race (Table 1). Regarding gender, 72 participants (48.3%) identified as male, 76 participants (51%) as female, and 1 participant (0.67%) as gender non-binary (Table 1). Of the 147 subjects, 98 (66.7%) participants were younger adolescents, and 49 subjects (33.3%) were older adolescents (Table 1). Regarding childcare experience, 22 participants (15%) reported providing childcare for a child less than 1 year of age.

The mean knowledge score for all participants was 51.5% (SD 12.57). The mean knowledge scores were 47.25%, 55%, and 53.33% for Blacks, Caucasians, and other races, respectively ($p=0.009$). Mean knowledge scores did not differ between groups based on age group, gender, Hispanic ethnicity, or caregiver experience. There were a number of survey questions answered

incorrectly by a majority of respondents. The question most commonly answered incorrectly was Q18 which asked respondents to identify which items should be placed in a baby's sleeping area. To answer correctly, subjects would need to identify 2 items as being acceptable (firm mattress and fitted sheet), and 6 as being unacceptable (diapers, clothes, crib bumpers, stuffed toys, soft blankets/comforters, and pillows). Of the 156 participants who answered this question, 153 participants (98.1%) were unable to accurately identify which items are safe to place in a baby's sleeping area (Table 2).

We sought to understand participants' attitudes and beliefs about infant safe sleep practices. When asked whether a child "sleeping on his/her stomach" was dangerous or not, White respondents were 3.6 times more likely than Blacks (95% CI, 1.64-8.2; $p=0.002$) to consider a baby sleeping on their stomach as dangerous (Figure 1). When participants were asked whether "sleeping with adults and other kids in the same bed" is very dangerous or dangerous, there was no significant difference between White and Black respondents. In addition, we solicited opinions regarding the most effective time frame to learn about safe sleep practices, as well as the preferred source of guidance.

When participants were asked to identify the best time to learn about safe sleep practices, 82 participants (55.0%) preferred before pregnancy (Figure 2). When participants were asked about the best way to learn about safe sleep practices, 139 participants (91.4%) preferred a discussion with a doctor. The second most popular method was workshops with an expert, with fewer than 10% preferring social media, text messages, or emails. Finally, 70% of respondents believe SIDS is preventable regardless of age, gender, race/ethnicity, or caregiver experience.

DISCUSSION

Our results revealed a significant knowledge gap regarding awareness of infant safe sleep recommendations among preconception adolescents. The knowledge gap was most significant when considering race, with Black subjects having the lowest knowledge scores compared to other races. Considering that African-Americans have 2.3 times the infant mortality rate as non-Hispanic whites, and SUID accounts for a significant proportion of the disparity in infant death⁹, this new finding of a racial disparity in SUID knowledge beginning as early as adolescence calls for an earlier intervention. Interestingly, adolescents have identified preconception as an ideal time period to learn about safe sleep and most preferred discussions with their doctors. This understanding of preconception adolescents' opinions regarding the preferred time frame to learn about safe sleep practices is key to the development of new approaches to promote safe sleep practices that are effective for this high-risk group. Given that 70% of survey respondents believe SIDS is preventable, refocusing SUID/SIDS education efforts to the adolescent population may improve future adherence to safe sleep recommendations.

Safe sleep recommendations to place infants supine, avoid the use of soft bedding, including crib bumpers, blankets, pillows, and soft toys, and using an approved crib or bassinet have potential to decrease the risk of sleep-related deaths.¹ Previous studies exploring adherence to AAP safe sleep recommendations among adolescents have revealed that most adolescent mothers are aware of AAP recommendations and the risk factors associated with SUID but are confident in their own parenting knowledge and abilities.⁷ Many rely on their own mothers as a primary source of parenting information while they rely on clinical providers for medical concerns outside the scope of safe sleep guidance.⁷ Additional studies have explored the influence of culture on the interpretation of SIDS-reduction guidelines and have elucidated the importance of targeted health messages that resonate with the intended audience. The aim of our study was to explore current knowledge, attitudes, and beliefs about

infant safe sleep recommendations among preconception adolescents. Considering that adolescent mothers are a demographic at high risk for SUID, we found it crucial to further explore some potential missed opportunities for SUID education. This is the first study assessing awareness of safe sleep recommendations among teens prior to pregnancy or parenthood.

Suggestions for improving awareness of safe sleep recommendations among the adolescent population include development of safe sleep learning modules that can be incorporated into the health education curriculum in high schools. School districts should consider investing in a babysitting course certification program that is mandatory for all high school students. When appropriate, clinicians should have conversations about safe sleep during adolescent well visits. Public health officials should focus on developing community partnerships with trusted organizations (e.g. local community-based organizations, faith communities, after-school programs) to increase community awareness of SUID risk reduction and prevention. In addition, hospitals could offer online or in-person age-appropriate babysitting and childcare training programs for age-appropriate children expecting a sibling.

