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Personalising Safe Sleep Messaging for Infant Caregivers in the United States

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Abstract

The purpose of our study was to better understand why parents/caregivers might not practice safe sleep behaviours. In autumn 2016, we conducted 'pulse' interviews with 124 parents/caregivers of children under the age of one year at a variety of local community events, festivals and meetings in cities with high infant mortality rates around the Midwestern US state of Ohio. Through an inductive approach, pulse interviews were analysed using thematic coding and an iterative process which followed for further clarification of themes (Qualitative Research in Psychology, 2006, 3, 77; BMC Medical Research Methodology, 2013, 13, 117). The six major themes of underlying reasons why parents/caregivers might not practice safe sleep behaviours that were identified in our coding process included the following: (a) culture and family tradition, (b) knowledge about safe sleep practices, (c) resource access, (d) stressed out parents, (f) lack of support and (g) fear for safety of baby. Using the descriptive findings from the pulse interviews, qualitative themes and key informant validation feedback, we developed four diverse fictional characters or personas of parents/caregivers who are most likely to practice unsafe sleep behaviours. These personas are characteristic scenarios which imitate parent and caregiver experiences with unsafe sleep behaviours. The personas are currently being used to influence development of health promotion and education programs personalised for parents/caregivers of infants less than one year to encourage safe sleep practices.

KEYWORDS

caregivers, infant mortality, parents, qualitative research, SIDS, sudden infant death

1 | INTRODUCTION

Sudden Unexpected Infant Death (SUID) is defined as the sudden death of an infant less than one year of age without an immediately apparent cause (Centers for Disease Control & Prevention [CDC], 2019). Approximately 3,600 United States (US) infants die suddenly and unexpectedly during sleep each year (CDC, 2019). These sleep-related deaths account for the highest percentage of infant deaths behind prematurity and congenital anomalies (CDC, 2019). While the exact cause of SUID is unknown, the CDC (2019) asserts that changing behaviours of parents/caregivers regarding how they put their child to sleep and the environment in which they sleep can reduce the risk of deaths.

In 1992, in response to studies from Europe and Australia, the American Academy of Pediatrics (AAP) released guidelines which recommended that babies be placed to sleep on their backs in order to reduce risks of sleep-related infant deaths (American Academy of Pediatrics, 2011; Kattwinkel, Brooks, Keenan, Malloy, & Willinger, 1996). This recommendation led to a very successful 'Back to Sleep Campaign' (National Institutes of Health [NIH], 2016) launched

in 1994 by the US National Institute of Child Health and Human Development (NICHD). Over the next decade, a 50% reduction in sleep-related deaths was noted (NIH, 2016).

In 2011, the AAP released additional safe sleep guidelines to attempt to further decrease SIDS (a form of SUID) and other sleep-related infant deaths (AAP, 2011). These guidelines expanded the original focus of the 'Back to Sleep Campaign' by including further recommendations for a safe sleep environment such as room sharing but not bed sharing and sleeping alone in a crib without toys and soft cushions (e.g., blankets, pillows and bumper pads). Despite the initial success of the Back to Sleep campaign and even with the release of the 2011 AAP Safe Sleep guidelines, the rates of sleep-related deaths in recent years have plateaued (Moon, 2011). The AAP released yet another round of updated safe sleep guidelines in 2016 (AAP, 2018). See Box 1 for a history of infant sleep-related statements and policies introduced in the United States (US).

Despite the release of these key policies and recommendations, the United States still has one of the highest infant mortality rates in the developed world, at 5.9 deaths per 1,000 live births; compared to 3.9 deaths per 1,000 live births in comparable countries (America's Health Rankings United Health Foundation, 2019). Interestingly, US babies born to wealthier and better educated parents tended to fare equal in infant mortality to European nations (Vital Record, 2019). Thus, disadvantaged US children are at an increased risk possibly due to a variety of issues such as a lack of child having a safe place to sleep [Finland supplies sleep spaces for infants and they have some of the lowest rates of infant mortality in the World (Lee, 2013)], racial or ethnic differences [African American and Alaska/Native American babies have higher risks of SIDS than Caucasian, Hispanic or Asian babies (Vital Record, 2019)], or reduced access to a healthcare provider and lack of adherence to recommendations about how best to keep infants safe [approximately 20% of parents still do not place their child to sleep on their back (Vital Record, 2019)].

'What is known about this topic'

- Approximately 3,600 United States infants died suddenly and unexpectedly during sleep in 2017 (Centers for Disease Control & Prevention [CDC], 2019).
- Despite American Academy of Pediatrics (AAP) recommendations
- Families/ caregivers commonly are not following the safest infant sleep practices.
- Most interventions designed to reduce sleep-related deaths in infants are designed with a 'one-size fits all' approach.

