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What are the barriers to sustaining a safe sleep program for infants within hospital settings: An integrative review of the literature

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ABSTRACT

Problem: Safe sleep programs have been existing since the concept was first defined in 1969. The need for health care providers to model safe sleep practices is essential for successful adherence; however, barriers to promoting safe sleep practices hinder healthcare providers' ability to implement safe sleep in hospital settings.
Aim: To determine the barriers to promoting safe sleep practices amongst healthcare workers in the hospital setting.
Methods: Whittemore & Knafl's framework (2005) guided this integrative review. CINAHL, PubMed, and Academic Search Complete databases were used as a search strategy. Inclusion criteria was limited to studies between 2010 and 2021, were peer-reviewed, in English, and quality improvement projects consisting of barriers to implementing safe sleep practices within hospitals. To assess quality of the included studies, the Mixed Methods Appraisal Tool and Standards for Quality Improvement Reporting Excellence were used. The studies were analyzed by two of the authors with data further categorized using the Social Ecological Model (SEM) to develop themes.
Results: Findings of the 10 included studies were presented in the form of a data display matrix. The authors used the SEM to categorize the findings under three main categories at the organizational, individual, and cultural levels.
Conclusions: Barriers need to be addressed in hospital settings to reduce the risk of sudden infant death syndrome. Therefore, it is vital to consider those barriers while providing teaching programs in hospital settings.
Implications: Findings from this review provide the core elements to consider for the development of safe sleep programs in the hospital setting.

Introduction

The initial definition of sudden infant death syndrome (SIDS) in 1969 included the unexpected death of any infant or small child in which a comprehensive examination fails to identify a sufficient cause of death (Brooke, 1996). Sudden infant death syndrome is neither a syndrome nor a diagnosis, and describing a child's death as SIDS gives caretakers the erroneous impression that the cause of death is recognized and understood (Houin et al., 2022). Today, the term has been expanded to sudden unexpected infant death (SUID), which is defined as "any sudden and unexpected death, whether explained (such as accidental suffocation or strangulation) or unexplained (including SIDS), occurring during infancy" (Moon et al., 2022, n.p.). Another terminology used to refer to sudden and unexpected death in infants specifically within the first week of life is known as sudden unexplained early neonatal death, and this condition is often due to congenital abnormalities (Akopian et al., 2020).

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Interestingly, SIDS is at its highest amongst infants between the age of 2 and 4 months while sleeping at night, with boys accounting for 60% of deaths related to SIDS (Fleming et al., 2015; Houin et al., 2022). According to Moon et al. (2022), about 3500 infants die every year due to SUID. Twenty-seven to 43% of these deaths are due to SIDS (Akopian et al., 2020). While infant death mortality rate in general has declined over the last 70 years across most racial groups in the United States (US), African American and Native American babies remain at higher risk while Asian Americans are at lower risk (Akopian et al., 2020; Burns, 2021; Moon et al., 2022). SIDS commonly occurs amongst the socially disadvantaged due to several risk factors, such as bed-sharing, prone-positioning, young maternal age and associated neonatal outcome (i.e., low preterm- and birth weight), infection, maternal substance use, and crowded living environments, to name a few (Houin et al., 2022). Amongst the modifiable SIDS risk factors, sleep position has remained in the spotlight and one of the prominent topics noted in studies associated with SIDS (Akopian et al., 2020). In particular, "the prone sleep position is associated with an odds ratio of 4.92 for SIDS. In clinical trials, prone infants were found to rebreathe expired air and experience hypercarbia" (Akopian et al., 2020, n.p.).

The American Academy of Pediatrics (AAP) instituted guidelines promoting safe sleep for infants (Task Force on Sudden Infant Death Syndrome & Moon, 2011). The AAP has recommended the supine sleep position for infants since 1992 as it does not increase the risk for aspiration for infants and preterm infants as well (Akopian et al., 2020; Moon et al., 2022). In 2022, the AAP released updated guidelines consisting of 19 recommendations to promote a safe sleeping environment for infants up to 1 year of age (Moon et al., 2022). The updated guidelines provide education to parents (especially the underserved), healthcare providers, policy makers, and researchers on how to avoid the causes, risk factors, and pathophysiology of SIDS and other sleep-related infant deaths. Fig. 1 summarizes the latest safe sleep guidelines from the AAP Taskforce on Sudden Infant Death Syndrome (Moon et al., 2022). The recommendations are broken down into three categories: A, B, and C. Level A recommendations are supported by substantial patient-oriented evidence; Level B recommendations are inconsistent and supported by limited patient-focused evidence; and Level C recommendations are supported by clinical consensus, disease-based evidence, common practice, opinion, and case studies for the purpose of diagnosing, treating, preventing, or screening.

