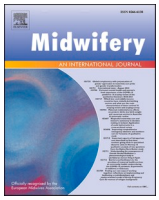
Midwifery 132 (2024) 103953

Contents lists available at ScienceDirect

Midwifery

journal homepage: www.elsevier.com/locate/midw



Community infant safe sleep and breastfeeding promotion and population level-outcomes: A mixed methods study

Rebecca Huber [a,*], Meera Menon [a], Rebecca B. Russell [a], Sharla Smith [b,c], Stacy Scott [a], Scott D. Berns [a,d,e]

[a] The National Institute for Children's Health Quality (NICHQ), 308 Congress Street, 5th Floor, Boston, MA 02210, USA
[b] Preventive Medicine and Public Health Department, University of Kansas School of Medicine, 3901 Rainbow Boulevard, Kansas City, KS 66160, USA
[c] Kansas Birth Equity Network, 3901 Rainbow Boulevard, Kansas City, KS 66160, USA
[d] Department of Pediatrics, Warren Alpert Medical School of Brown University, 222 Richmond St, Providence, RI 02903, USA
[e] Department of Health Services, Policy and Practice, Brown University School of Public Health, 121 S Main St, Providence, RI 02903, USA

ARTICLE INFO

Keywords:
Infant safe sleep
Breastfeeding
Community health promotion
Perinatal education
PRAMS
OPAS

ABSTRACT

Problem: In the U.S., sudden unexpected infant deaths due to accidental suffocation and strangulation in bed are increasing. Though breastfeeding is a protective factor against sudden unexpected infant death, motivations to breastfeed often couple with unsafe infant sleep practices. Racial/ethnic disparities are present in sudden unexpected infant death, accidental suffocation and strangulation in bed, and breastfeeding.

Background: Promoting infant safe sleep and breastfeeding through community-level initiatives could address disparities in related outcomes.

Aim: Investigate the relationship between community-level strategies and associated state-level outcomes for infant safe sleep and breastfeeding.

Methods: We employed an intervention mixed methods framework and exploratory sequential design. The qualitative component entailed a hermeneutical phenomenological framework to analyze key informant interview data from seven U.S. community-level providers participating in a practice improvement initiative. The quantitative component entailed descriptively analyzing infant safe sleep and breastfeeding indicators from the 2019 Pregnancy Risk Assessment Monitoring System and Ohio Pregnancy Assessment Survey. Qualitative and quantitative data were linked through embedded integration.

Findings: We identified two mixed insights: gaps in promotion and outcomes, and persistent disparities between infant safe sleep and breastfeeding promotion and outcomes.

Discussion: Our findings indicate conversational approaches could improve infant safe sleep and breastfeeding promotion, outcomes, and relative disparities. We find that community collaboration is needed to address organizational capacity limitations in promoting infant safe sleep and breastfeeding.

Conclusion: Community-level organizations and providers should consider tailoring program offerings and care delivery to include conversational approaches and community collaboration to promote infant safe sleep and breastfeeding and decrease relative disparities in outcomes.

Introduction

There has been a significant reduction of Sudden Unexpected Infant Deaths (SUID) in the U.S. since the 1990s. SUID includes infant deaths related to sudden infant death syndrome (SIDS), accidental suffocation and strangulation in bed (ASSB), and those of unknown cause (Parks et al., 2017). Though SUID and SIDS rates have decreased in recent decades, rates of ASSB and deaths of unknown cause have risen during this time (CDC, 2021). Further, racial/ethnic and geographic disparities exist in SUID: rates are higher among non-Hispanic Black and American Indian/Alaskan Native (AIAN) infants compared to other racial/ethnic groups (Drowos et al., 2019; Mitchell et al., 2020; Parks et al., 2017). Infant death rates are also higher in rural compared to urban areas (Drowos et al., 2019; Mitchell et al., 2020).

* Corresponding author at: Department of Applied Research and Evaluation, The National Institute for Children's Health Quality, 308 Congress Street, 5th Floor, Boston, MA 02210, USA.
E-mail address: rhuber@nichq.org (R. Huber).

https://doi.org/10.1016/j.midw.2024.103953
Received 24 April 2023; Received in revised form 14 November 2023; Accepted 10 February 2024
Available online 15 February 2024

SUID disparities highlight the importance of infant safe sleep (ISS) education as emphasized by the American Academy of Pediatrics (AAP). AAP recommendations promote infants room-share with caregivers without bedsharing, keeping soft objects out of cribs, and placing infants to sleep supine as SUID-preventative measures (Moon et al., 2022). Paradoxically, AAP-recommended ISS guidelines pose unique challenges to breastfeeding (World Health Organization, 2021). Current AAP recommendations support exclusive breastfeeding for 6 months, partly influenced by research indicating breastfeeding is a protective factor against SIDS (Thompson et al., 2017), and continuing breastfeeding up to 24 months (Meek and Noble, 2022). Yet, motivations to breastfeed are associated with bedsharing, potentially leading to increased risk for other forms of SUID, namely ASSB (Ball et al., 2016; Moon et al., 2017).

AAP breastfeeding guidelines are consistent with World Health Organization (WHO) breastfeeding recommendations (Breastfeeding, 2023; Meek and Noble, 2022). Regarding ISS, WHO recommendations are similar to AAP guidelines, except WHO does not provide guidance on crib usage (Making sure newborns and children under 5 years sleep safely, 2022; Moon et al., 2022). However, compared to other industrialized nations, the U.S. has among the lowest breastfeeding rates and the highest SUID rates (Bartick and Tomori, 2018; United Nations Children's Fund (UNICEF), 2018). There are disparities in most U.S. breastfeeding outcomes by race/ethnicity, paralleling SUID disparities (Jones et al., 2015; McKinney et al., 2016; Oniwon et al., 2016). Researchers indicate non-Hispanic Black and AIAN mothers initiate breastfeeding less than other racial/ethnic groups (Chiang et al., 2021). McKinney et al. (2016), suggesting that breastfeeding initiation and duration gaps between Black and White mothers can be explained by sociodemographic factors (e.g., partner status, economic background, education).

Notwithstanding wide adoption of AAP-informed messaging for ISS and breastfeeding promotion (de Luca and Hinde, 2016), geographic and racial/ethnic variation in ISS and breastfeeding practices persist. Research indicates that non-Hispanic Black parents exhibit higher rates of unsafe sleep practices compared to other racial/ethnic groups (Bombard, 2018). Researchers suggest a myriad of cultural (e.g., preconceptions), psychosocial (e.g., prior experience), and policy-related reasons (e.g., lack of partner support, maternity leave) influence the decision to not exclusively breastfeed or to breastfeed for less than 6 months (Dodgson et al., 2002; Mirkovic et al., 2016; Oniwon et al., 2016; Rempel and Rempel, 2004). Considering the abovementioned challenges with maintaining ISS recommendations while breastfeeding, particularly among groups exhibiting higher rates of SUID (Ball et al., 2016), developing educational messaging that supports ISS and breastfeeding recommendations while remaining sensitive to caregiver contexts, preferences, and culture is vital.

Regarding educational messaging, the Academy of Breastfeeding Medicine (ABM) suggests integrating conversational messaging (Bronheim, 2017) on risk-mitigation (Altfeld et al., 2017; Blair et al., 2020) in ISS promotion. Existing literature indicates abstinence-based approaches to ISS education may deter parents from initiating or prematurely ending breastfeeding (Blair et al., 2020). Alternatively, conversational and risk-mitigation approaches encourage providers to engage in dialogues around ISS, holistically considering factors that may risk infant death (e.g., smoking, parent consumption of alcohol/drugs, prematurity/low birth weight) while reducing the risk of adverse outcomes should unsafe sleep practices occur (Altfeld et al., 2017; Blair et al., 2020). Conversational and risk-mitigation messaging techniques may prevent parents from feeling overwhelmed by overhauling sleep practices, using stigma-free communication methods to consider parent circumstances (e.g., culture, community, preferences) and allowing for incremental changes towards ISS (Blair et al., 2020). A growing body of practitioners advocate for ISS conversational approaches as potentially optimal for parent outcomes (Bronheim, 2017; Haiek et al., 2021).

Regarding educational settings, several studies document success in combining ISS and breastfeeding messaging in hospital settings (Ahlers-Schmidt et al., 2019; Moon et al., 2017; Rivarola et al., 2016). However, considering disparities in practice uptake, community-level dissemination centering individuals vulnerable to ISS and breastfeeding disparities may increase reach and adoption. For this study, we define community as contained by place-based/geographic boundaries, with individuals who share social connections that may include culture, socioeconomic status, and race/ethnicity (MacQueen et al., 2001).