'What this paper adds'

- Health messages on the topic of safe sleep need to be tailored and communicated differently for diverse families depending on context lifestyle factors parent stress and other motivations needs and behaviours.
- Personas may be useful in creating public health education campaigns and messaging tailored to target safe sleep behaviours in different types of caregivers

Box 1 Overview of Recommendations for Safe Sleep in the United States (AAP, 2011, 2018; Kattwinkel et al., 1996; NIH, 2016)

1992 AAP recommends infants be placed to sleep on their sides or backs.
1994 Statement issued jointly by the AAP, several governmental agencies and SIDS organizations recommending infants not be placed on soft surfaces and soft objects should not be placed in infant's sleeping environment.
1994 Back to Sleep Campaign is launched.
1996 AAP updates recommendation that infants be placed to sleep on backs only.
1994–2006 Rates of SIDS decline in United States.
2011 AAP releases report *SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment*, which has a variety of new recommendations including recommendations that infants be breastfed, immunized and no bumper pads be placed in the crib.
2016 AAP releases another update to safe sleep recommendations which includes 'room sharing without bed sharing' and other evidence-based recommendations such as avoid tobacco and alcohol, avoid overheating and offer a pacifier at naptime.

The purpose of our study was to better understand why parents/caregivers might not be practicing safe sleep by: (a) exploring knowledge, attitudes, behaviours and current practices of infant sleep, (b) identifying what messages and information would motivate behaviour change towards infant safe sleep practices among diverse families and (c) describing preferences for setting (e.g., church vs. PCP office) and delivery modality (e.g., text messages, computer application, brochures and one-on-one) of safe sleep information.

2 | METHODS

2.1 | Participant recruitment

This research study was conducted by three partner organisations consisting of a state paediatric association, an urban paediatric hospital

medical centre and a public urban research university. To access a variety of parents/caregivers of babies less than one year old, we recruited and interviewed participants at a mixture of local community events, festivals and meetings in cities with high infant mortality rates around the state of Ohio. These events were chosen because they coincided with tabling events that the partner organisations were already planning to attend and provide information on health topics related to children. In autumn 2016, potential interview participants were approached at these events by research team members, described the details of the study, screened for inclusion criteria and asked to consent to a verbal agreement before participating in the safe sleep interviews. In order to qualify for the study, parents/caregivers had to be currently pregnant or have an infant under the age of one year old and place the infant to sleep 'regularly', defined as at least once a week. Pregnant mothers included were asked about intentions for placing their infant to sleep instead of actual practices. For example, instead of saying, 'describe the location where you place your infant to sleep the majority of the time', the question became 'describe the location where you will place your infant to sleep the majority of the time'.

At the time of recruitment, prospective participants were informed that the purpose of the interview study was to learn more about parents' and caregivers' knowledge, attitudes and practices with their infant related to safe sleep. They were also informed that the information collected from our interviews would be used in aggregate form to learn how to best educate and support families of infants under the age of one year in safe sleep practices.

2.2 | Data collection

A semi-structured qualitative interview guide was developed by a team of safety experts and research specialists to explore knowledge, attitudes, beliefs and practices related to infant sleep. The interview guide consisted of five sections. The first section consisted of our two screening questions: (a) Are you the parent or regular caregiver of a child 0–1 year old (or currently pregnant)? and (b) Do you place an infant to sleep regularly (at least once a week)? Participants had to answer yes to the first two questions in order to proceed with the interview process. The second section of the guide was about baby (when was baby born, who takes care of baby primarily, does mom breastfeed, etc.) The third section was about how the child sleeps (in crib, with parent, in car seat, etc.). The fourth section was about safe sleep messaging (how does the person prefer to receive messages, what do they believe are the best safe sleep messages to share with families, etc.) The fifth and final section of the interview guide consisted of demographic and descriptive questions such as participant's age, county of residence, gender, relationship to infant, race/ethnicity, type of health insurance, church attendance and stressors.

Research team members used a technique called 'pulse interviewing' to talk with parents/caregivers at community events, festivals and meetings. The idea of pulse interviews comes from the field of human resources where employees and/or customers are approached in public spaces on an intermittent basis to measure the 'pulse' of a company's operating climate, overall performance, and/or everyday feelings of employees or customers (Mahan, 2016). We chose to use pulse interviews as a way to create a conversational, friendly style of approaching parents/caregivers in a non-threatening community setting. Another advantage of pulse interviews is they only last for a brief period of time (15–20 min).

Responses to the pulse interview including demographic questions were recorded via pen and paper or tablet computers by interviewers at the time of the dialogue. As a thank you for participation, respondents received a sleep sack or baby book about safe sleep and a safety information postcard targeted to families with babies less than one year of age (incentive value was less than $15.00 in US currency). Interview data collection continued until saturation of major categories was achieved. Saturation, or informational redundancy, is used to collect relevant data, observe patterns in the data, organise the data into a conceptual framework, and then resume data collection to both explore and challenge the developing themes (Glaser & Strauss, 1967; Strauss & Corbin, 1998).

