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Insights into Inconsistent Infant Safe Sleep Practices among African American Caregivers

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Abstract **Background:** After the 1994 national "Safe Sleep Campaign," acceptance of infant sleep practices was followed by a significant reduction in the national SIDS death rate. Interestingly, SIDS deaths of African American (AA) infants has remained comparatively high --creating an incidence rate disparity. The elusive question is "why?" Understanding the basis of infant safe sleep practices by given AA caregivers is therefore important to effectively address inconsistency surrounding the "ABCs" of safe sleep practices. **Objective**: To understand the knowledge base, attitudes, circumstances, and current behavioral patterns surrounding infant safe sleep practices among given AA caregivers. **Methods**: A purposive sampling strategy, including 31 participants from three targeted Baltimore communities, was employed. Knowledge and attitudes of caregivers were assessed using a Focus Group questionnaire to draw participant responses about why ABC strategies for safe sleep were not consistently followed. Caregivers' practices of infant placement for sleep were first assessed by having them demonstrate their routine using a life-size doll in a crib which purposefully contained other items. All group conversations were audio-recorded and transcribed. Collected data were analyzed using Atlasti and by two researchers. **Results**: A substantial percentage of the AA caregivers of these communities did not fully understand safety-based and anatomical rationale for placing infants alone and on their backs for sleep. Many expressed fears that the baby might choke, the goal of getting maximum sleep for baby and caretaker, while some sought easy monitoring ability. **Conclusion:** Understanding the misgivings, circumstances, and fears are instrumental for imagining and supplementing existing safe sleep practice recommendations. Continued Town Hall forums that include practical demonstrations, along with meaningful discussions with educational tools, inclusive of Q & A follow-up should be developed to reduce fears and misconceptions to best increase consistent practice of placing infants alone in supine reduce the risk of SRID.

Keywords: *insights, inconsistency, infant safe sleep, African American caregivers*

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1. Introduction

While the root cause(s) of SIDS remains unknown, the incidence rate has dramatically decreased since 1994, due to the effectiveness of the "Back to Sleep Campaign [1]." The movement introduced the "ABC of Safe Sleep Practices," where ABC, which refers to infant sleep characteristics: "Alone," "Back," and "Crib." Since the start of the campaign, it has been known that approximately 3,400 infant deaths occur annually. The incident rate of sudden infant death syndrome had numerous causes. In 2019, there were about 1,250 deaths due to SIDS, about 1,180 deaths due to unknown causes, and about 960 deaths due to accidental suffocation and strangulation in bed [2].

Though the reduction in SUID rates is notable, very unfortunate and perplexing are that non-Hispanic Black (NHB) infants, as a collective group, continue to die at a rate more than twice that of non-Hispanic White (NHW) infants [e.g., 186.5 (NHB) versus 85.4 (NHW) per 100,000 live births [3]]. The elusive question is "why?"

A review on infant safe sleep interventions reported that while various interventions, including education in various forms are valuable and effective in reducing SUID death rates [4], cultural differences (e.g., beliefs passed down through generations, familial influences, instructional readiness, bedsharing purposes, environmental barriers, etc.) weigh-in on the extent and consistency of compliance with respect to the ABC of safe sleep practices – most essential for further reducing SUID rates especially in the NHB communities where deaths remain comparatively high.

To better understand the compliance gap between AA communities who live with poor SDOH compared to more affluent communities where SRID compare with national rates, it is suggested that culturally appropriate research is needed to better understand the challenges and constraints of some AA mothers. Embarking upon such research would help reveal the underpinnings that drive non-compliance. Hence, this qualitative study aims to

explore the knowledge, attitudes, and safe sleep practices of AA mothers and caregivers. The purpose of this study is to assess the perceptions of AA caregivers through use of qualitative data, to contribute to scholarly discussions about the types of interventions would be effective in fostering compliance of infant sleep recommendations set forth by the American Academic of Pediatrics (AAP) [1].

