Scandinavian Journal of Pain 11 (2016) 77–89

Contents lists available at ScienceDirect

Scandinavian Journal of Pain

journal homepage: www.ScandinavianJournalPain.com

Topical review

Postoperative pain documentation in a hospital setting: A topical review

Kristiina Heikkilä[a,*], Laura-Maria Peltonen[a,b], Sanna Salanterä[a,b]

[a] Department of Nursing Science, University of Turku, 20014 University of Turku, Finland
[b] Turku University Hospital, Kiinamyllynkatu 4-8, 20520 Turku, Finland

HIGHLIGHTS

- Postoperative pain documentation continues to be inadequate.
- Specific guidelines for postoperative pain documentation are necessary.
- Comprehensive tools for the evaluation of documentation are needed.
- Nurses need regular education about pain management, assessment and documentation.

ARTICLE INFO

Article history:
Received 3 July 2015
Received in revised form
17 December 2015
Accepted 20 December 2015
Available online 13 January 2016

Keywords:
Postoperative pain
Documentation
Hospital setting
Integrative review
Nursing

ABSTRACT

Background and aims: Nursing documentation supports continuity of care and provides important means of communication among clinicians. The aim of this topical review was to evaluate the published empirical studies on postoperative pain documentation in a hospital setting.
Methods: The review was conducted through a systematic search of electronic databases: Web of Science, PubMed/Medline, CINAHL, Embase, Ovid/Medline, Scopus and Cochrane Library. Ten studies were included. Study designs, documented postoperative pain information, quality of pain documentation, reported quality of postoperative pain management and documentation, and suggestions for future research and practice improvements were extracted from the studies.
Results: The most commonly used study design was a descriptive retrospective patient record review. The most commonly reported types of information were pain assessment, use of pain assessment tools, use of pain management interventions, reassessment, types of analgesics used, demographic information and pain intensity. All ten studies reported that the quality of postoperative pain documentation does not meet acceptable standards and that there is a need for improvement. The studies found that organization of regular pain management education for nurses is important for the future.
Conclusions: Postoperative pain documentation needs to be improved. Regular educational programmes and development of monitoring systems for systematic evaluation of pain documentation are needed. Guidelines and recommendations should be based on the latest research evidence, and systematically implemented into practice.
Implications: Comprehensive auditing tools for evaluation of pain documentation can make quality assessment easier and coherent. Specific and clear documentation guidelines are needed and existing guidelines should be better implemented into practice. There is a need to increase nurses' knowledge of postoperative pain management, assessment and documentation. Studies evaluating effectiveness of high quality pain documentation are required.

DOI of refers to article: http://dx.doi.org/10.1016/j.sjpain.2016.01.007.
* Corresponding author. Tel.: +358 451305306.
E-mail addresses: kemheik@utu.fi (K. Heikkilä), lmemur@utu.fi (L.-M. Peltonen), sansala@utu.fi (S. Salanterä).

http://dx.doi.org/10.1016/j.sjpain.2015.12.010
1877-8860/

Contents

1. Introduction

Pain management continues to be inadequate [1–7] in spite of increased development and new pain management standards [8]. Nearly every patient (80%) still experiences pain after surgery [1–5,7], and 86% of those have moderate, severe or extreme pain [8]. Pain can complicate mobility, which increases a risk of complications [3,5]. Adequate pain management is one of the most important factors in expediting recovery [2,9], by enabling fast mobilization [10]. Poorly managed pain impairs surgical outcomes and may prolong pain [2,9,10] or extend hospital stay, which increases costs for society [9–11].

Adequate documentation of pain, pain management [1,12] and regular pain assessment are essential to achieve sufficient pain relief after surgery [2,5,13–16]. Nurses need to understand the physiological changes caused by pain [16] and take into consideration the individual differences in experiencing pain [17] to be able to achieve proper pain assessment [16].

Documentation can support continuity of care [18,19] and provides an important means of communication between clinicians [12]. Written reporting is a primary way of information transfer between clinicians. Oral reporting is not reliable; it can be recalled correctly in less than 30% of cases [20]. Moreover consistent documentation provides legal evidence of the caring process and supports evaluation of quality of care [19]. Clinical documentation is regulated by law in many countries, also in Finland. The law obligates healthcare professionals to record all essential information to ensure organization, planning, implementation and follow-up actions for patients' care [21]. An ordinance created by the Ministry of Social Affairs and Health [22] obligates pain documentation about prescriptions, medications, administration, implementation, effectiveness and side effects.

Nursing documentation is insufficient [23–31], as are pain management [18,24,31–35] and assessment [33,34]. It is therefore important to explore earlier research on postoperative pain documentation. The aim of this review was to evaluate the published empirical studies on postoperative pain documentation in a hospital setting. The review followed a framework from Whittemore's and Knafl's [36] 5-stage method. Answers were sought to the following questions: (1) What kind of studies have been carried out concerning postoperative pain documentation? (2) What information about pain documentation has been of interest in the studies? (3) What kind of auditing tools have been used to assess the quality of postoperative pain documentation? (4) What is the reported quality of postoperative pain management and documentation in the studies? (5) What kind of suggestions or recommendations for future research or practice did studies reveal?

2. Methods

2.1. Design

An integrative review was chosen to carry out. It enables inclusion of various methodologies in one review, provides comprehensive understanding [36] and generates new knowledge of a research topic [37]. The review was performed following Whittemore's and Knafl's [36] 5-stage method, which provided a framework for the process. The phases of the process were to: (1) identify the research problem, (2) search the literature for data collection, (3) evaluate the studies, (4) integrate of the data and (5) synthesize and present the results.

2.2. Literature search

Relevant studies were identified by searching electronic databases: Web of Science, PubMed/Medline, CINAHL, Embase, Ovid/Medline, Scopus and Cochrane Library. The search was finalized by scanning the reference lists of the relevant publications. Search terms pain and documentation were used in different variations (Appendix 1). The search resulted in 2209 articles (Fig. 1). The first author (KH) reviewed all the titles. The abstracts and full texts were independently reviewed by two authors (KH, L-MP). At this point, the inclusion criteria were reappraised; hereafter, the focus was on postoperative pain instead of acute pain in general. Disagreements were discussed until consensus was reached. A total of 17 studies met the criteria. After a quality assessment of the studies and a reappraisal of inclusion criteria, 10 studies were included into the analysis. Six of the excluded studies were considered to be too old, as the time margin was decided to be 10 years. One study was excluded based on its low quality assessment score.