Several studies depict optimistic outcomes from community-level ISS and breastfeeding education (Ahlers-Schmidt et al., 2019, 2016; Moon et al., 2017; Segura-Pérez et al., 2021; Ward et al., 2018). In a systematic review of breastfeeding interventions, including components addressing policy and community-level factors (e.g., through health care, community agencies, federal programs) were most likely to improve breastfeeding outcomes (Segura-Pérez et al., 2021). Caregivers are more likely to modify habits when they receive messaging from multiple sources (e.g., health care professionals, social services, family and friends) (Cornwell et al., 2021). Community-level approaches with documented success in ISS and breastfeeding education and outcomes include community baby showers, peer counseling, and home visiting (Ahlers-Schmidt et al., 2019, 2016; Pugh et al., 2010; Ward et al., 2018). A community-level intervention that combined ISS and breastfeeding messaging found that African American women were able to maintain exclusive breastfeeding rates without bedsharing (Moon et al., 2017).

Though research shows success in ISS and breastfeeding promotion on the community level, obstacles to access and uptake remain (Reis--Reilly et al., 2018) through factors such as opinions among caregivers' social networks or cultural beliefs (Cornwell et al., 2021; Dodgson et al., 2002; Menon et al., 2023b; Moon et al., 2019a, 2019b, 2020; Oniwon et al., 2016; Zoucha et al., 2016). Additionally, community-level providers often have limited resources (Menon et al., 2023b; Mersky et al., 2021; Sullivan et al., 2011).

Further, there remains a need for research examining the experiences of U.S. community-level providers promoting ISS and breastfeeding. Community-level ISS and breastfeeding promotion is commonly researched using quantitative or qualitative methods; to our knowledge, there are few studies that use mixed methods to investigate the relationship between local promotion and state-level outcomes for ISS and breastfeeding. Mixed methods may assist researchers to address interrelated research questions through data triangulation (Morgan, 2014) and are well-suited to evaluating community-level health promotion as such initiatives typically encompass interconnected local initiatives. As such, findings from mixed methods studies may offer holistic recommendations to inform future public health initiatives. In this study, our research questions were: i.) To what extent did community-level perinatal organizations meet self-defined goals around ISS and breastfeeding promotion and reducing racial/ethnic and geographic disparities in their communities?, ii.) What are the state-level demographic, ISS, and breastfeeding indicators that contextualize or influence these organizational efforts?, and iii.) How can mixed insights highlight community-based strategies to promote ISS and breastfeeding?

Participants, ethics, and methods

Data collected for this study comes from the evaluation of the National Action Partnership to Promote Safe Sleep Improvement and Innovation Network (NAPPSS-IIN). NAPPSS-IIN was a national quality improvement (QI)/practice improvement project. NAPPSS-IIN aimed to make ISS and breastfeeding a national norm by increasing infant caregivers' AAP-recommended adoption of ISS and breastfeeding practices and empowering champions within systems serving historically marginalized families. All individuals participating in NAPPSS-IIN provided perinatal services in communities vulnerable to ISS and breastfeeding disparities (e.g., Black, Indigenous, and/or rural communities). The initiative was funded by the Maternal Child Health Bureau (MCHB) of the Health Resources and Services Administration (HRSA). Efforts were led by the National Institute for Children's Health Quality

(NICHQ). The funder had no involvement in the conduct or dissemination of this study.

For our overall method, we used an intervention mixed methods framework (Fetters et al., 2013; Lewin et al., 2009) (see Fig. 1). Qualitative data were used to assess the QI project and explain and provide context to associated quantitative findings. We used an exploratory sequential design: findings from the qualitative analysis were hypothesis-generating to examine associations in the quantitative analysis (Fetters et al., 2013; Lewin et al., 2009). The qualitative components of our study were determined exempt by Solutions Institutional Review Board (IRB). Solutions IRB is a private IRB accredited by the Association for the Accreditation of Human Research Protection Programs and registered with the Office for Human Research Protections in the U.S. Department of Health and Human Services. The quantitative components of our study used publicly available or de-identified data, and therefore did not require IRB approval (did not qualify as human subjects research per federal regulation).

Qualitative methods

The qualitative method employed a hermeneutical phenomenological framework (Creswell, 2013; Neubauer et al., 2019). The phenomenon studied was the reflections of individuals promoting community-level ISS and breastfeeding who participated in NAPPSS-IIN. Hermeneutical phenomenology was selected over transcendental phenomenology because a researcher's interpretations are necessary to triangulate qualitative findings with quantitative findings in mixed methods studies (Creswell, 2013).

We employed a convenience sample to recruit seven key informant interviews (KIIs) held with seven individuals participating in NAPPSS-IIN who consented to participate in interviews in February 2022. KIIs were selected over focus groups to foster individualized discussion about the phenomenon. Written informed consent procedures occurred before data collection on an online survey platform.

Interviews were conducted virtually on the Zoom platform and included informants and up to two members of the research team. Informants were asked about their community's landscape for ISS and breastfeeding, NAPPSS-IIN facilitation of community-level ISS and breastfeeding promotion and disparity reduction, and sustainability plans. Interviews lasted for approximately 60 min and the recordings were transcribed using the Rev.com service. Prior to review, all identifying information was redacted from transcripts. Audit trails and field notes from interviewers were compiled; verbal tones and non-verbal gestures were added to transcripts where necessary. Interviews, transcripts, audit trails, and field notes were secured on a password-protected server. Member checking was not performed in this study. We followed the recommendations of McConnell-Henry et al. (2011) and Webb (2003) who suggest member checking is unsuitable for phenomenological methods, as the purpose of qualitative research is to generate findings that are context-specific, accepting the lived experiences of participants at the time of interview.

Data were analyzed using rapid analysis. Rapid analysis entails coding findings onto pre-determined domains and is a suitable method for its ability to produce contextually relevant findings (Hamilton, 2020,