There were several limitations to our study. First, we utilized a non-validated survey instrument. Most of the survey questions were created and deemed suitable for knowledge assessment by the authors of this study. Second, subjects completed the survey without the researcher present in the room. Although specifically directed to complete the survey independently, this set-up posed the possibility that an individual may have asked a guardian (via texting, or when present which was rare) about the answer to a given question. Third, subjects were provided with an introduction to the study either before or after their doctor's visit. Although each patient was given the projected length of time needed to complete the survey successfully, subjects may have been compelled to arbitrarily select an answer to leave the doctor's office in a timely manner. Therefore, there may be a lack of validity in survey scores. Fourth,

there were several subjects who partially completed the survey, and their responses were excluded from the analysis. We did not have data on the background characteristics of those not consenting or those with incomplete surveys, therefore the sample is subject to selection bias. While we did not calculate a sample size based on differences expected in the NHB vs. white population, the sample was adequately powered to show this difference. Fifth, all subjects were affiliated with Cooper University Health System and were from urban and suburban towns.

We did not record high school attended by study subjects, so were unable to determine if differences in responses by race were in fact due to differences in curricula offered by urban vs. suburban schools. In addition, we were unable to explore potential differences in knowledge among rural populations, or populations outside of the northeast. The population from which this sample was selected has both a high rate of adolescent pregnancy (Camden City teen pregnancy rate is twice that of the state of NJ), as well as high rate of infant mortality (twice the state rate).¹⁰ Therefore, safe sleep education may be more relevant to the sample population, despite lack of knowledge and beliefs in safe sleep practices. In addition, if the survey was administered to a non-clinical population, we may expect an even larger knowledge gap among adolescents. This could be attributed to the exposure and access to comprehensive, quality health care services, as well as the demographics of the population selected.

CONCLUSION

Although the number of sudden unexpected infant deaths has plateaued in recent years, deaths classified as accidental suffocation and strangulation are increasing. Adolescent mothers are a demographic at high risk for sleep-related infant deaths. In this study, a significant knowledge gap was observed among subjects, and Black subjects had the lowest knowledge scores. Mean knowledge scores did not differ

between groups based on age group, gender, Hispanic ethnicity, or caregiver experience. While these results indicate a significant knowledge gap among those surveyed, studying a larger population with a varied demographic would help to broaden our results. The findings from this study suggest the need for educational modules targeted to adolescents and preventative measures to help ensure that the percentage of infant mortality from SUID continues to decline.

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Table 1. Characteristics of study participants (n=156)

Characteristics	N (%)	Mean Knowledge Score
Gender		
Male	71 (48.2%)	49.58 (SD 13.67)
Female	75 (51%)	53.33 (SD 11.31)
Non-Binary	1 (0.68%)	---
Race		
Black	51 (43.2%)	47.25 (SD 13.13)
White	64 (54.2%)	55.00 (SD 11.82)
Other	3 (2.5%)	53.33 (SD 11.55)
Ethnicity		
Hispanic	43 (28.7%)	52.63 (SD 12.01)
Non-Hispanic	107 (71.3%)	51.59 (SD 12.37)
Age Group		
14-16	98 (66.7%)	51.94 (SD 12.89)
17 and up	49 (33.3%)	50.61 (SD 11.97)
Caregiver Experience		
Caregiver	22 (14.9%)	50.91 (SD 14.11)
Non-caregiver	125 (85.0%)	51.6 (SD 12.33)

Table 2. Safe Sleep Survey: questions most commonly answered incorrectly

	Safe Sleep Survey Questions									
	Q13	Q14	Q15	Q17	Q18	Q19	Q20	Q21	Q22	Q25
Total Answered	151	150	156	156	156	156	156	156	156	156
Total Blank	5	6	0	0	0	0	0	0	0	0
Number Correct	147	116	17	143	3	87	27	17	117	105
Percent Correct	97.4%	77.3%	10.9%	91.7%	1.9%	55.8%	17.3%	10.9%	75.0%	67.3%
Number Incorrect	4	34	139	13	153	69	129	139	39	51
Percent Incorrect	2.6%	22.7%	89.1%	8.3%	98.1%	44.2%	82.7%	89.1%	25.0%	32.7%
					Most Incorrect					