2.3. Inclusion and exclusion criteria

Inclusion criteria:

- original study report
- written in English
- about acute postoperative pain

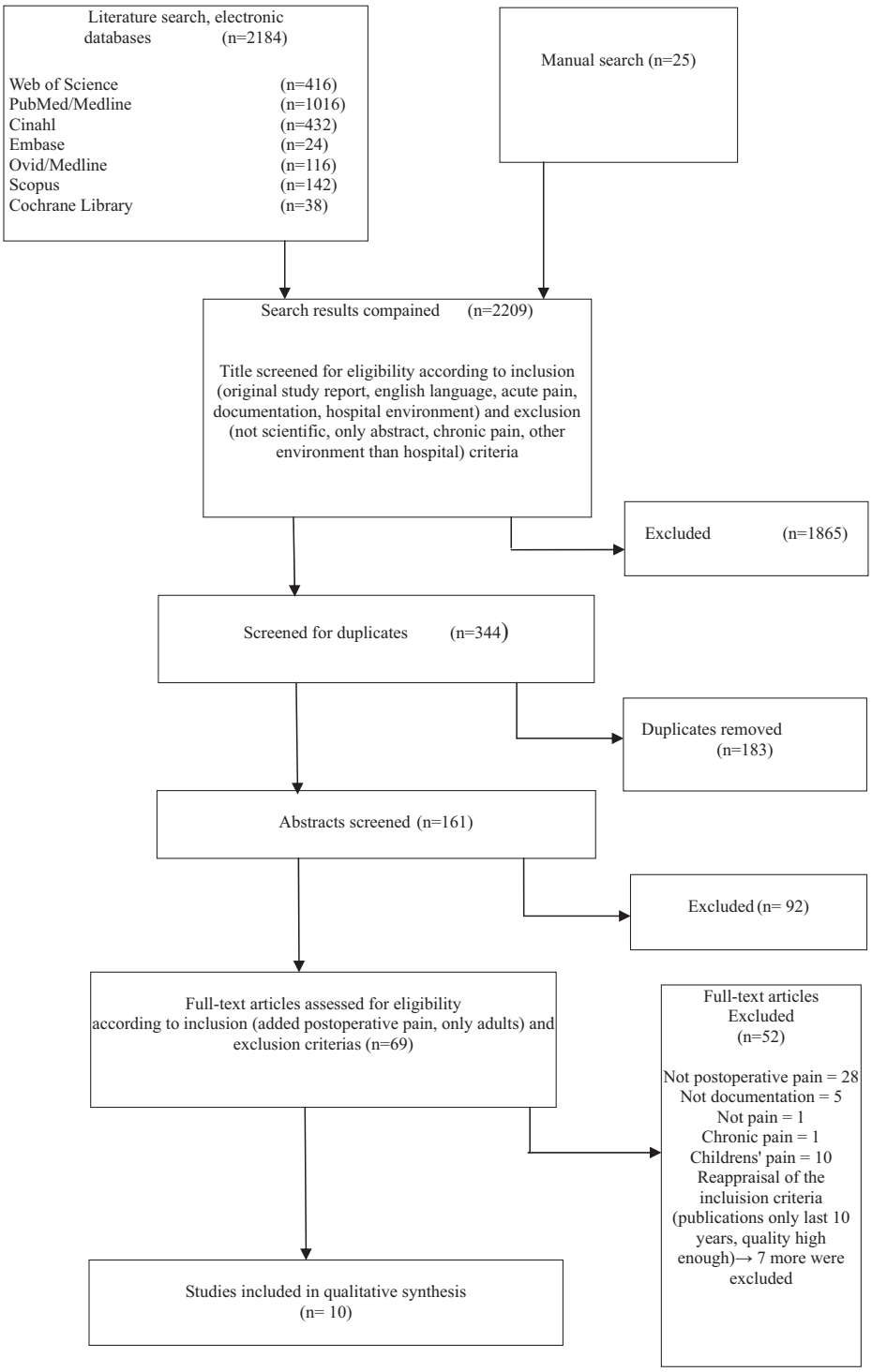

Fig. 1. Flow diagram of study selection.

- examining adult patients (over 18 years)
- focusing on documentation (nurses or physicians)
- taking place in a hospital environment

Exclusion criteria:

- not peer reviewed scientific reports
- an abstract without a full paper
- focusing on chronic pain
- lacking the minimum criteria for quality

2.4. Data extraction and synthesis

Three data extractions were done. Firstly, the details of study designs and processes were identified. Secondly, information was extracted about the auditing tools, different forms of postoperative pain documentation that were of interest and studies that examined information about pain. Information was collected about pain characteristics and management. Thirdly, information was extracted about postoperative pain documentation and auditing details.

Table 1
Criteria for assessing the quality of qualitative studies.

Criteria	Studies Eid and Bucnall, 2008 [46]
1. Question/objective sufficiently described?	2
2. Study design evident and appropriate?	2
3. Context for the study clear?	2
4. Connection to a theoretical framework/wider body of knowledge?	2
5. Sampling strategy described, relevant and justified?	2
6. Data collection methods clearly described and systematic?	1
7. Data analysis clearly described and systematic?	1
8. Use of verification procedure(s) to establish credibility?	2
9. Conclusions supported by the results?	2
10. Reflexivity of the account?	1
Total score	0.85

2, yes; 1, partial; 0, no; NA, not applicable.

2.5. Quality assessment

Two authors (KH, L-MP) independently assessed the quality of the selected studies. According to Whittemore and Knafl [36] there is no rigorous method for evaluating studies' quality. The used quality assessment instrument was a two-part scoring system that included check-lists for both qualitative and quantitative research reports [38]. The check-lists for qualitative studies had 10 criteria and for quantitative studies 14 criteria (Tables 1 and 2). All items were rated with a four-point scale: yes = 2 points, partially = 1 point, no = 0 points and n/a (not applicable). A summary score was calculated for the studies by adding up the points and dividing the sum by the total possible score. A "not applicable" score was excluded from the calculation of the total score. Inter-rater agreement was calculated for the total scores based on the inter-class correlation coefficient (ICC) with a two-way mixed model, using IBM SPSS Statistics 22.0, to evaluate the consistency of the evaluations between the two authors. The ICC was good (ICC = 0.736, 95% CI, $p < 0.005$). Thereafter, the authors discussed differences in their evaluations and reached a consensus on the quality of each study.

The quality of the studies was good. Total summary scores varied between 0.8 and 1.0 (maximum score), with an exception of one study [39], which scored 0.65. All studies achieved maximum points for evidence and appropriateness of study design and all studies had some estimate of variance reported for the main results. Results were reported in sufficient detail, and conclusions were supported by the results. Subject characteristics were sufficiently described, and outcome and exposure measures were well-defined. The remaining assessed criteria had some variation in the scores.