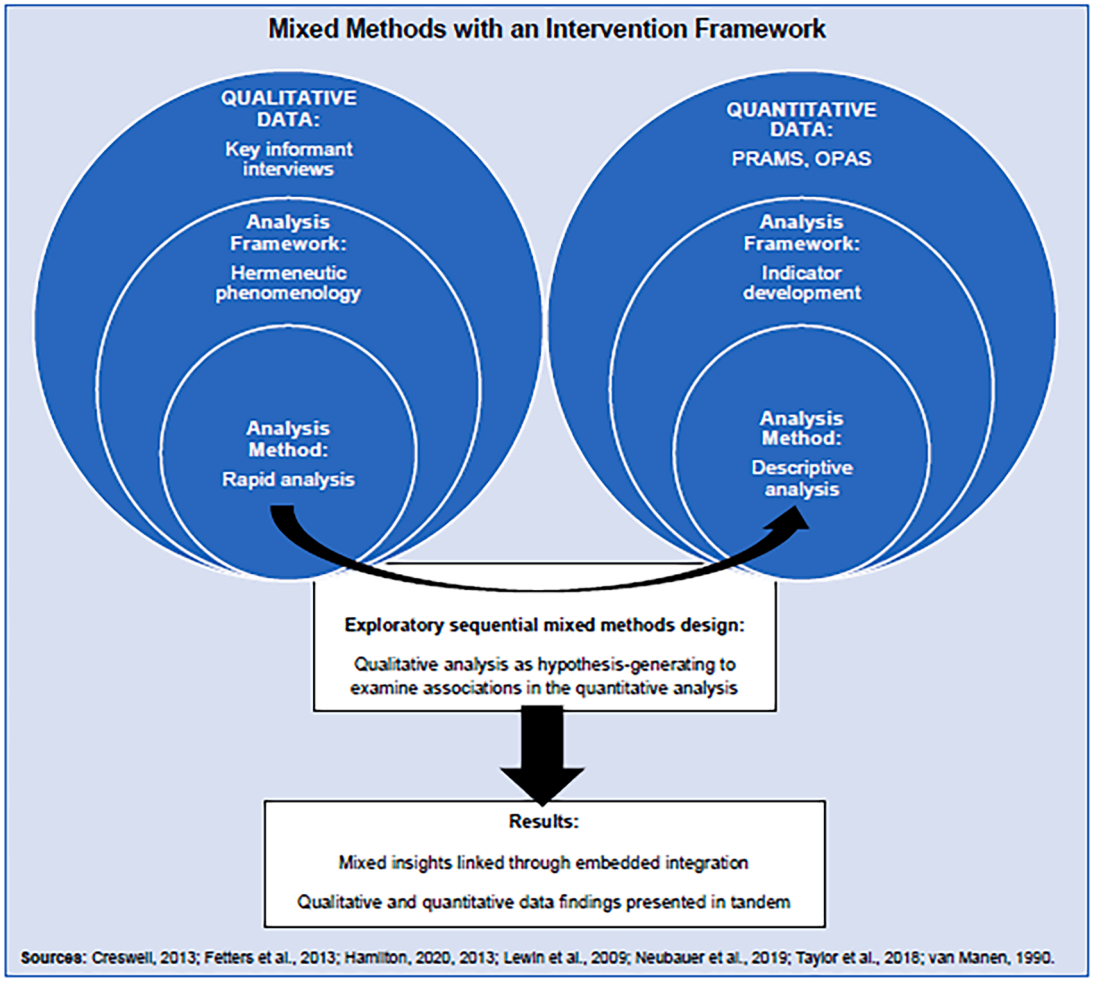


Fig. 1. Methodology overview.

2013) to complete a hermeneutic phenomenology. The interview guide used for KIIs is available upon request.

Quantitative methods

To contextualize the experiences of informants, NAPPSS-IIN developed a series of state-level ISS and breastfeeding indicators disaggregated by race/ethnicity and geography using Pregnancy Risk Assessment Monitoring System (PRAMS) microdata and Ohio Pregnancy Assessment Survey (OPAS) indicators. Data were descriptively analyzed.

Developed in 1987, PRAMS is a state- and population-based surveillance system which collects information on maternal behaviors before, during, and after pregnancies that result in live births. Using birth certificates, PRAMS researchers sample live births delivered within the previous 2–4 months. Self-administered questionnaires are mailed to mothers' homes and non-responders are followed up by telephone. Each questionnaire is linked to the respondent's child's birth certificate (Centers for Disease Control and Prevention, 2022). More details on PRAMS are available at www.cdc.gov/prams.

Indicators from 2019 OPAS were obtained for this analysis. Similar to PRAMS, OPAS collects data to examine maternal behaviors before, during, and after pregnancy. OPAS is representative of women who gave birth in Ohio. Sampled women are contacted approximately 2–4 months after delivery and can participate by completing a mailed, online, or telephone survey. We used OPAS as Ohio does not participate in PRAMS and there was one informant from Ohio. OPAS indicators follow PRAMS sampling/measurement strategy and are comparable to PRAMS indicators (Menegay, 2019).

Analysis

We used NVivo for qualitative data analysis and management ("NVivo, 2020). We followed the five phases for rapid analysis of KII data as defined by Hamilton (2020, 2013), embedding reflexivity into all stages. Prior to data collection, Author 1 developed four domain names which mapped onto interview questions to address the overall research questions. Authors 1 and 2 refined domain names and interview questions to meet research goals. Authors 1 and 2 shared a summary template with Authors 3 and 5, further refining domain names and interview questions. Once the domains and interview guide were finalized, data collection occurred. Topics discussed in interviews, as categorized by domains, guided the interview topics in a deductive manner. Of the 15 NAPPSS-IIN teams, seven individuals from seven unique teams participated in interviews. States represented in the qualitative sample include New Jersey, Kansas, Ohio, Florida, Maryland, and Mississippi. Once data collection completed, Authors 1 and 2 coded and overlapped on three cases. Analysis began with inductive coding within each domain, and then switched between inductive and deductive coding, guided by the content of the transcripts. Additionally, domain names were further refined based on their relevance to the content discussed in interviews. After coding consistency was established, Author 1 coded the remaining four cases. Coding summaries were transferred to a matrix (Averill, 2002), which was reviewed by the rest of the research team (see Table 1) and exemplar quotes were identified. Memo generation and team discussions around codes and domains were employed to maintain reflexivity in the analysis.

Quantitative data from the 2019 PRAMS were descriptively analyzed using R (RStudio Team, 2020). PRAMS and OPAS measures and definitions can be found in Table 2. Demographic findings can be found in Table 3. Quantitative indicators were disaggregated by state, geography, and maternal race/ethnicity, consistent with federal guidance on reporting of infant health indicators (National Center for Health Statistics, 2005). PRAMS respondents who indicated their infant died or was born with a birth defect were categorized as missing, as both circumstances may influence engagement with ISS and breastfeeding practices; however, we retained any observations with missing data on death or birth defects. States with geography data available for 30 % or more of observations were retained, including two in our analysis, Kansas and Florida (30 % benchmark was selected after reviewing the completeness of the geographic variable by state).

To integrate the two components of our analysis, qualitative and

Table 1
Matrix of qualitative findings.

Community landscape for ISS and breastfeeding	NAPPSS-IIN **facilitation of ISS and breastfeeding promotion**
• Prior ISS and breastfeeding work • Individual considerations influencing ISS and breastfeeding • Education/messaging for ISS and breastfeeding • Resources/supports needed for ISS and breastfeeding • Infant care/health outcomes	• Data/surveys for program improvement • Learning opportunities for ISS and breastfeeding promotion • Program development • Community partnerships
Sustaining ISS and breastfeeding work	NAPPSS-IIN **facilitation of disparity reduction**
• Community engagement/ advocacy • Continued data efforts around program improvement • Continued education efforts • Continued efforts around changed program practices	• Tools/resources to promote ISS and breastfeeding education • Community partnerships to reduce disparities • Not a focus for organization • Developed evaluation to identify ISS and breastfeeding disparities

Table 2
PRAMS and OPAS measures and definitions.

Indicator title	Data source	Measurement definition
Breastfeeding 8 weeks or greater	PRAMS OPAS	Percent of women who breastfed for 8 weeks or more, excluding those who were currently breastfeeding or never breastfed, out of all women with a live birth whose baby was alive and living with them or still in the hospital.
Breastfeeding less than 8 weeks	PRAMS	Percent of women who breastfed for less than 8 weeks, excluding those who were currently breastfeeding or never breastfed, out of all women with a live birth whose baby was alive and living with them or still in the hospital.
Ever breastfed	PRAMS OPAS	Percent of women who ever breastfed, out of all women with a live birth whose baby was alive and living with them or still in the hospital.
Baby sleeps alone	OPAS	Percent of women who placed babies to sleep alone, out of all women with a live birth whose baby was alive and living with them.
Baby sleeps alone always or often	PRAMS	Percent of women who always or often placed babies to sleep alone, out of all women with a live birth whose baby was alive and living with them.
Baby sleeps alone sometimes	PRAMS	Percent of women who sometimes placed babies to sleep alone, out of all women with a live birth whose baby was alive and living with them.
Baby sleeps alone rarely or never	PRAMS	Percent of women who rarely or never placed babies to sleep alone, out of all women with a live birth whose baby was alive and living with them.
Provider recommended baby sleep on back	PRAMS OPAS	Percent of women who were told by a health care provider to lay their baby on their back to sleep, out of all women with a live birth whose baby was alive and living with them.
Baby slept in crib, bassinet, or play-yard	PRAMS OPAS	Percent of women who placed baby to sleep in a crib, bassinet, or play-yard, out of all women with a live birth whose baby was alive and living with them.

Table 3
Demographics of quantitative sample.

