Scandinavian Journal of Pain 16 (2017) 15–21

Contents lists available at ScienceDirect

Scandinavian Journal of Pain

journal homepage: www.ScandinavianJournalPain.com

Clinical pain research

Using education and support strategies to improve the way nurses assess regular and transient pain – A quality improvement study of three hospitals

Anna Peterson[a], Siw Carlfjord[b], Anne Schaller[a,b], Björn Gerdle[a,b], Britt Larsson[a,b,*]

[a] Pain and Rehabilitation Centre and Department of Medical and Health Sciences, Linköping University, SE-581 85 Linköping, Sweden
[b] Division of Community Medicine, Department of Medical and Health Sciences, Linköping University, SE 581 85 Linköping, Sweden

HIGHLIGHTS

- Systematic pain assessment in wards increased after an education programme and support.
- However, the pain assessment levels were not satisfactory.
- The discrepancy between documented and reported transient pain should be decreased.
- Interactive implementations might complement educational programmes at the work place.

ARTICLE INFO

Article history:
Received 10 November 2016
Received in revised form 30 January 2017
Accepted 31 January 2017
Available online 23 February 2017

Keywords:
Pain
Assessment
Documentation
Observation
Implementation

ABSTRACT

Background and aims: Systematic and regular pain assessment has been shown to improve pain management. Well-functioning pain assessments require using strategies informed by well-established theory. This study evaluates documented pain assessments reported in medical records and by patients, including reassessment using a Numeric Rating Scale (NRS) after patients receive rescue medication.
Methods: Documentation surveys (DS) and patient surveys (PS) were performed at baseline (BL), after six months, and after 12 months in 44 in-patient wards at the three hospitals in Östergötland County, Sweden. Nurses and nurse assistants received training on pain assessment and support. The Knowledge to Action Framework guided the implementation of new routines.
Results: According to DS pain assessment using NRS, pain assessment increased significantly: from 7% at baseline to 36% at 12 months ($p < 0.001$). For PS, corresponding numbers were 33% and 50% ($p < 0.001$). According to the PS, the proportion of patients who received rescue medication and who had been reassessed increased from 73% to 86% ($p = 0.003$). The use of NRS to document pain assessment after patients received rescue medication increased significantly (4% vs. 17%; $p < 0.001$).
Conclusions: After implementing education and support strategies, systematic pain assessment increased, an encouraging finding considering the complex contexts of in-patient facilities. However, the achieved assessment levels and especially reassessments related to rescue medication were clinically unsatisfactory. Future studies should include nursing staff and physicians and increase interactivity such as providing online education support. A discrepancy between documented and reported reassessment in association with given rescue medication might indicate that nurses need better ways to provide pain relief.
Implications: The fairly low level of patient-reported pain via NRS and documented use of NRS before and 12 months after the educational programme stresses the need for education on pain management in nursing education. Implementations differing from traditional educational attempts such as interactive implementations might complement educational programmes given at the work place. Standardized routines for pain management that include the possibility for nurses to deliver pain medication within well-defined margins might improve pain management and increase the use of pain assessments. Further research is needed that examines the large discrepancy between patient-reported pain management and documentation in the medical recording system of transient pain.

DOI of refers to article: http://dx.doi.org/10.1016/j.sjpain.2017.04.004.
* Corresponding author at: Pain and Rehabilitation Centre and Department of Medical and Health Sciences, Linköping University, Linköping, SE-581 85 Linköping, Sweden.
E-mail address: Britt.Larsson@liu.se (B. Larsson).

http://dx.doi.org/10.1016/j.sjpain.2017.01.013
1877-8860/

1. Introduction

In modern health care, effectively controlling pain using pharmacological methods requires establishing standardized procedures to assess pain recommended in clinical guidelines. The need for high quality pain assessment is reflected in the high prevalence of severe pain in hospital patients [1–3].

Effective pain management improves recovery from cancer, surgery, and trauma [4–6] and decreases the risk of developing chronic back pain [7]. Compared to hospitalized patients in the USA hospitalized patients in Europe are less likely to undergo daily pain assessments [8,9,1]. A Swedish study on nursing documentation of postoperative pain management found that 60% of patients did not have their pain assessed using pain assessment tools and fewer than 10% had their pain assessed at least once a shift [10].

Although systematic and regular pain assessment has been shown to improve pain management [8,11,12], pain assessment does not always lead to better pain management [13–15]. To increase the use of systematic pain assessments, implementation of pain assessment routines should include staff education, participation, support, and feedback [16]. In addition, well-functioning pain assessment routines should be informed by well-developed theories such as action research theory [17,18].

