Pain Management Nursing 20 (2019) 444–454

Contents lists available at ScienceDirect

Pain Management Nursing

journal homepage: www.painmanagementnursing.org

Review Article

Parents' Participation in Managing Their Children's Postoperative Pain at Home: An Integrative Literature Review

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ARTICLE INFO

Article history:
Received 12 January 2017
Received in revised form
2 December 2018
Accepted 4 December 2018

ABSTRACT

Objectives: This integrative review aimed to synthesize and critically evaluate the methodological quality of the evidence on parent's participation in managing their children's postoperative pain at home.
Design: Integrative review.
Data Sources: To locate relevant articles, two reviewers independently searched four electronic databases systematically using predefined inclusion and exclusion criteria.
Review/Analysis Methods: The methodological quality of 23 eligible studies was critically appraised using published evaluation criteria. A qualitative content analysis was then conducted to synthesize findings of the studies to identify thematic trends and factors on the nature of parents' participation and ability to effectively manage their children's pain at home.
Results: Methodological quality of most of the 15 surveys was adequate, whereas shortcomings were identified in 6 of the 7 clinical trials and the 1 qualitative study that were included in this review. The three themes identified pertained to parent use of *informational sources*, *postoperative pain medications*, and *nonpharmacologic pain treatment approaches*. Results indicate parents lack the information they need to effectively make use of pharmacologic and nonpharmacologic pain treatment approaches.
Conclusions: There is need to improve communication between parents and health professionals before and after the child's surgery and to provide parents with specific verbal and written instructions and strategies on how to assess and manage their children's pain.
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Over the past 30 years there has been a universal trend toward increased use of noninpatient elective day surgical services for children. It is currently estimated that 60% of pediatrics elective surgeries in developed countries are conducted in the daycare settings (Bowen & Thomas, 2016). This trend has been beneficial because it has led to reductions in hospital stays, surgical wait lists, and overall financial costs to hospitals and health system (Dunmade & Alabi, 2009) including the redistribution of scarce health care resources to more complex cases (Bowen & Thomas, 2016). In addition, it has helped reduce children's exposure to hospital-acquired infection (Upadhyaya & Lander, 2013). Having the child recover at home is also less disruptive to family routines and it significantly reduces child trauma associated with the separation of the child from the family (Bowen & Thomas, 2016; Upadhyaya & Lander, 2013). However, day surgery is not free of complications. Sedation,

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https://doi.org/10.1016/j.pmn.2018.12.002
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pain, nausea and vomiting, bleeding, headache, dizziness, and difficulty in walking and in passing urine are some of the common immediate postoperative symptoms that children experience at home after elective day surgery for herniotomy, circumcision, and excisional biopsies (Bowen & Thomas, 2016). Furthermore, postoperative symptoms, mainly pain, add burden to the family because parents now must assume the responsibility of assessing and managing their children's postoperative pain at home (Dorkham et al., 2014). Acute postoperative pain that is poorly assessed and controlled can heighten pain intensity and lengthen the period of surgical recovery for the child. Poor pain experiences during childhood may also contribute to adverse pain behavior to subsequent pain events and to development of chronic pain in later life (Twycross, Dowden, & Bruce, 2009).

The type of surgery may influence the intensity and duration of children's postoperative surgical pain at home. Tonsillectomy, one of the most common surgical procedures, is often associated with high levels of pain (Hansen, Shah, & Benzon, 2016) that can last up to 7 days postoperative (Warnock & Lander, 1998). Findings of a recent survey that involved 111 children after tonsillectomy found that 15 of the children (14%) rated their pain levels as mild, 59 (53%) as moderate, and 37 (33%) as moderate-severe (Persino et al., 2017). The age of the child can also affect pain ratings. For example, in the study by Warnock and Lander (1998), the highest pain ratings were reported by school-aged children (aged 5-12 years) compared with older study participants (aged 13-16 years). In that study, school-aged children were also prescribed acetaminophen, whereas older children were prescribed codeine, and they received less than the prescribed dose of analgesics by their parents.

Results of a growing number of quantitative studies also report a moderate to strong association between prolonged pain in children and suboptimal pain assessment and treatment practices by parents at home (Fortier, MacLaren Chorney, Perret, & Zeev, 2010; Lee & Jo, 2014). Despite the growing number of studies and study types, no review has critically evaluated the methodological quality of existing studies or has synthesized findings across studies to identify thematic trends. Identifying thematic trends may provide health professionals with information useful for the development of targeted pain practice guidelines to optimize parents' ability to effectively manage their children's postoperative pain at home. Hence the first aim of this current integrative review was to locate and critically evaluate the quality of relevant studies published between 1997 and 2016. The second aim was to use qualitative content analysis on the identified literature so that thematic trends and factors relevant to parents' participation and ability to manage their children's pain at home could be identified. Authors opted to do an integrative research review of the existing evidence rather than a systematic narrative review because of the diversity of study designs.

Methods

This integrative review was based on the methodology and systematic steps outlined by Whittemore and Knafl (2005): research problem identification, literature search, study methodology assessment, data analysis, and interpretation. The main question that guided this review was: What is the current evidence and its quality regarding parents' participation and ability to manage their children's postoperative pain at home?

Literature Search

To be included in this review, papers had to meet the following inclusion criteria: (a) pertain to postoperative pain after day surgery in children aged 12 years and younger; (b) focus on parents' participation in managing their children's postoperative pain at home; (c) be original studies written in English, Portuguese, or Spanish; and (d) be published between January 1997 and December 2016. The exclusion criteria were dissertations and theses, as well as nonresearch articles, such as review and opinion papers. Authors also excluded studies that focused on testing the effectiveness of pharmacologic approaches or that tested instruments for pain measurement.

Four electronic databases were systematically searched: CINAHL (Cumulative Index to Nursing and Allied Health Literature), LILACS (Latin American and Caribbean Health Science Literature), PsycINFO (Psychology Information), and PubMed (National Library of Medicine [USA]). The following DeCS (Descriptors in Health Sciences), MeSH terms (Medical Subject Headings), and keywords in different combinations were entered into the four databases to locate relevant peer-review papers: postoperative pain, child, family, parents, parental participation, discharge, information, nonpharmacologic methods, pain alleviation, day surgery, management, pain relieve methods, parental guidance, and nursing.

Two members of the research team independently selected abstracts that met the inclusion criteria. The criterion for determining interrater reliability in the selection of the studies beyond chance agreement was set at $\kappa = 0.80$ (Cohen, 1960). Disagreements were resolved through face-to-face discussion with interrater reliability at $\kappa > 0.82$.

Of the 407 abstracts located, 40 were excluded because they were literature review papers (n = 14), books or chapters (n = 2), abstracts of dissertations (n = 5), commentaries (n = 5), and editorials or congress annals published in journals (n = 14). A further 337 abstracts were excluded because they focused on unrelated topics such as pharmacologic approaches or the use of surgical techniques or anesthetics to control postoperative pain or were studies that involved validating or testing of pain assessment instruments, that reported on parents' expectations after their child's surgery, or that focused on nurses' perceptions or perspectives on how to assess or manage children's pain. After a full reading of the 30 remaining references, 7 were further excluded because the studies did not involve or take place in the home setting. In total, 23 papers met all inclusion criteria (Fig. 1).