	National		FL		KS		MD		MS		OH		NJ	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	95 % CI	%	SE
Race/ethnicity														
Non-Hispanic AIAN	1 %	0.00	NA	NA	0 %	0.00	NA	NA	0 %	0.00	NA	NA	0 %	0.00
Non-Hispanic API	5 %	0.00	2 %	0.01	2 %	0.01	5 %	0.01	1 %	0.00	NA	NA	11 %	0.00
Non-Hispanic Black	17 %	0.00	21 %	0.00	7 %	0.01	31 %	0.02	44 %	0.02	17 %	15.5–18.4	14 %	0.00
Hispanic	17 %	0.00	31 %	0.02	17 %	0.02	19 %	0.01	4 %	0.01	6 %	4.9–6.8	28 %	0.00
Non-Hispanic Multi-Racial	2 %	0.00	2 %	0.00	2 %	0.01	1 %	0.00	1 %	0.00	NA	NA	1 %	0.00
Non-Hispanic White	57 %	0.00	42 %	0.02	71 %	0.02	43 %	0.02	50 %	0.02	70 %	68.3–71.9	45 %	0.00
Non-Hispanic Other Race	1 %	0.00	1 %	0.00	1 %	0.00	0 %	0.00	0 %	0.00	7 %	6.0–8.2	1 %	0.00
Hispanic Black	1 %	0.00	1 %	0.00	0 %	0.00	1 %	0.00	0 %	0.00	NA	NA	1 %	0.00
Missing	0 %		0 %		0 %		0 %		0 %		NA		1 %	
Geography														
Urban	71 %	0.00	74 %	0.02	74 %	0.02	NA	NA	NA	NA	NA	NA	NA	NA
Rural	29 %	0.00	26 %	0.02	26 %	0.02	NA	NA	NA	NA	NA	NA	NA	NA
Missing	86 %		3 %		0 %		NA		NA		NA		NA	
Number of prenatal care visits														
≥8	18 %	0.00	23 %	0.02	15 %	0.01	21 %	0.02	14 %	0.01	NA	NA	21 %	0.01
9–11	30 %	0.00	31 %	0.02	32 %	0.02	31 %	0.02	24 %	0.01	NA	NA	36 %	0.02
12+	53 %	0.00	45 %	0.02	53 %	0.02	48 %	0.02	62 %	0.02	NA	NA	43 %	0.02
Missing	6 %		8 %		0 %		6 %		1 %		NA		0 %	
Kotelchuck/Adequacy of Prenatal Care Utilization Index														
Inadequate	13 %	0.00	15 %	0.01	7 %	0.01	15 %	0.01	13 %	0.01	NA	NA	14 %	0.01
Intermediate	10 %	0.00	13 %	0.01	7 %	0.01	9 %	0.01	5 %	0.01	NA	NA	14 %	0.01
Adequate	44 %	0.00	44 %	0.02	64 %	0.02	45 %	0.02	37 %	0.02	NA	NA	45 %	0.02
Adequate plus	34 %	0.00	28 %	0.02	22 %	0.02	31 %	0.02	45 %	0.02	NA	NA	27 %	0.01
Missing	6 %		8 %		0 %		5 %		1 %		NA		1 %	
Method of payment														
Medicaid	41 %	0.00	43 %	0.02	30 %	0.02	44 %	0.02	63 %	0.02	41 %	38.6–43.0	31 %	0.01
Private	52 %	0.00	50 %	0.02	58 %	0.02	51 %	0.02	33 %	0.02	47 %	44.8–49.1	60 %	0.01
Self-pay	3 %	0.00	4 %	0.01	6 %	0.01	2 %	0.01	4 %	0.01	6 %	5.1–7.3	9 %	0.01
IHS	0 %	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ChampVA/TriCare	1 %	0.00	NA	NA	5 %	0.01	2 %	0.00	NA	NA	NA	NA	NA	NA
Other government insurance	0 %	0.00	NA	NA	1 %	0.00	0 %	0.00	NA	NA	NA	NA	NA	NA
Other	2 %	0.00	3 %	0.01	1 %	0.00	0 %	0.00	1 %	0.00	6 %	5.0–7.1	1 %	0.00
Missing	1 %		0 %		0 %		0 %		0 %		NA		0 %	

Note: All data were leveraged from the PRAMS with the exception of data from Ohio which were leveraged from the OPAS.

quantitative data for the states of New Jersey, Kansas, Ohio, Florida, Maryland, and Mississippi were linked through embedded integration (Fetters et al., 2013; Lewin et al., 2009). Findings from both data modalities were reviewed independently and assessed for areas of data fit (confirmation, expansion, or discordance) by three analysts (Authors 1, 3, and 4). Author 1 reviewed the three summaries holistically and compiled mixed insights for joint display (Fetters et al., 2013). Mixed insights were discussed and refined by the entire research team to maintain reflexivity.

Findings

PRAMS and OPAS respondents were mostly non-Hispanic White, living in urban areas, had adequate prenatal care, and private medical insurance (see Table 3). Informants from the qualitative analysis all worked in perinatal services, mostly in nonprofits in urban settings in New Jersey, Kansas, Ohio, Florida, Maryland, or Mississippi. Many informants were clinicians (e.g., nurse, Certified Lactation Consultant (CLC), Licensed Mental Health Counselor (LMHC), etc.) working in project management/director roles (see Table 4). Mixed insights resulting from data integration, including exemplar quotes, can be found in Table 5. We identified two mixed insights for NAPPSS-IIN states: i.) gaps in promotion and outcomes, and ii.) persistent disparities between ISS and breastfeeding promotion and outcomes.

Mixed insight 1: Gaps in promotion and outcomes

Results from data integration demonstrated gaps between promotion and outcomes on two topics: i.) infant sleep education and messaging and ii.) community-level engagement.

Table 4
Demographics of qualitative sample.

Informant/ case	Role/credential	Sector	Geographic scope
1	Project Director, PhD	Nonprofit	Urban
2	Executive Director, CLC	Nonprofit	State-wide
3	Project Director, LMHC	Nonprofit	Rural
4	Program Manager, CLC	Nonprofit	Urban & Rural
5	Program Manager	Nonprofit	Urban
6	Program Coordinator, RN	Public health	Urban
7	Executive Director, PhD	LLC	State-wide

Mixed insight 1a: Infant sleep education and messaging. Informants discussed developing education/messaging approaches to promote ISS and breastfeeding combined and breastfeeding alone as part of NAPPSS-IIN. There was little discussion around education/messaging on ISS alone; however, several informants expressed interest in promoting alternative infant sleep practices in sustainability planning. One informant explained how their sustainability goals involved risk-mitigation messaging:

"[We want to] make it okay for home visitors to talk about reducing the risk of co-sleeping…we dance around [the topic], but we have not addressed it. I want to remove the [feeling] that they can only share prescriptive [ISS solutions] out of concern of losing their job."

These findings are discordant to those in our PRAMS analysis, in which parents indicated high estimates of providers recommending ISS (range=92–97 %).

Table 5
Mixed insights.

Mixed insight title	Data fit	Qualitative themes and exemplar quotes	Quantitative PRAMS/ OPAS 2019 findings
Mixed insight 1a: Gaps in promotion and outcomes, infant sleep education and messaging	Promotion: Discordance	Absence of discussion around promoting ISS alone; only discussed in partnership with breastfeeding promotion. Interest in alternative infant sleep promotion for sustainability plans. • "[Our sustainability goal is to] make it okay for home visitors to talk about reducing the risk of co-sleeping… We've walked up to it, we danced around it, but we have not addressed it. I want to remove the that they can only share prescriptive [ISS solutions] out of concern of losing their job."	High estimates of providers recommending baby sleeps on back. • Range=92–97 % for total depending on state. • Racial/ethnic disparities exist; groups with unfavorable estimates vary by state. • By geography and state, rural parents are often less likely to receive recommendations than urban parents; disparities are smaller than race/ethnicity.
	Outcomes: Confirmation	Frequent acknowledgement of poor ISS outcomes. • "In my particular community, which is a lot of African American women, we see that our rates are, with infant morbidity, higher than any other race. So we know the importance of enforcing [ISS] information."	ISS outcomes are universally lower than provider recommendation estimates. • For U.S. total, 95 % of parents report providers recommended baby sleep on back, 90 % of parent report baby sleeping in a crib/ bassinet/play-yard, and 76 % report baby sleeps alone always/ often. • Pattern is consistent across most states, racial/ ethnic groups, and geographies. Gap is particularly pronounced for sleeping alone. • 76 % sleep alone always/often for U. S. total. • Substantial variation by state and race/ethnicity; AIAN, API, and Black groups often show lowest estimates. • Variation by state and urban/rural, but less substantial.
Mixed insight 1b: Gaps in promotion and outcomes, community-level engagement	Expansion	Culture, family, community influencing education provision; struggles providing messages while remaining sensitive to client circumstances. • "We have this stigma [with our African American community] that [breastfeeding] is nasty…we're really trying to make it a normal thing." Remaining unmet needs due to policies, capacity; limited ability to promote ISS and breastfeeding. • "We are a very small [organization]… it's four of us… we partner closely with a nonprofit and that nonprofit has maybe six people. Capacity is often an issue and we stretch thin to provide resources." Used media tools and community collaboration to address both. • "A lot of our Black, Indigenous, and People of Color (BIPOC) partners are on the same page [with normalizing breastfeeding]. It is easier for us to get the word out and make sure that families have what they need [when those partnerships are aligned]." Sustainability efforts rooted in the community. • "We can't [solve ISS and breastfeeding] alone, because we're only one	Substantial gaps between ISS education/ breastfeeding initiation indicators and related ISS/ breastfeeding outcomes. • Strong estimates for ever-breastfed (range=68–91 % for total), but gaps present in continuing breast-feeding to 8 weeks (range=46–56 % for total). • Strong estimates for provider recommending back sleeping (range=92–97 % for total), but gaps present with associated ISS outcomes (range=64–78 % for baby sleeping alone always/ often, range=83–92 % for baby sleeping in a crib/bassinet/ play-yard). Differences are most pronounced by race/ ethnicity; urban/ rural disparities present as well.