If patients require additional pain relief medication, they should be reassessed and this reassessment should be documented [19]. There are two main types of transient exacerbation of pain: breakthrough pain (BTP) and episodic pain [20]. BTP is exacerbation of pain that occurs spontaneously or in response to a trigger [21] on a pain background and episodic pain is intermittent pain that occurs on a pain-free background [22]. Although transient exacerbation of pain is often managed with supplemental doses of analgesic rescue medications [19,20], health care professionals need more knowledge about transient pain such as BTP [23–25].

To this end, this study investigates the outcomes of implementation of new pain assessment routines established in an education and support programme for nurses and nurse assistants. These nurses and nurse assistants were working in in-patient wards of three hospitals located in Östergötland County, Sweden. To evaluate the outcomes of pain assessment routines, this study gathered data from medical records and a short patient questionnaire. The aim of this study was to answer the following questions:

1. Did an educational programme and support for nurses and assistant nurses change the use of a Numeric Rating Scale (NRS) and other pain assessment instruments/scales?
2. Did the frequency of pain assessment and of documentation concerning pain in the medical records improve as a consequence of the education and support programme?
3. Did the pain assessments and documentation in the medical records after receiving pain rescue medication improve as a consequence of the education and support programme?

2. Material and methods

2.1. Procedures and design

In 2012, the research group received information about pain assessment routines primarily through regular contact with the Pain Resource Nurses (PRNs) for the three hospitals in Östergötland County. The PRNs serve as both a resource and change agents in disseminating information, interfacing with nurses, physicians, other members of the health care team, patients and families to facilitate quality pain management [26]. The information the PRNs provided included shortcomings and the main barriers to the implementation of regular pain assessment (i.e., lack of time, knowledge, assessment routines, and documentation as well as ongoing quality improvement studies and high turnover of staff). This information forms the base for the design of this study. As a result of this information, new pain assessment routines established in an education and support programme for nurses and nurse assistants at in-patient wards were implemented. We evaluated the situation at baseline (BL) (i.e., before implementation of the programme), at the six-month follow-up (FU-6m), and at the twelve-month follow-up (FU-12m). These data were collected using a documentation survey of the medical records (DS) and a patient survey (PS).

2.2. Implementation model

This study was guided by the Knowledge to Action framework (KTA) [27]. In the KTA framework, knowledge creation is described in terms of knowledge inquiry, knowledge synthesis, and knowledge tools/products. The KTA includes the following action steps: identify the problem; identify, review, and select knowledge; adapt knowledge to local context; assess barriers to knowledge use; select, tailor, and implement interventions; monitor knowledge use; evaluate outcomes; and sustain knowledge use.

2.3. Intervention

Between the BL and the FU-6m, the first author (AP) and a research nurse met with nurses and nurse assistants to inform them about the new pain assessment routines. To reach as many nurses and assistant nurses as possible, this informational and educational meeting was offered three times – two months in-between each meeting – at each ward (Fig. 1). Before the first two information and education meetings, all the nurses and nurse assistants at each hospital received an e-mail that described the project and invited them to participate (Fig. 1). Because the meetings coincided with the regular staff meetings, the new pain assessment routines were adapted to the local context. Several unit care managers suggested that the PRNs should conduct the third meeting to facilitate the implementation of routines. The PRNs also served as advisers, providing support for the new routines, encouraging the use of pain assessment and documentation, and setting a good example for the nurses and assistant nurses. In addition, the PRNs repeated the new routines during workplace meetings and supervised new and temporary employees regarding pain assessment routines.

The first author (AP), the research nurse, and the PRNs (the second repetition = third education and information meeting) used a PowerPoint presentation to introduce the study's purpose and to provide education on pain and pain assessment.

The presentation included data that addressed the importance of relieving patient pain as for example post-operative pain can lead to complications such as pneumonia, myocardial infarction, and chronic pain conditions. The presentation therefore stressed that avoiding complications and alleviating suffering requires assessing pain using standardized pain assessment and documentation routines. NRS was selected as the pain assessment tool to been primarily used because it is easy to use in clinical practice, it is preferred by patients and health professionals [28], and it is frequently followed-up by phone. The NRS consists of rating the pain on a visual or imagined 11-point scale with the endpoints 0 (no pain) and 10 (worst pain imaginable), a design that makes follow-up easy and consistent. The presentation demonstrated how to use the NRS and emphasized that such pain assessment should be performed at least once per work shift (i.e., three times per 24 h) as well as before and after administering rescue medication for transient pain. The presentation also detailed how to document pain assessment using the electronic medical recording system, which had been recently adapted for the study and for the local contexts of each clinical department. At the end of the meeting, the

