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Parent-Targeted Education Regarding Infant Pain Management Delivered During the Perinatal Period

A Scoping Review

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ABSTRACT

All infants experience pain in early life from procedures. Parents recognize pain as a prevalent issue, reporting a strong desire for more information on infant pain. The aim of this study was to explore and map the current evidence of parent-targeted educational interventions about infant pain, delivered throughout the perinatal period. Records were identified in PubMed, CINAHL, EMBASE, and ERIC databases and hand searching recent publications in 3 relevant journals. Records in English that described or evaluated educational interventions on infant pain management aimed at parents during the perinatal period were eligible for review and those not related to pain or aimed at healthcare providers were excluded. Evaluation was completed following the Methodology for JBI Scoping Reviews and standardized critical appraisal instruments from the Joanna Briggs Institute. Initial search yielded 6946 records, with 9 included in analysis. Six studies were quantitative, 2 qualitative, and 1 mixed methods. Included interventions contained information about parent-led pain management strategies for infants in the neonatal intensive care unit ($n = 4$), full term ($n = 4$), or both ($n = 1$). Despite being an area of high concern for parents of newborns, few studies addressed parent-targeted education regarding infant pain. Future research examining the impact and efficacy of these interventions addressing parental and neonatal outcomes is warranted.

Key Words: neonatal, pain management, parental involvement, procedural pain, scoping review

From birth and throughout the next 12 months, infants experience numerous painful procedures. As part of routine postpartum care, all infants must receive vitamin K by intramuscular injection, as well as heel lancing to collect blood specimen for metabolic screening. Even healthy, full-term infants often undergo painful procedures, some receiving upwards of 10 repeated heel lances to monitor blood glucose levels.[1,2] Because of their critical conditions, infants in the neonatal intensive care unit (NICU) are known to receive the highest amount of pain exposure, receiving on average 12 painful procedures per day.[3] Outside of postpartum care, infants also experience at least 4 rounds of vaccination throughout their first year of life to protect and enhance their immune systems.[4]

Despite widespread evidence supporting proper pain management, infants often receive little to no pain-relieving treatments.[5] While most concerning in the preterm population, untreated pain in early life can have detrimental effects on all infants, including heightened pain response in infancy and childhood, impairments in their neurodevelopment, and altered behavior regulation.[6–10] Almost half of infants fail to receive any treatment of pain relief despite evidence for

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several known effective interventions.[3,11] Although there is evidence to support the efficacy of pharmacological and nonpharmacological pain management interventions, specifically for infants and children experiencing vaccination pain,[12–14] it is often overlooked in clinical practice.[15]

Parent-led interventions, such as skin-to-skin contact and breastfeeding, have been shown to significantly reduce biobehavioral procedure-related infant pain response.[16–18] In addition, preterm infants demonstrate enhanced motor development, reduced stress, and less irritability upon handling when parents are involved.[19] Parental engagement in preterm infant care has also been shown to reduce parental stress and anxiety, increase their sense of competency as caregivers, and enhance their attachment to their infants.[20] Similarly, regarding parental involvement with pain-relieving interventions in the healthy term population, research has demonstrated positive parental outcomes, including decreased parental stress and increased confidence in care.[16,21,22]

Although known to be beneficial in reducing procedural pain in infants, parental involvement can be dictated by numerous factors. In the NICU, many parents experience overwhelming fear due to the foreign environment, health status of the infant, and complex technologies that may be used to support the infant.[23] The NICU environment can be intimidating to someone who is unfamiliar with the setting and thus parents will often wait to be invited by the healthcare team to engage with their infants.[24,25] In addition to staff facilitating involvement, parents emotional state, the severity of their infants' condition, and external demands influence parents' ability to achieve their desired level of involvement.[26] In previous research, unless receiving education from the NICU healthcare team upon admission, it was found that parents remained unaware of their infants experiencing pain or that they have the ability to help minimize pain.[23,26] Parents' lack of knowledge about their capacity to provide pain-relieving treatment for their infants has been recognized as the greatest barrier to utilizing parent-led interventions for procedural pain, including vaccination.[15,27]