The AAP's campaigns on safe sleep for infants are saving lives (Houin et al., 2022). Safe sleep practices have been shown to dramatically reduce infant rates of death since the early nineties in Australia and the US. For example, there was a reduction in infant mortality by 85% in Australia (Australian Bureau of Statistics, 2019), while in the US, there was a reduction in infant death from 120 deaths per 100,000 live births in 1992 to 56 deaths per 100,000 live births in 2001 (Mathews et al., 2015). This has been mainly due to public health campaigns that began in the 1990s, which focused solely on having babies sleep in a supine position (Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), 2022). These campaigns have been further refined to emphasize practices which include breastfeeding, avoiding placing babies in prone positions for sleep, keeping the head and face of babies uncovered, ensuring smoke-free environments

A level recommendations:
Back to sleep for every sleep.
Use a firm, flat, noninclined sleep surface to reduce the risk of suffocation or wedging/entrapment.
Feeding of human milk is recommended because it is associated with a reduced risk of SIDS.
It is recommended that infants sleep in the parents' room, close to the parents' bed, but on a separate surface designed for infants, ideally for at least the first 6 mo.
Keep soft objects, such as pillows, pillow-like toys, quilts, comforters, mattress toppers, fur-like materials, and loose bedding, such as blankets and nonfitted sheets, away from the infant's sleep area to reduce the risk of SIDS, suffocation, entrapment/wedging, and strangulation.
Offering a pacifier at naptime and bedtime is recommended to reduce the risk of SIDS.
Avoid smoke and nicotine exposure during pregnancy and after birth.
Avoid alcohol, marijuana, opioids, and illicit drug use during pregnancy and after birth.
Avoid overheating and head covering in infants.
It is recommended that pregnant people obtain regular prenatal care.
It is recommended that infants be immunized in accordance with guidelines from the AAP and CDC.
Do not use home cardiorespiratory monitors as a strategy to reduce the risk of SIDS.
Supervised, awake tummy time is recommended to facilitate development and to minimize the risk of positional plagiocephaly. Parents are encouraged to place the infant in tummy time while awake and supervised for short periods of time beginning soon after hospital discharge, increasing incrementally to at least 15 to 30 min total daily by age 7 wk.
It is essential that physicians, nonphysician clinicians, hospital staff, and child care providers endorse and model safe infant sleep guidelines from the beginning of pregnancy.
It is advised that media and manufacturers follow safe sleep guidelines in their messaging and advertising to promote safe sleep practices as the social norm.
Continue the NICHD "Safe to Sleep" campaign, focusing on ways to reduce the risk of all sleep-related deaths. Pediatricians and other maternal and child health providers can serve as key promoters of the campaign messages.
B level recommendations:
Avoid the use of commercial devices that are inconsistent with safe sleep recommendations.
C level recommendations:
There is no evidence to recommend swaddling as a strategy to reduce the risk of SIDS.
Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms of sleep-related deaths, with the ultimate goal of eliminating these deaths entirely.

Based on the strength-of-recommendation taxonomy for assignment of letter grades to each of its recommendations (A, B, C)[11]: level A, the recommendation is on the basis of consistent, good-quality, patient-oriented evidence; level B, the recommendation is on the basis of inconsistent or limited-quality, patient-oriented evidence; level C, the recommendation is on the basis of consensus, usual practice, opinion, disease-oriented evidence, or case series for studies of diagnosis, treatment, prevention, or screening. Patient-oriented evidence measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, and quality of life. Disease-oriented evidence measures immediate, physiologic, or surrogate end points that may or may not reflect improvements in patient outcomes (eg, blood pressure, blood chemistry, physiologic function, pathologic findings). NICHD, Eunice Kennedy Shriver National Institute of Health and Human Development.

Fig. 1. AAP summary of safe sleep recommendations with strength of recommendation.
Note. Reprinted from "Sleep-related infant deaths: Updated 2022 recommendations for reducing infant deaths in the sleep environment," by Moon et al., 2022.

around the baby, and refraining from co-sleeping or having loose articles in the crib (Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), 2022; Red Nose Limited, 2021).

There have been myriad educational programs included in many hospitals worldwide, such as Safe to Sleep®, Cribs for Kids®, and ABCs of Safe Sleep, to name a few (CDC, 2022; Cramer, 2022). These programs educate healthcare providers about the incidence and prevalence of SIDS and safe sleep practices, such as those listed above, that can be implemented by both the nurse and the parents. Even with these preventive initiatives, SIDS persists as the fourth leading cause of all infant deaths in the US (Ely & Driscoll, 2021), with a gradual but steady increase since 1997 seen in mortality rates due to accidental suffocation and strangulation in bed (ASSB) (CDC, 2022). Healthcare workers are dedicated to ensuring the safe sleep of infants in the hospital setting; however, current practices have been found to have gaps in compliance with established guidelines (Newberry, 2019). Despite receiving training on safe sleep practices, nurses continue to model inconsistent safe sleep practices, have knowledge and practice discrepancies, and do not all adhere to the recommended guidelines (Newberry, 2019). Tantamount to the success of these programs is having healthcare providers emulating safe sleep practices for parents along with teaching about the importance of safe sleep (Newberry, 2019). Inherent to the success of safe sleep practices, therefore, is nurses' compliance with the goals and objectives of safe sleep programs initiated within their given hospital environments. There is a need for more comprehensive and targeted training that is implemented within the hospital setting and that addresses the various barriers hindering full compliance. Thus, the purpose of this integrative review is to determine the barriers to promoting safe sleep practices amongst healthcare workers in hospital settings.