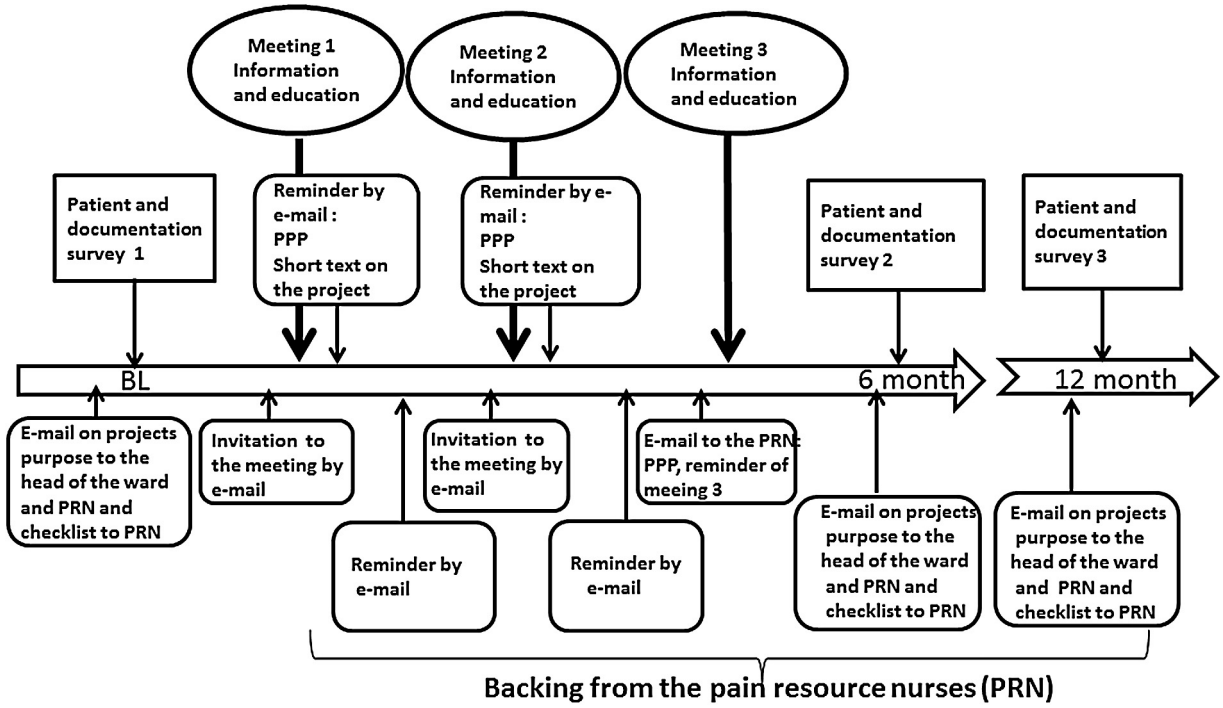

Fig. 1. Flowchart of implementation activities directed to heads of the wards, supporting nurses, nurses, and assistant nurses. PPP, PowerPoint presentation; BL, baseline.

ward-specific outcomes of the two BL surveys (i.e., DS and PS), which had been performed five to six weeks before the first meeting, were discussed. Finally, to clarify barriers for the new routines and to adapt the new routines to the local context and thereby facilitate their use, the nurses and nurse assistants were encouraged to discuss the advantages and disadvantages of the new pain assessment routines. To further ensure the use of the new routines, the PowerPoint presentation was e-mailed to all nurses and nurse assistants one week after the meetings. Three weeks later a reminder of the study was e-mailed to the nurses and nurse assistants to encourage the use of the new routines. As part of the implementation strategy, a poster was displayed in the staff room of each ward. When the project started, some information was provided on the Intranet; after six months, this information was supplemented with a short movie that reminded the nurses and nurse assistants of the project, including the NRS assessment. Information of the progress of the project was continuously delivered via the clinical departments' Intranet.

Ten to 15 nurses attended each education session. In total, about 1200 nurses and nurse assistants participated in the educational programme. All eligible nurses and assistant nurses (approximately 2000) received the educational programme on two occasions in the form of PowerPoint presentation.

2.4. Setting and sample

Forty-four in-patient wards at the three hospitals (in Linköping, Norrköping, and Motala) of Östergötaland County participated in the study (Table 1). These hospitals are responsible for certain geographical areas of Östergötland. In addition, the hospital in Linköping is a university hospital, so it is responsible for research, health care education, and the most highly specialized care.