2. Conceptual Model of Knowledge, Attitude, and Practice Assessment

The effectiveness of the causes, prevention, and barriers to following safe sleep interventions may lead to dramatically decreased SIDS-related concepts. Assessment of caregiver knowledge, attitude, and practice (KAP) in the targeted communities helped to identify and assess the gaps.

Baseline standards were identified from a literature review which included following AAP infant safe sleep recommendations [6], national and state level interventions [7,8], and education on infant safe sleep [9]. Multiple interventions, such as free crib distribution and educational materials on infant safe sleep delivered to individuals helped to change behaviors of caregivers in adopting healthy safe sleep practices [4].

In the KAP assessment process, caregivers were interviewed, group discussions were held, and caregivers who demonstrated infant placement in cribs were critiqued. During the focus group interview, a semi-structured questionnaire was used, which organized the questions for qualitative data gathering.

Data included: current knowledge, attitudes, and management practices. From the data, insights into inconsistent behaviors were identified. Fears concerning choking, feedback on having minimal understanding about supine versus prone sleep positioning was conveyed. Additionally, preferences with reasons for bedsharing (e.g., breastfeeding, safety from rodent pests, and social/bonding benefits) were expressed.

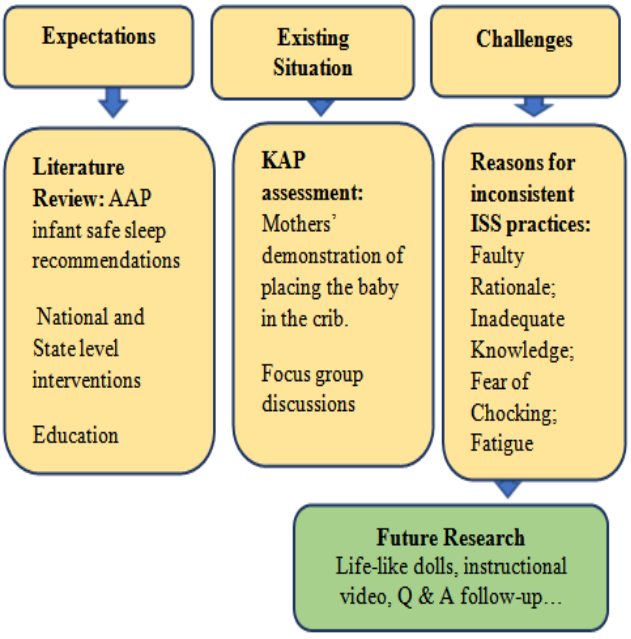

Figure 1. KAP model to assess Infant sleep practices

3. Methods

An exploratory qualitative research design was used to assess the attitudes of participants regarding the reasons for not adopting safe sleep recommendations in the targeted Baltimore communities.

3.1. Setting and Sampling

Using a purposive sampling strategy, volunteer participants were recruited between May 2019 through February 2020 from the Sandtown-Winchester, Dru-Mondawmin, and Cherry Hill Healthy Family clinics, as these participants were current clients of the clinics for care of their babies. These communities had a history–of high SRID when compared to national incidence rates that aligned with high percentages of poor–Social Determinants of Health (SDOH). Before the sessions started, each participant read, signed, and dated a volunteer form giving informed consent. In total, 31 clients participated in 4 focus group interviews (one with father; three with mothers) to give their responses to the semi-structured interview questions. All 31 (100%) participants were African American (Table 1).

Table 1. Racial/ethnic Demographics of Participants by Neighborhood

Neighborhood	Type of Event	Racial/ethnicity of participants			Total
		NHB	NHW	Hispanic	
Sandtown-Winchester	Focus group (fathers)	4	0	0	4
Dru-Mondawmin	Focus group	7	0	0	7
Cherry Hill	Focus group x 2	20 (2 + 18)	0	0	20
Total participants		**31**	**0**	**0**	31

3.2. Inclusion and Exclusion Criteria

People who were over 18 years, English speaking/reading/writing, and residing in the communities of: Sandtown-Winchester, DRU Mondawmin Healthy Families, and Cherry Hill in Baltimore, Maryland were recruited as study participants. Gender, education, and experience with SIDS were not regarded. Exclusion criteria included participants under the age of 18, non-English speaking/reading/writing, as well as being a non-resident of above-mentioned communities.