Methods

An integrative review can portray the complexity of health care problems in nursing, which will enhance a holistic understanding of the topic. Therefore, an integrative review was suitable as it helped to elucidate the barriers related to the topic of safe sleep practices within hospital settings. This integrative review was guided by the Whittemore & Knafl (2005) framework, which includes problem identification (barriers to safe sleep practices), literature search, data evaluation, data analysis and presentation.

Problem identification

As the first phase in Whittemore and Knafl's (2005) framework is problem identification, thus this review focused on barriers to the implementation of safe sleep practices within hospital settings.

Literature search

This review consists of a librarian's assisted search, which included databases such as CINAHL, PubMed, and Academic Search Complete. Search terms included *safe sleep, sleep promotion, sleep environment, safe sleep practice, infants, infancy, newborn, baby, barriers, prohibit, enable, hospitals, inpatient and hospitalized.* Inclusion criteria for the search consisted of articles written during the period of 2010–2021 and peer-reviewed scholarly articles that are written in the English language, quality improvement projects, practices within the hospital environment, and safe sleep practices. Exclusion criteria consisted of grey literature and safe sleep programs that were not conducted in hospitals for healthcare workers.

Data evaluation

Evaluation using the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018) was utilized to assess the quality of the primary studies included in this review. The MMAT is a comprehensive tool used to assess empirical studies such as qualitative, quantitative and mixed methods. The MMAT consists of various steps to determine acceptable articles for inclusion which include looking at the application of the screening questions for all studies, then reviewing the study design to determine if it meets the inclusion criteria of the appraisal. These steps were completed using two independent authors to review and conduct the critical appraisal of the articles in order to provide an overall quality score (Hong et al., 2018). After careful assessment, it was noted that the four studies, three quantitative and one qualitative, met the quality appraisal of the MMAT. As the MMAT does not evaluate quality improvement studies, the authors chose the Standard for Quality Improvement Reporting Excellence (SQUIRES) tool. This tool is useful when using reports that describe system level work, such as quality improvements (Ogrinc et al., 2016). In each instance, two authors independently evaluated the included articles utilizing both the MMAT and the SQUIRES tools.

Data analysis

Data analysis consists of data reduction, data display, data comparison, conclusion drawing and verification (Whittemore & Knafl, 2005). In the data reduction phase, data is reviewed for type of evidence, methodologies and characteristics of the findings in order to develop codes. For this review, data was extracted using a table developed by the authors. The table consisted of headings such as author, year and country, design, program, implementation, and findings/barriers (see Table 1). Two authors reviewed and extracted the data independent of each other and then met to review the data to ensure there were no inconsistencies present and to come to a congruence of the findings.

In the data display phase, the extracted data was converted into visuals as codes (see Fig. 2), which illustrate the barriers extracted from the 10 articles. The Social Ecological Model (SEM) was then used to categorize the data into resultant themes.

During the data comparison phase, data was reviewed to identify themes, and the SEM was utilized to direct to the findings related to the barriers of safe sleep. The SEM was introduced as a conceptual model to understanding factors that influence behavior (Bronfenbrenner, 1989). It consists of intersecting levels that enable the researcher to look beyond the individual level and to other factors that may influence how one behaves in a certain manner. At the relationship level, this model considers the person's inner circle, which may include family, friends and partners, while at the community level, this model explores settings such as schools, work and neighborhoods. Lastly, at the societal level, this model looks at such things that may alter or influence health behaviors, including culture, economics and education to name a few (Krug et al., 2002). The SEM guided the authors in thinking about the barriers, as well as the organization and presentation of these barriers related to safe sleep practices. This model helped identify factors that may affect behaviors by enabling the researchers to look beyond the individual level, an example of which is exploring the organizational, policy, individual, cultural, or environmental levels (Golden et al., 2015). The SEM can be used to examine and describe the dynamic relationship amongst organizational, individual and cultural levels.

Finally, for the conclusion drawing and verification phase, the authors drew inferences by observing similarities and differences amongst the data. At this time, the authors integrated the sub themes into main classifications according to the SEM to provide a description of the topic of concern (Whittemore & Knafl, 2005). Results from application of the SEM are discussed further below in the Findings section.

Findings

The literature search yielded 383 articles; however, after careful review, removing duplicates, and applying the inclusion/exclusion criteria, 10 articles remained for this review (see Fig. 3).