Only three in-patient wards did not participate: the psychiatric wards (protected medical records), the emergency wards (short periods of care), and the paediatric wards (NRS is not applicable for children). Thus, this is a total study as it comprises most of the wards of the three included hospitals. No control wards was included in this study which was part of an ongoing quality assurance programme. All wards had at least one experienced PRN as part of their regular health care staff. Each unit care manager and the PRNs received information by e-mail on why and when (predetermined by the project leader) the new pain assessment routines would be implemented. The information also included instructions on how to complete the DS and how to distribute and inform the participants about the PS. The e-mail also included information about the upcoming intervention (i.e., information about the educational programme and about support for nurses and assistant nurses).

2.5. Measurements

The identifying and tailoring phases of the KTA were created using a documentation survey (DS) and a patient survey (PS) (Fig. 1). Hence, data were obtained both from the electronical medical records of all patients enrolled in the in-patient wards and from a brief paper survey concerning pain assessments answered by enrolled patients. To avoid bias, the DS was always answered one week before the PS.

The first author (AP), a research nurse, and ten PRNs created a pilot DS and PS. These pilot surveys were completed by five randomly selected nurses and five randomly selected patients completed. These participants provided verbal feedback about the surveys. Using this information and consensus discussions, we revised the surveys. This procedure was done twice before consensus was reached. The final DS included the items on current documentation on pain assessment in medical records (Table 2), and in the final PS the first question was: Have you experienced any pain during the hospitalisation period (yes/no)? The patients who answered "yes" were asked to answer four items on pain assessment for the previous 24 h (Table 2). According to KTA model, the PRNs were provided with a checklist regarding distribution and collection of surveys and the nurses were asked to inform the patients that their identity would be protected and their participation was voluntary (Fig. 1).

Table 1
Medical specialities of the 44 in-patient wards that participated in the study.

Surgical specialty ($N = 18$)	Number of wards	Non-surgical specialty ($N = 26$)	Number of wards
Ear, nose, and throat	1	Cardiology	3
Ophthalmology	1	Endocrine gastro intestinal	1
General surgery	4	General medical	2
Gynaecological	2	Geriatric	3
Hand and plastic surgery	1	Haematologist	2
Neurosurgical	1	Infectious	2
Orthopaedics	5	Intensive care	4
Thoracic surgical	1	Medical emergency	1
Urology	1	Neurological	3
Vascular surgery	1	Oncology	1
		Pulmonary medical	2
		Rehabilitation medicine	1
		Renal medical medicine	1
Total	18		26

Table 2
The items and answering alternatives for the patient (PS) and documentation (DS) surveys.

Patient survey (PS)
1. Have you experienced any pain during the hospitalisation period (yes/no)? *If "no", items 2–6 were not answered.*
2. How many times did caregivers ask you about your pain the previous 24 h (once, twice, three times, or more)?
3. Did the staff ask you to assess your pain the previous 24 h using a horizontal line with the numbers 0–10* (yes/no), a line with anchors marked with "no pain" and "worst pain imaginable" **(yes/no), evaluative words*** (mild, moderate, severe, unbearable; yes/no), or by another instrument/scale without the above characteristics (yes/no)?
4. Did you receive any extra pain medicine the previous 24 h (yes/no)?
5. If yes, did the staff ask if the extra pain medicine alleviated the pain appropriately (yes/no)?
   I was asked to tell the staff if the extra pain medicine the previous 24 h did not alleviate the pain appropriately (yes/no)?

Documentation survey (DS)
1. Does documentation on pain during hospitalisation exist in the medical record (yes/no)? *If "no", items 2–4 were not answered.*
2. Was pain intensity the previous 24 h of the current patient assessed by NRS* (yes/no), VAS** (yes/no), VRS** (yes/no), any other scales (yes/no), or no scale was used?
3. Did the patient receive any rescue medicine the previous 24 h (yes/no)?
4. If so, was the effect evaluated by NRS* (yes/no), VAS** (yes/no), VRS** (yes/no), any other scales (yes/no), or no scale was used?

*Numeric Rating Scale(NRS); ** Visual Analogue Scale (VAS); *** Verbal Rating Scale (VRS).

2.6. Data collection

DS was used to document pain in all medical records the previous 24 h. A PRN in each ward completed the DS, which included four items (Table 2). Thus, the medical records of the patients who were enrolled in the ward were only reviewed by the predetermined PRN. One week after the DS, all patients competent in written and spoken Swedish and who were enrolled at a certain ward were asked to complete the PS. The PRN distributed and collected the PS (Fig. 1). Both the DS and PS were repeated at the two follow-ups (FU-6m and FU-12m) using the same procedures. The two BL surveys were completed in November 2012.