(*continued on next page*)

Table 5 (*continued*)

Mixed insight title	Data fit	Qualitative themes and exemplar quotes	Quantitative PRAMS/ OPAS 2019 findings
		program. But we [will continue to] partner with others in the community to make [ISS and breastfeeding promotion] more holistic…and ensure [solutions are] family-centered…so families have the best outcomes possible."	
Mixed insight 2: Persistent disparities between ISS and breastfeeding promotion and outcomes	Expansion	Disparities were not addressed through NAPPSS-IIN work. • "[ISS and breastfeeding] disparities are real in our county…but we have not been able to address those at this point." Developed evaluations to identify disparities. • "We developed a pre- and post-intervention evaluation. So we wanted to see where [clients] were [with ISS and breastfeeding knowledge] before [they used our services]. And then after we were able to see…they understand that babies sleeping on their back alone in a crib was much safer than in a big bed and just having pillows around them. We work a lot with multi-generational families, and we know that if the elders of the family are on board, [these practices] will continue." In service of disparity reduction: physical modeling, material resource provision, referrals, community partnerships	Disparities in all ISS and breastfeeding outcomes by race/ ethnicity remain present. • For ISS outcomes (sleeping alone always/often, sleeping in crib/ bassinet/play-yard) by state, disparities were most pronounced for AIAN parents (average of a 19-percentage point gap from overall estimates, though should be interpreted with caution due to small sample), followed by API (average of a 12-percentage point gap from overall estimates) and Black parents (average of an 8-percentage point gap from overall estimates). • For breastfeeding at 8 weeks, disparities were most pronounced for AIAN parents (average of a 5-percentage point gap from overall estimates, though should be interpreted with caution due to small sample) followed by API parents (average of a 3-percentage point gap from overall estimates). Geographic disparities also present but less substantial than those by race/ethnicity. • For ISS outcomes, disparities were inconsistent

Table 5 (*continued*)

Mixed insight title	Data fit	Qualitative themes and exemplar quotes	Quantitative PRAMS/ OPAS 2019 findings
		(families, organizations). • "We give out crib beds, breast pumps, sleep sacks… and diapers....We contract with a mental health provider [to provide counseling services], who's a Black mother [in the community]."	between urban and rural parents, however the most pronounced disparity was for rural parents (up to a 5-percentage point gap from overall estimates). • For breastfeeding at 8 weeks, disparities were most pronounced for rural parents (average of a 4-percentage point gap from overall estimates).

The absence of ISS-specific education/messaging discussed in KIIs was countered with frequent acknowledgment of poor ISS outcomes in communities. One informant connected their ISS outcomes to racial/ ethnic disparities:

"In my community, [with] mostly African American women, we see that infant morbidity rates are higher than other races…we know the importance of enforcing [ISS] information."

These findings offer confirmation for related outcomes in our quantitative analysis. Though our quantitative findings indicated high rates of parents receiving provider-recommended ISS education, ISS outcomes were universally lower, particularly for the sleeping alone indicator. For instance, nationally 95 % of parents reported providers recommended back sleeping, but 90 % of parents reported their baby slept in a crib/bassinet/play-yard, followed by 76 % reporting their infant slept alone always/often. This pattern was consistent across nearly all NAPPSS-IIN states, racial/ethnic groups, and geographies. By race/ethnicity, AIAN, non-Hispanic Asian/Pacific Islander (API), and Black groups often showed lowest estimates for ISS outcomes. While there was some variation in outcomes by state and geography, differences were less substantial than those by race/ethnicity.

Mixed insight 1b: Community-level engagement. In addition to gaps between infant sleep promotion and outcomes, informants also identified gaps in community-level promotion and outcomes while participating in NAPPSS-IIN. Informants noted struggles providing messaging that remained sensitive to participants' culture/family practices. One informant shared that in their community mostly comprised of African Americans, "We have this stigma that [breastfeeding] is nasty…we're trying to make it a normal thing." Informants also noted how few policies supporting ISS and breastfeeding and limited staff capacity left their community with unmet needs around ISS and breastfeeding promotion. One informant elaborated, "We are a small [organization]…it's four of us…we partner closely with a nonprofit and that nonprofit has maybe six people. Capacity is often an issue and we stretch to provide resources."

To address gaps in community-level promotion and capacity constraints, informants described participating in NAPPSS-IIN to develop media tools (e.g., literature, brochures, images, models) and to further community collaboration efforts. Many sustainability efforts were rooted in the latter, with one informant describing the importance of community collaboration to mitigate capacity constraints:

"We can't [solve ISS and breastfeeding] alone…We [will continue to] partner with others in the community to make [ISS and breastfeeding promotion] more holistic…and ensure [solutions are] family-centered…so families have the best outcomes possible."

The abovementioned findings were expanded upon in our

quantitative analysis, which indicated substantial gaps between ISS education and breastfeeding initiation indicators and related ISS and breastfeeding outcomes. For instance, while there were strong estimates for the ever-breastfeeding indicator (range=68–91 %), there were lower rates observed in breastfeeding continuation to 8 weeks (range=46–56 %). This pattern was also present in ISS: there were strong estimates for providers recommending back sleeping (range=92–97 %), but there was discordance in associated ISS outcomes (range=64–78 % for baby sleeping alone always/often, range=83–92 % for baby sleeping in a crib/bassinet/play-yard). Differences in these findings were most pronounced by race/ethnicity. Urban/rural disparities were present, but to a lesser extent.

Mixed insight 2: Persistent disparities between ISS and breastfeeding promotion and outcomes

Our final mixed insight relates to racial/ethnic and geographic disparities in ISS and breastfeeding. Informants shared varied approaches to addressing disparities as part of NAPPSS-IIN. Some informants identified that though "[ISS and breastfeeding] disparities are real in our county…we have not been able to address those at this point." Other informants developed evaluations to identify the disparities present in their communities and connected these efforts to sustainability, as exhibited in the following quote:

"We developed a pre- and post-intervention evaluation. We wanted to see where [clients] were [with ISS and breastfeeding knowledge] before [they used our services]. After, we were able to see [that our clients implemented ISS practices]. We work with multi-generational families, and we know that if the elders of the family are on board, [these practices] will continue."

For the informants who aimed to reduce disparities while participating in NAPPSS-IIN, they targeted resources for those in need, including physical modeling, material resource provision, referrals, and community partnerships with families and other organizations. An informant elaborated on their community-level approach to reduce disparities: "We give out crib beds, breast pumps, sleep sacks… and diapers…We contract with a mental health provider [to provide counseling services], who's a Black mother [in the community]."

These qualitative findings were expanded upon in our quantitative analysis. Racial/ethnic disparities were present in all ISS and breastfeeding outcomes for NAPPSS-IIN states. For ISS outcomes (sleeping alone always/often, sleeping in crib/bassinet/play-yard), disparities were most pronounced for AIAN parents (average of a 19-percentage point gap from overall estimates, though findings should be cautiously interpreted due to small sample), followed by API (average of a 12-percentage point gap from overall estimates) and Black parents (average of an 8-percentage point gap from overall estimates). For breastfeeding at 8 weeks, disparities were most pronounced for AIAN parents (average of a 5-percentage point gap from overall estimates, though findings should be cautiously interpreted due to small sample) followed by API parents (average of a 3-percentage point gap from overall estimates). Geographic disparities were also present but were less substantial than those by race/ethnicity in NAPPSS-IIN states. For ISS outcomes, disparities were inconsistent between urban and rural parents; however, the most pronounced disparities were for rural parents (up to a 5-percentage point gap from overall estimates). For breastfeeding at 8 weeks, disparities were most pronounced for rural parents (average of a 4-percentage point gap from overall estimates).