Parents express a strong desire for more information on all aspects of infant pain care and involvement opportunities[26,28] and report less stress when actively engaged.[29] Printed education materials containing information on infant care and pain may often be set aside and then misplaced as parents may be preoccupied with their infants' condition.[23] Coincidentally, parents have been found to spend up to 20 hours per week on the Internet searching for information regarding their infants' health despite knowing that it may not always be accurate.[30–32] In a study regarding parental preferences in accessing information on infant care in the NICU, more than half of parents reported searching the Internet specifically on how to help their children get pain relief.[28] Yet, a recent systematic review evaluating Internet resources aimed at parents of preterm infants found that there were significant concerns regarding the overall quality and credibility of available Web sites, with only 5% addressing infant pain at all.[33] Although parents value the Internet as an avenue to access information regarding their infants' health through use of popular search engines or social media communities,[34] they still prioritize education delivered by healthcare providers and have reported interest in using a credible Web site created by health centers that provides information on parent-led interventions for infant pain relief.[28]

Although there are various reviews of the efficacy of parent-led interventions in reducing procedural pain, there has not been a synthesis of the literature examining how parents are being educated to be involved in interventions about infant pain care. Thus, in an effort to better understand the range of strategies that promote parent-led interventions with infant procedural pain, this review sought to identify current educational interventions aimed at parents throughout the perinatal period.

OBJECTIVE

The objective of this review is to explore and map the current evidence of parent-targeted educational interventions about infant procedural pain, delivered throughout the perinatal period. This scoping review aims to answer the following questions:

1. What types of parent-targeted educational interventions regarding infant procedural pain management are available?
2. What are the common delivery modes of parent-targeted educational interventions about infant procedural pain?
3. What are the common outcomes measured in studies regarding parent-targeted educational interventions about infant procedural pain?

METHODS

Methodology

The Methodology for Joanna Briggs Institute (JBI) Scoping Reviews was followed to complete study selection and data extraction for this review.[35] True to the methodology, this review sought to identify the range of available parent-targeted educational interventions and synthesize evidence related to the implementation strategies and identified outcomes related to parent

education on infant procedural pain management. Identifying gaps in evidence and understanding the feasibility and impact of interventions in the context of healthcare delivery are a priority concern often addressed in a variety of approaches and methods in research.[35] Thus, a scoping review using JBI methodology was determined to be the best approach to explore the primary research objective. While scoping reviews are intended to provide a broad overview of the current evidence, the research questions explored in this review informed the eligibility criteria required to focus on specific elements related to parent-targeted education on infant procedural pain management. These questions also facilitated the following structured report and provided greater context and direction for future systematic reviews on this topic.

Search strategy

Our search strategy was developed in collaboration with a medical library scientist and included combinations of terms for "pain," "infant," and "patient education" (see Table 1 for full search strategy). We searched the following databases: PubMed, CINAHL, EMBASE, and ERIC. Medical Subject Headings (MeSH) terms, key word terms, and text terms were applied to ensure a comprehensive search. In addition, the previous 5 years of leading journals in this topic area, including *PAIN*, *BMC Pediatrics*, and *The Journal of Perinatal & Neonatal Nursing*, were hand searched for articles that met the inclusion criteria. Studies published in English were considered for inclusion in this review. There were no restrictions on the time frame of studies included, up to the search date: February 2018. The protocol for this review was registered with the Open Science Framework.[36]

Eligibility criteria

Given the paucity of syntheses on this topic, we considered any existing literature, such as empirical studies (experimental and nonexperimental), reviews of any type, commentary, editorial articles, theses, or dissertations for inclusion. Studies that included parents receiving education about infant (ie, up to the first 12 months of age) pain management at some point during the perinatal period (ie, antenatal and postpartum up to 6 weeks) were eligible. The studies could describe or evaluate educational interventions delivered by any method (ie, printed educational materials, presentations, or eHealth learning), with no restrictions on when the educational intervention was developed. The educational intervention had to be linked to a reputable source, including research, education, or health institutions. Studies that described or evaluated educational interventions that were delivered outside the perinatal period, not related to pain, or aimed at healthcare providers were not considered in this review.