2.7. Statistical analysis

Statistical analyses were performed using SPSS statistical programme for Windows (version 21.0). Descriptive statistics (%, mean ± sd) are reported for outcomes. The Chi-square test was used to compare distribution between groups. Statistical significance was set at $p < 0.05$.

3. Results

Using the DS, we surveyed the medical records of 2002 patients (BL: $n = 687$; FU-6m: $n = 644$; and FU-12m: $n = 671$). At all three time points, the mean age of these patients was 68 ± 18 years. The PS was completed by 1432 patients (BL: $n = 508$; FU-6m: $n = 467$; and FU-12m: $n = 457$). The mean ages of these patients were 66 ± 17 (BL), 67 ± 17 (FU-6m), and 68 ± 18 (FU-12m) years. The majority of these patients reported pain during hospitalization (BL: 70%; FU-6m: 64%; and FU-12m: 68%). The corresponding figures from the DS were 62%, 63%, and 60%.

3.1. Use of NRS, other pain assessments, and frequency of assessment

According to the DS and PS, the percentage of patients who underwent pain assessment using the NRS increased significantly from BL to the follow-ups (Fig. 2). According to the PS, the percentage of patients who had been asked about current pain but who had not been asked to rate their pain intensity using a pain assessment scale/instrument decreased significantly. In addition, no significant

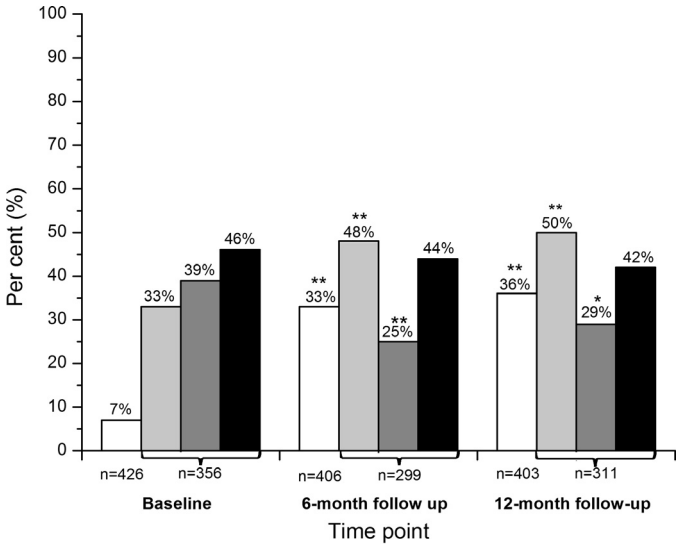

Fig. 2. Changes in the use of NRS, in other pain assessments, and in frequency of assessment. PS only included those patients who reported any pain during the hospital period. White bars: pain assessment by NRS (DS). Light grey bars: pain assessment by NRS (PS). Dark grey bars: percentage of patients asked about current pain but not asked to use a pain assessment scale (PS). Black bars: percentage of patients asked about pain ≥3 times during the previous 24 h (PS). *$p < 0.05$; **$p < 0.001$.

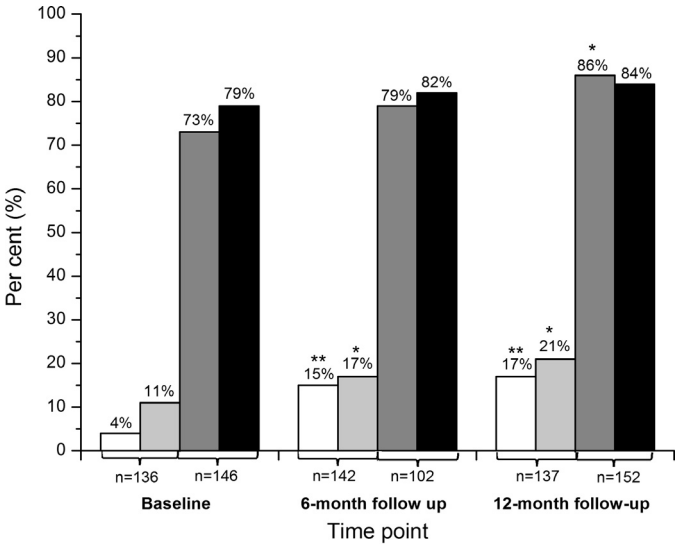

Fig. 3. Changes of pain assessment and reassessment after rescue medication. White bars: pain assessments using NRS after receiving rescue medication (DS). Light grey bars: pain assessments with any pain assessments scale/instrument at all including NRS (DS). Dark grey bars: the percentage of patients (with pain previous 24 h) who received rescue medication and who had been asked (not specifically by the use of pain assessment scale/instrument) if the medication alleviated the pain appropriately (PS). Black bars: the percentage of patients (with pain previous 24 h) who had received rescue medication and who also had been asked (not specifically by the use of pain assessment scale/instrument) to inform the nurses or nurse assistants if the medication did not alleviate the pain in an appropriate way (PS). $^{*}p < 0.05$; $^{**}p < 0.001$.

changes were found from BL to the follow-ups for patients asked to rate their pain ≥3 times during the previous 24 h.