The 23 retained studies were then classified in terms of the hierarchy of evidence according to Melnyk and Fineout-Overholt (2011). As stated by these authors, the levels of evidence are ranked in terms of the ability of the study design to control of bias: I for systematic reviews and meta-analysis of randomized controlled trials, II for randomized controlled trials, III for nonrandomized controlled trial (quasi-experiment), IV for case-control or cohort studies, V for systematic reviews of qualitative or descriptive studies, VI for qualitative or descriptive studies, and VII for opinion of authorities and/or reports of expert committees. This hierarchical approach to evidence classifies levels I and II as strong, III-V as moderate, and VI-VII as weak (Melnyk & Fineout-Overholt, 2011).

The methodological quality of the seven clinical trials was assessed using criteria by Warnock et al. (2010) on the basis of the CONSORT (Consolidated Standards of Reporting Trials) statement. Authors also made use of the attributes suggested by Malhotra and Grover (1998) to assess the quality of the 15 survey studies and the criteria set by Clark (2003) to evaluate the remaining qualitative study. Because of the mixed nature of study methodology and hence heterogeneity, we did not employ a rating scale or a cutoff score to judge the scientific acceptability of the seven clinical trials or the 15 survey studies. Instead, we made use of an extraction tool we developed together with the aforementioned criteria to abstract the presence or absence of important methodological issues. In taking this approach, we were able to critically examine each study in terms of the respective study design, study population, study measures, data collection procedures, participation rates, and analytic approach.

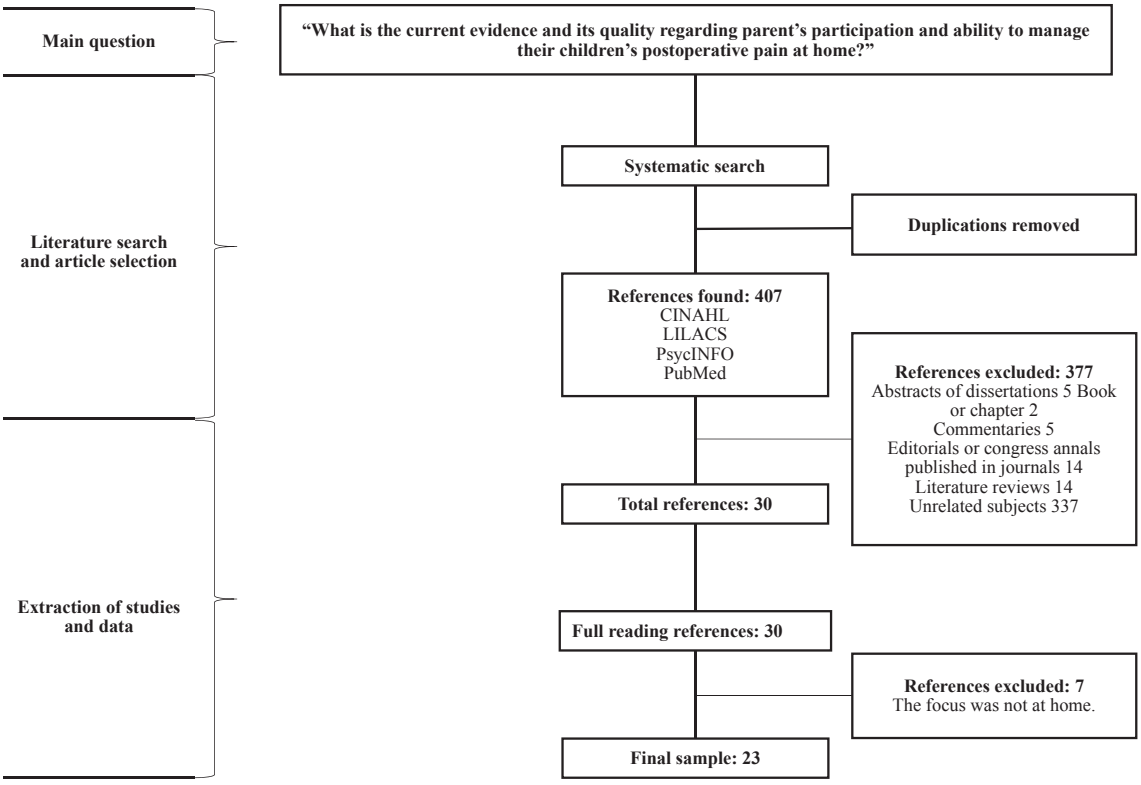

Figure 1. Flowchart to select studies.
(Elaborated by the authors.).

Data Analysis and Interpretation

A systematic process was used to extract, reduce, critique, and interpret data (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005). To facilitate synthesis and critical analysis, the 23 articles were first categorized into subgroups according to their study design (e.g., experimental or quasi-experimental, survey, and qualitative). All authors made use of the study extraction tool to independently synthesize findings of the 23 studies according to authors' name, origin and year of publication, study aim, study design/methods, analytic approach, main findings, and conclusion. Findings were also examined according to their conceptual content (Dey, 1993). After this independent first step, the authors met face to face to synthesize data of each article and to refine the synthesis making use of the aforementioned quantitative and qualitative critique criteria.

Next, we conducted a qualitative content analysis of the findings of the 23 studies. Synthesized data from each study were compared and similar data were categorized and grouped together. Three commonly occurring themes were identified as a result of the following systematic analytical process: (1) *information provided to parents to enable them to manage their children's postoperative pain*; (2) *use of pharmacologic approaches*; and (3) *use of non-pharmacologic approaches by parents to relieve their children's postoperative pain.*

Results

Characteristics and Quality of the Studies

As noted in Table 1, of the 23 studies, 7 were clinical trials: 6 experimental (Bailey, Sun, Courtney, & Murphy, 2015; Chambers, Reid, McGrath, Finley, & Ellerton, 1997; Hegarty et al., 2013; Huth, Broome, & Good, 2004; Huth, Broome, Mussato, & Morgan, 2003; Vallée, Lafrenaye, Tétrault, Mayer, & Dorion, 2008) and 1 quasi-experimental (Vincent et al., 2012). Fifteen were surveys (Abou-Karam et al., 2015; Kankkunen, Vehviläinen-Julkunen, Pietilä, & Halonen, 2003a, 2003b, 2003c, 2003d; Stanko, Bergesio, Davies, Hegarty, & Von Ungern–Sternberg, 2013; Stewart, Ragg, Sheppard, & Chalkiadis, 2012; Sutters et al., 2012; Sutters & Miaskowki, 1997; Swallow, Briggs, & Semple, 2000; Voepel-Lewis et al., 2016; Zisk, Grey, Medoff Copper, & Kain, 2007), and the remaining study had a qualitative approach (Kankkunen, Vehviläinen-Julkunen, & Pietilä, 2002).