†**Questions and answers to Safe Sleep Survey:** Q13. Should every baby have his/her own crib or bassinet? A. *yes* or no Q14. True or False: Sudden Infant Death Syndrome (SIDS) is the leading cause of death of babies less than one year of age A. *true* or false Q15. What do you consider safe sleep practices for babies? (check all that apply) A. *sleeping in own room*, sleeping in parents' room, *sleeping on his or her back*, sleeping on his or her own stomach, sleeping on

his or her side, sleeping with a soft blanket and pillows from comfort, *sleeping in a crib or bassinet*, and/or sleeping in a crib with stuffed toys Q17. Where should a baby sleep for most of the night? (chose one) A. In parents' bed, *crib or bassinet*, on the couch, or in a car seat or swing set Q18. Which items should be placed in the baby's sleeping area? (check all that apply) A. *firm mattress*, diapers, clothes, crib bumpers, stuffed toys, *fitted sheet*, soft blankets/comforters, and/or pillows Q19. In what position should a baby be placed to sleep? (choose one) A. stomach, *back*, side, or all the above Q20. When is it okay to use a car seat to put a baby to sleep? (choose one) A. nap time only, *only in car*, or never Q21. For naps, it is safest for a baby to sleep (check all that apply) A. In parents' bed, *in his/her crib*, in a playpen, in a car seat, and/or on the couch Q22. True or False: After traveling, it is safe for a baby to stay asleep in his/her car seat at home? A. true or *false* Q25. Do you agree or disagree with this statement: "There are ways in which sudden infant death syndrome (SIDS) can be prevented"? A. *agree* or disagree

Figure 1. Participants’ response to survey question “How dangerous is it for a baby to sleep on his/her stomach?”

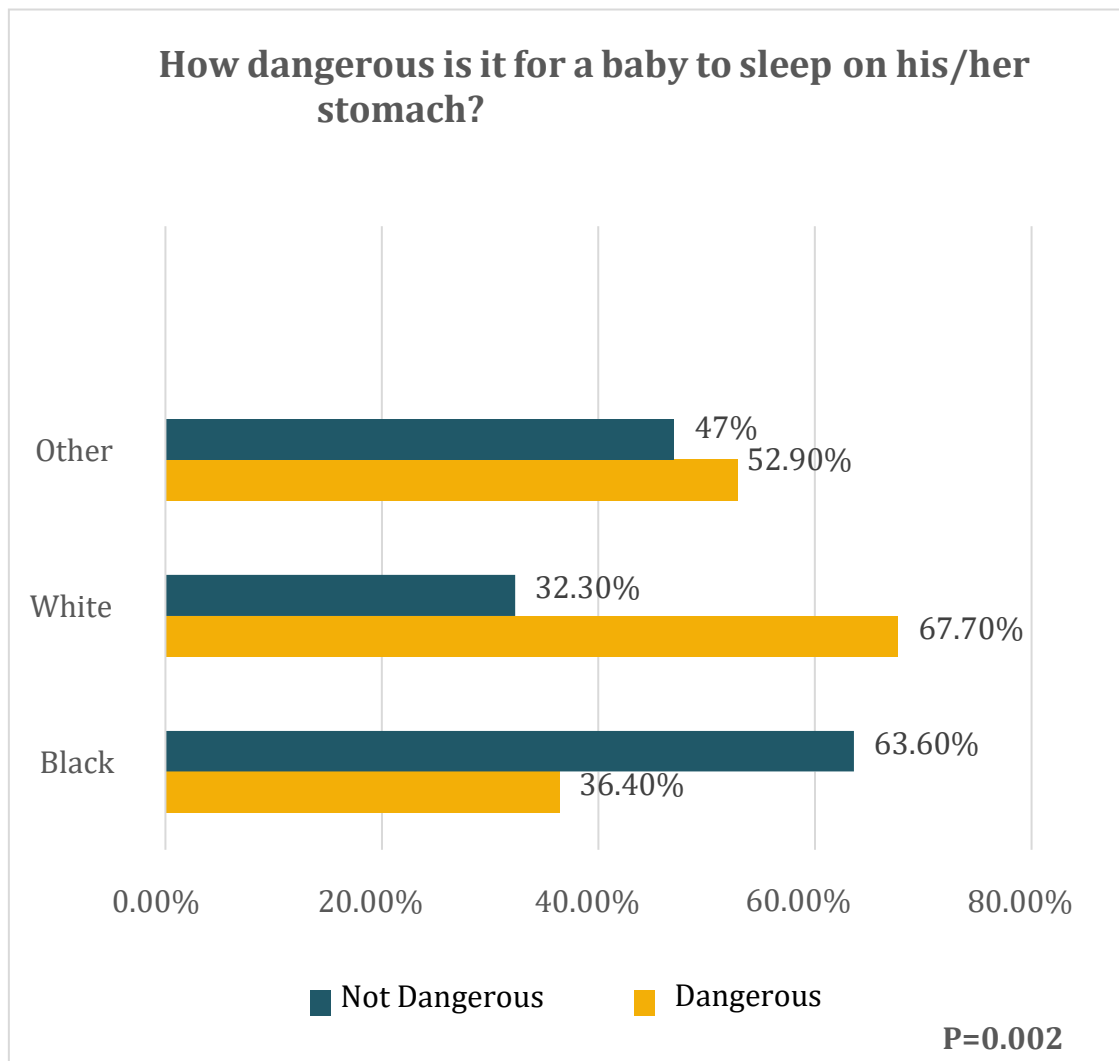


Figure 2. Participants' response to survey question "When is the best time to learn about safe sleep practices?"