To validate our interview findings, we held two key informant group phone calls with ten partner organisations (of the state paediatric association) across our state. During this interview validation process, findings from our interviews were shared with our partners and they were asked to identify anything noteworthy that stood out to them or anything that surprised them about our findings. We asked them to look at our top stressors and compare them to the stressors of the families that they work with on a daily basis. Finally, we shared the safe sleep messaging that was created through this work and asked them to identify what they liked best and least and to explain what venues they thought would be most effective in reaching families.

Because data were anonymous and intended to inform safe sleep messaging within our state, our Institutional Review Board issued an exempt determination. However, all study procedures followed ethical standards and met regulations for research involving humans. For each phase (pulse interviews, interview findings validation and persona validation surveys), we provided participants with a verbal explanation of the reason for the project, what participation would entail, the anonymity of their responses, how the findings would be used and participants verbally agreed to participate.

2.3 | Data analysis

2.3.1 | Pulse interviews

An inductive approach was used to analyse the pulse interviews with thematic coding and a subsequent iterative process for further clarification of themes (Braun & Clarke, 2006; Gale, Heath, Cameron, Rashid, & Redwood, 2013). With a thematic analysis approach, the intention is not to produce generalisable results but instead to systematically identify meaningful themes and patterns around a specific area of interest (Gale et al., 2013; Polit & Beck, 2010). During phase 1

(data familiarisation), the research team independently reviewed the data and then together reached consensus about important themes and ideas. In phase 2 (generating initial codes), the research team systematically coded interesting features and patterns across the entire data set reviewing differences in coding until consensus was reached. In phase 3 (searching for themes), the data were organised into potential themes. During phase 4 (reviewing themes), the team used the constant comparison method to examine and polish the themes by assessing and comparing information within and across the interviews (Boeije, 2002; Braun & Clarke, 2006; Gale et al., 2013; Polit & Beck, 2010; Strauss & Corbin, 1967). In phase 5 (defining and naming themes), the research team refined and further condensed the themes. Descriptive and demographic data from the pulse interviews were tabulated by number and percentage of respondents.

2.3.2 | Development and validation of personas

Personas are fictional 'portraits' with visual and narrative descriptions that represent a composite archetype of a group of 'end-users' who share similar goals, motivations and behaviours (Chapman, Love, Milham, ElRif, & Alford, 2008; Fore, Goldenhar, Margolis, & Seid, 2013; LeRouge, Ma, Sneha, & Tolle, 2013; Marshall et al., 2015). Using *Ten steps to personas* (Nielsen, 2007) as our model, we first charted descriptive findings alongside qualitative themes from the pulse interviews. Next, we presented the findings and themes to key informants from partner organisations for validation and feedback. Within and across the three sources of data (descriptive findings, qualitative themes and key informant validation feedback), we mapped common patterns that resulted in the primary components of the personas. The resulting personas were composite portraits incorporating data from all participants (in other words, the individual participants do not match one-to-one with each persona). To attain a realistic representation with the end-user the personas were given a neutral name, photograph, illustrative quote, list of characteristics, needs related to safe sleep, potential messages, potential vehicles and a description of their situation based on the patterns identified in the data (Marshall et al., 2015),

The personas were validated through member checking (Morse, Barnett, Mayan, Olson, & Spiers, 2002) using an electronic survey containing 23 multiple-choice questions and 1 open-ended question. An invitation to complete the online survey was distributed to 95 safe sleep partners of the state paediatric association (including organisations such as children's and birthing hospitals, federally qualified health centres, and local infant mortality reduction-initiatives) who then shared the electronic survey link directly with their contact parents/caregivers. The persona validation survey contained descriptions of various segments of each of the personas (e.g., My relationships with family, friends and the community help determine my behaviours. I need to hear from trusted others about the importance of safe sleep practices. I primarily make decisions about my children based on my experiences and family input.) as well as the safe sleep messaging that was created to accompany each persona. Respondents were asked to indicate which of the descriptions of the personas and corresponding safe sleep messages were most compelling to them, as well as what venues they would prefer to receive safe sleep messaging.

3 | FINDINGS

3.1 | Participant demographics and descriptives

One hundred twenty-four parents/caregivers who met inclusion criteria responded to the pulse interviews. The majority of respondents (86%) reported their caregiver role as parent. A majority of respondents were English speaking (91%) and African American (40%) or White Caucasian (42%). See Table 1 for an overview of participant demographics and descriptive characteristics.

Respondents reported a variety of ages, educational levels, socioeconomic statuses, stressors and behaviours related to safe/unsafe sleep practices. Respondents indicated top stressors as financial insecurity (36%), parent/caregiver stress and discipline (19%), other (14%), mental illness and drug/alcohol abuse (7%), and violence (5%). Note: financial insecurity included responses such as living in poverty, job loss or unemployment, food insecurity, inability to meet basic needs and lack of stable housing. Also, some parents/caregivers indicated that they had 'other' stressors not listed in our interview guide which included things such as divorce, multiple infants (twins), time, childcare costs and unpaid maternity leave. When asked 'who do you turn to when you need info about baby?', parents/caregivers indicated that the main place that they get their health information about caring for their baby is from baby's doctor, Internet, Google, professional websites such as Baby Center and WebMD, and family and friends. Participants also indicated a variety of venues as preferences to receive safe sleep messaging such as discussions with medical staff at their doctors' offices, printed materials, Internet and community group education classes.