Clinical Trials

Study aims were clearly stated in all seven clinical trials, and all involved hypothesis testing except for two (Huth et al., 2004; Vallée et al., 2008). All seven were parallel-group designs, where parents received written information (e.g., reoperation guidelines, admission to the unit, anesthesia induction, discharge care, verbal instructions of pain medication, and parental guide) or take-home medication versus routine care. In addition to receiving written instructions, parents allocated to the intervention group may have received additional information or intervention. For example, in the study by Vincent et al. (2012) parents had an opportunity to discuss the information they received with nurses of the investigative team. In the other studies, parents received a booklet on pain management, followed by one teaching session to reinforce the information provided (Huth et al., 2003), received instruction on how to use a pain algorithm to assess their children's pain (Vallée et al., 2008), or received a booklet and a videotape and audiotape to teach their children relaxation and imagery skills for postoperative pain (Huth et al., 2004).

Sample size ranged from 24 to 92 per group across the seven studies. Two made use of a priori power analysis to determine the

Table 1
Synthesis of 23 Selected Articles According to the First Author, Year, Discipline Origin, Focus of the Study, Sample Size, Type of Surgery, Procedure, and Measures

Author/Year/ Discipline Origin	Focus of the Study	Sample Size/Type of Surgery	Procedure and Measures
Experimental Studies			
Bailey et al. (2015) Medicine Australia	To evaluate pediatric post-tonsillectomy pain management, at home, by parents, using oxycodone when a specific analgesia information sheet is included with standard postoperative information.	58 children (2-16 years old) and their parents Tonsillectomy, adenotonsillectomy or adenotonsillectomy with insertion of tympanostomy tube	Patients received an envelope containing information about the procedure in the preanaesthetic room by the surgeon. Parents received verbal information about the suggested analgesic regimen, with the possibility of discussion with the surgeon, and were instructed not to open the envelopes with the information until they got home. Routine nursing information was given to the children and parents. *CG:* routine care. *IG:* routine care + specific information about oxycodone. Three survey tools: FLACC scale; Wong-Baker FACES Pain Scale; Day 10 Questionnaire.
Hegarty et al. (2013) Medicine Australia	Explore if the technics used by parents in the management of postoperative pain in children relieve this symptom; and the parents' satisfaction after hospital discharge.	181 children (0-12 years old) and their parents Elective day-case surgery	*CG:* "advised" group (parents were required to purchase their own postdischarge analgesia) + routine care. *IG:* "dispensed" group (parents were provided with take-home analgesia) + routine care. Parents completed a postoperative questionnaire. Parents were interviewed by telephone 24 hours postoperatively and within a week after hospital discharge.
Vincent et al. (2012) Nursing USA	The authors tested home pain management for children for effects on pain intensity, analgesics administered, satisfaction, and use of healthcare services over 3 postdischarge days.	108 children (7-17 years) and their parents Appendectomy, pectus repair, osteotomy, and spinal fusion	*CG:* routine care + no protocol or guidelines to standardize pain management discharge teaching on the patient-care units. *IG:* routine care + provided the parents and children with the pain management information sheet (available to take home), asked them to read it, and scheduled a follow-up session for later that day or the next day to discuss the pain management principles presented in the information sheet. Self-report scale (0-10 NRS or FPS-R).
Vallée et al. (2008) Medicine Canada	Development of a treatment algorithm to be added to parental guide to improve the management of pain after pediatric tonsillectomy.	8 children (5-17 years) and their parents Ambulatory surgery (tonsillectomy)	*CG:* routine care: acetaminophen (15 mg/kg) + morphine (0.3 mg/kg), information about the medication. *IG:* routine care + pain algorithm for analgesic use + parental guide. Child's pain rated by them and his/her parent (VAS) and child's condition (index cards) at home.
Huth et al. (2004) Nursing USA	The effectiveness of imagery, in addition to routine analgesics, in reducing child's tonsillectomy and/or adenoidectomy pain and anxiety after ambulatory surgery and at home.	73 children (7-12 years old) Ambulatory surgery	*CG:* routine care. *IG:* videotape on the use of imagery + 30 minutes audiotape of imagery 1 week before surgery (T1), 1-4 hours after surgery (T2), and 22-24 hours after discharge from ambulatory surgery (T3). Child's affective pain (FAS), sensory pain (Oucher,) and anxiety (STAI-C), amount of analgesics used in ambulatory surgery and at home.
Huth et al. (2003) Nursing USA	The effectiveness of a pain booklet on parental pain support to children experiencing postoperative pain.	51 children (3-16 years old) and their parents (gender not identified) Open or closed cardiac surgery	*CG:* routine care: verbal routine preoperative instructions + postoperative care. *IG:* routine care + age-appropriate booklet + 15- to 20-minute teaching session on the day of the child's surgery or on the first postoperative day. Child's pain (Oucher); parent's attitudes regarding pain medication (MAQ).
Chambers et al. (1997) Nursing, Medicine, and Psychology Canada	The effectiveness of an educational booklet on parent's attitudes and management of their children's postoperative pain.	82 parents of children 2-12 years Ambulatory surgery	*CG:* routine care + no pain control booklet. *IG1:* routine care + pain education booklet. *IG2:* routine care + pain assessment control booklet. One of the three folders was mailed to parents before their children's hospital admission. One week after surgery, parents answered a questionnaire by telephone on their attitudes toward children's pain medications.
Survey Studies			
Voepel-Lewis et al. (2016) Nursing USA	How parent's analgesic understanding influenced their hypothetical decisions to give opioids when faced with trade-off situations in the child postoperatively.	514 parents whose children (3-17 years old) required opioids after discharge Day surgery (tonsillectomy, general surgery, urologic, plastic, and orthopedic surgeries)	*Preoperative procedures:* Consenting parents were asked to complete a preoperative survey and decision-making exercises while their children were in the operating room and after having received routine verbal and written information from their care providers regarding their child's general postoperative pain management plan and prescriptions. A preoperative booklet that included an overview of postoperative pain management and analgesic adverse effects was given by clinics to all parents. The survey explored the following aspects: parents' general familiarity with and general understanding of commonly prescribed opioid and nonopioid analgesics, as well as their analgesic decision making under hypothetical decision scenarios presented in the survey.