Table 1
Extraction table of selected articles.

No.	Title, Authors, Year, Country	Type of Study	Safe Sleep Program/Policy	Implementation	Main findings
1	Safe sleep practices of Kansas birthing hospitals *Ahlers-Schmidt, Schunn, Sage, Engel & Benton* 2018, US	Cross sectional survey of existing safe sleep practices on 18 responding hospitals in Kansas hospitals	Policy	In regard to training, 58% reported training for staff and 44% said they provided yearly training	Barriers included patient and family beliefs, language barriers, nursing staff do not always follow guidelines, competing staff priorities, lack of educational material, lack of awareness of safe sleep practices, staff believe that co-sleeping promotes bonding, physicians don't always follow guidelines, not enough time to educate patients
2	Facilitators and Barriers to Implementation of Safe Infant Sleep Recommendations in the Hospital Setting *Colson, Schaeffer, Hauck, Provini, McClain, Corwin, Drake, Kellams, Geller, Tanabe, & Moon* 2019, US	Qualitative study consisting of barriers and facilitators to following safe sleep policy within their institutions of 5 focus groups with 46 participants	Policy	Huddles, emails, staff meetings	Nurses reported difficulty in following the guidelines as some wanted to give pacifiers straight away, some felt that laying baby on the back was not safe even though it is recommended guideline, practitioners knew about safe sleep but stated guidelines change over time which is confusing and a barrier to adherence, family members had negative attitudes, many staff felt families would do what they want no matter what, noncompliance of pediatricians who recommend co-sleeping once discharged, staff education was variable, no resources, some participants noted the conflict about baby friendly designation and the AAP recommendation for safe sleep
3	Implementation of safe sleep practices in Massachusetts NICUs: A state-wide QI collaborative *Hwang, Melvin, Diop, Settle, Mourad & Gupta* 2018, US	Quality Improvement Project of 10 NICUs in Massachusetts	Implementation of a policy and safe sleep program	Implemented over a 2-year period to all NICUs utilizing education, webinars, in-person summits and regular reports	Statewide quality improvement initiative improved compliance went from 48%–81% with safe sleep program. Barriers mentioned were noncompliance with having parents to keep blankets, dolls and other unsafe objects out of the cribs.
4	Implementing a Statewide Safe to Sleep Hospital Initiative: Lessons Learned *Miller, Salm Ward, McClellan, Dawson, Ford, Polatty, Walcott & Corso* 2018, US	Quality Improvement project	Policy and safe sleep program	Providing safe sleep information to all hospital staff, support for the implementation of the program, provide guidance and education to address concerns for parents, regular education for healthcare staff	The adherence to practice yielded 100% participation but took a substantial amount of staff time, barriers were noted when safe sleep champions had a change in shift workload or staff turnover, however identifying a backup champion mitigated this, several hospitals initiated a club approach and included hospital leadership as a support
5	Implementation of Safe Sleep Practice Recommendations for Infants in Inpatient Wards *Sobaihi, Banjari & Alahmadi* 2020, KSA	Observational cross-sectional study	Policy	Not reported	Hospitals need to role model safe sleep practices, insufficient awareness of guidelines, cultural norms, lack of time to adequately audit the sleep environment
6	Certified Nurse-Midwives' Knowledge, Attitudes, and Behaviors About Infant Safe Sleep *Hodges, Anderson, McKenzie & Katz* 2018, US	Cross sectional survey study	Not reported Survey regarding safe sleep practices were sent to 303 potential participants with 207 who met the criteria and responded	Not reported	Lack of education, resources, some disagreed with the AAP recommendations, lack of time
7	Integrating Safe Sleep Practices into a Pediatric Hospital: Outcomes of a Quality Improvement Project *Rowe, Sisterhen, Mallard, Borecky, Schmid, Rettiganti & Luo* 2016, US	Quality Improvement Project	Policy and implementation of a safe sleep program	Safe sleep baseline regarding knowledge, understanding and beliefs surrounding the AAP guidelines along with an audit tool to assess safe sleep. Then an online education training model was developed for staff, families and sleep packs given to families.	Increase in staff knowledge regarding safe sleep practices were noted. Study showed that at times, nurses were conflicted about implementation of safe sleep practices secondary to patients' condition, comfort needs, and parental request.