Discussion

Our results have implications for ISS and breastfeeding promotion, particularly around messaging approaches, community partnerships, and addressing outcome disparities. We found substantial gaps between ISS and breastfeeding promotion and outcome indicators. Findings from our qualitative analysis indicated that informants struggled to provide education while navigating clients' culture and preferences. Informants attempted to remain sensitive to client circumstances while navigating capacity and policy constraints. Absent from informants' discussion was their promotion of ISS alone. Our quantitative analysis similarly indicated substantial gaps between ISS education and outcomes and breastfeeding initiation and breastfeeding at 8 weeks, suggesting that there were barriers to breastfeeding continuation and engagement in ISS. Taken together, our findings may indicate that while providers did promote ISS and breastfeeding, the level of depth and personalization of discussions may have been inconsistent, which is supported by existing literature (Mersky et al., 2021; Reis-Reilly et al., 2018; Sullivan et al., 2011). Relatedly, there were disparities in all ISS outcomes and breastfeeding at 8 weeks by race/ethnicity, particularly pronounced for AIAN and API parents for ISS and breastfeeding and for Black parents for ISS. Our qualitative analysis similarly indicated navigating cultural preferences presented struggles while promoting ISS and breastfeeding. Indeed, these findings are supported by a plethora of literature indicating that cultural preferences influence engagement with ISS and breastfeeding practices for AIAN and Black parents specifically (Bombard, 2018; Dodgson et al., 2002; Oniwon et al., 2016; Rempel and Rempel, 2004).

As informants identified the source of their challenges in promoting ISS and breastfeeding was partly related to messaging, organizations and providers seeking to improve ISS and breastfeeding outcomes in their community could consider messaging strategies such as conversational approaches (Bronheim, 2017) using risk-mitigation (Altfeld et al., 2017; Blair et al., 2020). Conversational and risk-mitigation messaging may prevent parents from feeling overwhelmed by overhauling sleep practices, instead using stigma-free communication that considers culture, community, and preferences to allow for attainable incremental changes towards ISS (Blair et al., 2020). It is notable that informants discussed the challenges of not engaging in conversations around bedsharing, with literature indicating that abstinence-based approaches to ISS education may deter parents from initiating or prematurely ending breastfeeding (Blair et al., 2020). Accordingly, a growing body of U.S. practitioners advocate for conversational approaches to ISS and breastfeeding promotion as potentially optimal for parent outcomes (Bronheim, 2017; Haiek et al., 2021). Though not directly comparable to the U.S., after implementing risk-mitigating communication models country-wide in the early 1990s, Norway and Sweden simultaneously significantly reduced SIDS rates while increasing breastfeeding rates, indicating that broad adoption of this messaging may also positively influence child outcomes (Wennergren et al., 1997). Thus, offering culturally-sensitive resources using risk-mitigation messaging to a larger expanse of providers could potentially improve ISS and breastfeeding outcomes and the disparities identified in this study for AIAN, API, and Black parents.

Informants also identified their challenges in promoting ISS and breastfeeding in NAPPSS-IIN were partly related to capacity. Some informants in our study mitigated organizational capacity through community collaboration, a potential solution other organizations could use to address constraints in promoting ISS and breastfeeding. Extant research identifies that community collaboration is also associated with positive ISS and breastfeeding outcomes: caregivers are more likely to alter habits when receiving messages from multiple sources in their community (Cornwell et al., 2021), and several studies depict positive outcomes in ISS and breastfeeding knowledge when delivered in community settings compared to clinical settings alone (Ahlers-Schmidt et al., 2016; Pugh et al., 2010; Segura-Pérez et al., 2021). Though not directly comparable to the U.S., Scandinavian countries (e.g., countries with low SUID rates and high breastfeeding rates) have also shown success in implementing community partnerships to increase ISS and breastfeeding practices (Kronborg et al., 2007; Lindgren et al., 1998). Taken together, community collaboration could offer opportunities to address organizational capacity as identified by our study, while improving ISS and breastfeeding messaging strategies and ultimately, ISS and breastfeeding outcomes.

Limitations

Our analysis qualitatively examined community-level strategies for ISS and breastfeeding promotion and associated quantitative state-level indicators for a small sub-set of states that participated in NAPPSS-IIN. Qualitative data by nature cannot be generalizable and researcher bias is possible. To address this, we engaged the entire research team throughout the analysis process using investigator triangulation. We only captured the experiences of community-level perinatal organizations in our qualitative analysis; an area of future study would be to capture the perspectives of individuals who received services. As interviews were conducted virtually on the Zoom platform, we may have missed non-verbal communication to contextualize findings.

Our quantitative analysis was descriptive; predictive modeling would be an area of future research to determine the significance between ISS and breastfeeding promotion and outcomes. We note several limitations related to PRAMS and OPAS data. Informants discussed their work promoting ISS and breastfeeding at the local level while the smallest geographic unit of PRAMS data is the state level. PRAMS and OPAS data are reported by new mothers, and could incorporate self-reporting error/bias. We experienced issues with PRAMS data completeness; geographic data were incomplete for three states in our analysis. Relatedly, PRAMS and OPAS data are reported by participating state agencies. Since each state agency performs their own data collection, it is possible that their data collection schemas could incorporate bias. Finally, PRAMS and OPAS data are released after a 2-year delay. PRAMS and OPAS data from 2020 were available at the time of analysis. The COVID-19 pandemic began in early March 2020, influencing ISS and breastfeeding practices considerably (Menon et al., 2023a), and would likely be reflected in PRAMS and OPAS data. In our qualitative analysis, the COVID-19 pandemic was rarely discussed. Recognizing that findings from the 2020 PRAMS and OPAS could be skewed due to the pandemic, and the fact that the impacts of the pandemic were rarely discussed in KIIs, the research team opted against including 2020 quantitative data for their inapplicability to our overall findings on community-level ISS and breastfeeding promotion.

Conclusion

Community-level strategies show promise to promote ISS and breastfeeding (Menon et al., 2023b) and decrease relative racial/ethnic, geographic, and socioeconomic disparities in SUID and breastfeeding outcomes (Ahlers-Schmidt et al., 2019, 2016; Moon et al., 2017; Pugh et al., 2010; Segura-Pérez et al., 2021; Ward et al., 2018). We performed a mixed methods study to highlight community-level strategies for ISS and breastfeeding promotion and associated state-level ISS and breastfeeding outcomes.

Our findings add to a growing body of literature that indicates conversational approaches (Altfeld et al., 2017; Blair et al., 2020; Bronheim, 2017; Haiek et al., 2021) that consider parental circumstances (Bombard, 2018; Dodgson et al., 2002; Oniwon et al., 2016; Rempel and Rempel, 2004) could improve ISS and breastfeeding outcomes and associated disparities for AIAN and Black parents and children (Chiang et al., 2021; Drowos et al., 2019; Jones et al., 2015; McKinney et al., 2016; Mitchell et al., 2020; Oniwon et al., 2016; Parks et al., 2017; Wennergren et al., 1997). To our knowledge, our study is the first mixed methods approach supporting the usage of conversational approaches on community-level ISS and breastfeeding promotion and outcomes. Our study also found that community collaboration may address organizational capacity limitations in promoting ISS and breastfeeding, an approach that is optimal for ISS and breastfeeding messaging strategies and outcomes (Ahlers-Schmidt et al., 2016; Cornwell et al., 2021; Kronborg et al., 2007; Lindgren et al., 1998; Pugh et al., 2010; Segura-Pérez et al., 2021). Community-level perinatal organizations and providers may use these findings to tailor programs, care delivery, and partnerships around ISS and breastfeeding promotion.

Funding sources

This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number HRSA-17-094, National Action Partnership to Promote Safe Sleep Program, $4,988,565. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government. The project funder had no involvement in the conduct or dissemination of this study.