Over 26% of respondents indicated that they sometimes or always place their infant to sleep on a shared surface. Approximately 14% of respondents admitted that they sometimes, rarely or never position baby in the crib on their back, while another 14% of parents/caregivers acknowledged placing baby to sleep sometimes or always with crib bumpers, pillows or blankets, or other objects.

3.2 | Qualitative themes

Six themes of underlying reasons why caregivers might not practice safe sleep behaviours were identified in our coding process. The themes included the following: (a) culture and family tradition; (b) knowledge about safe sleep practices; (c) resource access; (d) stressed out parents; (e) lack of support; and (f) fear for safety of baby.

With regard to culture and family tradition, a prominent theme was related to parenting practices being passed down from one

TABLE 1 Descriptive characteristics of parents and caregivers (*N* = 124)

Characteristic	Number/Percentage (%) of respondents
Caregiver type	
Aunt/Uncle	1 (1)
Foster parent	1 (1)
Grandparent	7 (6)
Parent	87 (70)
Sibling	1 (1)
Other	4 (3)
Missing	23 (19)
Age of Caregivers	
Under 18	1 (1)
18–26	33 (27)
27–40	56 (45)
41–49	8 (6)
50+	3 (2)
Missing	23 (19)
Education	
6th –11th grade	9 (7)
Currently in school	1 (1)
HS Grad/GED/Technical	21 (17)
Some College	21 (17)
College Degree	46 (37)
Missing	26 (21)
Church attendance	
Yes	53 (43)
No	43 (35)
Missing	28 (23)
Race/Ethnicity	
African American	43 (35)
Asian/East Indian	5 (4)
Caucasian	46 (37)
Latino/Hispanic	1 (1)
Other	6 (5)
Missing	23 (19)
Language	
English	97 (78)
Spanish	1 (1)
Japanese	1 (1)
Filipino	1 (1)
Missing	24 (19)
Health Insurance	
Medicaid	51 (41)
Private Insurance	47 (38)
Both	1 (1)
Missing	25 (20)
Frequency with which caregiver puts infant to sleep on a shared surface	
Never	45 (36)
Rarely	15 (12)
Sometimes	18 (15)
Always	14 (11)
Missing	32 (26)
Frequency with which caregiver positions baby in the crib on their back	
Never	7 (6)
Rarely	2 (2)
Sometimes	8 (6)
Always	79 (64)
Missing	28 (23)
Frequency with which caregiver puts baby to sleep with crib bumpers, pillows or blankets, or other objects	
Never	77 (62)
Rarely	4 (3)
Sometimes	11 (9)
Always	6 (5)
Missing	26 (21)
Top Stressors[a] (*N* = 180 total responses)	
Financial Insecurity/Poverty	65 (36)
Parent/Caregiver Stress/Discipline	35 (19)
Other	26 (14)
Mental Illness/Drugs/Alcohol/Grief	13 (7)
Community & Domestic violence	9 (5)
Missing	32 (18)
Who do you turn to when you need info about baby?[a] (*N* = 153 total responses)	
Baby's doctor/Nurse/Hospital	51 (33)
Internet/Google/professional websites	33 (22)
Aunts/Mom/Sister/Family/Friends	20 (13)
Other Moms/Books/Pamphlets/WIC	7 (5)
'Just want the info'	1 (1)
Missing	41 (27)
Vehicle Messaging Preferences[a] (*N* = 174 total responses)	
One-on-one discussion with Medical Staff	45 (26)
Internet	34 (20)
Printed materials	23 (13)
Community Group Education Classes	20 (11)
Video/TV	11 (6)
Missing	41 (24)

Note: Percentages may exceed 100% due to rounding.

[a]Respondents could provide more than one answer.

(Continues)

generation to another. We learned that co-sleeping was found to be especially prevalent in the African American population that we interviewed. Many participants reported versions of the statement, 'I slept with my mom and I turned out fine'. We also learned that when asked 'who do you get information from', many of our interviewees said they received information from their female trusted family members such as grandmothers, mothers, sisters and aunts.

When it came to knowledge, only a small percentage of participants admitted that they did not know some of the AAP guidelines. The biggest area where we found a gap in knowledge was around not placing toys and soft items in crib with baby. Respondents seemed surprised to learn that bumper pads, loose blankets and stuffed animals were discouraged by the AAP. We also found that the majority of caregivers we interviewed reported that they knew they were not supposed to bed share but still did so despite these recommendations.

A number of interviewees stated that they lacked access to resources that would allow them to comply with the AAP safe sleep guidelines. For example, some acknowledged that they did not have a crib for baby or were living in one room apartments and lacked an independent sleeping space for baby. It was also mentioned that babies were often going back and forth between mom and dad's homes and sometimes one parent lacked a crib or pack-n-play for baby to sleep. Lack of resources reported seemed directly related to hectic family lifestyles and financial insecurity which was noted as one of parents' interviewed biggest stressors.