3. Results

3.1. Study designs in postoperative pain documentation research

Ten studies were included into the review (Table 3). Five studies were conducted in the USA [12,40–43], four in different countries outside Europe [39,44–46] and one in Sweden [47]. Mainly quantitative methods were used [12,39–45,47]; one study had a qualitative design [46]. The most commonly used study design was a descriptive retrospective patient-record review [12,40,41,44–46], and seven studies used comparative approach [12,41–45,47]. The differences in documentation from day to day [44,45] or nurses' and patients' assessments of the quality of postoperative pain management between those who had more pain than expected and those who did not, or the differences between nurses' documentation

Table 2
Criteria for assessing the quality of quantitative studies.

Criteria	Studies							
	Abdalrahim et al., 2008 [44]	Chanvej et al., 2004 [45]	Gunningberg and Idvall, 2007 [47]	Samuels and Fezer, 2009 [12]	Samuels and Kritter, 2011 [40]	Samuels and Bliss, 2012 [41]	Samuels and Eckardt, 2014 [42]	Topolovec-Vranic et al., 2010 [39]
1. Question/Objective sufficiently described?	2	1	2	1	1	2	2	2
2. Study design evident and appropriate?	2	2	2	2	2	2	2	2
3. Method of subject/comparison group selection or source of information/input variables described and appropriate?	2	2	2	1	1	1	2	1
4. Subject (and comparison group, if applicable) characteristics sufficiently described?	2	2	2	1	2	2	2	2
5. If interventional and random allocation was possible, was it described?	NA	NA	NA	NA	NA	NA	NA	0
6. If interventional and blinding of investigators was possible, was it reported?	NA	NA	NA	NA	NA	NA	NA	0
7. If interventional and blinding of subjects was possible, was it reported?	NA	NA	NA	NA	NA	NA	NA	NA
8. Outcome and (if applicable) exposure measures(s) well defined and robust to measurement/misclassification bias? means to assessment reported?	2	1	2	2	2	2	2	2
9. Sample size appropriate?	2	2	2	2	1	2	1	1
10. Analytic methods described/justified and appropriate?	2	2	2	1	2	1	2	1
11. Some estimate of variance is reported for the main results?	2	2	2	2	2	2	2	2
12. Controlled for confounding?	NA	NA	NA	NA	NA	NA	NA	1
13. Results reported in sufficient detail?	2	2	2	2	2	2	2	1
14. Conclusion supported by the results?	2	2	2	2	1	2	2	2
Total score	1.0	0.90	1.0	0.80	0.80	0.90	0.95	0.65

2, yes; 1, partial; 0, no; NA, not applicable.

Table 3
Summary of studies included into the review.

Author	Country	Purpose of the study	Study design	Data collection time duration	Sample size	Main result/finding	Future recommendations
Abdalrahim et al., 2008 [44]	Jordan	To describe and compare nursing documentation of pain assessment and management in the first 72 h postoperatively in surgical wards.	Descriptive retrospective comparative	Over 6 months	322	The results show the need to improve postoperative pain assessment and documentation and importance of pain management education programmes.	Development of educational programmes and monitoring system of documentation
Chanvej et al., 2004 [45]	Thailand	To describe the documentation of pain assessment and management in the first 72 h postoperatively.	Descriptive retrospective comparative	12 months	425	Quality of pain documentation was not found to meet the acceptable standards.	Attempts to develop individual nurses and clinical setting to gain more adequate knowledge about pain, pain assessment and documentation and to have guidance for assessment and documentation
Eid and Bucknall, 2008 [46]	Australia	To describe the documentation of the type of pain assessment and management received by post-operative with a hip fracture in an Australian orthopaedic ward.	Descriptive retrospective	5 months	43	Documentation of pain assessment and management was deficient and did not support continuity of care.	An observational study to examine differences between nurses' pain management practices and documentation of pain and pain management, to increase understanding of the gap between practice and documentation.
Gunningberg and Idvall, 2007 [47]	Sweden	To study the quality of postoperative pain management. To describe and compare patient and nurse assessments of the quality of postoperative pain management, compare quality of postoperative pain management between patients who experienced more pain than expected and those who did not and compare patients' assessments and nursing documentation regarding patient information and pain intensity ratings	Descriptive comparative	6 weeks	121 patients 47 nurses	Issues for improvements were found in all subscales of the SCQIPP-instrument.	Qualitative approach with interviews or observation to develop quality of pain care, to get more information about differences between nurses and patients' assessments of pain.
Samuels and Fetzer, 2009 [12]	USA	To describe the quality of pain management documentation	Descriptive comparative	–	85 nurses' records	Nurses' pain management documentation was found to be clearly below the quality requirements of Join Commission standards.	Individual educational interventions to nurses who consistently document below expectations. Pain medication documentation should reflect clinical decision making more.

Table 3 (*Continued*)

Author	Country	Purpose of the study	Study design	Data collection time duration	Sample size	Main result/finding	Future recommendations
Samuels and Kritter, 2011 [40]	USA	To describe pain management documentation output from the electronic medical record to gain an understanding of its presentation and evaluate the quantity and quality of the output.	Cross-sectional descriptive	–	51	Pain management documentation changes with pain severity. Documentation was found to be inconsistent, deficiencies and duplicated documentation were found.	To implement strategies to assist nurses document more specifically and eliminate the duplication.
Samuels, 2012 [43]	USA	To describe methodological issues arising from abstracting pain management documentation (PMD) from electronic medical record in three different hospitals and to compare documentation of pain management	Descriptive retrospective comparative	–	Not clear	Pain management, assessment, interventions and reassessment documentation was found to be inconsistent across all three hospitals.	Work to standardize pain medication documentation across computer systems is needed. Research to reveal the best pain medication documentation practices.
Samuels and Bliss, 2012 [41]	USA	To create variables describing patient and process variation in pain management using timed entries from the EHR and then to use simple linear regression procedures to determine the impact of process variation on patient outcomes.	Descriptive cross-sectional comparative	18 months	137	Relationships were found between increased pain variability and less frequent assessment and more frequent intervention.	Large cross-organizational research is needed using multilevel modelling procedures to determine which hospital-level factors impact pain outcomes.
Samuels and Eckardt, 2014 [42]	USA	To examine the methodological issues that arise when conducting multilevel modelling research aimed to answer the question: what is the impact of assessment and reassessment documentation routines on postoperative pain severity trajectory (PST)?	Comparative effectiveness research using multilevel modelling Pilot study	18 months	146	The PST with the repeated assessment of NRS may supply more clinically significant acute symptom management experience for patients. The advantages of using PST as a pain management outcome added insight into earlier reported predictors of postoperative pain severity.	Interdisciplinary teams comprised of nurses specialized in pain management, informatics, statisticians and researchers may facilitate the consistency of data for research purposes.
Topolovec-Vranic et al., 2010 [39]	Canada	To evaluate the effect of implementing a new pain assessment tool in a trauma/neurosurgery intensive care unit	Before and after measurement The first face of intervention	data collection (before intervention) 4 weeks	72 patients charts (40 intubated: 20 before, 20 after implementation), 32 nonintubated (16 before, 16 after) 64 patients (25 before, 39 after) 53 nurses (32 after)	Implementation of the Nonverbal Pain Scale in a critical care setting improved patients' ratings of their pain experience, improved nursing documentation and increased nurses' confidence in assessing pain in nonverbal patients.	Research for validate the use of objective tools for pain assessment