3.2. Pain assessment and reassessment after rescue medication

According to the DS, the percentage of patients who received rescue medication was 32% for BL, 35% for FU-6m, and 34% for FU-12m. The corresponding figures for PS were 41%, 34%, and 49%. In the DS, transient pain (requiring rescue medicine) was operationally defined by the answer "yes" for the items in rescue medicine. In the PS, treatment of transient pain was defined as "yes" for the items in extra medicine.

According to the DS, the use of NRS after receiving rescue medication increased significantly at both follow-ups (Fig. 3). This increase was also the case for pain assessments with any pain assessments scale/instrument at all, including NRS. The percentage of patients who received rescue medication and who had been asked (PS) (not specifically with a pain assessment scale/instrument) if the medication alleviated the pain appropriately had increased significantly at the FU-12m. The percentage of patients with pain who had received rescue medication and who also had been asked (PS) (not specifically with a pain assessment scale/instrument) to inform the nurses or nurse assistants if the medication did not alleviate the pain in an appropriate way was unchanged at the follow-ups.

4. Discussion

The majority of patients had pain and three important results were found:

- Pain assessments using NRS or any other pain assessment scale/instrument increased significantly according to both surveys at FU-6m and FU-12m.
- The documentation of reassessment after receiving rescue medication remained low.
- A large discrepancy between management and documentation of transient pain was found.

As with our results, previous studies show that using NRS [29] and assessments similar to the NRS [30,18,31,32] with an education programme improve how nurses assess and document pain. Given the low level of documented use for NRS at BL in our study, the increase of about one-third of the patients assessed by NRS at FU-6m and FU-12m is encouraging since these changes represent behavioural changes in the complex contexts of in-patient facilities. However, we consider the results at FU-12m (DS: 36% and PS: 50%) too low from a clinical perspective although repeated education and support sessions might improve this unsatisfactory situation. These educational sessions are resource demanding although non-traditional educational strategies can be successful. For example, an interactive implementation programme in an oncology ward improved the use of a pain assessment tool from 50% to 83%, and patient's records that documented pain increased from 29% to 75% [33].

In our study, nearly half of the patients reported that they had been asked about their pain but not asked to rate their pain using any instrument. This finding suggests that the health care providers attended to the patient's pain, although the use of an assessment tool and the documentation of pain level may have helped optimize care.

The DS showed that evaluation of rescue medication with NRS was rarely performed at BL. Pain assessments using NRS had increased significantly at the two follow-ups but was still low (DS: 15% and 17%), and these results are in line with a study conducted in an emergency department of a university hospital [34]. In that study, 698 randomly selected medical records showed a surprising lack of documentation regarding pain assessments, pain treatments, and follow-ups. Such a result was also found in a study of emergency departments [35], a finding attributed to the format of the record keeping, a procedure that made it difficult to consistently document pain assessments. In the present study, it was not possible to differentiate between transient types of pain – i.e., BTP and episodic pain – because the source of the results regarding transient medication were nonspecific regarding the type of pain but focused on rescue medication received. In a large European study of 1241 nurses, less than half used any pain assessment instruments associated with BTP before medication, and many of these nurses found it difficult to differentiate between background pain and BTP [24]. On the other hand, another study reported that a minority of nurses did not use pain assessment tools in association with BTP in cancer patients, but the majority of nurses who used pain assessment tools found them useful [25]. Although nurses may have general knowledge of principles of pain management, they may lack opportunities to give efficient pain medications because of medico-legal requirements. This situation might interfere with the nurse's motivation to reassess and document the outcome of pain medication (e.g., rescue medication). Implementation of standardized routines for post-operative pain management that include the possibility for the nurses to deliver pain medication within well-defined margins reduced the need for nurses to contact physicians, decreased pain intensity of patients, increased the number of pain assessments, and improved the knowledge of the nursing staff [36]. Moreover, physicians who proactively prescribe adequate analgesia enable nurses to deliver continual pain relief without consulting the physician, a finding also identified in a study that aimed to identify barriers, enablers, and current nursing knowledge regarding pain management [37]. Alternatively, nurses could regard some aspects of nursing care (e.g., reassessment after rescue medication) so fundamental that they do not even bother to