3.3. Recruitment

In addition to recruitment fliers posted in daycare centers, libraries, clinics, and family health centers, eligible clients were invited to participate by their Community/Family Health Worker. There were only two participants who attended the first focus group in Cherry Hill. With an announcement, incentive offerings, an additional 29 caregivers participated and shared their KAP on infant sleep practices.

3.4. Instrument

To assess KAP of caregivers' infant sleep practices, a semi-structured questionnaire was developed following a review of literature. The content of questions was

intentionally worded to evaluate the caregivers' knowledge and attitudes for causes and prevention of SRID, as well as barriers in following AAP recommendations. The questionnaire was reviewed for content and face validity by project faculty from the Morgan State's Departments of Public Health, Nursing, and Health Education. The first question posed to each caregiver was, "Can you demonstrate how you place the baby in the crib?" The remaining open-ended questions were followed by more probing questions to foster clarification of their responses.

3.5. Data Collection

After informed consent was obtained, participants were given a brief overview of the epidemiology of sleep-related infant deaths. Each focus group session began with evaluating participants' practice of placing an infant doll in a crib. For the interactive evaluation, participants were given: a portable crib, an infant doll, plush toys, and wrinkled sheets. Participants were asked to demonstrate how they practice the ABCs of safe sleep.

After everyone had completed their demonstration, participants were given the discussion protocol before the question session began. Focus groups were conducted for fathers and mothers separately, since familiarity or homogeneity of group participants increased their comfort level in sharing their thoughts and tendency for emotionally driven "dove-tailed" or echoed comments.

The semi-structured interview questionnaire was used with open ended questions regarding the causes and prevention of SIDS, and barriers in following the ABCs of safe sleep recommendations. This questionnaire was to provide participants with the flexibility and freedom to explore their knowledge and attitudes on infant sleep practices. Probing questions were used, when necessary, to encourage participants to elaborate on or clarify a response [10]. Conversations were audio recorded and notes were also taken during each session by trained research assistants. Discussions lasted for approximately 60 minutes. Each participant received a $25 gift card for participation at the conclusion of the session.

3.6. Data Analysis

Two researchers independently reviewed the transcripts to determine the themes, and highlighted quotes and phrases from the interviews. Using the "constant comparative method," the researchers searched for the consistently emerged categories. When there was a disagreement, the themes were discussed, and consensus reached. Second, the audio recordings were professionally transcribed and coded using Atlas.ti, then checked for the relationships within and across data sources. This multi-step process was used to maximize accuracy of the data. Themes were developed, revised in an iterative manner, and agreed upon by the authors.

3.7. Ethical Statement

Institutional Review Board (IRB) approval was obtained from the Morgan State University and the Maryland Department of Health (MDOH) before study initiation. Written informed consent was obtained from each participant prior to data collection. No personal identification of the participants was collected (e.g., name, date of birth, social security number, email address, and home address).

4. Results

There were four focus group sessions held in the three community centers. Participants were caregivers who inhabited in the same geographical area of Baltimore city. As we adopted purposive sampling technique to collect data from caregivers relating to infant sleep practices, participants who were over the age of 18 and spoke English were allowed to participate. A total of 31 participants attended the focus groups, all (100%) participants were non-Hispanic Black, all were married, and had infant children.

4.1. ABCs of Safe Sleep Practice

Almost all mothers demonstrated correct placement practices of the infant doll in the crib. They removed all soft items, made the bed without significant wrinkles, and placed the baby alone in the supine position. Such demonstration signified their knowledge and attitude of proper placement of the baby: alone (A), in the supine position (B-Back), and in a crib (C).