and patients' assessment of pain were compared[47]. There was also a comparison of documentation and pain management routines between hospitals [42]. One study evaluated the effect of an intervention: the implementation of a new pain assessment tool and its effect on pain assessment and documentation [39].

Sample sizes varied from 43 [46] to 425 [39]. One study did not reveal the sample size [43]. Data collection duration varied from 4 weeks [39] to 18 months [41]. Four studies did not mention the duration of the data collection, or stated that this was not relevant information [12,40,42,43]. All studies described the quality of postoperative pain documentation, and five studies assessed the quality of both, pain documentation and management [39,40,44,46,47].

3.2. Patient-record auditing details

Eight studies examined nurses' documentation entries [12,39–42,44,46,47], and two examined both nurses' and physicians' entries [43,45]. Length of auditing varied from 72 h [44,45] to patient's entire hospital stay [40,43]. Five studies did not report length of auditing or number of investigators [12,39,41,42,47]. In addition to these, one more study did not reveal how many investigators were auditing [46]. Number of reviewers varied from two to four. A variety of surgical specialities were represented, with orthopaedic and general surgery being the most common. Five studies were carried out in one hospital [39,40,45–47], one in two hospitals [12], three in three hospitals [41–43] and one in six hospitals [44]. See Table 4.

Even though laws in many countries regulate documentation of care, only one study report mentioned that a law was guiding pain documentation [46]. All studies compared documentation to current regulations or guidelines. The Joint Commission and American Pain Society were the most frequently mentioned associations guiding documentation (Table 4).

3.3. Auditing tools and questionnaires used for pain management and documentation quality assessment

A variety of auditing tools were used (Table 5) in the studies to assess documentation in the patient records. All studies used different tools. The Pain and Anxiety Audit Tool (PAAT) was used to examine prescribed and administered medication and to describe nursing documentation of pain management [44]. The North American Nursing Diagnosis Association (NANDA) form was used to examine characteristics of acute pain in addition to patients' self-reports, changes in vital signs and pain behaviour, such as restlessness or sweating. The comprehensiveness assessment tool was used to evaluate comprehensiveness of documentation by scoring it with a five-point scale [44]. One study used a 4-point scale with a 7-item audit form to assess accuracy, completeness, comprehensiveness and clarity of documentation [45]. The Pain Documentation Audit Tool was used to evaluate pain assessment, management and education information [46]. The Samuels Pain Management Documentation Rating Scale (SPMDRS) was used to assess documentation of pain assessments, interventions, reassessments and further interventions [12]. Four studies did not mention the use of auditing tools [40–43].

Two studies [39,47] used questionnaires to assess pain management. The Strategic and Clinical Quality Indicator in Postoperative Pain Management (SCQIPP) questionnaire has a 5-point scale with 14 items about communication, action, trust and environment. This questionnaire was used to examine patients' assessments of quality of their postoperative pain management [47]. The questionnaire was modified to create a matching questionnaire to examine nurses' views of how an individual patient's pain care was carried out [47]. The Patient Pain Management Questionnaire, a 12-item instrument was used to examine patients' satisfaction with pain assessment and management during an ICU stay [39]. The Staff Satisfaction Questionnaire, a 10-item instrument was used to examine nurses' satisfaction with current practices for pain assessment and management in an ICU and their comfort level in assessing and managing pain of communicative and non-communicative patients [39]. Nurses were also asked about concerns or barriers to using the pain scale in an ICU. The End-of Study Questionnaire, an 11-item instrument was used to determine nurses' satisfaction with training, utility and ease of use of the new pain assessment tool (the Nonverbal Pain Scale) [39].

A total of 28 information details about pain were investigated in the studies (Table 5), although none of the studies included them all. The most comprehensively audited studies investigated 20 [40,44] or 21 [43] details. The most commonly examined details were pain assessment (in 8 studies), use of pain assessment tools ($n = 8$), use of pain management interventions ($n = 8$), reassessments ($n = 8$), demographic information ($n = 9$) and pain intensity ($n = 6$). The most seldom explored information were pain duration ($n = 1$), onset of pain ($n = 1$), patient's self-report of pain ($n = 2$), anxiety level ($n = 2$) and nausea scale score ($n = 1$).

3.4. Quality of postoperative pain documentation and management

All studies reported, that the quality of postoperative pain documentation did not meet the acceptable standards and that documentation should be improved (Table 4). Pain management education for nurses was suggested method for improving practice [44]. One study reported that more than 80% of pain documentation was unsatisfactory. The mean quality score was 1.4 on a scale ranging from 1 to 5, 5 representing the most comprehensive documentation [44]. In another study, the mean total audit score was 10.7 the maximum score being 28 [45].

Patients' satisfaction and nurses' documentation of pain assessment improved after the implementation of a new pain assessment tool, the Nonverbal Pain Scale, additionally patients' pain was milder. Before the implementation, 55% of patients reported severe pain, and afterwards only 35% did. Moreover, after the implementation, nurses felt more confident in pain assessment; 81% felt confident or very confident [39]. Even though documentation improved, it was still notably below recommendations of the best practice guidelines.

Pain assessment was irregularly and inadequately documented [44,45,47]. There was a significant difference in documentation depending on the time after an operation; in 35% of the records pain management process was not documented during the first postoperative day. Medication was not documented in 53.7%, and outcomes of pain management were not documented in 15.2% of the records. On the second postoperative day, 46% of patients' documentation included pain assessment. Pain assessment documentation was mostly lacking on the third postoperative day [44]. In the worst case, 0.5% of records achieved the hospital's recommendations of regular pain assessment every 2–4 h during the first 24 h [45]. In another study, less than 50% of patient records contained pain assessment documentation [47].