Study selection and data extraction

Two independent reviewers (B.R. and A.F.) systematically screened for eligible studies at the title and abstract stage, with a third reviewer to resolve any conflicts (J.S.). Reviewers (B.R., A.F., and J.S.) then independently conducted full-text screening using specified eligibility criteria (see Figure 1 for screening process). Extracted data included specific details about the study methods, populations, interventions, and outcomes of significance to the review question and specific objectives. Studies included for full review were independently assessed for methodological quality using standardized critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI).[37] Any disagreements between the reviewers were resolved through discussion or with a third reviewer.

RESULTS

Description of studies

The initial systematic search identified 6946 records and after the removal of duplicates, 5539 articles remained. Titles and abstracts of all identified articles were

Table 1. **Search strategy**

Concept	MeSH heading	Key words
Pain	"pain"[Mesh] OR "Pain Management"[Mesh]) OR "Pain Measurement"[Mesh]	pain*[tiab]
Infant	infant[MeSH]	low birth weight[tiab])) OR ((Infan*[tiab] or newborn*[tiab] or new-born*[tiab] or perinat*[tiab] or neonat*[tiab] or baby[tiab] or babies[tiab] or prematur*[tiab] or preterm*
Education	(("Patient Education as Topic"[Mesh] OR "Education"[Mesh:NoExp]) OR "Health Education"[Mesh]	educat*[tiab] or teach*[tiab] or learn*[tiab] OR "Patient Education Handout" [Publication Type]

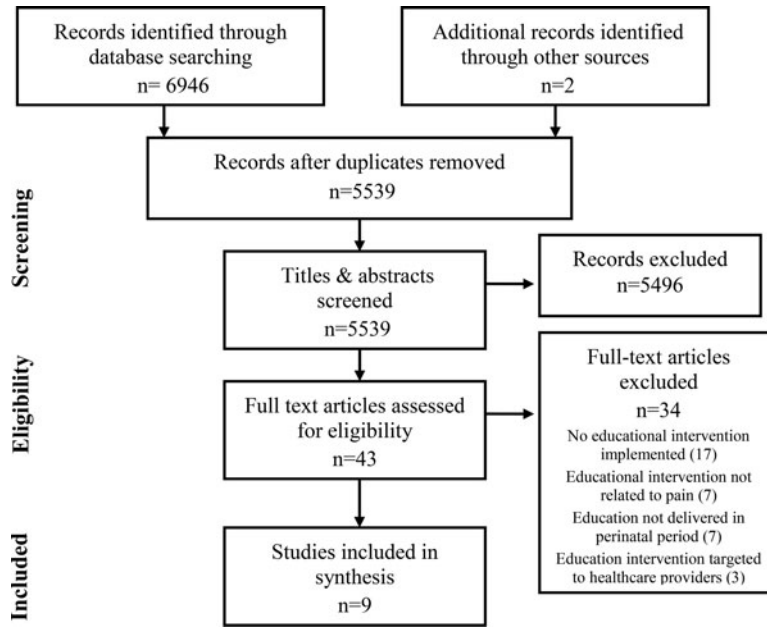

Figure 1. PRISMA. From Moher et al.[38]

screened and reviewed for relevance to the study criteria; 5496 articles were excluded, resulting in 43 articles for possible inclusion. Full text of the 43 articles was reviewed for meeting the eligibility criteria. From this, 9 articles were identified for inclusion (see the Figure). Articles were excluded because of the following reasons: no educational intervention implemented ($n = 17$); educational intervention not related to pain ($n = 7$); education not delivered in the perinatal period ($n = 7$); and educational intervention aimed at healthcare providers ($n = 3$). The methodology of the 9 studies included 6 quantitative studies (4 randomized controlled trials, 1 cross-sectional: survey, 1 quasi-experimental: pre/post), 2 qualitative studies (2 thematic analysis), and 1 mixed methods (qualitative component: usability testing/interviews, and quantitative component: survey). The publication dates of the articles ranged from 2011 to 2017. Five of the studies were conducted in Canada by the same team, and the remaining came from the United Kingdom and Brazil. Eight of the included studies described interventions that were conducted in hospital within the NICU[23,26,39,40] or postnatal ward,[41–44] and 1 intervention was conducted prenatally.[45] There was a wide variation of reported sample sizes among the studies, ranging from 11 to 354 participants (see Table 2). Two of the 9 publications employed the Knowledge to Action Framework.[41,45] The remaining studies did not report using a theoretical framework,