(*continued on next page*)

Table 1 (*continued*)

Author/Year/ Discipline Origin	Focus of the Study	Sample Size/Type of Surgery	Procedure and Measures
Abou-Karam et al. (2015) Pharmacy Canada	To describe the use of morphine at home as an analgesic after surgery in children aged 0-12 years. The safety of this use was also evaluated.	219 parents and legal guardians of children 0-12 years old Day surgery and general surgery	Two types of discharge prescriptions for morphine were given: morphine to be taken on a regularly scheduled basis ("regular basis prescription") and morphine to be taken only when necessary, when pain is present ("as needed prescription"). Guardians answered a short questionnaire concerning their child's medical history and received a logbook to note the number of doses of pain medication administered to the child after hospital discharge as well as adverse effects perceived by them to be morphine related. They were contacted on day 3 or later (day 0 being the day of patient discharge) for a short telephone interview. Medical chart was used to obtain additional information (surgery and discharge). Three questions were asked to identify attitudinal barriers toward the medication (ie, acceptability, adverse effects, and addiction potential).
Stanko et al. (2013) Medicine Australia	To assess the incidence and extent of pain, nausea, and vomiting in children undergoing adenotonsillectomy on postoperative days 3 and 7. To investigate how parents perceived their child's recovery profile and whether their perceptions met their expectations.	100 parents of children 0-16 years Elective adenotonsillectomy	Parents were contacted on day 3 and 7 after surgery by telephone. They were asked to rate their children's level of pain on a VAS and their satisfaction with prevention and treatment of PONV and pain in the first 24 hours after surgery using a 0-10 Likert scale. Parents were also asked whether the written discharge information and verbal instructions were clearly explained before discharge, whether they knew when and where to seek help, and which events would trigger them to seek help. About pain management, parents were asked what, if any, analgesia they had given their children on day 3 or 7. On day 7, parents were asked whether the recovery of their child had met their expectations, and if not, parents were asked to provide a reason for this. Survey questionnaire + parental VAS + a single yes or no answer for other events such as vomiting or nausea.
Stewart et al. (2012) Medicine Australia	Postdischarge pain profiles, analgesia requirements, and functional limitation in children after tonsillectomy, orchidopexy, or inguinal hernia repair	105 children: 50 tonsillectomy (mean age 5.7 ± 2.9), 24 orchidopexy (mean age 5.6 ± 3.2), and 31 inguinal hernia repair (mean age 4.5 ± 1.9)	After discharge, parents were asked to record their child's pain levels, analgesia consumption, and functional limitation in a pain diary. Daily telephone call to parents the day after the child's operation. Parents were asked to measure their child's pain using the PPPM. The child's degree of functional limitation as a result of the operation was measured using the validated FAS. These data were recorded once daily in the pain diary and scored as severe, mild, or no function limitation.
Sutters et al. (2012) Nursing USA	Feasibility of scheduled analgesic dosing after outpatient tonsillectomy, by determining the intensity of pain experienced by young children and an evaluation of parental adherence with a scheduled analgesic regimen and their experiences with the management of post-tonsillectomy pain at home in young children using ATC dosing.	47 parents of children 3-5 years old Day surgery (tonsillectomy, with or without other concurrent minor procedures such as myringotomy tube placement)	*Preoperative procedures:* The research nurse explained to parents how to use the FLACC scale and asked them to measure pain intensity twice a day. *Perioperative analgesics administration:* Parents received instructions on proper dose measurement and were advised to call the research nurse in case of any side effects. They were also provided with a digital timer to control the ATC dosing. *Postoperative instructions:* A research nurse used a teaching booklet to provide postoperative instructions to parents. *Follow-up phone calls:* All parents received a call to evaluate their level of adherence with completing the home diary. *Home visits:* The home diary was collected and an interview was conducted with parents about their child's pain experience.
Zisk-Rony et al. (2010) Nursing, Medicine, and Psychology Israel and Canada	Parental attitudinal barriers regarding children's pain expression and the use of analgesics for children and to connect these variables to the actual practice of assessing and treating children's pain after outpatient surgery.	114 parents of children 2-12 years old Day surgery	In the hospital, parents answered a demographic questionnaire as well as the PEPP to examine barriers to pain assessment and the MAQ about pain management. After discharge, parents completed a diary about their child's pain assessment and management for the first 48 hours at home.
Zisk et al. (2007) Nursing and Medicine USA	Comparison of parental global impression of children's level of acute pain at home with parental assessment of children's pain assessed with a structured, reliable, and valid instrument and child's self-report of pain.	32 parents (88% mothers) of children 5-10 years old Trauma, in the emergency department (ED)	In the ED the authors collected information regarding demographic characteristics and the child's injury and explained what the parents need to do at home. Once at home, the principal author contacted parents during the evening on the first 2 days after discharge. The authors evaluated the parental global impression of the children's pain by asking the parents "Do you think your child is in pain?" (yes/no). To evaluate the child report of pain to parent, the author asked the parents "Did your child tell you that he or she was in pain?" (yes/no). The PPPM was used to assess the parental assessment of the child's pain. *Pain diaries:* The child's oral report of pain to parent, parental

Table 1 (*continued*)