Significant differences were found in pain documentation when wards in one hospital were compared [47]. Pain intensity was better-documented in a general surgery ward comparing to a thoracic surgery ward; 41% of general surgery patients' pain intensity was documented according to the hospital's quality goals, when the corresponding number in the thoracic surgery ward was 6.7% [47]. The reason for this was likely the quality improvement programme, compulsory education and annual monitoring of documentation that were organized in the general surgery ward. Nurses did not have a realistic conception of their pain assessment and documentation skills; in the thoracic surgery ward, nurses believed

Table 4
Patient record auditing details.

Author	Whose entries Nurses/Physicians	Length of auditing hours/days post op	Number of reviewers	Patients' surgical specialty	Number of hospitals/ wards	Law mentioned as basis of documentation	Recommendations/guidelines mentioned as basis of documentation
Abdalrahim et al., 2008 [44]	N	72 h	3	Intraabdominal Orthopaedic Eye, ENT and neck Renal Intrathoracic	6 h/8 w	–	Committee on Quality Assurance Standards of Acute Pain Service: Guideline on Acute Pain Management Standards
Chanvej et al., 2004 [45]	N,P	72 h	2	Intra-abdominal extremities/back/spine Eye, ENT, neck, superficial endoscopic perineum/inguinal kidney intra-thoracic	1 h	+	Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
Eid and Bucknall, 2008 [46]	N	5d	?	Orthopaedic	1 h/1 w	–	The National Health and Medical Research Council (NHMRC):Clinical practice guidelines: The management of acute pain American Pain Society (APS)
Gunningberg and Idvall, 2007 [47]	N	Not clear (whole hospital stay?)	4	General thoracic	1 h/2 w	+	Agency for Health Care Policy and Research: Clinical Practice Guideline for Acute Pain Management
Samuels and Fetzer, 2009 [12]	N	–	?	Cardiac Orthopaedic Trauma general surgery	2 h/3 w	–	Joint Commission on Accreditation of Healthcare Organizations. Comprehensive Manual for Hospitals: The official Handbook
Samuels and Kritter, 2011 [40]	N	Whole hospital stay	2	Thoracic abdominal vascular gynaecologic prostate plastic orthopaedic	1 h	–	American Pain Society (APS) guidelines for quality improvement Joint Commission pain management standards
Samuels, 2012 [43]	N,P	Whole hospital stay	1 primary investigator 3 (collecting data, 1 in each hospital)	Not clear	3 h	–	The Joint Commission (TJC) standards for pain medication documentation The Joint Commission (TJC), comprehensive accreditation manual for hospitals
Samuels and Bliss, 2012 [41]	N	Whole hospital stay	?	General orthopaedic gynaecologic	3 h	–	The Joint Commission (TJC) standards for pain medication documentation
Samuels and Eckardt, 2014 [42]	N	Whole hospital stay	?	General orthopaedic gynaecologic	3 h	–	The Joint Commission (TJC), comprehensive accreditation manual for hospitals
Topolovec-Vranic et al., 2010 [39]	N	Whole hospital stay	?	Neurosurgical Trauma	1 h/1 w	–	Agency for Health Care Policy and Research (AHCPR) American Pain Society (APS) Quality of Care Committee American Society of Anaesthesiologist (ASA) guidelines for Acute Pain Management

Table 5
Auditing tools and pain documentation details.

Author	Abdalrahim et al., 2008 [44]	Chanvej et al., 2004 [45]	Eid and Bucknall, 2008 [46]	Gunningberg and Idvall, 2007 [47]	Samuels and Fetzer, 2009 [12]	Samuels and Kritter, 2011 [40]	Samuels, 2012 [43]	Samuels and Bliss, 2012 [41]	Samuels and Eckardt, 2014 [42]	Topolovec-Vranic et al., 2010 [39]
Auditing/interviewing tool(s)/	Pain and Anxiety audit tool The North American Nursing Diagnosis Association from characteristics of Acute Pain (NANDA) Comprehensiveness assessment tool	Audit form was a 7-item, 0–4 point Likert-type-scale tool	Pain Documentation Audit Tool (developed following a review of NHMRC and APS guidelines and previous research)	Strategic and Clinical Quality Indicator in Postoperative Pain Management (SCQIPP) questionnaire	The Samuels Pain Management Documentation Rating Scale (SPMDRS)	–	–	–	–	Patient Pain Management Questionnaire, Staff Satisfaction Questionnaire, Staff End-of-Study Questionnaire
The information examined:										
Pain assessment	+	+	+		+	+	+	+	+	+
Use of an assessment tools	+	+	+		+	+	+	+	+	
Use of pharmacological interventions	+	+	+		+	+	+	+	+	
Use of non-pharmacological interventions	+	+	+		+	+	+	+	+	
Outcomes of interventions (reassessment)	+	+	+		+	+	+	+	+	
Routes of analgesics		+	+			+	+	+	+	
Analgesics used		+	+		+	+	+	+	+	
Administration time			+			+	+	+	+	+
Dose			+			+	+		+	
Analgesics side effects	+	+	+				+			
Pain location	+	+	+			+	+			
Duration	+									
Intensity	+	+	+	+	+	+	+			
Description		+			+	+	+			
Pain education	+							+		
Self report of pain	+					+	+			
Quality	+						+			
Onset							+			
Patient demographics	+	+	+	+		+	+	+	+	+
Pain behaviour	+		+			+	+			
Alleviating factors	+					+	+			
Aggravating factors	+		+			+	+			
Sedation score		+				+	+			
Anxiety level						+	+			
Nausea scale score							+			
Patient refusal of analgesics			+		+			+		

that they assessed and documented pain according to the quality goals [47].

Nurses assessed patients' worst pain less severe than patients themselves [47]. Patients who experienced more pain than they had expected preoperatively, were less satisfied with quality of pain management. Patients assessed quality of care higher than nurses. The authors believed that nurses knew, that they could have done better [47]. Nurses did not administer as many analgesics as had been prescribed even though patients' pain had been assessed as moderate to severe, according to the documentation [46].

Those patients to whom the importance of pain relief had been clearly explained were satisfied with how nurses and physicians had reacted to their pain [39]. They believed that professionals did their best with pain management. A connection between increased pain variability, less frequent assessment and more frequent interventions was found [41]. Older age and smaller surgical incisions was associated with lower pain but not a shorter pain duration [42]. Even though reassessment of pain was rare, an important finding was that a more favourable pain severity trajectory can be achieved, if reassessment occurred within an hour after pain management intervention [42].

Some barriers to good pain assessment and management were found [39]. One barrier was related to physicians' practices in pain management. Other barriers were inconsistent pain management and assessment and a need for education. The barriers included nurses' beliefs and attitudes regarding their own competence to assess and manage pain. Further barriers were patients' limited ability to express pain and concerns about overuse of pain medication [39].