Table 1 (*continued*)

No.	Title, Authors, Year, Country	Type of Study	Safe Sleep Program/Policy	Implementation	Main findings
8	Improving Safe Sleep Modeling in the Hospital through Policy Implementation *Heitman, Nilles, Jeans, Moreland, Clarke, McDonald & Warren* 2017, US	Quality Improvement Project	Policy, safe sleep program across 71 hospitals	Policies were implemented and the educational sessions were provided to healthcare personnel, follow up visits and phone calls	Nearly all hospitals (91%) reported training their staff, which included face to face, pamphlets and online training. 31% reported they had conducted crib audits. Removing time constraints and cost contributed to the success of the program.
9	As easy as ABC: Evaluation of safe sleep initiative on safe sleep compliance in a freestanding pediatric hospital *Leong, Billaud, Agarwal, Miller, McFadden, Johnson, & Lazarus* 2019, US	Quality Improvement Project	Policy, safe sleep program	Education and collaborative meetings with nurse managers followed by crib card audits, safe sleep carnival and safe sleep handouts	Safe sleep environment was safer after the intervention, nurses stated parents put things in the crib which was a challenge to ensure a safe sleep environment, nurses felt infants needed more intervention due to crying while lying supine, nurses did not find crib cards to be helpful, crib cards that were lost were not reported in order to be replaced, this study figured the Hawthorne effect played a role here as the intervention was new and wondered about its efficacy long term, crib cards were reported to not be enough.
10	Outcomes of a quality improvement project: An implementation of inpatient infant safe sleep practices *Rholdon* 2017, US	Quality improvement project	Safe sleep program	AAP guidelines were used, Nurses were given one month to complete an NIH online training program	Revealed an increase in the number of infants found sleeping on their backs, firm surface, no objects, and loose bedding. However, the number was not statistically significant. One reason for this is staff participation, completion rate was low in the training program, change in leadership, perhaps knowledge from the education was not effective, and no policy was created to go along with the safe sleep program

Characteristics of the studies

The 10 studies included in this review were published between 2010 and 2021. Of those, four were primary resources comprising three quantitative cross-sectional studies (Ahlers-Schmidt et al., 2018; Hodges et al., 2018; Sobaihi et al., 2020) and one qualitative study consisting of focus groups (Colson et al., 2019). The remaining six were quality improvement projects (Heitmann et al., 2017; Hwang et al., 2018; Leong et al., 2019; Miller et al., 2018; Rholdon, 2017; Rowe et al., 2016). The studies were carried out in the US ($N = 9$) and one in the Kingdom of Saudi Arabia (Sobaihi et al., 2020). Details of the studies fulfilling the inclusion criteria are listed in the extraction table (see Table 1). Several recurring themes about barriers to implementing safe sleep practices were identified in the various studies and were further categorized according to the SEM at the organizational, individual and cultural levels. The three main themes that surfaced were lack of time to educate parents and lack of educational support for staff, staff beliefs and compliance, and language barriers and cultural beliefs (see Fig. 4).

Organizational level

At the organizational level, lack of time to educate parents and lack of educational support for staff were amongst the major themes noted. Several studies highlighted the lack of time available for staff to educate patients about safe sleep, largely due to competing work demands (Ahlers-Schmidt et al., 2018;Colson et al., 2019; Hodges et al., 2018). The lack of education pertained both to staff and patients. Lack of education and awareness amongst staff about safe sleep was a concern reported by healthcare professionals (Ahlers-Schmidt et al., 2018; Colson et al., 2019; Hodges et al., 2018; Rholdon, 2017). Barriers to patient education occurred due to patients being uninterested in receiving education about safe sleep (Hodges et al., 2018), staffing changes (Miller et al., 2018), inconsistent messaging between shifts (Colson et al., 2019), and a lack of monetary and other resources for educational materials (Ahlers-Schmidt et al., 2018; Colson et al., 2019; Hodges et al., 2018; Miller et al., 2018). Certain hospital policies, such as waivers signed by caregivers that allow co-sleeping in inpatient pediatric units (Leong et al., 2019), also worked against the adoption of safe sleep practices. The removal of cost and time barriers for staff, the provision of education to staff and educational materials to families, and support through hospital policy and leadership facilitated the implementation of safe sleep practices in hospitals (Heitmann et al., 2017; Miller et al., 2018; Rowe et al., 2016).

Individual level

Predominant themes at the individual level involved staff beliefs and compliance. Staff who believed that infants could choke while supine or that co-sleeping promotes bonding demonstrated lower adherence to safe sleep practices and provided inconsistent messaging to parents (Ahlers-Schmidt et al., 2018; Colson et al., 2019). Some pediatricians and staff still promoted co-sleeping despite being familiar with the guidelines and risks associated with this practice (Ahlers-Schmidt et al., 2018; Colson et al., 2019). Both physicians and nurses were found to not comply with safe sleep hospital policies (Ahlers-Schmidt et al., 2018; Miller et al., 2018) for reasons including disagreement with the AAP recommendations (Colson et al., 2019; Hodges et al., 2018) and confusion about changing guidelines, resulting in inconsistent messaging (Colson et al., 2019). Additionally, staff had a difficult time implementing seemingly contradictory recommendations, such as promoting skin-to-skin contact for breastfeeding while simultaneously discouraging bed sharing (Colson et al., 2019). Some nurses

Fig. 2. Barriers to safe sleep practices.