Author/Year/ Discipline Origin	Focus of the Study	Sample Size/Type of Surgery	Procedure and Measures
			global impression of the child's pain, and 15 items of the PPPM were included in the pain diaries. Pharmacologic and nonpharmacologic pain management uses were reported.
Riddell et al. (2004) Psychology England	Influence of related beliefs, prior medical experience (child and parent), demographic variables, parental empathy, parental pain relief goals, and preference on the use of alternative pain-relieving practices.	236 parents/caregivers (207 mothers, 27 fathers, 1 guardian, 1 grandparent) of children 2-13 years old Day surgery (circumcision, hernia repair, removal of wires or pins, cystoscopies).	After the child went to surgery room, parents answered seven questionnaires addressing demographic data, child's medical experience, parents' surgical pain experience, parents' postoperative pain relief experience, parents' global attitude regarding the utility of pain medication, parental report of goals for pain relief, and the Interpersonal Reactivity Index. One week after surgery, parents answered by phone the Attitudes to Pain Medication Scale and the Checklist of Psychosocial Management Strategies.
Kankkunen et al. (2003a) Nursing and Biostatistics Finland	Relationship between the parent-rated sufficiency of discharge instructions and the postoperative pain behaviors of children at home after day surgery.	201 mothers and 110 fathers of children 1-6 years old Day surgery	On the day after their child's surgery at home, parents completed a questionnaire package including VAS, PPPM, and the subscale measuring parents' perceptions of discharge instructions.
Kankkunen et al. (2003b) Nursing Finland	Parents' perceptions and use of analgesics for children after discharge at home.	315 parents (fathers and mothers) of children 1- 6 years old Day surgery (ear, nose and throat surgery)	On the day after their child's surgery at home, children's pain level (VAS) and behavior (PPPM) were rated by parents. Parents' perceptions of children's pain were also measured by a 5-point Likert scale and 1 open-ended question.
Kankkunen et al. (2003c) Nursing Finland	Parents' use of nonpharmacologic methods at home in children's pain alleviation after minor day surgery.	201 mothers and 110 fathers of children 1-6 years old Day surgery (throat surgery, hernia, or ear surgery)	On the day after their child's surgery at home, child's pain level (VAS) and behavior (PPPM) were rated by parents. Parents' use of a nonpharmacologic pain reliving methods was measured with a dichotomous scale and 1-open ended question about the three most effective methods they use.
Kankkunen et al. (2003d) Nursing Finland	Relationship between the parent-rated sufficiency of discharge instructions and the postoperative pain behaviors of children at home after day surgery.	201 mothers and 110 fathers of children 1-6 years old Day surgery (throat surgery, hernia, or ear surgery)	On the day after their child's surgery at home, child's pain level (VAS) and behavior (PPPM) were rated by parents. Parents' opinions related to the hospital discharge instructions were assessed by one open-ended question.
Jonas (2003) Nursing UK	Parental management of their child's pain at home after day surgery and parents' satisfaction with hospital discharge information.	89 parents (gender not specified) of children 5 months–17 years old All general surgical day case children.	Parents answered a structured interview administered by phone 18-24 hours after their children's hospital discharge at home. As per routine care, all patients were supposed to receive a take-home medication package and an information leaflet.
Swallow et al. (2000) Nursing England	Frequency, severity, and duration of pain level after children's hospital discharge; use and source of analgesia during the postdischarge period; and ease of use and appropriateness of the written discharge information.	52 children (1-16 years old) and their parents/caregivers (gender not specified) Tonsillectomy, adeno-tonsillectomy and myringotomy, grommet insertion.	Children's pain was measured on discharge with the available tool at the surgical ward. Parents answered a questionnaire 2-3 weeks after their children's surgery about the number of days their children had pain, level of pain, worst pain experienced; type, frequency, and parent's perceived effectiveness of administered analgesia; eating or sleeping problems related to pain; need for further advice with general practitioner; and parent's opinion about usefulness of pain assessment tools at home and standard written discharge advice.
Sutters & Miaskowski (1997) Nursing USA	Descriptive data on the pediatric pain experience after tonsillectomy (intensity of the overall and worst pain; type and amount of analgesics prescribed and administered by parents; the percentage of children experiencing adequate pain relief; and the effects of pain on the child's sleep pattern, behavior, and ability to consume fluids in the first 24 hours after surgery).	84 parents (gender not identified) of children (3-12 years old) who underwent tonsillectomy/ambulatory surgery (tonsillectomy)	A demographic data sheet was completed preoperatively to register discharge pain medication. Parents were interviewed by telephone 24 hours after their children's surgery using a semistructured questionnaire related to type and amount of analgesics prescribed at hospital discharge and administered by parents to their children at home, children's pain level, and complications after surgery.
Qualitative Study			
Kankkunen et al. (2002) Nursing Finland	Methods used by parents in the identification and management of postoperative pain in children; parents' perceptions of children's pain, pain medication, and discharge advice.	17 children (1-7 years old), their siblings, and parents Day surgery	One or two weeks after child's hospital discharge, the child and family members were interviewed at home. The interviews started with broad themes, and the families were asked to relate their experiences in identifying and managing their children's postoperative pain. They were also asked to relate their perceptions of children's pain, pain medication and the discharge advice received from the hospital. The children were asked to answer the questions first to avoid having them repeat the concepts and words used by their parents. The parents were asked to assess their children's minimum and maximum pain intensity at home by using a VAS.

CG = control group; IG = intervention group; FLACC = Faces, Legs, Activity, Cry, and Consolability scale; NRS = Numeric Rating Scale; FPS-R = FACES Pain Scale–Revised; VAS = visual analog scale; FAS = Facial Affective Scale; STAI-C = State-Trait Anxiety Inventory for Children; MAQ = Medication Attitude Questionnaire; PONV = Postoperative Nausea and Vomiting; PPPM = Parents' Postoperative Pain Measure; ATC = around-the-clock; PPEP = Parental Pain Expression Perceptions.

sample size required to sufficiently power the respective study (Huth et al., 2004; Vincent et al., 2012). Interventions were delivered to parents before (Chambers et al., 1997) or after (Bailey et al., 2015; Hegarty et al., 2013; Huth et al., 2003; Vincent et al., 2012) or both before and after the child's surgery at the hospital (Huth et al., 2004). One of the studies (Vallée et al., 2008) did not provide information on the timing of when the intervention was implemented.

All seven specified their inclusion and exclusion criteria, collected data similarly from study groups, and made clear the targeted outcome measures. However, only one (Huth et al., 2004) reached a high level of methodological rigor. In addition to conducting a priori power analysis, Huth et al. (2004) allocated participants to study groups using robust random allocation methods, they controlled for confounding variables statistically, and they reported measures of effect size to determine effect of the study intervention. Vincent et al. (2012) similarly reported making use of a priori power calculations, but the authors did not employ random allocation procedures. One of the seven studies (Chambers et al., 1997) kept research staff blinded to aims of the study and another to the allocation of information sheets (Bailey et al., 2015). Two (Bailey et al., 2015; Hegarty et al., 2013) made use of allocation concealment, which reduced selection bias. In all seven clinical trials, conclusions were solely based on *p* values, except for the study by Huth et al. (2004).

Survey Studies

As Table 1 shows, the 15 surveys included in this review consisted of structured questionnaires to determine parent pain assessment practices. In addition, data were collected on the type, dose, and medication that parents administered to their children (Abou-Karam et al., 2015; Stewart et al., 2012; Sutters et al., 2012; Sutters & Miaskowski, 1997; Zisk et al., 2010), on the opinion of parents regarding the pain assessment tool (Sutters et al., 2012), about discharge instructions (Kankkunen et al., 2003a; Stanko et al., 2013), or whether they made use of any nonpharmacologic approaches to relieve their children's pain (Kankkunen et al., 2003c; Ridell, Lilley, & Craig, 2004; Zisk-Rony, Fortier, MacLaren Chorney, Perret, & Zeev, 2010). Data were also collected from children regarding their pain experiences and from parents about managing their children's pain (Ridell et al., 2004) and regarding their beliefs concerning the use of analgesics (Ridell et al., 2004) and about the barriers to pain assessment (Zisk-Rony et al., 2010). All 15 survey studies involved an interview with parents, but three (Jonas, 2003; Sutters & Miaskowski, 1997; Swallow et al., 2000) did not specify the gender of these parents. Three studies (Abou-Karam et al., 2015; Ridell et al., 2004; Zisk-Rony et al., 2010) also included caregivers (e.g., grandparent, guardian).

Sample size ranged from 32 to 514. The response rate ranged between 46% and 91%. All but 1 of the 15 surveys (Jonas, 2003) defined and justified the sample. Seven (Jonas, 2003; Kankkunen et al., 2003b, 2003c, 2003d; Sutters et al., 2012; Swallow et al., 2000; Voepel-Lewis et al., 2016) pilot tested the study survey before its implementation in the study. Five studies (Abou-Karam et al., 2015; Jonas, 2003; Stanko et al., 2013; Sutters & Miaskowski, 1997; Swallow et al., 2000) did not provide information about validity and reliability of study measures.