3.5. *Reported suggestions and recommendations for future research and practice*

Several recommendations for future research and practice were proposed (Table 4). Nurses' regular educational programmes should be developed to increase their knowledge of the latest scientific evidence of pain assessment and documentation [12,44–46] and to guide them to document more detailed [40]. Development of a monitoring system of documentation was recommended [44]. Nurses' work burdens should be considered; clear guidelines or care plans for pain management and documentation would save time and provide suggestions about what to document [44]. Guidelines and recommendations should be based on the latest evidence, and they need to be strategically and systematically implemented [46].

Qualitative studies with interviews or observations were proposed [46,47] to improve quality of pain management, to identify differences' in pain management and documentation and to influence nurses' decisions [46]. Studies to reveal the best pain documentation practices [43] and hospital-level factors that impact pain outcomes were requested [41].

Patients' preoperative education, should be carefully considered, as pain expectations can be influenced by the information given to them. Previous pain experiences and individual aims in pain management need to be taken into account [47]. Effects of postoperative pain management methods should be examined using larger samples and a greater variety of surgical types [41].

All patient groups should have equally satisfactory pain management. For example, patients with neurological impairment have deficiencies in their pain management, due to nurses' concerns about side effects of opioids, such as low blood pressure [39]. This should be explored in more detail to improve pain management for this patient group [39].

4. Discussion

The aim of this review was to evaluate the published empirical studies on postoperative pain documentation in a hospital setting. Ten studies were found, reviewed, assessed and synthesized. Most of the studies were retrospective patient record reviews. Other types of study designs would provide different perspectives and a broader understanding about the subject. However, a retrospective approach offers a good image of the quality of documentation. Prospective research, in which nurses were aware of the auditing, would easily bias the results.

Nine of the studies were conducted outside Europe, and they were fairly old. There is clearly a need to research this phenomenon in the European setting. In addition, large sample sizes were lacking. Quality of the studies was good. Total summary scores varied between 0.8 and 1.0 (maximum score), with an exception of one study [39], which scored 0.65. Even if the quality evaluations were good, there were room for improvement in reporting of the research processes. In some studies, important information was lacking, such as the number of reviewers, the data collection duration or the auditing tools used. All studies used different auditing tools, with little validation. New, more comprehensive auditing tool could be developed.

Based on the analyzed studies, documentation of pain assessment and management was infrequent and insufficient. Consequently, it is unclear if patients received high-quality care to which they are entitled. Surely it needs to be considered that documentation does not reflect reality; presumably more actions have occurred than were documented. However, in the worst case, less than 50% of the records contained pain assessment [44,46], even on the first postoperative day [44], when pain management is essential. Comprehensive reassessment was lacking totally [46]. Due to inadequate documentation, continuity of care was jeopardized, and communication between clinicians and patients was not sufficient [46]. Pain as a problem did not become visible through the records, even though presumably the patients were having pain. It was impossible to see the nurses' decision-making process through the pain management documentation, even though it should be visible. Documentation has not developed as efficiently as supposed, it still is inadequate. This review came to same conclusion as previous studies: there is a demand for more systematic and standardized pain assessment and documentation.

Patient-oriented and individualized care is needed to achieve good pain management. It was difficult to identify individualized care in nursing documentation based on the analyzed studies. Documentation was more task-oriented than patient-oriented. Patients' opinions of their symptoms and care were not sufficiently documented. Nurses play a key role in educating patients about the importance of pain management and its role in recovery. Quality of pain management is dependent on nurses' knowledge, skills and attitudes. Therefore, continuing education in pain care is vital for nurses, as was suggested in many studies [12,40,44–46]. This was already the case in Breivik's and colleagues' [53] project of implementing a new pain management programme in two hospitals in the early nineties. They also highlighted the importance of nurses' education in pain management. As early as 30 years ago they revealed, that postoperative pain is treated inadequately. In addition, they exposed that, this was the case already in 1952 and in 1978. Amazingly studies still come to the similar conclusions [1–8].

Proper documentation is needed since nursing care needs to be high-quality and safe despite shift changes and changes in personnel. Nurses need to have access to all essential information to be able to make decisions. The fact that an oral report given during a shift change contains more information than a written report [48–50] also supports a need for more adequate documentation

instead of favouring oral reports. The essential information about patient care is too massive and vital information to be handled only by remembering. Individuals are only able to recall less than 30% of information they have heard [20]. Sometimes, oral reports have even been found to promote confusion [51]. Therefore, adequate documentation is necessary for continuity of care and patient safety. A need for pain documentation improvements is based on patients' legal rights and legal protection of nurses' work [22].

There are many possible reasons for inadequate documentation. It is possible that nurses do not consider all actions, such as patient education to be pain management interventions, so they do not see the importance of documenting them [46]. Furthermore, a shortage of nursing stuff forces nurses to prioritize care, focusing only on compulsory tasks and they might not consider documentation to be such a thing. Nurses might find electronic recording systems complicated and time-consuming, as Stevenson and Nilsson [52] reported. Nurses may be aware of existing guidelines, but not their details or how to make use of them, or guidelines might be unclear.

This study has several limitations. The findings of the reviewed studies cannot be generalized since the data were mostly collected only in one to three wards or hospitals per study. Even though many surgical specialities were represented, a broader understanding of quality of pain management documentation would require larger sample sizes in a greater variety of settings. Similar results have been found across countries. This suggests that cultural and surgical speciality differences do not affect pain documentation and management. Documentation is poor from Australia to Sweden and from minor surgery to demanding thoracic surgery. The only factor that could be found to affect documentation quality is education. Since there were no analysis frameworks available to extract the data, a framework was created for this study. Further testing of this framework would increase validity of analysis.

Future research is needed to develop and test educational interventions for nurses to increase their knowledge about pain management and the importance of documentation in a proper pain-care process. Research with larger sample sizes, conducted in several hospitals, is needed to get a broader understanding of quality of postoperative pain documentation and generalizable results. Patients' perspectives are required to develop pain management in a more individualized direction. Auditing tools for assessing quality of postoperative pain documentation also need to be developed and validated.

5. Conclusions and implications

All studies came to same conclusion: postoperative pain documentation does not meet acceptable standards and improvements are needed. Regular educational programmes, development and implementation of monitoring systems for documentation has a potential to improve documentation. Guidelines and recommendations should be based on the latest research evidence, and they need to be systematically implemented.