struggled to follow safe sleep practices due to discomfort with providing education about the topic, increased infant crying when supine (Leong et al., 2019) or the condition or comfort needs of the patient (Rowe et al., 2016). Staff were less likely to promote a safe sleep environment if they had positive experiences of infants sleeping in the prone position when raising their own children (Colson et al., 2019). A resounding theme that encouraged the adoption of safe sleep practices by caregivers was the importance of positive role-modeling by staff (Ahlers-Schmidt et al., 2018; Colson et al., 2019; Heitmann et al., 2017; Miller et al., 2018; Rholdon, 2017; Rowe et al., 2016; Sobaihi et al., 2020). Families were much more likely to demonstrate safe sleep practices at home if they observed staff doing so with appropriate teaching during the inpatient stay.

Cultural level

Finally, influential considerations at the cultural level included language barriers and family beliefs or preferences impacting compliance. The inability of staff and families to communicate in a common language contributed to nonadherence of infant safe sleeping practices, regardless of hospital size (Ahlers-Schmidt et al., 2018; Miller et al., 2018). Factors involving the family posed another hurdle. Respecting caregiver requests (Rowe et al., 2016) or family attitudes/beliefs (Ahlers-Schmidt et al., 2018; Colson et al., 2019) at odds with the guidelines reduced adherence to safe sleep practices. The practice of co-sleeping, for example, persisted for a myriad of factors, including caregiver preference (Colson et al., 2019), easier access to the baby (Sobaihi et al., 2020), and financial constraints (Colson et al., 2019). While some caregivers knew of the dangers of placing a baby prone to sleep, they lacked awareness of the risks of having soft blankets or bumpers in the crib (Colson et al., 2019). Some staff believed that no matter what education they provided, cultural values and beliefs would prevail, and families would act accordingly (Colson et al., 2019; Miller et al., 2018; Sobaihi et al., 2020). One major challenge stemming from family beliefs involved ensuring that infant cribs were clear and free of clutter. Despite educating families about a safe sleep environment, staff still struggled with parents placing items in the crib for soft bedding, as a holder for extra belongings, or for purely visually aesthetic purposes (Colson et al., 2019; Hwang et al., 2018; Rowe et al., 2016; Sobaihi et al., 2020).

Discussion

Findings from this literature review suggest that various factors related to the successful uptake of the AAP safe sleep guidelines exist at the organizational, individual, and cultural levels.

At the organizational level, we found that having time to educate parents and for educational support of staff were key to the success of safe sleep programs within hospitals. Our findings are congruent with existing literature about hospital-based safe sleep programs. A lack of time due to competing patient priorities and documentation needs is often cited by hospital providers as the main barrier for providing patient teaching about safe sleep (Naugler & DiCarlo, 2018). Prioritizing nursing education about safe sleep also improves nursing compliance and modeling of safe sleep practices (Naugler & DiCarlo, 2018). A quality improvement project carried out by Shadman et al. (2016) found that continuing education to further expand the scope of nursing knowledge would go a long way to building the confidence of nurses so that they may adhere to safe sleep practices. The researchers also go on to say that for nurses to receive and fully understand information regarding safe sleep practices, time needs to be allotted for them to receive the training and to impart this knowledge on to patients (Shadman et al., 2016). Our findings similarly align with another study by McMullen