A theme of stress, feeling exhausted in general and the parenting struggle came up a number of times with parents/caregivers in our study. As a result of these constant struggles, parents mentioned that they often would allow baby to sleep in a place that was 'easiest' to get them to settle even if that location did not always meet AAP guidelines.

A related theme identified from our data was parents/caregivers lacking social support. Some participants stated they were too 'proud' to ask for help or did not feel that they had anyone to ask for help when the stress of caring for their infant became overwhelming.

The final theme from our interviews was safety. Interviewees identified 'worry about safety' for their baby as a serious concern. They stated that they felt better in general if baby was in the same room with them (i.e., parents felt if the baby was next to them, they could protect them from unknown harms such as community violence).

3.3 | Validation of interview findings

When we presented our interview findings to ten professionals from organisations around the state, we found that the professionals agreed that our results were in alignment with their formal and informal knowledge about safe sleep practices based on their work with parents/caregivers of infants under 1 year. They admitted that they were not surprised by our results. They corroborated the ideas that we uncovered through our interviews regarding transfer of generational knowledge, lack of compliance with recommendations even if one has knowledge about them, safety issues in the community, lack of resources such as cribs to practice safe sleep and the idea that many families are stressed out and do not have proper support or do not know how to ask for support.

3.4 | Personas

The mapping process across descriptive findings, qualitative themes and key informant validation feedback revealed five primary components of the personas: characteristics, context, needs, potential messaging and potential vehicles for messaging (see Figure 1). (a) Characteristics represented personal, family and lifestyle attributes (e.g. marital and work status). Demographic information such as age and income were also collected but followed no consistent pattern across the data. (b) Context included interpersonal, environmental and cultural factors that may impact safe sleep behaviours (e.g. financial insecurity, distrust of others and lack of support). (c) Needs represented services and supports deemed necessary to assist parents/caregivers in practicing safe sleep behaviours such as the need to build trust with healthcare providers and community leaders. (d) Potential Messaging referred to the type of safe sleep messages that may appeal to parents/caregivers. (e) Potential Vehicles comprised the potential ways to best reach parents/caregivers regarding safe sleep messaging.

Based on the common patterns within these five components, we developed four diverse fictional characters or personas of parents/caregivers related to unsafe infant sleep behaviours: (a) Rose; (b) Pamela; (c) Kara and James; and (d) Lauren and Isaiah. The persona Rose is extremely busy and experiences high levels of stress that go along with being a single, working parent. She has a support network and relies on them for child-rearing and parenting advice. See Figure 2 for a detailed example of the Rose persona. The persona Pamela is also stressed out and exhausted from her daily routine. Although she is married, she lacks friends and family support and typically makes her parenting decisions based off of what works at the moment so she can move on to her next task. While Kara and James represent a couple attempting to co-parent, they are dealing with relationship stresses as well as financial instability and housing issues. They are afraid to ask for help. They are distrustful of others and not sure who to turn to for advice about parenting. The Lauren and Isaiah persona are also overwhelmed, lack social support and are very busy with their jobs and baby. They typically make decisions about baby based on what is sensible, realistic and efficient. Additionally, they have little time to work on their relationship. Table 2 contains an overview of all four personas.

3.5 | Survey validation of personas

A total of 336 electronic responses were received from the persona validation and member checking process. Families responding

Descriptive findings	Six qualitative themes	Key informant ideas	Five components of personas	Personas
Age Caregiver type Marital status Financial status Stressors Education levels Safe/unsafe sleep practices Social supports Church attendance Messaging preferences Vehicle preferences	(1) Culture and family tradition (2) Knowledge about safe sleep practices (3) Resource access (4) Stressed out parents (5) Lack of support (6) Fear for safety of baby	• Transfer of generational knowledge does occur • Lack of compliance with recommendations even if one has knowledge about them • Safe sleep not as important when it comes to parents/caregivers getting sleep • Safety issues in the community • Lack of resources such as cribs to practice safe sleep • Many families are stressed out and do not have proper support • Safety looks like different things to different people • Caregivers are afraid to ask for help or don't know how to ask for help	(1) Characteristics (2) Context (3) Needs (4) Potential Messaging (5) Potential Vehicles	(1) Rose (2) Pamela (3) Kara and James (4) Lauren and Isaiah

FIGURE 1 Diagram of the Persona Creation Process

ROSE

"Doing the best I can….my family is a blessing"

Rose is a twenty-seven year old single mom of two boys – a 5-year-old and a 3-month-old. She sometimes puts her infant to sleep on a shared surface. As a working/breastfeeding mom, she has a lot to juggle but stays positive most of the time. She finds that it is easier to feed her infant at night, he settles better, and she sleeps better when the baby is in the bed with her. In caring for her children, Rose draws upon the generational knowledge that has been passed down to her from her mother, grandmother, and even aunts. In fact, Rose gets together with her extended family most weekends where lots of food and stories are shared around the kitchen table while the kids all play together. While Rose has heard that a baby should not sleep in the same bed as his/her parents, she knows that her mother slept with her and she turned out fine. She also practiced bed-sharing with her 5-year-old child and although he is a happy and healthy child, he still has trouble sleeping through the night.