Documentation is an important part of continuity of care and especially educators and nurse leaders should show interest in development of pain documentation to support clinical decision-making. Comprehensive auditing tools for documentation would make quality monitoring easier and coherent. Specific and clear guidelines for documentation of postoperative pain management need to be developed and existing guidelines need to be implemented in practice. Studies that evaluate effectiveness of pain documentation should be conducted.

Conflict of interest

The authors declare no conflict of interest.

Funding sources

This study was supported by a grant from the Finnish Cultural Foundation.

Appendix A. Appendix 1

Literature search.

Database	Vocabulary	Limits	Search result
Web of Science	pain* AND document* OR record* OR chart* OR note*	Title	627,767
	pain* AND document*	Topic	35,466
	pain AND document**	Title	314
Pubmed/Medline	((((pain*[Title]) AND document*[Title]) OR record*[Title]) OR chart*[Title]) OR note*[Title]	Title	97,582
	(pain*[Title/Abstract]) AND document*[Title/Abstract]	Title/Abstract	12,779
	Pain[title]) AND (document*[title]*	*Title*	*128*
	(*"Pain"[Mesh]) AND "Documentation"[Mesh]*	*Title*	*888*
Cinahl	TI pain* AND TI document* OR TI record* OR TI chart* OR TI note*	Title	25,711
	AB pain* AND AB document*	Abstract	2626
	(MH "Pain+") AND (MH "Documentation+")	Title	3246
	MW pain AND MW document**	*Word in subject heading* *Academic journal*	*352*
	Pain AND document**	*Title*	*80*
Scopus	Pain* AND document* OR record* OR chart* OR note*	Health science Article or review Article title	512
	Pain* AND document*	Health science Article or review Article Title, Abstract, Keywords	16,887
	pain* AND document*	Health science Article or review Keywords	1385
	Pain AND document**	*Health science* *Article or review* *Article title*	*142*

Appendix A (*Continued*)

Database	Vocabulary	Limits	Search result
Embase	Pain*:ab:ti AND document*:ab:ti	Abstract, Title	18,161
	pain*:ti AND document*:ti OR record*:ti OR chart*:ti OR note*:ti	Title	100,497
	pain:ti AND document*:ti*	*Title*	*24*
Ovid/Medline	Pain* AND document*	Keyword	12,561
	Pain* AND document* OR record* OR chart* OR note*	Title	80,914
	Pain AND document**	*Title*	*116*
Cochrane Library	Pain* AND document*	Title, Abstract, Keywords	2088
	Pain* AND document*	Abstract	1959
	Pain* AND document* OR record* OR chart* OR note*	Title	2785
	Pain AND document**	*Keywords*	*31*
	Pain AND document**	*Title*	*7*