Qualitative Study

The remaining qualitative study (Kankkunen et al., 2002) involved face-to-face qualitative interviews of 17 parents. The stated aims were to obtain self-reports from parents of the approaches or strategies they used to identify and manage their children's pain after minor outpatient surgery at home and to obtain data on parents' perceptions regarding children's pain and pain medication and about the discharge advice they received from the hospital staff. Rigor was determined in view of ethical considerations, selection and description of study participants, methods used to process and analyze the data using inductive content analysis, and assessment of study reliability. However, the authors do not explicitly describe a theoretical framework, state the research question, or explain how they determined data saturation.

Evidence levels of the analyzed studies ranged from II to IV (Melnyk & Fineout-Overholt, 2011). Sixteen studies were classified as weak (level VI) (Abou-Karam et al., 2015; Jonas, 2003; Kankkunen et al., 2002; Kankkunen et al., 2003a, 2003b, 2003c, 2003d; Ridell et al., 2004; Stanko et al., 2013; Stewart et al., 2012; Sutters & Miaskowki, 1997; Sutters et al., 2012; Swallow et al., 2000; Voepel-Lewis et al., 2016; Zisk et al., 2007; Zisk-Rony et al., 2010); six studies had a strong level of evidence (level II) (Bailey et al., 2015; Chambers et al., 1997; Hegarty et al., 2013; Huth et al., 2003, 2004; Vallée et al., 2008), and one study had a moderate level of evidence (level III) (Vincent et al., 2012).

In sum, most of the 15 surveys included in this review were of adequate methodologic quality. In contrast, there were methodologic shortcomings in six of the seven clinical trials that were summarized earlier (e.g., lack of blinding, lack of randomization, and an overreliance on *p* values). Addressing such shortcomings in future research will help strengthen the body of evidence-based interventions provided to parents. Similarly, the only qualitative study included in this review lacked methodologic quality. The authors of that study did not provide the research question that justified or guided the study, and they provided little explanation of the processes they used to recruit the 17 study participants or the steps they took to ensure that study findings were credible. Future qualitative studies rooted in rigorous methods would contribute to understanding parents' experiences in managing their children's pain at home after day surgery.

Content Analysis

The three themes that were identified using qualitative content analysis of the 23 studies included in the present review were as follows: (1) *information provided to parents to enable them to manage their children's postoperative pain*; (2) *use of pharmacologic approaches*; and (3) *use of nonpharmacologic approaches by parents to relieve their children's postoperative pain.*

Information Provided to Parents

To facilitate parents' understanding of information, it is important for health professionals to consider the content, timing, and manner in which information is provided to them (Kankkunen et al., 2002, 2003a; Sutters, Savedra, & Miaskowski, 2011). Results of the content analysis indicated that some parents acknowledged requiring specific understandable information to enable them to participate effectively in managing their children's postoperative pain (Kankkunen et al., 2002, 2003a; Stewart et al., 2012; Sutters et al., 2012; Swallow et al., 2000).

Parent reports of experiencing anxiety and fatigue during the day of their child's surgery, as well as nurses' disregard for parents' feelings (Kankkunen et al., 2003a), were factors that influenced their capacity to absorb any verbal or written information provided. In the studies by Kankkunen et al. (2003d) and Zisk-Rony et al. (2010), parents reported holding mistaken conceptions about pain that are known to hamper effective assessment and management of children's pain (Kankkunen et al., 2003d; Zisk-Rony et al., 2010). For example, some parents believed that children feel less pain, that they tolerate it better than adults, or that the pain experience will benefit the child's future health. Kankkunen et al. (2003d) reported that fathers, more than mothers, believed

that their child needed to experience and tolerate pain to learn how to cope with their pain. Boys, in particular, were expected to learn how to tolerate pain more than girls. In addition, fathers, more than mothers, believed their children pretended they were feeling pain (Kankkunen et al., 2003d).

In the study by Kankkunen et al. (2003a) parents were critical of the written and verbal information they received from health professionals because the information was sometimes inconsistent (Kankkunen et al., 2003a). In that study, parents recommended that oral information be provided to them on the day of the preoperative consultation and repeated on the day of surgery to facilitate their understanding. They also recommended that written details and instruction be provided to them to enable them to remember or to make use of the information once they returned home. On the other hand, Chambers et al. (1997) found that providing parents a booklet with general written information about postoperative pain assessment and management 10 days before surgery without additional oral information was insufficient to guide them as to "when" to provide their children with adequate doses of pain medication and "why." In another study (Jonas, 2003), less than half the parents reported having read an information pamphlet provided to them before their child's discharge from hospital, substantiating the recommendations made by Chambers et al. (1997) that parents receive both verbal and written information 10 days before surgery. Regarding the written information, Bailey et al. (2015) reported that parents of children who received written information about oxycodone promoted better pain relief for their children, which was confirmed through lower pain scores.

According to parents, the techniques they identified as most useful to them included verbal information provided to them individually or in groups, written information, and the opportunity to call a health professional by phone to clarify doubts once they returned home (Kankkunen et al., 2002; Stanko et al., 2013; Sutters et al., 2012). Other techniques reported to be useful to increase parents' knowledge and improve their attitudes toward pain medications include the use of an educational folder or guide (Chambers et al., 1997; Huth et al., 2003; Sutters et al., 2011, 2012; Vallée et al., 2008). However, in their study involving children with congenital cardiac anomalies, Huth et al. (2003) found that parents' comfort level in communicating with health professionals after discharge increased as a result of the long-term relationship they had established with the health professionals who cared for their children rather than by being provided an information folder.

When parents were provided insufficient information by the health professionals, some sought information and advice from family and friends (Kankkunen et al., 2002; Swallow et al., 2000), physicians (Swallow et al., 2000), and the media (Kankkunen et al., 2002).

In one study the lack of adequate information and communication difficulties with health professionals was linked to parents' providing their children inadequate dosage of pain medication, even though the parents had been provided with an analgesic prescription (Sutters & Miaskowski, 1997).

In their study, Zisk et al. (2007) found that although there was more than 60% agreement between parents' pain rating and their children pain self-report, parents did not always agree that their child was in pain. This suggests the importance of informing parents about the value of listening and responding to their children's self-report of pain. In addition, parents should be advised that children may be in pain even though they may not cry or exhibit overt expressions of pain behaviors, like when they are quiet.

In summary, health professionals should provide individualized verbal and written information to parents to prepare them to adequately assess and manage their children's postoperative pain at home. Therapeutic or open communication and positive relationships between parents and health professionals and providing parents opportunities to clarify doubts and to practice pain relief interventions are key elements to promote parents' skills in pain management.

Use of Pharmacologic Approaches by Parents

In this review, although parents reported they made use of pharmacologic approaches to relieve their children's postoperative pain, fears associated with overdosing resulted in some parents providing their children with suboptimal doses of prescribed analgesics (Abou-Karam et al., 2015; Stanko et al., 2013; Zisk-Rony et al., 2010). Parents who administered the prescribed postoperative analgesic dose to their children considered analgesics to have few negative effects. Most parents who provided insufficient doses of analgesics still considered postoperative pain relief as necessary (Abou-Karam et al., 2015; Hegarty et al., 2013; Kankkunen et al., 2003b; Stewart et al., 2012; Sutters et al., 2012). Child age was not a predictor of the amount of medication administered by parents at home (Zisk-Rony et al., 2010). According to Kankkunen et al. (2003d), Stewart et al. (2012), and Hegarty et al. (2013), parents disagreed on whether analgesics should be administered immediately after surgery or at the first opportunity that children felt pain. This conception is present in some cultural contexts, like in Finland, where parents value pain tolerance.