Table 2. **Summary of design and intervention in the included studies**

	Study				
Author	**Year**	**Design**	**Sample, *n***	**Setting**	**Intervention**
Franck et al[26]	2012	Qualitative	169	NICU	Educational booklet
Franck et al[39]	2011	RCT	169	NICU	Educational booklet
Skene et al[23]	2012	Qualitative	11	NICU	Educational booklet
Smart et al[44]	2012	RCT	178	Postpartum	Factsheet in discharge package
Taddio et al[42]	2014	RCT	120	Postpartum	Factsheet
Taddio et al[45]	2014	RCT	174	Prenatal Education	Factsheet + video + discussion groups
Bueno et al[40]	2018	Questionnaire	100	NICU	Video
Taddio et al[41]	2013	Mixed methods	37	Postpartum	Factsheet + video
Taddio et al[43]	2015	Quasi-experimental	354	Postpartum	Factsheet in discharge package

Abbreviations: NICU, neonatal intensive care unit; RCT, randomized controlled trial.

although the work of Franck and colleagues[26,39] was guided by family-centered care philosophy.

Description of interventions

Although participants were reported as "mothers" or "parents" in the included studies, mothers were found to be the primary respondent consistently across all studies where either parent were eligible to participate. The infants of the participants included full term only,[41–44] NICU population only,[23,26,39,40] or both.[45]

All of the educational interventions included information about infant pain management strategies. Studies specified interventions for procedural pain such as breastfeeding ($n = 7$),[26,39–43,45] skin-to-skin contact ($n = 3$),[26,39,40] facilitated tucking ($n = 2$),[26,39] sucrose ($n = 2$),[43,45] topical anesthetic ($n = 2$),[43,45] nonnutritive sucking ($n = 2$),[26,39] holding ($n = 3$),[41–43] and deep breathing and distraction ($n = 2$).[41,42] The method of implementation of the educational interventions included only written components such as booklets or factsheets ($n = 2$),[42,44] only video components ($n = 1$),[40] and multimodal ($n = 6$) including a mix of video, written, verbal discussion, pictorial information, and role-playing. Of the multimodal method, 2 were written, verbal, and role-playing,[26,39] 1 was written, verbal, and video education,[41] 1 was written, pictorial, video, and PowerPoint presentation,[45] 1 was written and pictorial,[43] and 1 was written and verbal.[23] All but one study had at least a written component integrated into intervention. The dose duration of the interventions ranged from 6 to 45 minutes, depending on the method of the educational intervention (eg, video vs factsheet). Interventions were delivered passively ($n = 5$) through a written factsheet at discharge,[42–44] a video,[40] or a combination of both[41] or were interactive ($n = 4$), whereby a research nurse supplemented written material by demonstrating comfort techniques[23,26,39] or provided interactive prenatal educational sessions.[45] Six of the 9 studies included follow-up after discharge, 3 had the follow-up 3 months after discharge, and 3 had the follow-up 2 months after discharge. The method of follow-up for the 6 studies included 2 by telephone,[42,43] 2 by mailed questionnaire,[26,39] 1 by observation,[45] and 1 study did not identify the method of contact for follow-up.[44]

Description of outcomes and study findings

Outcomes measured across studies included parental knowledge, self-efficacy, parental involvement in procedural pain management, stress, anxiety, postnatal depression, role attainment, pain assessment documentation, and measure of social support (see Table 3). All studies measured knowledge, most measured parental involvement ($n = 8$),[23,26,40–45] and more than a third measured self-efficacy ($n = 4$),[39,41,42,45] whereas the remaining outcomes were measured in only one study.[26] Although there was some consistency across studies, outcomes were assessed using various measures. To measure parental knowledge, 4 studies used the same survey that was developed by their team[41–43,45] and Franck and colleagues[26,39] used the Parent Attitudes About Infant Nociception (PAIN) questionnaire, which includes a survey and a section for open-ended questions. The remaining studies measured knowledge through discussion[23,44] or a unique questionnaire.[40] Parental involvement in pain management during procedures was measured by observation and interview,[23] self-report questionnaires,[45] or telephone surveys.[42–44] The intention to use pain management strategies for future procedures was measured by self-report questionnaires, whereby parents reported their intention for