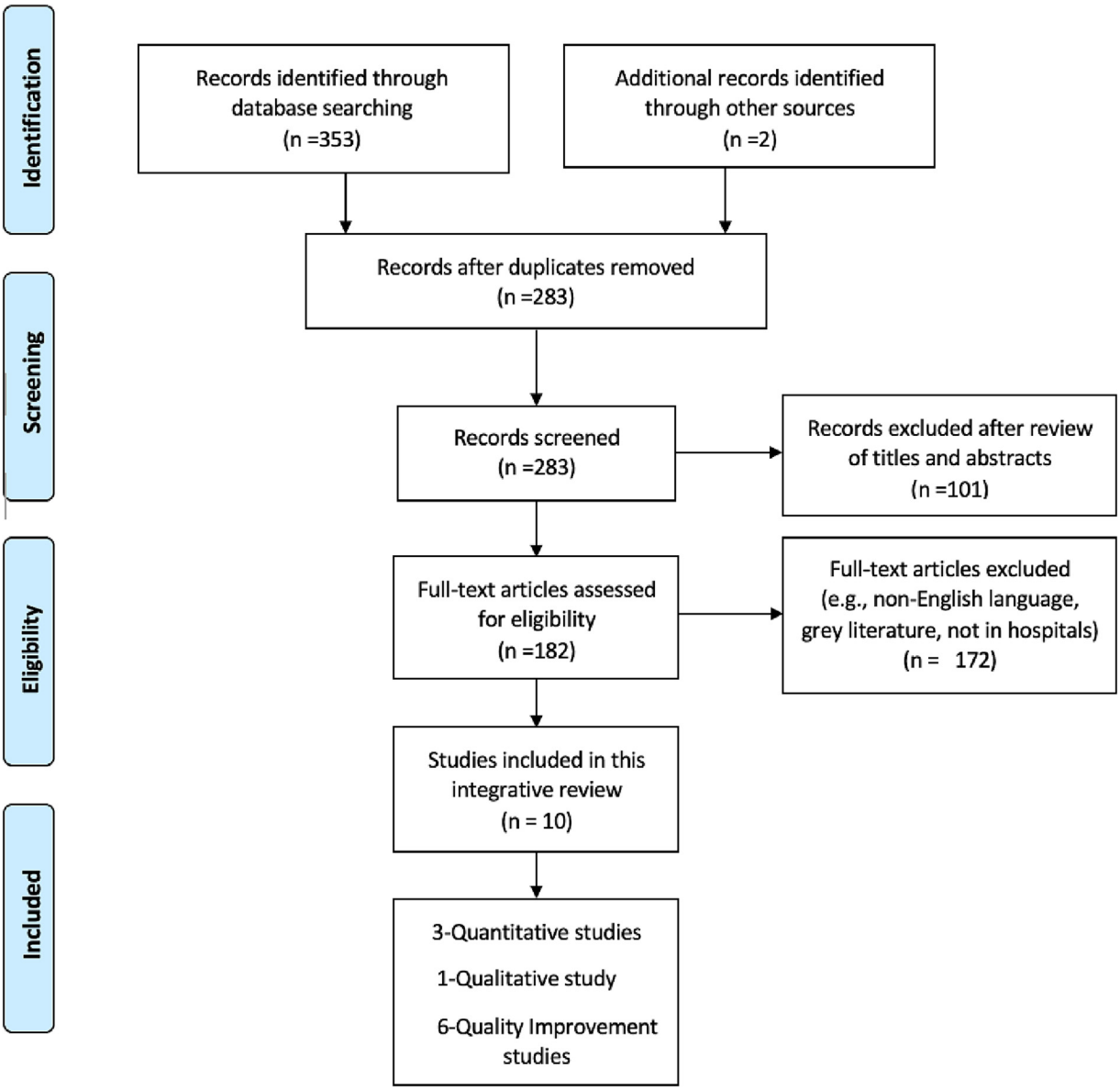

Fig. 3. Literature search flow diagram.
Note. Adapted from "The PRISMA 2020 statement: An updated guideline for reporting systematic reviews," by Page et al., 2021.

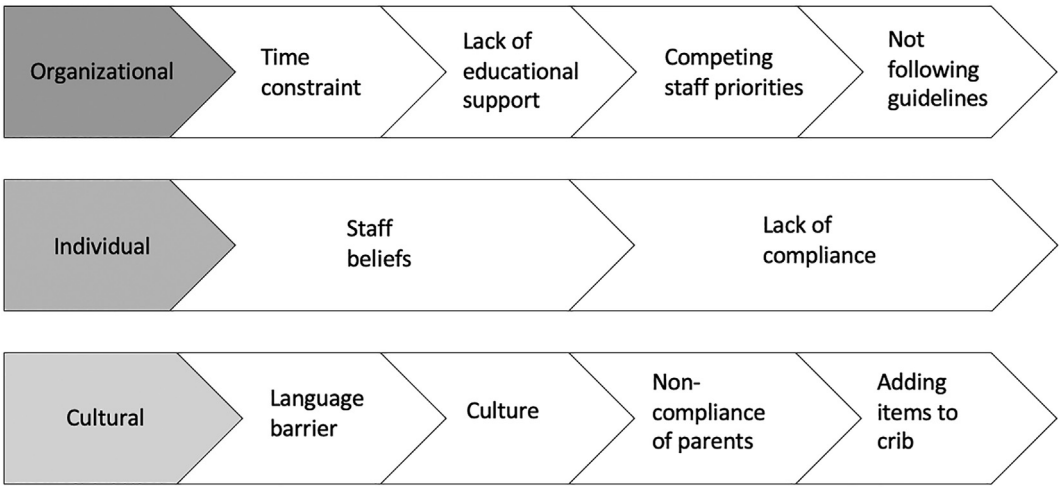

Fig. 4. Barriers categorized at three main levels of the SEM.

et al. (2016), who conducted a quality improvement project looking at the promotion of AAP safe sleep guidelines. They found a high correlation between nurses' and patients' knowledge and subsequent adherence to the guidelines. Their study demonstrated a significant increase in nurses' practices related to safe sleep guidelines when mandatory training was delivered so that nurses were able to attend (McMullen et al., 2016).