To allow parents to intervene adequately in their children's pain management, they should receive concise written and verbal information about analgesics doses and administration times (Jonas, 2003; Stewart et al., 2012; Sutters et al., 2011; Swallow et al., 2000). Authors of those studies observed that many parents decreased the amount of children's prescribed pain medication based on the dosing instructions contained in the packages. The parents did this because they doubted the correctness of the information they received from nurses or physicians at hospital discharge (Kankkunen et al., 2003b). Unfortunately, this strategy of undermedication may contribute to poor pain control because of occurrences of breakthrough pain.

Abou-Karam et al. (2015) reported that, even in cases of fixed-time morphine prescription, the parents did not administer the medication correctly. When the parents were instructed to offer the medication "if necessary," the child had better pain scores than those who had morphine prescribed at fixed times. In the same study, parents could identify the side effects related to morphine. The morphine-related adverse effects perceived by parents were consistent with the already known potential side effects of this drug. However, some parents avoided administering the drug because they feared the child's addiction to morphine (Abou-Karam et al., 2015).

According to Voepel-Lewis et al. (2016), parents' knowledge of nausea and vomiting as a possible opioid adverse drug event (ADE) influenced parents' decision whether or not to administer the prescribed analgesics postoperatively. The same study also adds that qualitative knowledge regarding certain ADEs associated with analgesics influenced effective and safe analgesic administration at home.

In three studies (Kankkunen et al., 2003b; Sutters et al., 2012; Voepel-Lewis et al., 2016), the use of pharmacologic approaches for pain relief depended on the views of parents. Fathers administered analgesics more than mothers, but only in cases of severe pain. In contrast, fathers' and mothers' previous surgery experiences did not influence them to administer analgesics to their children (Kankkunen et al., 2003b). Children who received more analgesics were those who exhibited overt expressions of pain and who had parents who judged their pain intensity as significant (Kankkunen et al., 2003b; Sutters et al., 2012).

In summary, fear of overdosing and lack of knowledge about the ADEs and about the merits of providing their children regular doses of analgesics, as prescribed, were the main reasons that parents did not provide analgesics for their children. Parents' gender and judgment about their children's pain were additional factors that may have influenced parent analgesic decision-making.

Use of Nonpharmacologic Approaches

Similarly to pharmacologic approaches, several studies found that children's overt pain behaviors influenced parents' use of nonpharmacologic approaches for their children's pain alleviation at home (Kankkunen et al., 2002, 2003c). Among these categories, the strategies that parents used the most often were distraction (watching television and video) (Jonas, 2003; Kankkunen et al., 2003c; Sutters et al., 2012), holding the child on the parent's lap, comforting the child, and spending more time with the child (Kankkunen et al., 2003c). Other strategies were caressing the child and preparing a lukewarm bath (Jonas, 2003). Parents also mentioned touching, limiting playing, controlling the children's emotions, administering natural products (vitamins and herbs), positioning, providing joy (Kankkunen et al., 2002), special feeding techniques, and applying cold (Kankkunen et al., 2002; Sutters et al., 2012) as useful approaches for the children's postoperative pain management. A less often used technique was relaxation (sleeping) (Kankkunen et al., 2002).

Some nonpharmacologic approaches were used more by parents of girls than boys (Kankkunen et al., 2003c), such as holding the child on the parent's lap, reading, or watching videos and television (Kankkunen et al., 2003c).

The combination of analgesics with nonpharmacologic approaches, such as a booklet and videotape with imagery techniques (e.g., deep breathing, muscle relaxation, music, and suggestions for picturing a park) reduced pain and anxiety after day surgery, but not at home, compared with attention (Huth et al., 2004). Authors hypothesized that children's low pain and anxiety scores at home might have accounted for the nonsignificant difference between treatment and control groups. Another reason may be the fact that the videotape was no longer novel and fun. Further studies are needed to examine the effectiveness of combined pain-relieving interventions for children at home (Huth et al., 2004).

In summary, findings of the content analysis suggest that parents make use of a large variety of nonpharmacologic approaches to relieve their children's pain. The approaches that were referred by parents were to simply spend more time with their children, holding and comforting them, reading to the child, or encouraging the child to watch television or videos.

Discussion

In general, methodological rigor of the reviewed articles was satisfactory. However, future intervention studies should explicitly comment on sample size calculation and allocation methods and report effect sizes. For survey studies, validity and reliability of instruments should be described. The piloting of surveys developed by authors should be conducted to improve the quality and utility of the questionnaires. Considering that only one qualitative study was available, there is a need for more studies with this approach to assess parent-related barriers to effective children's pain management at home.

Results of this review suggest that parental factors such as gender and age may influence pain care decision-making. For example, fathers and mothers may differ in their perceptions of their children's postoperative pain and in their pain assessment and management practices. In one study, mothers were found to have greater skills in detecting their children's pain through listening to their verbal reports and observing changes in the children's behavior and routine activities (Gedaly-Duff & Ziebarth, 1994). Although in another study, fathers and mothers did not differ in their evaluation of their newborn to 4-year-old children's rating of pain, but younger parents, compared with older ones, tended to evaluate pain as more severe (Rosenbloom et al., 2011). However, studies contained in this review did not consistently make clear who had been recruited: only mothers, only fathers, or fathers and mothers. Future studies should make clear their definition of *parent* in view of the influence parent gender may exert on the adoption of postoperative pain relief approaches in children.

In this review it was found that parents' use of valid and reliable instruments to assess their children's pain was useful because it provided them with guidelines to adopt pharmacologic and nonpharmacologic pain relief approaches. However, overevaluation of pain assessment instruments can inhibit parents' creativity and willingness to use other approaches, including those they routinely use in daily life with the children. Parents indicated the need to be instructed on how to use pain assessment instruments at home. In this sense, nurses should establish partnerships with the parents, teaching them how to use the pain assessment instruments while considering the children's experiences and developmental stages (Rossato & Magaldi, 2006).

The day of surgery is considered as a highly stressful event for parents because they can be tired and hungry, which decreases their capacity to understand and remember instructions (Pölkki, Pietilä &, Vehviläinen-Julkunen, 2003; Warnock & Lander, 1998). Parents' anxiety also influenced their capacity to absorb the information health professionals provided (Kankkunen et al., 2003a). Hence, reducing the parents' anxiety entails beneficial effects to reduce their children's anxiety (Al-Sagarat, Al-Oran, Obeidat, Hamlan, & Moxham, 2017). Preoperative preparation programs aim to mitigate the child's and parent's anxiety and affect pediatric postoperative pain control based on evidence that preoperative anxiety among children undergoing surgery was significantly associated with painful recovery after surgery (Al-Sagarat et al., 2017).