Table 3. Summary of reported outcomes in the included studies

Author	Year	Outcomes			
		Parental knowledge	Parental self-efficacy	Parental involvement in pain management	Additional outcomes[a]
Franck et al[26]	2012	√		√	
Franck et al[39]	2011	√	√		√
Skene et al[23]	2012	√		√	
Smart et al[44]	2012	√		√	
Taddio et al[42]	2014	√	√	√	
Taddio et al[45]	2014	√	√	√	
Bueno et al[40]	2018	√		√	
Taddio et al[41]	2013	√	√	√	
Taddio et al[43]	2015	√		√	

[a]Additional outcomes include parental stress; frequency of pain assessment documentation; role attainment; anxiety; postnatal depression; and measure of support.

implementing pain-relieving interventions[26,40] or indicated the likelihood of using pain management strategies during future vaccination by a Likert scale.[41] Of the 4 studies that measure parental perceived self-efficacy, only one[39] used a validated and reliable tool, the Self-efficacy in Infant Care Scale[46] while the remaining studies assessed this outcome with the same survey that measured knowledge by using Likert scale questions where the respondent ranked their confidence in each survey answer.[41,42,45] Franck and colleagues[39] used well-known, validated, and reliable tools to measure stress (Parental Stressor Scale: NICU),[47] anxiety (Spielberger State-Trait Anxiety Inventory),[48] postnatal depression (Edinburgh Postnatal Depression Scale),[49] social support (Measure of Support),[50] and role attainment (What Being a Parent of a New Baby Is Like–Revised).[51] In addition, they measured frequency of pain assessment documentation through health record review.[39]

Parental knowledge regarding infant procedural pain was reported to increase following receipt of the educational intervention. Parental perceived self-efficacy increased in 3 studies[39,41,42] and parental involvement in subsequent painful procedures increased in 5 studies,[23,42–45] whereas 3 studies identified that parents had an increased intention to be involved.[26,40,41] The prenatal educational program was found to have sustained efficacy in utilization of parent-led pain management interventions up to the 2-month immunization appointment.[45] There were no significant differences between unadjusted or adjusted mean scores with parental stress, anxiety, social support, and postnatal depression, whereas parental role attainment and pain assessment documentation were found to be higher in the intervention group.[39] Although not identified as an outcome of interest, one study reported on parental advocacy for pain and recommendation of intervention in its findings.[40] Taddio and colleagues[41] derived 3 themes from their qualitative analysis: receptivity to learning (parents were open and receptive), accessibility to tools (parents wanted access to tools and information; parents preferred video and pamphlet combination), and validity of information (credibility of information was important). Similarly, Franck and colleagues[26] identified the following 3 themes: the importance and desired level of parental involvement in infant pain care; what parents want to know about infant pain; and parents' suggestions for improving pain management. These findings provided greater insight into the contextual factors that influence parents' experience with infant pain management and added more depth to the previous quantitative findings from the same cohort, leading to the development of a conceptual model of parental involvement in neonatal pain that is widely used in neonatal pain research.[26]

DISCUSSION

Although parent-led infant pain management has been widely recognized to reduce neonatal pain, this scoping review found few studies that described or evaluated parent-targeted educational interventions on infant pain and management strategies. The educational interventions provided instruction on common procedural pain management strategies, such as breastfeeding or skin-to-skin contact. The majority of the research included in this review was conducted by Taddio and colleagues; however, this work is focused primarily on vaccination pain, which may not necessarily account for all the painful procedures that infants endure before their immunizations. One study had implemented the educational intervention in the prenatal period[45]; however, since all babies experience at least 1 painful procedure shortly after birth, there may be a need for more education prenatally to equip parents with the knowledge and skills to advocate for pain management, as needed. While evidence remains unclear due to limited experimental studies exploring the impact of prenatal education on postpartum outcomes, what is available suggests that prenatal education can enhance knowledge acquisition[52] and has been found to positively influence caregiving behaviors, such as breastfeeding.[53]