4.2. Themes

"Causes" and "prevention," as well as "barriers to following safe sleep interventions" were three SIDS-related concepts. From these concepts, four themes emerged from the data. When caregivers articulated that they understood the risk factors of SIDS, it is assumed that they knew the importance of executing the psychomotor techniques. The themes provided insight into the participants' emotional and circumstantial positions for inconsistent safe sleep practices. The following 4 themes (reasons) emerged from the data:

1. Faulty Rationales
2. Inadequate knowledge of airway anatomy
3. Fear of choking
4. Fatigue

4.2.1. Faulty Rationales

Optimizing the duration of a sleep session was the most essential point of discussion for participating parents.

- One caretaker expressed that she places her baby prone (on the stomach), a lot, since "my baby sleeps almost twice as long," which is good for both of us." Eight other caretakers agreed with her.
- A mother shared that "I leave my baby in his bouncy chair, because doing so helps him to sleep safely and comfortably." Two other mothers agreed. The mothers defended their bouncy chair choice, explaining that the baby's sound sleep is occurring as it would in the bouncing arms of their caretaker.

4.2.2. Inadequate Knowledge of Airway Anatomy

The majority of participants (24 of 31) did not understand the reason, which has an anatomical basis, for placing the infant in supine.

- One mother stated, "When my baby is sleeping soundly on his/her stomach, I do not want to bother the baby." Nine other mothers agreed.
- Many mothers and fathers described that they do not understand why the baby cannot sleep on his stomach. Five mothers and one father asked, "Why is tummy sleeping a risk for SIDS? My baby sleeps so well without having any startling reactions."
- Eight mothers mentioned that babies don't seem secure or comfortable sleeping on their backs. They shared "My baby does not sleep as well. It is in the back position as opposed to stomach when 'night frights or spontaneous crying while asleep occur."

4.2.3. Fear of Choking

Many participants reported that placing their babies in supine seems to give rise to a choking hazard. It was apparent that the 'Fear of choking' was a barrier for these parents to the adoption of Safe Sleep recommendations by the AAP.

- Ten caregivers said, "It is on the back versus stomach, for the most part, when milk regurgitate happens after being fed." They also conceded that their babies had not been burped before being laid down on his/her back.
- One mother exclaimed, as she seemed to relive her frightening experience, "I was in a light sleep, when I heard was sounds like my son was choking! He was on his back! After that, I was scared to put him on his back, so I began to put him on his stomach."
- Another mother in the group recounted having the same experience. She said, "I placed my baby immediately on her stomach! Okay, so I am not the only one who had this experience. What then do you all advise for the best position for my baby? How would he fully clear his lungs out if he was really aspirated?" There were two mothers who described having disagreement and a battle of sorts with their spouses concerning the infant's sleep position.
- One mother stated: "I placed my daughter on her back, then my husband came behind me and turned her on her stomach. So, we got into a 'back-and-forth thing." A second mother affirmed that the same set of dynamics happened early-on with her daughter and husband.

4.2.4. Fatigue

Several mothers realized that they did not pay attention to the "back to sleep" recommendation, because at times they felt somewhat inattentive to detail being excessively tired to "fuss" with the ABC, or just wanting to get a lot of sleep.

- In total, 18 of 31 participants reported, "I co-sleep with my infant for at-least for a short period or the whole period of sleep time. I am perpetually tired; doing this helps the infant to sleep well, so then I do as well."
- Many of the participants (12) described that, "When my husband comes home from work, he always puts the baby tummy down on his chest for a couple of hours sometime, while they both sleep."
- Over half (17) of the participants mentioned that they put their baby in bed with them when sharing, "Babies sleep better when they sleep with someone, because of the body heat that is soothing to them." As many nodded and concurred with the expressed sentiment, "I am more comfortable when my baby is next to me; I can open my eyes and see my baby easily." Another mother reiterated her need to bed-share in saying, "Yes, as I am a single mother -- taking care of my baby, I am chronically tired. keeping Maya close to me is helpful for breastfeeding convenience, as well as for bonding and protection reasons".