document their actions [38]. The importance of reassessment documentation was shown in a model of pain severity development [39]. According to the model, the reassessment documentation within one hour of an intervention and the type of surgical procedure affected pain development. An aggregated proportion of 95% properly documented pain re-examinations was reached by application of a large-scale plan-do-check-act documentation of pain re-examinations and with improved evidence-based organisational policy, repetitive teaching meetings with bedside training, alterations in daily bedside records, and response [40].

Transient pain requires the reassessment of pain after giving rescue medication (e.g., according to the guidelines developed by the European Oncology Nursing Society for pain management in cancer patients) [41]. Unfortunately, our results show that the reassessment after giving rescue medication remained deficient despite the project's repetitive efforts, which included education and support.

The results of the PS showed that the proportion of patients who were asked if rescue medication had helped was already high at BL and remained high at follow-ups. Thus, our results show a discrepancy between action of pain management and documentation in the medical records. Similar results were reported in a study using focus group interviews with nursing staff; only one-third of the patients who had experienced problems were documented in the medical records and the nursing staff had more knowledge than was documented [42]. A similar discrepancy between knowledge and documentation was reported by an academic primary clinic [43]. The nurses in our study might have had more knowledge about the patient's reports of the effect of rescue medication than was documented. On the other hand, a study that assessed the agreement between data retrieved from interviews with nurses and data from electronic medical records found that majority of the assessed variables (pain, dyspnoea, nausea, and treatment variables) ranged from moderate to good levels of agreement [44].

The KTA framework proved to be valuable as it informed the implementation process. However, the KTA framework does not provide details about how to tailor the implementation strategies and other sources were also used. The implementation in this large study concerned three hospitals and different types of wards. Furthermore, the drop-out rates were small for DS and relatively small for PS, which may indicate generalizability. The internal validity may have been affected by the fact that the survey questions were self-formulated and not validated. The questions, however, were designed and adapted based on repeated feedback from staff and patients, and explanations of possibly unfamiliar terms and concepts were thoroughly provided with text and pictures.

Since pain is a subjective experience, it is unclear how the participants with widely varying underlying causes of hospitalization perceived the word "pain", which occurred several times in the PS. The initial question about pain during hospitalization may allow for responses that consider other dimensions, such as anxiety. Patients who had received long-term treatment on the ward may have underestimated their pain if they only experienced pain on a single occasion during their hospital stay.

We do not know how well informed PRNs were about the DS survey questions and how carefully the medical records were read. Motivation and time limitations may certainly come into play. However, PRNs received in advance a detailed checklist about distribution and collection of PS as well as the procedure for completing the DS. All 44 PRNs responsible for the data collection from the medical records using DS registered the required data without asking for support from project staff and the surveys were collected at the right time. We therefore assume that the PRNs did not experience difficulty in understanding the questions in the DS or in distributing the PS. However, the fact that the PRNs helped implement the intervention and then collected data is a limitation of the study. It was important to conduct the surveys on predetermined and different days known only to the project management and PRNs since the two surveys were intended to reflect the most common pain assessments and their documentation. We assume that the information given to the PRNs before the start of the project was sufficiently clear concerning this issue. Undoubtedly, this study is built on the project management having great confidence in the professionalism of the PRNs.

Only the nurses and assistant nurses who were on duty and had time to attend the meeting were given the verbal training. To reduce the impact of missed training, the training was repeated twice on each ward. Unfortunately, we do not know in detail what proportion of staff received the verbal training. On the other hand, the PowerPoint files from the verbal training were e-mailed to all nurses and assistant nurses employed on the participating wards. Moreover, the educational component was limited and might have been improved with the use of more interactivity such as online support. In addition, due to financial constraints, physicians were not included in this study.

5. Conclusions

The implementation of the new pain assessment protocol resulted in significant behavioural improvements. That is, systematic pain assessment increased, which is encouraging when considering the complex contexts of wards. However, the assessment levels, especially reassessment related to rescue medication, were not satisfactory from a clinical perspective. To improve the results, it may be necessary to include the physicians working at the wards and to increase the interactivity and support for the education component. The discrepancy between documented and reported transient pain might indicate a need to change the way nurses provide pain relief.