Many studies deemed that parents (ie, mother, partner, or both) were eligible to participate, but mothers were often reported as the majority of respondents throughout the studies included in this review. While mothers play an essential role, and have been found to be more effective than other caregivers in providing pain relief for their infants,[54,55] there are many variations of family structures. Future studies should strive for equal representation with both parents, when possible, to capture the differences in the partner's role and identify possible needs that are unique to them. Various methods of educational interventions were employed across the included studies. However, beyond interventions that utilized videography, none of the included studies implemented an eHealth intervention as a method of educating parents. Given that parents have been found to prefer accessing health information on the Internet or through their smartphone,[28] an eHealth approach presents a viable opportunity to provide parent education on parent-led interventions. While several interventions provided education on the most effective parent-led pain management strategies (ie, breastfeeding and skin-to-skin contact), treatments typically administered by a healthcare provider were also incorporated into educational interventions, including sucrose and topical anesthesia.

The analysis showed that only 2 of the studies reported using a specific theory to guide their research; both studies used the Knowledge to Action Framework.

According to Taddio and colleagues,[41,45] the framework was applied to the development of clinical practice guidelines regarding pediatric pain relief, which were then modified to develop the parent-targeted educational tools used in their study to further promote adoption of scientific evidence in clinical practice. In addition, despite being an important factor,[56,57] only one of the included studies reported procedures for ensuring intervention fidelity.[39] It is imperative to consider the development and fidelity of interventions in order to determine whether a health intervention is effective and sustainable.[58] Use of theory will allow researchers to better understand the mechanisms of action of an intervention, and reporting intervention fidelity will improve replication, knowledge synthesis, and implementation into practice. We recommend that future research regarding parent-targeted educational interventions provide rich description and reporting of the interventions to help deepen our understanding of intervention components that work in a particular context.

The conceptual model Parent Involvement in Infant Pain Management, derived from the findings from Franck and colleagues,[26,39] presents a systematic framework outlining the barriers and facilitators to parental involvement in infant pain management, divided across 3 specific domains: parental beliefs; information and support; and parent-infant proximity. While this model seeks to support parent involvement to reduce infant pain from procedures, it also represents a pathway for parents to have increased confidence and capacity in their caregiving activities, as well as a stronger sense of attachment.[26] Attachment has been found to be influenced by parents' perception of responsibility or ability to provide comfort to their infants during painful procedures.[59] If parents remain unaware that they are able to be involved in pain-relieving treatments, it could continue to prolong developing a strong sense of attachment and potentially negatively impacting parental and infant well-being.[26] As information and support comprise an important domain, effective parent-targeted education is about more than just reducing infant pain to improve neonatal outcomes; it also has implications for supporting parental attachment.

Depending on how the educational intervention was delivered, the time participants interacted with the materials varied. For booklets or factsheets included in discharge packages, the actual time that each participant spent reviewing the material is unknown. After discharge, parents are concerned with having additional information or support with basic infant care, including feeding, sleeping, and bathing.[60] In addition, parents in the NICU have reported valuing the Internet higher than printed educational materials,[28] and if parents' priority concerns after discharge do not include pain, this could influence whether parents would use those resources delivered passively, such as factsheets in the discharge package. Including a questionnaire for participants to complete that reports their usage with the intervention could be an important measure to support an assessment of the intervention's effectiveness for future studies. Although the aim of this scoping review was not to conduct an in-depth evaluation of the impact and efficacy of these interventions, it was noted that any kind of intervention appeared beneficial in either improving parental knowledge and self-efficacy or increased participation of parents with infant pain management. Even interventions that were delivered passively, such as an educational factsheet included in the discharge package, showed improvements in parents' knowledge.[43,44]

The oldest study included in this review was published in 2011, suggesting that support for increased parental involvement and an emphasis on building parental capacity with infant pain management are an emerging area of interest in the field of pediatric pain. Although this review provides a brief description of the implications of the educational interventions on parental outcomes, future research examining the impact and efficacy of these educational interventions to address parent learning needs, parental engagement, and neonatal outcomes is warranted, as well as further research assessing optimal methods to educate and involve parents in providing pain management to their newborns, with attention to the influence of healthcare provider involvement in interventions for parental knowledge and skill attainment.