Nurses should provide information about children's common behaviors related to pain, like groaning, grumbling, and crying (Zisk et al., 2007), and also make them aware of less evident signs of pain, such as sleep and restrained behaviors (Herr et al., 2006). A study reports that both parents and nursing staff from a pediatric postoperative unit identified intense and persistent crying as the main sign of pain expression in children in the late postoperative phase of heart surgery (Queiroz et al., 2007). The misinterpretation or lack of understanding of painful experiences in children is one factor that contributes to unnecessary suffering in the postoperative phase or after complicated treatments (Wiroopanich & Strickland, 2004).

A range of interventions can mitigate painful experiences in children (Queiroz et al., 2007; Tanabe, Ferket, Thomas, Paice, & Marcantonio, 2002). In this review, parents commonly used pharmacologic approaches to relieve their children's postoperative pain (Abou-Karam et al., 2015; Bailey et al., 2015; Jonas, 2003; Kankkunen et al., 2003b; Simons & Roberson, 2002; Sutters & Miaskowski, 1997; Swallow et al., 2000; Voepel-Lewis et al., 2016). Parents' attitude toward pain medication and their perception about their child's pain can influence the quantity and number of times they administer pain medications (Abou-Karam et al., 2015; Sutters & Miaskowski, 1997; Voepel-Lewis et al., 2016). Parents may lack of preparation regarding pharmacologic approaches to control children's pain during the postoperative period. This may arise because they received inadequate information or were influenced by orientations of health professionals that favored the

parents' insecurity and fear about medication overdosing (Abou-Karam et al., 2015; Kankkunen et al., 2003b; Simons & Roberson, 2002; Sutters & Miaskowski, 1997). Oligoanalgesia still occurs after pediatric surgery because parents often do not provide their children with the proper dosage of medications (Gorodzinsky, Davies, & Drendel, 2014). Moreover, parents may not provide a night dose or skip some dosages, leading to inadequate pain control (Gorodzinsky et al., 2014; Warnock & Lander, 1998). This fact, in combination with the parents' lack of knowledge about maintaining blood levels of analgesics, can result in breakthrough pain, prolonged pain, and delays in surgical recovery, which may perpetuate the cycle of pain.

According to He, Pölkki, Pietilä, and Vehviläinen-Julkunen (2005), nurses should promote patient safety and maintain care quality. In this sense, the direct participation of nurses in guiding parents toward safe and correct analgesic decision-making is considered fundamental. They should teach parents safety-related actions about pharmacologic pain management, such as administration time, dose, route, and medication (in line with the medical prescription) (Swallow et al., 2000; Warnock & Lander, 1998). It is important for nurses to reflect on parents' pain management experiences and to facilitate parents' early and direct involvement in their child's pain care plan for optimal postoperative pain management (Longard, Twycross, Williams, Hong, & Chorney, 2016). Parents can draw on a number of strategies in addition to pharmacologic pain relief approaches to comfort their children after surgical procedures. Most distraction techniques are easy to use and inexpensive and can be an important resource for professionals and parents (Chorney, Twycross, Mifflin, & Archibald, 2014). The parents' mere presence was mentioned as one of the most effective measures for postoperative pain relief (Kankkunen et al., 2002, 2003c). Nursing professionals should know about different pain-relieving approaches for children, especially nonpharmacologic ones, because these approaches can add to the analgesic effect of prescribed medication, allowing parents to choose those approaches that better adapt to their needs and respecting their choice.

Parents' dissatisfaction with the instructions provided by the hospital team regarding pain has been acknowledged in different studies (Kankkunen et al., 2002; Kankkunen, Vehviläinen-Julkunen, & Pietilä, 2004; Simons, Franck & Roberson, 2001; Swallow et al., 2000). Lack of communication between parents and nurses and the latter's knowledge deficit about pain management created obstacles for effective pain relief. These obstacles need to be overcome to improve pain management in children through the improvement of nursing education and communication with the parents (Simons & Roberson, 2002).

Parents can manage their child's postoperative pain effectively after receiving individual verbal (Kankkunen et al., 2002) and written (Bailey et al., 2015; Huth et al., 2003) information, but also when having the opportunity to contact a health professional by phone to clarify doubts (Kankkunen et al., 2002). Although nurses mentioned they provided information about pharmacologic approaches, the parents indicated that this information was insufficient (He et al., 2005). The use of web-based approaches combined with follow-up telephone support could potentially facilitate parents' access to prompt information about pain management in their children at home.

How children express and cope with pain can be modeled as a family-learned phenomenon or it can be shaped on the bases of cultural values (Kankkunen et al., 2004). Likewise, learning how to relieve a child's pain can be shared in the family sphere. Culture strongly influences all aspects of people's lives. This includes cultural beliefs, behaviors, perceptions, emotions, religion, family structure, language, food, clothing, body image, and, among other situations, exerting a strong effect on pain tolerance or not (Budó et al., 2007). Consequently these factors can interfere with treatment adherence, type, and quality of care delivered by the health professionals and even the client-team relationship (Budó et al., 2007). Hence, an individual assessment of the child and his or her family is considered fundamental to the success of the child's pain management plan. Such a plan should be performed by health professionals as early as possible, with the aim of grasping any opportunity to improve parents' abilities to promote child's postoperative recovery and adequate pain management at home.

Limitations

Even though the four databases that were systematically searched in this review resulted in locating relevant studies, other databases, such as Embase and Scopus, can be incorporated in future reviews.

The results of this review need to be interpreted with caution because results were based on studies that were conducted in developed countries such as Australia, Canada, England, Finland, Israel, the United Kingdom, and the United States. This limits the extent to which results can be generalized to developing countries. This is because the context and the resources that families from developing countries have to manage their children's postoperative pain at home may substantially differ. Despite these limitations, this review contributes to guiding recommendations to improve the management of pain in children at home.

Conclusion

This article provides a critical review of available research about the participation of parents in managing their children's pain at home after day surgeries. Given the increased use of day surgeries for children worldwide, it is important to encourage ongoing research on this subject in different countries and cultures.

Progress has been made in the assessment and treatment of pediatric postoperative pain in general, and guidelines are available for clinicians. Nevertheless, there remain a significant number of children who experience pain for prolonged periods after discharge from day surgery. On the basis of this review, it is recommended that nurses educate parents and provide individualized verbal and written material to parents before their child is discharged from day surgery. This process should include the opportunity for parents to practice any procedure before the child's discharge and to have access to professional support over the phone or via webcast once the child is at home. This would allow parents to discuss concerns and encourage them to access evidence-based information to strengthen pain care decision-making. Although this review focused on children's pain at home after day surgery, studies that target children's pain after major surgical procedures are also needed. This would provide the basis for development of educational strategies to help support parents in managing their child's pain effectively in the varying contexts and settings that children experience pain.

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