CRediT authorship contribution statement

Rebecca Huber: Conceptualization, Investigation, Project administration, Resources, Data curation, Methodology, Software, Formal analysis, Validation, Writing – original draft, Visualization. **Meera Menon:** Conceptualization, Investigation, Methodology, Formal analysis, Validation, Writing – review & editing. **Rebecca B. Russell:** Conceptualization, Methodology, Validation, Writing – review & editing, Supervision. **Sharla Smith:** Validation, Writing – review & editing. **Stacy Scott:** Validation, Writing – review & editing, Supervision. **Scott D. Berns:** Funding acquisition, Conceptualization, Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number HRSA-17-094, National Action Partnership to Promote Safe Sleep Program, $4,988,565. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government. The authors thank the HRSA team for their support: Sara Kinsman, MD, MSCE, PhD, Maureen Perkins, MPH, Bethany Miller, MSW, MEd, and Erin Reiney, MPH. The authors thank Colleen Bernard for her assistance with data collection and Kelly Boyd, MA for her assistance with quantitative data analysis.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2024.103953.

References

Ahlers-Schmidt, C.R., Schunn, C., Engel, M., Dowling, J., Neufeld, K., Kuhlmann, S., 2019. Implementation of a statewide program to promote safe sleep, breastfeeding and tobacco cessation to high risk pregnant women. J. Community Health 44, 185–191. https://doi.org/10.1007/s10900-018-0571-4.

Ahlers-Schmidt, C.R., Schunn, C., Lopez, V., Kraus, S., Blackmon, S., Dempsey, M., Sollo, N., 2016. A comparison of community and clinic baby showers to promote safe sleep for populations at high risk for infant mortality. Glob. Pediatr. Health 3, 1–6. https://doi.org/10.1177/2333794X15622305.

Altfeld, S., Peacock, N., Rowe, H.L., Massino, J., Garland, C., Smith, S., Wishart, M., 2017. Moving beyond "abstinence-only" messaging to reduce sleep-related infant deaths. J. Pediatr. 189, 207–212. https://doi.org/10.1016/j.jpeds.2017.06.069.

Averill, J.B., 2002. Matrix analysis as a complementary analytic strategy in qualitative inquiry. Qual. Health Res. 12, 855–866. https://doi.org/10.1177/104973230201200611.

Ball, H.L., Howel, D., Bryant, A., Best, E., Russell, C., Ward-Platt, M., 2016. Bed-sharing by breastfeeding mothers: who bed-shares and what is the relationship with breastfeeding duration? Acta Paediatr 105, 628–634. https://doi.org/10.1111/apa.13354.