Characteristics	Needs related to infant safe sleep
• Working parent • High stress levels; extremely busy • Has support from family and friends • Depends on cultural and generational knowledge for child-rearing advice • Biggest stressors are discipline and parenting stress	• Interpersonal relationships and community influence behaviors • Needs to hear from trusted others about the importance of safe sleep practices • Primarily makes decisions about her children based on her experiences and family input

Potential safe sleep messages for this persona:

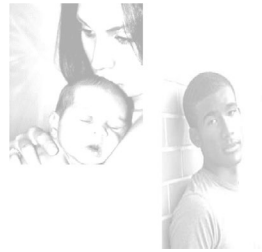
- *Safe sleep is a wise choice for you and your baby. Safe sleep can be the difference between life and death.*
- *Teaching your baby how to sleep alone is just the first of many important skills you can give them.*

Potential "Vehicles" for safe sleep messages:

- At community/church events targeted to multiple generations of families
- Interpersonally conveyed through trusted clinic/paediatrician's office
- "Champion" video campaigns made by demographically similar peers and community members
- Conveyed through pastors and other trusted community leaders

FIGURE 2 Detailed Rose Persona

TABLE 2 Overview of four persona patterns

	Pattern A: Rose	Pattern B: Pamela	Pattern C: Kara & James	Pattern D: Lauren & Isaiah
				
Characteristics	• Working parent • High stress levels; extremely busy • Has support from family and friends • Depends on cultural and generational knowledge for child-rearing advice • Biggest stressors are discipline and parenting	• Extremely stressed out in general • Exhausted • Suffering from a lack of sleep • Experiencing parent/caregiver stress • Living in poverty and financial insecurity	• Concerns about psychological and physical safety issues for self and baby • Mental health issues • Generational poverty • Financial insecurities and lack of stable housing are biggest stressors	• Hard-working • Lack of social support • Feel overwhelmed • Feel like they have no one to ask for help • Busy with work and baby- not a lot of time to work on their marriage
Needs	• Interpersonal relationships and community influence behaviours • Needs to hear from trusted others about the importance of safe sleep practices • Primarily makes decisions about her children based on her experiences and family input	• Peer support group • Easy, efficient, convenient access to healthcare and information for her kids • Engaging and supportive resources in her community and at kids' school (e.g. weekend parent/family activities, school-based health centre) • Primarily makes decisions about her children based on whatever works in the moment so she can get some rest and/or complete the next task	• Distrustful of others • Afraid to ask for help • Not sure who to turn to for advice • Multiple caregivers who put infant to sleep • Primarily makes decisions about her baby based on gut feelings due to fear/safety	• Parent support group • Primarily make decisions about baby based on what is sensible, realistic, and efficient • Practical, easy to implement advice or strategies for caring for baby
Potential Messages	• *Safe sleep is a wise choice for you and your baby. Safe sleep can be the difference between life and death.* • *Teaching your baby how to sleep alone is just the first of many important skills you can give them.*	• *You love your baby enough to keep them safe – even when you're both tired and need sleep.* • *A consistent, safe sleep routine is a gift you can give them.*	• *Safe sleep is a sound choice for you and your baby. Safe sleep can be the difference between life and death.* • *You have the ability to provide everything your baby needs – love and attention during awake times and safety when they sleep.* • *Keep your baby alive—on their back, in their crib, every time!*	• *Teaching your baby how to sleep alone is just the first of many important skills you can give them.* • *You love your baby enough to keep them safe – even when you're both tired and need sleep.* • *A consistent, safe sleep routine is a gift you can give them.* • *'Keep soft objects or loose bedding out of the crib. This includes pillows, blankets, and bumper pads'.* (AAP Guideline)

(Continues)

TABLE 2 (Continued)

	Pattern A: Rose	Pattern B: Pamela	Pattern C: Kara & James	Pattern D: Lauren & Isaiah
Potential Vehicles	• At community/church events targeted to multiple generations of families • Interpersonally conveyed through trusted clinic/paediatrician's office • 'Champion' video campaigns made by demographically similar peers and community members • Conveyed through pastors and other trusted community leaders	• Parent/peer champion via school, community centre • Free family events in the community or school • Safe sleep activities that reach older kids and entire families • Short videos delivered through social media • Supportive texts from paediatrician office that reinforce parents' efforts	• Billboards in the community • At community events targeted to diverse families including single dads • Via non-traditional sites and people (e.g., barber shops, beauty salons, local neighbourhood stores) • Information sharing and parent champions at neighbourhood/home daycares	• Information sharing and parent champions at neighbourhood/home daycares • Educational information through worksite wellness programs • Church activities and groups for new parents • Hospital advocacy, support and outreach for premature babies

to this survey were from 38 counties in Ohio, representing diverse geographic and socioeconomic locations. The majority of parents/caregivers reported that they identify with one of the personas we developed. Rose was the most frequently selected persona with Lauren and Isaiah, Pamela and Kara and James all being selected less frequently (see Table 3).