References

[1] Aslan FE, Badir A, Arli SK, Cakmakci H. Patients' experience of pain after cardiac surgery. Contemp Nurse 2009;34:48–54.
[2] Cogan J. Pain management after cardiac surgery. Semin in Cardiothor Vasc An 2010;14:201–4.
[3] Jafari H, Zeydi AE, Khani S, Esmaeili R, Soleimani A. The effects of listening to preferred music on pain intensity after open heart surgery. Iran J Nurs Midwif Res 2012;17:1–6.
[4] Manias E, Bucknall T, Botti M. Nurses' strategies for managing pain in the postopeative setting. Pain Manag Nurs 2005;6:18–29.
[5] Milgrom LB, Brooks JA, Qi R, Bunnel K, Wuestefeld S, Beckman D. Pain levels experienced with activities after cardiac surgery. Am J Crit Care 2004;13:116–25.
[6] Raschke GF, Peisker A, Rieger U, Djedovic G, Guentsch A, Schaefer O, Venth E, Dammeier MG, Meissner W. Qualiy of postopeative pain management after midfacial fracture repair – an outcome-oriented study. Clin Oral Investig 2015;19:619–25.
[7] Sasseron AB, de Figueiredo LC, Trova K, Cardoso AL, Lima NMFV, Olmos SC, Petrucci O. Does the pain disturb the respiratory function after heart surgeries? Rev Bras Cir Cardiovasc 2009;24:490–6.
[8] Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: Results form a national survey suggest postoperative pain continues to be undermanaged. Anesth Analg 2003;97:534–40.
[9] Marmo L, Fowler S. Pain assessment tool in the critically ill post-open heart surgery patient population. Pain Manag Nurs 2010;11:134–40.
[10] Kapritsou M, Korkolis DP, Konstantinou EA. Open or laparoscopic surgery for colorectal cancer. A retrospective comparative study. Gastroenterol Nurs 2013;36:37–41.
[11] Leal EN, Ribeiro JLP, Oliveira MM, Roquette J. Psychosocial aspects associated with pain perception in individuals undergoing coronary surgery. Rev Port Cardiol 2005;24:1221–31.
[12] Samuels JG, Fetzer S. Pain management documentation quality as a reflection of nurses' clinical judgement. J Nurs Care Qual 2009;24:223–31.
[13] Breivik H, Borchgreivink PC, Allen SM, Rosseland LA, Romundstad L, Breivik Hals EK, Kvarstein G, Stubhaug A. Assessment of pain. Brit J Anaesth 2008;101:17–24.
[14] Bucknall T, Manias E, Botti M. Nurses' reassessment of postoperative pain after analgesic administration. Clin J Pain 2007;23:1–7.
[15] Chapman CR, Donaldson GW, Davis JJ, Bradshaw DH. Improving individual measurement of postoperative pain: the pain trajectory. J Pain 2011;12:257–64.
[16] Dunwoody CJ, Krenzischek DA, Pasero C, Rathmell JP, Polomano RC. Assessment, physiological monitoring and consequences of inadequately treated acute pain. Pain Manag Nurs 2008;9:11–21.
[17] Chapman CR, Zaslansky R, Donaldson GW, Shinfeld A. Postoperative pain trajectories in cardiac surgery patients. Pain Res Treat 2012:1–8.
[18] Bååth C, Hall-Lord M-L, Larsson BW. Nursing assessment documentation and care of hip fracture patients' skin. J Orthop Nurs 2007;11:4–14.
[19] Cheevakasemsook A, Chapman Y, Francis K, Davis C. The study of nursing documentation complexities. Int J Nurs Pract 2006;12:366–74.
[20] Dowling D. Examining the effects that manipulating information given in the change of shift report has on nurses' care planning ability. J Adv Nurs 2001;33:836–46.
[21] Law on patient's rights 17.8.1992/785. http://www.finlex.fi/fi/laki/ajantasa/1992/19920785.
[22] Ministry of Social Affairs and Health. Asetus potilasasiakirjoista; 2009 http://www.stm.fi/c/document_library/get_file?folderId=64939&name=DLFE-21317.pdf.
[23] Dalton JA, Carlson J, Blau W, Lindley C, Greer SM, Youngblood R. Documentation of pain assessment and treatment: how are we doing? Pain Manag Nurs 2001;2:54–64.
[24] McNeill JA, Sherwood GD, Starck PL. The hidden error of mismanaged pain: a systems approach. J Pain Symptom Manage 2004;28:47–58.
[25] Ansell J, Caro JJ, Salas M, Dolor RJ, Corbett W, Hudnut A, Seyal S, Lordan ND, Proskorovsky I. Wygant Quality of clinical documentation and anticoagulation control in patients with chronic nonvalvular atrial fibrillation in routine medical care. Am J Med Qual 2007;22:327–33.
[26] Bergh A-L, Bergh C-H, Friberg F. How do nurses record pedagogical activities? Nurses' documentation in patient records in a cardiac rehabilitation unit for patients who have undergone coronary artery bypass surgery. J Clin Nurs 2007;16:1898–907.
[27] Friberg F, Bergh A-L, Lepp M. In search of details of patient teaching in nursing documentation–an analysis of patient records in a medical ward in Sweden. J Clin Nurs 2006;15:1550–8.
[28] Karlsson A-K, Lidell E, Johansson M. Health-care professionals' documentation of wellbeing in patients following open heart surgery: a content analysis of medical records. J Nurs Manag 2013;21:112–20.
[29] Kim YJ, Park H-A. Nursing outcome documentation in nursing notes of cardiac-surgery patients. Stud Health Technol Inform 2005:617–22.
[30] McGain F, Cretikos MA, Jones D, Van Dyk S, Buist MD, Opdam H, Pellegrino V, Robertson S, Bellomo R. Documentation of clinical review and vital signs after major surgery. Med J Aust 2008;189:380–3.
[31] Stomberg MW, Lorentzen P, Joelsson H, Lindquist H, Haljamäe H. Postoperative pain management on surgical wards – impact of database documentation of anesthesia organized services. Göteborg, Sweden. Pain Manag Nurs 2003;4:155–64.
[32] Idvall E, Berg A. Patient assessment of postoperative pain management – orthopaedic patients compared to other surgical patients. J Ortho Nurs 2008;12:35–40.
[33] Klopfenstein CE, Herrmann FR, Mamie C, Van Gessel E, Forster A. Pain intensity and pain relief after surgery. A comparison between patients' reported assessment and nurses' and physicians' observations. Acta Anaesthesiol Scand 2000;44:58–62.
[34] McMillan SC, Tittle M, Hagan S, Laughlin J. Management of pain and pain-related symptoms in hospitalized veterans with cancer. Cancer Nurs 2000;23:327–36.
[35] Sommer M, de Rijke JM, van Kleef M, Kessels AGH, Peters ML, Geurts JWJM, Gramke H-F, Marcus MAE. The prevalence of postoperative pain in a sample of 1490 surgical inpatients. Eur J Anaesthesiol 2008;25:267–74.
[36] Whittemore R, Knafl K. The integrative review: updated methodology. J Adv Nurs 2005;52:546–53.
[37] Torraco RJ. Writing integrative literature review: guidelines and examples. Hum Resour Develop Rev 2005;4:356–67.
[38] Kmet LM, Lee RC, Cook LS. Standard quality assessment criteria for evaluating primary research papers from a variety of fields. HTA Initiative # 13; 2004 http://www.ihe.ca/documents/HTA-FR13.pdf.
[39] Topolovec-Vranic J, Canzian S, Innis J, Pollmann-Mudryj MA, White McFarlan A, Baker AJ. Patient satisfaction and documentation of pain assessments and management after implementing the adult nonverbal pain scale. Am J Crit Care 2010;19:345–55.
[40] Samuels JG, Kritter D. Pain management documentation. Analyzing one hospital's computerized clinical records. CIN 2011;29:512–8.
[41] Samuels JG, Bliss RL. Analyzing variability in pain management using electronic health record data. J Nurs Care Qual 2012;27:316–24.
[42] Samuels JG, Eckardt P. The impact of assessment and reassessment documentation on the trajectory of postoperative pain severity: a pilot study. Pain Manag Nurs 2014;15:652–63.
[43] Samuels JG. Abstracting pain management documentation from the electronic medical record: comparison of three hospitals. Appl Nurs Res 2012;25:89–94.
[44] Abdalrahim MS, Majali SA, Bergbom I. Documentation of postoperative pain by nurses in surgical wards. Acute Pain 2008;10:73–81.
[45] Chanvej L, Petpichetchian W, Kovitwanawong N, Chainbandit C, Vorakul C, Khunthong T. A chart audit of postoperative pain assessment and documentation: the first step to implement pain assessment as the fifth vital sign in a University Hospital in Thailand. J Med Assoc Thai 2004;87:1447–53.
[46] Eid T, Bucknall T. Documenting and implementing evidence-based postoperative pain management in older patients with hip fractures. J Orthop Nurs 2008;12:90–8.
[47] Gunningberg L, Idvall E. The quality of postoperative pain management from the perspectives of patients, nurses and patient records. J Nurs Manag 2007;15:756–66.

[48] Johnson M, Sanchez P, Suominen H, Basilakis J, Dawson L, Kelly B, Hanlen L. Comparing nursing handover and documentation: forming one set of patient information. Int Nurs Rev 2014;61:73–81.
[49] Lamond D. The information content of the nurse change of shift report: a comparative study. J Adv Nurs 2000;31:794–804.
[50] Suominen H, Johnson M, Zhou L, Sanchez P, Sirel R, Basilakis J, Hanlen L, Estival D, Dawson L, Kelly B. Capturing patient information at nursing shift changes: methodological evaluation of speech recognition and information extraction. J Am Med Inform Assoc 2015;22:e48–66.
[51] Sexton A, Chan C, Elliott M, Stuart J, Jayasuriya R, Crookes P. Nursing hadovers: do we really need them? J Nurs Manag 2004;12:37–42.
[52] Stevenson JE, Nilsson G. Nurses' perceptions of an electronic patient record from a patient safety perspective: a qualitative study. J Adv Nurs 2012; 68:667–76.
[53] Breivik H, Högström H, Niemi G, Stalder B, Hofer S, Fjellstad B, Haugtomt H, Thomson D. Safe and effective post-operative pain relief: introduction and continuous quality-improvement of comprehensive post-operative pain management programmes. In: Breivik H, editor. Post-operative pain management, vol. 9. Ballière's Clinical Anaesthesiology International Practice and Research; 1995. p. 423–60. ISBN 0-7020-2070-2.