At the individual level, results from our review indicate that nurses' personal beliefs led to noncompliance with AAP guidelines related to safe sleep. The literature indicates that although nurses may be aware of the AAP guidelines, this awareness is not necessarily reflected in their day-to-day practice (Bartlow et al., 2016; Kellams et al., 2017; Naugler & DiCarlo, 2018). At one hospital, approximately 60% of nurses deviated from safe sleep practices despite having knowledge of the recommended guidelines (Bartlow et al., 2016). The importance of nurses needing to emulate safe sleep behavior in order for parents to comply with such practices has also been highlighted in the literature (Andreotta et al., 2016; Grazel et al., 2010; Kellams et al., 2017; Patton et al., 2015). In line with our findings, nurses, however, can be conflicted in their decisions due to personal beliefs about the positioning of the infant even though there are clear guidelines and evidence to support safe sleep practices (Andreotta et al., 2016; Grazel et al., 2010; Kellams et al., 2017; Patton et al., 2015). Even if anticipatory guidance is provided, hospital staff who do not model safe sleep practices may contribute to lower adherence of parents to the recommended guidelines (Grazel et al., 2010; Kellams et al., 2017).

Finally, at the cultural level, we found that language was seen as a barrier as well as families' beliefs, which were not always congruent with staff recommendations (Ahlers-Schmidt et al., 2018; Miller et al., 2018). Bechtel et al. (2020) similarly reported that the provision of safe sleep education to non-English speaking parents was a barrier, even though legislation mandated them to do so. Although lack of guideline awareness was present amongst caregivers, in addition was the existence of cultural values and beliefs that were an obstacle to swaddling, using blankets to protect an infant's face from cold breeze, and keeping belongings in the crib (Sobaihi et al., 2020). In fact, one of the most challenging factors was keeping the crib void of hazards such as blankets, loose sheets (Sobaihi et al., 2020), bumpers and positioners (Colson et al., 2019). Our review finding that culture was an important influence on family decision making and compliance is supported in the literature (Gaydos et al., 2015; Patton et al., 2015). Through focus group interviews with mothers and healthcare providers, Gaydos et al. (2015) found that even when mothers reported understanding the safe sleep guidelines, noncompliance occurred largely due to cultural factors. Furthermore, providers indicated feeling that advice from the family often took priority over clinical guidance. Reasons for not adhering to safe sleep guidelines found in the literature and consistent with our findings include perceived infant safety and comfort, concerns of choking, aesthetics, and to promote comfort and closeness through co-sleeping (Austin et al., 2017; Bailey, 2016; Chahin et al., 2022; Duzinski et al., 2013; Gaydos et al., 2015; Lau & Hall, 2016; Zoucha et al., 2016).

Limitations

There are some limitations and challenges to this integrative review. The authors included original articles; however, this review contains evidence which comes from quality improvement projects and not empirical evidence. Additionally, the inclusion criteria was limited to peer-reviewed journals only and excluded grey literature, which may have contained insightful information for this review. Furthermore, since the search included articles in the English language only, pertinent information from the literature in non-English languages may have been missed.

Conclusion

Despite decades of efforts and dramatic reductions in the infant death rate following wide-spread public health campaigns (NICHD, 2022), multiple barriers continue to exist in sustaining safe sleep practices in the hospital setting. The implementation of hospital-based safe sleep programs has not consistently translated to awareness or compliance to safe sleep practices amongst healthcare workers. This integrative review has identified three main themes as barriers to sustaining a safe sleep program in the hospital setting, existing at the organizational, individual and cultural levels. The identification of these themes, including lack of time to educate parents and educational support for staff, staff beliefs and compliance, and cultural beliefs and noncompliance, provides the core elements to be considered for the development of safe sleep programs. The hospital setting provides an opportune time to educate families about the dangers of unsafe sleep practices and possible infant death. Educational interventions tailored to increase staff knowledge and compliance, and the modeling of safe sleep practices by staff will promote adoption of such practices by patient families.

Next steps / future implications

Additional research targeting the barriers identified in this integrative review are necessary. Based on the findings presented here, the authors have started preliminary work with the nursing department of the local women and children's hospital to address some of the identified barriers with nursing staff. More specifically, mandatory training about safe sleep will be provided to nurses, affording them the time and support to attend. Following the provision of this training, a study will be undertaken to evaluate the level of adherence to safe sleep practices within the inpatient hospital.

CREDIT Statement

Tawny Lowe: Writing – original draft, Writing – review & editing, Visualization. **Jessie Johnson:** Conceptualization, Methodology, Validation, Writing – original draft, Writing – review & editing, Supervision. **Melody Blanco:** Writing – review & editing. **Kristi Yassine:** Formal analysis, Writing – original draft, Writing – review & editing. **Sumayya Ansar:** Resources. **Dina Schnurman:** Writing – original draft. **Hayfaa Al-Naemi:** Writing – review & editing. **Helen Sutherland:** Writing – review & editing.

Declaration of Competing Interest

We declare as authors of this article that we do not have either any competing interest or any conflict of interest. Open Access funding provided by the Qatar National Library.

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