4 | DISCUSSION

The purpose of this study was to explore knowledge, attitudes, behaviours and practices of parents/caregivers related to infant safe sleep. Additionally, we wanted to identify what messages would motivate behaviour change towards safe sleep and determine parent and caregiver preferences for receiving safe sleep information. Analysis of our interview data resulted in the development and validation of four personas of typical scenarios reflecting parents'/caregivers' experiences practicing unsafe sleep behaviours. In a time, when the infant mortality rates in the United States remain high compared to other industrialised countries, the current findings make timely contributions to the safe sleep literature.

Personas have most often been used by technology designers and software developers to describe prototypical users and customers of information technology (Cooper, 1999; Marshall et al., 2015; Mulder & Yaar, 2006). Although there are a few examples of persona usage within the healthcare arena, such as racial disparities in surgical cancellation (Vaughn, DeJonckheere, & Pratap, 2017), an elderly population's engagement with healthcare services (LeRouge et al., 2013), tailoring health education messages for coronary heart disease patients (Vosbergen et al., 2014) and establishing a learning health system for paediatric inflammatory bowel disease (Fore et al., 2013), they have not been widely used in the field of health.

According to LeRouge et al., (2013), creating multidimensional personas can be very useful because it enables creators to identify with target users and ultimately communicate more effectively with them. We were able to identify unique information from our data, such as the persona Rose, a single mother, relies heavily on her close family and friends to obtain health and child-rearing advice to care for her sons. This inter-generational transfer of knowledge is common when it comes to parenting issues and a mother's decision on how she puts her baby to sleep can definitely be influenced by the baby's grandmother or other caregivers (Aitken et al., 2016). Influences from family and past experiences are an important dynamic when it comes to compliance with safe sleep practice—one that must be considered with developing messaging and interventions.

On the other hand, the persona Pamela lacks much needed support from family and friends which can lead to feelings of isolation in new mothers. In a qualitative study on staying connected while caring for an infant, Paris and Dubus (2005) found that all of their participants who were new mothers reported having feelings of isolation and disconnectedness after the birth of a newborn. Therefore, it is understandable that caregivers like Pamela would need and

TABLE 3 Persona validation and member checking

Persona	Times selected/ percentage (*n* = 284)	Shared experience
Rose	235 (82.75%)	Working parent and provider for family; High stress levels and extremely busy; Supported by family and friends; Use culture and family advice for childrearing; Worry about parenting and disciplining children
Pamela	15 (5.28%)	Extremely stressed out and busy; Exhausted, long term lack of sleep; Worry about parenting and disciplining children; Living in poverty, worried about where to live or find food
Kara & James	4 (1.41%)	Worry about physical safety for yourself and baby Very sad, overwhelmed, or depressed Living in poverty, worried about where to live or find food
Lauren & Isaiah	30 (10.56%)	Working parent, provider for family Lack of support from others, no close family or friends to help High stress levels and extremely busy Feel overwhelmed at times

Note: Respondents were asked to pick the one persona they most closely related to. Of the 336 individuals that completed the validation survey, there were 52 (15%) survey respondents who did not answer this question/select any of the personas.

benefit from parent support groups as well as other engaging and supportive resources in her community.

Trust is also an important factor in relaying health messages to families particularly those like the Kara and James persona who have concerns about psychological and physical safety issues for self and baby, mental health issues, generational poverty, financial insecurities and lack of stable housing. Paediatricians and medical providers can be a valuable source for relaying safe sleep messaging to families such as Kara and James. Unfortunately, prior negative relations with the healthcare system cannot be undone but promoting trust and communication between families and medical providers can help (Vaughn et al., 2017). If trust and communication cannot be improved, health professionals may need to consider utilising non-traditional messaging vehicles to reach families like Kara and James with safe sleep education.

The persona Lauren and Isaiah lack social support, often feel overwhelmed, feel like they have no one to ask for help and are so busy with work and baby, they do not have a lot of time to work on their marriage. It is not unusual for couples to feel like they do not have much time to work on their own relationships after the birth of a new baby. In fact, new mothers frequently feel detached from other adults around them (Paris & Dubus, 2005). Often times, these feelings of separation are felt in relationships where the mother once felt she had an understanding and supportive relationship (perhaps with a spouse). Parents/caregivers who relate to Lauren and Isaiah could benefit from building trust with healthcare providers, accessing safe sleep education and other parenting issues from non-traditional venues, as well as dedicated time to work on their own relationship.

In our persona validation process, the majority of our 336 respondents (85%) indicated that they could relate to one of the personas. However, 52 respondents (15%) skipped that survey question altogether. In the persona validation survey, 'does not apply' was not a response option provided for this question; therefore, respondents were forced to choose a persona. Perhaps the 15% who omitted this validation question may represent parents/caregivers who are already practicing safe sleep and thus did not align with any of the developed personas.