Bartick, M., Tomori, C., 2018. Sudden infant death and social justice: a syndemics approach. Matern. Child. Nutr. 15, e12652. https://doi.org/10.1111/mcn.12652.
Blair, P.S., Ball, H.L., McKenna, J.J., Feldman-Winter, L., Marinelli, K.A., Bartick, M.C., Medicine, the Academy of Breastfeeding, Young, M., Noble, L., Calhoun, S., Elliott-Rudder, M., Kair, L.R., Lappin, S., Larson, I., Lawrence, R.A., Lefort, Y., Marshall, N., Mitchell, K., Murak, C., Myers, E., Reece-Stremtan, S., Rosen-Carole, C., Rothenberg, S., Schmidt, T., Seo, T., Sriraman, N., Stehel, E.K., Wight, N., Wonodi, A., 2020. Bedsharing and breastfeeding: the Academy of Breastfeeding Medicine protocol #6, revision 2019. Breastfeed. Med. 15, 5–16. https://doi.org/10.1089/bfm.2019.29144.psb.
Bombard, J.M., 2018. Vital signs: trends and disparities in infant safe sleep practices — United States, 2009–2015. MMWR Morb. Mortal. Wkly. Rep. 67, 39–46. https://doi.org/10.15585/mmwr.mm6701e1.
Breastfeeding, 2023. World Health Organ. URL. https://www.who.int/health-topics/breastfeeding (accessed 10.26.23).
Bronheim, S., 2017. Building On Campaigns With conversations: an Individualized Approach to Helping Families Embrace Safe Sleep and Breastfeeding. National Center for Education in Maternal and Child Health, Washington, DC.
CDC, 2021. Data and Statistics for SIDS and SUID. URL. https://www.cdc.gov/sids/data.htm (accessed 1.18.22).
Centers for Disease Control and Prevention, 2022. PRAMS Methodology. URL. https://www.cdc.gov/prams/methodology.htm (accessed 1.19.23).
Chiang, K.V., Li, R., Anstey, E., Perrine, C., 2021. Racial and ethnic disparities in breastfeeding initiation - United States, 2019. MMWR Morb. Mortal. Wkly. Rep. 70 https://doi.org/10.15585/mmwr.mm7021a1.
Cornwell, B., Yan, X., Carlin, R.F., Fu, L., Wang, J., Moon, R.Y., 2021. Social network influences on new mothers' infant sleep adjustments. Soc. Sci. Med. 269, 1–23. https://doi.org/10.1016/j.socscimed.2020.113585.
Creswell, J.W., 2013. Qualitative Inquiry and Research Design, 3rd ed. SAGE Publications, Los Angeles.
de Luca, F., Hinde, A., 2016. Effectiveness of the 'Back-to-Sleep' campaigns among healthcare professionals in the past 20years: a systematic review. BMJ Open 6, 1–8. https://doi.org/10.1136/bmjopen-2016-011435.
Dodgson, J.E., Duckett, L., Garwick, A., Graham, B.L., 2002. An ecological perspective of breastfeeding in an indigenous community. J. Nurs. Scholarsh. 34, 235–241. https://doi.org/10.1111/j.1547-5069.2002.00235.x.
Drowos, J., Fils, A., Mejia de Grubb, M.C., Salemi, J.L., Zoorob, R.J., Hennekens, C.H., Levine, R.S., 2019. Accidental infant suffocation and strangulation in bed: disparities and opportunities. Matern. Child Health J 23, 1670–1678. https://doi.org/10.1007/s10995-019-02786-5.
Fetters, M.D., Curry, L.A., Creswell, J.W., 2013. Achieving integration in mixed methods designs—principles and practices. Health Serv. Res. 48, 2134–2156. https://doi.org/10.1111/1475-6773.12117.
Haiek, L.N., LeDrew, M., Charette, C., Bartick, M., 2021. Shared decision-making for infant feeding and care during the Coronavirus disease 2019 pandemic. Matern. Child. Nutr. 17, 1–11. https://doi.org/10.1111/mcn.13129.
Hamilton, A.B., 2020. Rapid Qualitative Analysis: Updates/Developments. VA Womens Health Res. Netw. QUERI Implement. Res. Group. URL. https://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=3846. accessed 8.9.22.
Hamilton, A.B., 2013. Qualitative Methods in Rapid Turn-Around Health Services Research. VA Womens Health Res. Netw. QUERI Implement. Res. Group. URL. http://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=780 (accessed 8.9.22).
Jones, K.M., Power, M.L., Queenan, J.T., Schulkin, J., 2015. Racial and ethnic disparities in breastfeeding. Breastfeed. Med. 10, 186–196. https://doi.org/10.1089/bfm.2014.0152.
Kronborg, H., Væth, M., Olsen, J., Iversen, L., Harder, I., 2007. Effect of early postnatal breastfeeding support: a cluster-randomized community based trial. Acta Paediatr 96, 1064–1070. https://doi.org/10.1111/j.1651-2227.2007.00341.x.
Lewin, S., Glenton, C., Oxman, A.D., 2009. Use of qualitative methods alongside randomised controlled trials of complex healthcare interventions: methodological study. BMJ 339, b3496. https://doi.org/10.1136/bmj.b3496.
Lindgren, C., Thompson, J., Häggblom, L., Milerad, J., 1998. Sleeping position, breastfeeding, bedsharing and passive smoking in 3-month-old Swedish infants. Acta Paediatr. 87, 1028–1032. https://doi.org/10.1111/j.1651-2227.1998.tb01408.x.
MacQueen, K.M., McLellan, E., Metzger, D.S., Kegeles, S., Strauss, R.P., Scotti, R., Blanchard, L., Trotter, R.T., 2001. What is community? an evidence-based definition for participatory public health. Am. J. Public Health 91, 1929–1938. https://doi.org/10.2105/ajph.91.12.1929.
Making Sure Newborns and Children Under 5 Years Sleep Safely, 2022. World Health Organ. URL https://www.who.int/tools/your-life-your-health/life-phase/newborns-and-children-under-5-years/making-sure-newborns-and-children-under-5-years-sleep-safely. (accessed 10.26.23).
McConnell-Henry, T., Chapman, Y., Francis, K., 2011. Member checking and Heideggerian phenomenology: a redundant component. Nurse Res. 18, 28–38.
McKinney, C.O., Hahn-Holbrook, J., Chase-Lansdale, P.L., Ramey, S.L., Krohn, J., Reed-Vance, M., Raju, T.N.K., Shalowitz, M.U., 2016. Racial and ethnic differences in breastfeeding. Pediatrics 138, 1–11. https://doi.org/10.1542/peds.2015-2388.
Meek, J.Y., Noble, L., 2022. Breastfeeding and the use of human milk. Pediatrics 150, 1–15. https://doi.org/10.1542/peds.2022-057988.
Menegay, M., 2019. Ohio Pregnancy Assessment Survey 2019 Data Book.
Menon, M., Huber, R., Russell, R.B., Feldman-Winter, L., Goodstein, M.H., Scott, S., Berns, S.D., 2023a. Maternity care clinicians' experiences promoting infant safe sleep and breastfeeding during the COVID-19 pandemic. Nurs. Womens Health 27. https://doi.org/10.1016/j.nwh.2023.01.004.
Menon, M., Huber, R., West, D.D., Scott, S., Russell, R.B., Berns, S.D., 2023b. Community-based approaches to infant safe sleep and breastfeeding promotion: a qualitative study. BMC Public Health 23. https://doi.org/10.1186/s12889-023-15227-4.
Mersky, J.P., Janczewski, C.E., Plummer Lee, C., Gilbert, R.M., McAtee, C., Yasin, T., 2021. Home visiting effects on breastfeeding and bedsharing in a low-income sample. Health Educ. Behav. 48, 488–495. https://doi.org/10.1177/1090198120964197.
Mirkovic, K.R., Perrine, C.G., Scanlon, K.S., 2016. Paid maternity leave and breastfeeding outcomes. Birth 43, 233–239. https://doi.org/10.1111/birt.12230.
Mitchell, E.A., Yan, X., Ren, S.Y., Anderson, T.M., Ramirez, J.-M., Ferres, J.M.L., Johnston, R., 2020. Geographic variation in sudden unexpected infant death in the United States. J. Pediatr. 220, 49–55. https://doi.org/10.1016/j.jpeds.2020.01.006.
Moon, R.Y., Carlin, R.F., Cornwell, B., Mathews, A., Oden, R.P., Cheng, Y.I., Fu, L.Y., Wang, J., 2019a. Implications of mothers' social networks for risky infant sleep practices. J. Pediatr. 212, 151–158. https://doi.org/10.1016/j.jpeds.2019.05.027.
Moon, R.Y., Carlin, R.F., Hand, I., 2022. Sleep-related infant deaths: updated 2022 recommendations for reducing infant deaths in the sleep environment. Pediatrics 150, 1–22. https://doi.org/10.1542/peds.2022-057990.
Moon, R.Y., LoCasale-Crouch, J., Turnbull, K.L.P., Colson, E., Kellams, A., Heeren, T., Kerr, S., Hauck, F.R., Corwin, M.J., 2020. Investigating mechanisms for maternal education disparities in enacting health-promoting infant care practices. Acad. Pediatr. 20, 926–933. https://doi.org/10.1016/j.acap.2020.03.008.
Moon, R.Y., Mathews, A., Joyner, B.L., Oden, R.P., He, J., McCarter, R., 2017. Impact of a randomized controlled trial to reduce bedsharing on breastfeeding rates and duration for African-American infants. J. Commun. Health 42, 707–715. https://doi.org/10.1007/s10900-016-0307-2.
Moon, R.Y., Mathews, A., Oden, R., Carlin, R., 2019b. Mothers' perceptions of the internet and social media as sources of parenting and health information: qualitative study. J. Med. Internet Res. 21 https://doi.org/10.2196/14289.
Morgan, D.L., 2014. Integrating Qualitative and Quantitative methods: a Pragmatic Approach. SAGE Publications, Inc., London https://doi.org/10.4135/9781544304533.
National Center for Health Statistics, 2005. Vital Statistics of the United States: 2003, 1. natality, Hyattsville, MD.
Neubauer, B.E., Witkop, C.T., Varpio, L., 2019. How phenomenology can help us learn from the experiences of others. Perspect. Med. Educ. 8, 90–97. https://doi.org/10.1007/s40037-019-0509-2.
NVivo, 2020. https://lumivero.com/products/nvivo/. Lumivero, LLC.
Oniwon, O., Tender, J.A.F., He, J., Voorhees, E., Moon, R.Y., 2016. Reasons for infant feeding decisions in low-income families in Washington, DC. J. Hum. Lact. 32, 704–710. https://doi.org/10.1177/0890334416653739.
Parks, S.E., Erck Lambert, A.B., Shapiro-Mendoza, C.K., 2017. Racial and ethnic trends in sudden unexpected infant deaths: United States, 1995–2013. Pediatrics 139, 1–16. https://doi.org/10.1542/peds.2016-3844.
Pugh, L.C., Serwint, J.R., Frick, K.D., Nanda, J.P., Sharps, P.W., Spatz, D.L., Milligan, R. A., 2010. A randomized controlled community-based trial to improve breastfeeding rates among urban low-income mothers. Acad. Pediatr. 10, 1–14. https://doi.org/10.1016/j.acap.2009.07.005.
Reis-Reilly, H., Fuller-Sankofa, N., Tibbs, C., 2018. Breastfeeding in the community: addressing disparities through policy, systems, and environmental changes interventions. J. Hum. Lact. 34, 262–271. https://doi.org/10.1177/0890334418759055.
Rempel, L.A., Rempel, J.K., 2004. Partner influence on health behavior decision-making: increasing breastfeeding duration. J. Soc. Pers. Relatsh. 21, 92–111. https://doi.org/10.1177/0265407504039841.
Rivarola, M., Reyes, P., Henson, C., Bosch, J., Atchabahian, P., Franzosi, R., Di Pietro, C., Balboni, C., Giglio, N., 2016. Impact of an educational intervention to improve adherence to the recommendations on safe infant sleep. Arch. Argent. Pediatr. 114, 223–231. https://doi.org/10.5546/aap.2016.eng.223.
RStudio Team, 2020. RStudio: Integrated Development for R.
Segura-Pérez, S., Hromi-Fiedler, A., Adnew, M., Nyhan, K., Pérez-Escamilla, R., 2021. Impact of breastfeeding interventions among United States minority women on breastfeeding outcomes: a systematic review. Int. J. Equity Health 20, 72. https://doi.org/10.1186/s12939-021-01388-4.
Sullivan, E.M., Bignell, W.E., Andrianos, A., Anderson, A.K., 2011. Impact of education and training on type of care provided by community-based breastfeeding counselors: a cross-sectional study. Int. Breastfeed. J. 6, 1–13. https://doi.org/10.1186/1746-4358-6-12.
Thompson, J.M.D., Tanabe, K., Moon, R.Y., Mitchell, E.A., McGarvey, C., Tappin, D., Blair, P.S., Hauck, F.R., 2017. Duration of breastfeeding and risk of SIDS: an individual participant data meta-analysis. Pediatrics 140, 1–9. https://doi.org/10.1542/peds.2017-1324.
United Nations Children's Fund (UNICEF), 2018. Breastfeeding: a Mother's Gift for Every Child.
Ward, T.C.S., McClellan, M.M., Miller, T.J., Brown, S., 2018. Evaluation of a crib distribution and safe sleep educational program to reduce risk of sleep-related infant death. J. Commun. Health 43, 848–855. https://doi.org/10.1007/s10900-018-0493-1.
Webb, C., 2003. Editor's note: introduction to guidelines on reporting qualitative research. J. Adv. Nurs. 42, 544–545. https://doi.org/10.1046/j.1365-2648.2003.02716.x.
Wennergren, G., Aim, B., Øyen, N., Helweg-Larsen, K., Milerad, J., Skjaerven, R., Norvenius, S., Lagercrantz, H., Wennborg, M., Daltveit, A., Markestad, T., Irgens, L., 1997. The decline in the incidence of SIDS in Scandinavia and its relation to risk-

intervention campaigns. Acta Paediatr 86, 963–968. https://doi.org/10.1111/j.1651-2227.1997.tb15180.x.
World Health Organization, 2021. Infant and Young Child Feeding. URL. https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding (accessed 1.19.22).
Zoucha, R., Walters, C.A., Colbert, A.M., Carlins, E., Smith, E., 2016. Exploring safe sleep and SIDS risk perception in an African-American community: focused ethnography. Public Health Nurs. 33, 206–213. https://doi.org/10.1111/phn.12235.