A number of mothers (10) shared that while they have a spouse, their state of fatigue is ongoing. The babies' fathers work long hours to financially support the family, so the mothers are on duty with the infant almost around the clock. Fourteen mothers agreed by saying, "I spend a lot of time taking care of my baby; my 'mental bandwidth' at times is narrow. I feel like I have 'brain fog,' and perhaps are not paying close attention to instructions or to the ABC of the 'Back to Sleep' recommendations."

5. Discussion

There is a long history, worldwide, of revising infant sleep practice recommendations in an effort to limit the risk of infant death. The changes are driven mainly by cultural context and scientific understanding of safety practices [11]. In the US, following adoption of the 1994 AAP safe sleep recommendations, SRID dropped significantly [12]. However, there remains a troubling racial disparity in some communities compared to national SRID rates, given the inconsistent practice of the ABC of safe sleep in the AA community.

Although many caregivers who participated in Focus Groups demonstrated the correct technique of placing the infant doll alone while in the session, the same mothers conceded that they have inconsistent safe sleep practices at home --due to fatigue, fear, doubts about supine safety, and a desire to bedshare for bilateral warmth and ease of observation. Given that, our research findings from participant feedback align with stated reasons for inconsistent safe sleep practices noted in published literature. The overwhelming majority of AA participants expressed many reasons, as aforementioned, for not adopting safe sleep practices with consistency.

Perhaps without fully realizing the gravity of their inconsistent behavior at home, some mothers continue to have a pattern of risky infant care decisions. Concerning natural protection from aspiration in supine, given anatomical and functional normalcy, there didn't seem to be full understanding about how the epiglottis protects the entranceway of the windpipe or trachea from liquid, food, and regurgitate even from the supine position [13]. Since there is not full understanding, there exists a chronic pattern of poor decision making that translates to infant vulnerability, thus the risk of SIDS for their infant.

Similarly, some mothers reported that they sometimes skip the essential act of "burping" their babies after feeding them. Again, inadequate education or understanding about the importance of stimulating the exit of trapped gas in the digestive system, to help prevent spontaneous regurgitation regardless of the infant's position [14] have led some caretakers to believe that only the supine position causes regurgitation with choking.

There is no evidence that healthy babies placed on their backs are more likely to have serious or fatal choking episodes than those placed on their stomachs [15]. Babies may clear secretions better when placed on their backs. When babies are in the back sleep position, the trachea lies on top of the esophagus. Anything regurgitated or refluxed from the esophagus must work against gravity to be aspirated into the trachea [16], thus, limiting the risk of choking versus going down the windpipe if the baby was on its back. This important information should be passed on to the caregivers via demonstration using life-size dolls, and instructional video with the infant's anatomical structure when in supine and prone position, as well as providing the rationale of how the supine infant sleep position is safe in reducing the risk of SIDS.

Concerning bed-sharing, Focus Group discussions on the topic revealed that mothers and fathers co-sleep with their babies. Particularly those of low socio-economic status (SES), as they believe that bedsharing protects their infant from household pests and provides positional convenience for breastfeeding mothers. Equally important, it was expressed frequently that bedsharing helps to ensure better quality and more sleep for parent(s) and baby, with the added benefit of easy baby monitoring.

As informed persons are aware, a bedsharing environment with poor ambient air quality, contaminated with molecules of nicotine, alcohol, and other air-borne pollutants put infants at notable risk for SIDS [17]. Given this, often times it is families of low SES whose sleep environments suffer from poor ambient air quality.

Academy of Pediatrics (AAP) and the US Consumer Product Safety Commission strongly recommends against bedsharing with an infant, which is defined "as sleeping on the surface as an infant, such as a chair, sofa, or bed" [18].