It is important to note that historically, public health and other infant sleep safety campaigns have relied on the idea that health behaviours can be influenced by delivering risk-education and simple recommendations (Ball & Volpe, 2013). Similar to social marketing campaigns, however, the authors of this study contend that public and community health professionals must also work to design targeted and tailored interventions as customising messages to a particular audience has the potential to maximise the message's strength and influence (Schmid, Rivers, Latimer, & Salovey, 2008). Further, we propose that public health messaging is not a 'one-size fits all' approach meaning all parents/caregivers should not receive the same safe sleep message. Personalising messages to parents/caregivers ensure that the primary underlying contextual, demographic and sociocultural contributors to unsafe sleep practices are addressed.

Schmid et al., 2008 describe two different methods (message targeting and message tailoring) well-known in health communication research that can be used to customise health messages. Message targeting entails describing a subgroup of a population based on shared qualities and providing education in a manner consistent with those features (Schmid et al., 2008). Message targeting speaks to shared characteristics or lifestyle factors of a population subgroup such as 'high school graduates working in health education' or 'physically inactive moms' or 'men over age 50 with Diabetes'. Health

messages may be targeted at a sub-population based on the fact that all share the same or similar characteristics. For example, one health message could be created to target men over age 50 affected by the same disease such as Diabetes. The message targeting approach accepts the concept that if group members have sufficient characteristics and motivations, then they will more than likely be impacted by the same message (Schmid et al., 2008).

Message tailoring, on the other hand, is customising messages to match an individual's characteristics such as their coping styles for stress or preferences for thinking about choices (Schmid et al., 2008). Schmid et al. (2008) state that message tailoring is basically crafting messages in a way that speaks to each individual's needs and characteristics, as opposed to targeting group measures, and this is likely to be more impactful when targeting health behaviour change.

For a public health issue as important as safe sleep, educators should consider both tailoring and targeting messages to meet an individual's needs. Professionals could consider personas as a way to do just that. Through our research, we learned that parents/caregivers of infants under one year of age have very different contexts and needs within which they are operating. To assume that all parents need the same safe sleep message, is an oversight. All families are dealing with issues that can be especially challenging to overcome and these various problems should be considered when developing safe sleep messaging and intervention programs. Unfortunately, most of the interventions and informational campaigns designed to reduce sleep-related deaths in infants have been designed with a 'one-size fits all approach'. Consideration of our four personas can influence contextualized development of health messaging and interventions tailored for typical families not practicing safe sleep behaviours.

While our member checking and validation process corroborated our research findings and personas, our study is not without limitations. Limitations included non-random, convenience sampling resulting in possible selection bias, missing data and social desirability bias. We conducted pulse interviews with parents/caregivers attending community events and meetings. Therefore, we missed parents/caregivers who were not in attendance at these types of events and may have had different perspectives on infant safe sleep. Additionally, although the community-based pulse interviews were intended to maximise the breadth of our sample, the downside was that we had a fairly high rate of missing data due to the conversational style of the interviews in which we did not push respondents to answer every question, especially the demographic questions. In other words, we prioritised the conversation and salient safe sleep issues of importance to each respondent over a more formal data collection process using surveys or highly structured interviews. Another limitation may have been social desirability bias resulting in our interviewees reporting answers about safe sleep knowledge or behaviours that they felt would be more favourable to the researchers who were representing paediatric organisations and a university. Finally, it is important to note that the findings of our research which resulted in the development of four personas were context specific to the parents/caregivers we spoke with and therefore are not meant to be generalisable.

5 | CONCLUSION

Personas can be beneficial because they personalise the users (in this case parents/caregivers of infants) and offer a common language for health professionals to meaningfully incorporate caregiver perspectives into the development of tailored and targeted health education messages and interventions. By using personas, we ensure that underlying root causes of unsafe sleep behaviours are addressed including the psychological and behavioural challenges that impact caregivers of infants under one year of age. Without the personal face and context of families, research and interventions can lack the necessary empathy and connection to fundamental experiences that lead to unsafe sleep practices. By better understanding parents'/caregivers' underlying reasons for not practicing safe sleep behaviours, healthcare professionals can alter their current practices to include trust building, improved communication and acknowledgement of needs and experiences of families which as a result may motivate and encourage parents/caregivers to engage in safe sleep practices. Better understanding preferred messaging and venues can help healthcare professionals reach more of the population not practicing safe sleep. Finally, healthcare professionals can be trained on how to use these personas and incorporate them into their visits with families. Because this study was focused on exploring why parents/caregivers do not practice safe sleep behaviours, some of the characteristics of our personas were fairly negative and deficit-based. In the future, researchers investigating this topic may want to incorporate more of a strengths-based perspective that emphasizes positive parental qualities while still recognising the multiple external challenges and larger social issues (e.g. poverty) that can lead to unsafe sleep practices.

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