Implications for nurses

Four studies described interventions where a research nurse was needed to provide parents with verbal information or conduct role-playing exercises,[26,39,45] or authors recommended their intervention could be supported with a bedside nurse to provide education to supplement the factsheet on infant pain that was included in parents' discharge package.[43] Although the educational interventions included in this review were all aimed at parents, healthcare providers would still have a great deal of responsibility for these interventions to be successfully implemented in clinical settings. Since there were few studies overall that described or evaluated parent-targeted educational interventions, it is likely that parents are not able to easily access this information on their own. Parents want to be informed and involved in pain-relieving treatments for their infants.[15,27] Therefore, until there are effective parent-targeted educational resources implemented consistently in perinatal care settings, so that responsibility may be transferred from the nurse to the parent, it

is crucial for nurses to engage and educate parents on parent-led pain interventions or provide parents with resources where they can access more information, such as The Power of a Parent's Touch,[61] an evidence-based video widely accessible on YouTube (https://www.youtube.com/watch?v=3nqN9c3FWn8). Given that parents report feeling less stressed, having an increased sense of capacity, and greater attachment to their infants when involved,[16,20–22] providing resources where parents can access additional information related to their role in pain management is a demonstration of quality family-centered care. Increasing access to parent-targeted educational resources is a mutually beneficial method to foster a greater partnership between the nurse and families and to facilitate parents' sense of autonomy and confidence as caregivers without increasing workload on to the nurses in the fast-paced postpartum environments. Moreover, any additional information could inform the pain relief provided for infants during subsequent procedures, influencing their health and well-being well beyond infancy.

Limitations

Although this review provides further insight into available parent-targeted educational interventions on infant pain management as identified in the literature, there were some limitations noted. The small number of studies eligible for inclusion and diversity in study design and procedures limited our ability to draw substantial conclusions. Despite a rigorous search strategy, some articles that reported on the development of educational interventions may have been missed because they did not evaluate the intervention during the perinatal period. One study did not meet the JBI critical appraisal inclusion criteria for a randomized controlled trial, as it was a published conference abstract. We contacted the corresponding author, requesting more information on the abstract or whether there was another written report that had been missed in our search; however, there was no response from the author. Despite the critical appraisal score, we decided to include this publication since the objective of this scoping review was to map all available educational interventions. In addition, throughout the screening process, we found there were many studies using parent-led interventions to assess their efficacy on reducing neonatal pain ($n = 17$ at full-text screening). The studies did not report on how parents were educated or engaged to be involved with the pain-relieving interventions being assessed and therefore those studies were not included in this review. It should be assumed that there was some sort of education or instruction given to parents so they would understand how and why they are involved in pain-relieving interventions for their infants; however, there was no evidence in study report to confirm that. Although parental education may not be the primary objective for studies assessing parent-led interventions, we recommend that future studies include a brief statement indicating the process that was completed for educating and involving parents.

CONCLUSION

This scoping review provided a comprehensive overview of parent-targeted educational interventions on infant pain and management strategies. Despite being identified as an area of high concern for parents of newborns, few studies addressed parent-targeted educational interventions regarding infant pain. Of those articles that did, interventions that provided education on common parent-led pain management strategies were typically multimodal and delivered either in person or passively. The educational interventions appeared to improve parental knowledge and self-efficacy or increased involvement in pain management activities. Since there is evidence that infants are still experiencing many painful procedures without pain management and given the detrimental effects untreated pain has on infant well-being and development, it is essential that parents are educated on their role with infant pain management. This education could enhance their knowledge and capacity to care for their infants, as well as increase the likelihood that pain-relieving interventions will be implemented in the clinical setting.

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