On the other hand, the atmospheric air of infants of more affluent families with normal ambient air qualities have the benefit of living and sleeping in an environment where the air quality is more likely to be in its "natural state," not contaminated by air-borne pollutants [19], and where the bassinet or "Pack-n-Play" ® sleeper is situated adjacent to the parents' bed. Infants having this sleeping arrangement would be much safer from the known risks of SIDS, while in reach of the breastfeeding mother as well as can be readily observed.

While bedsharing can provide emotional comfort and warmth for the baby, parents are typically not able to pay attention to their baby while they are in a deep sleep. Additionally, co-sleeping poses the risk of an adult rolling onto the baby, leading to suffocation, or the baby falling onto the floor and, suffering a head trauma or bone fracture [20,21].

Again, the findings from the community discussion groups indicate that some caretakers unintentionally place their infant at risk for SIDS and SRID, given their uninformed or "absent-minded" justifications for practicing and over-looking behaviors that can be risky for their infant. Education that is clear and includes illustrations on the topics of: upper airway anatomy, the importance of effective post-meal burping, supine sleep, and alone sleep are key for regular reminders and reinforcements using various teaching platforms (e.g., social media, doctor office propaganda, TV infomercials, community health services, and formal education).

Educational interventions such as 15-minute small group education using brochure on safe sleep practices: sleep position and bedsharing/co-sleeping for low-income AA parents was effective in changing behavior [9]. It is suggested that video education with handouts is more effective than small group education with a brochure. Separate studies can determine whether video education is more helpful for the adoption of ABC of infant safe sleep practices by AA caregivers.

6. Limitations

The study population was limited to African American caregivers from three neighborhoods in Baltimore City. Given this, the findings and conclusions may not be readily generalizable to populations of the same or similar SES and racial make-up. In addition, purposive sampling in qualitative studies can provide a wide range of thoughts and views. They cannot be used to define the incidence of any specific thought or view. Therefore, these findings may not be generalizable to other racial/ethnic groups and neighborhoods. It is suggested that this study can be expanded to other AA neighborhoods to understand the reasons for inconsistent safe sleep practices in the society as whole. However, our study findings largely consistent with other qualitative studies of African American populations [22]. Although caregivers were actively involved in the discussion of infant safe sleep practices, the results demonstrated the high levels of subjectivity.

7. Conclusion and Recommendations

Although there has been substantial state and national level debates and agreements by pediatric authorities on what are now accepted ABC practices, there is still a high prevalence of SRID among some AA communities. Hence, this study focused on the subset of AA caregivers who are not adhering to the AAP safe sleep practices and identified their KAP surrounding infant safe sleep. In addition, barriers/obstacles that hinder caregivers from adopting AAP recommended safe sleep practices were also found.

Although multiple interventions including education are valuable, culturally appropriate research is needed to better understand what specific intervention(s) would work best for adherence to the AAP safe sleep recommendations by AA caregivers. Otherwise, this population will continue to disproportionately contribute to the SRID disparity. This data is helpful to emphasize the need for effective strategies that mitigate the risks associated with unsafe sleep practices, as well as bring attention to the benefits associated with safe sleep practices.

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Statement of Competing Interests

The authors have no competing interests.

List of Abbreviations

AA	- African American
AAP	- American Academy of Pediatrics
ABC	- Alone, Back, Crib
IRB	- Institutional Review Board
ISS	- Infant Safe Sleep
KAP	- Knowledge, Attitude, and Practice
MDOH	- Maryland Department of Health
NHB	- Non-Hispanic Black
NHW	- Non-Hispanic White
NICHD	- National Institute of Child Health and Human Development
SDOH	- Social Determinants of Health
SES	- Socio-Economic Status
SIDS	- sudden infant death syndrome
SRID	- Sleep-Related Infant Deaths
SUID	- Sudden Unexpected Infant Death

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