Implications

The fairly low level of patient-reported and documented use of NRS before and 12 months after the educational programme stresses the need for education on pain management in nursing education. Non-traditional educational strategies such as interactive implementations might complement educational programmes given at the work place. Standardized routines for pain management that include the possibility for nurses to deliver pain medication within well-defined margins might increase pain management and the use of pain assessments. The large discrepancy between patient-reported transient pain management and documentation in the medical recording system of transient pain needs further study.

Ethical issues

Collection of the data was part of the on-going quality assurance programme of the hospitals, so it constituted part of the routine medical records and patient monitoring system. The study was approved by the director of the County Council and by the heads of the clinical departments. The researchers carefully trained the PRNs on principles of clinical research. They were informed verbally and in writing about ethical guidelines set for medical research.

Verbal and written information about the quality assurance programme was given to all eligible patients. This information stressed that participation was voluntary and that non-participation did not affect present or future treatment and promised anonymity. Informed verbal consent was obtained from all patients that participated in the study. The informed consent was verbal; that is, the PRNs believed that the participating patients understood their rights and the aim of the study. All data were secured in locked

archives and all possible identifications were deleted before analyses. Hence, the ethical guidelines set for medical research by the World Medical Association Declaration of Helsinki [45] were followed.

Funding

This study was supported by a grant from the research funds of the Östergöland County Council. The funder had no role in study design, data collection, data analysis, preparation of the manuscript, or decision to publish.

Conflicts of interests

None.

References

[1] Wadensten B, Frojd C, Swenne CL, Gordh T, Gunningberg L. Why is pain still not being assessed adequately? Results of a pain prevalence study in a university hospital in Sweden. J Clin Nurs 2011;20:624–34.
[2] Visentin M, Zanolin E, Trentin L, Sartori S, de Marco R. Prevalence and treatment of pain in adults admitted to Italian hospitals. Eur J Pain 2005;9:61–7.
[3] Jabusch KM, Lewthwaite BJ, Mandzuk LL, Schnell-Hoehn KN, Wheeler BJ. The pain experience of inpatients in a teaching hospital: revisiting a strategic priority. Pain Manag Nurs 2015;16:69–76.
[4] Costantini R, Affaitati G, Fabrizio A, Giamberardino MA. Controlling pain in the post-operative setting. Int J Clin Pharmacol Therap 2011;49:116–27.
[5] Lewis KS, Whipple JK, Michael KA, Quebbeman EJ. Effect of analgesic treatment on the physiological consequences of acute pain. Am J Hosp Pharm 1994;51:1539–54.
[6] Sinatra R. Causes and consequences of inadequate management of acute pain. Pain Med 2010;11:1859–71.
[7] Valat JP, Goupille P, Rozenberg S, Urbinelli R, Allaert F. Acute low back pain: predictive index of chronicity from a cohort of 2487 subjects. Spine Group of the Societe Francaise de Rhumatologie. Joint Bone Spine 2000;67:456–61.
[8] Purser L, Warfield K, Richardson C. Making pain visible: an audit and review of documentation to improve the use of pain assessment by implementing pain as the fifth vital sign. Pain Manag Nurs 2014;15:137–42.
[9] Zoega S, Ward SE, Sigurdsson GH, Aspelund T, Sveinsdottir H, Gunnarsdottir S. Quality pain management practices in a university hospital. Pain Manag Nurs 2015;16:198–210.
[10] Idvall E, Ehrenberg A. Nursing documentation of postoperative pain management. J Clin Nurs 2002;11:734–42.
[11] Silva MA, Pimenta CA, Cruz Dde A. Pain assessment and training: the impact on pain control after cardiac surgery. Revista da Escola de Enfermagem da U S P 2013;47:84–92.
[12] Anwar ul H, Hamid M, Baqir M, Almas A, Ahmed S. Pain assessment and management in different wards of a tertiary care hospital. JPMA 2012;62:1065–9.
[13] Chapman CR, Stevens DA, Lipman AG. Quality of postoperative pain management in American versus European institutions. J Pain Palliative Care Pharmacotherapy 2013;27:350–8.
[14] Nworah U. From documentation to the problem: controlling postoperative pain. Nursing Forum 2012;47:91–9.
[15] Wells N, McDowell MR, Hendricks P, Dietrich MS, Murphy B. Cancer pain management in ambulatory care: can we link assessment and action to outcomes? Supportive Care Cancer 2011;19:1865–71.
[16] Ista E, van Dijk M, van Achterberg T. Do implementation strategies increase adherence to pain assessment in hospitals? A systematic review. Int J Nurs Stud 2013;50:552–68.
[17] Bourbonnais FF, Perreault A, Bouvette M. Introduction of a pain and symptom assessment tool in the clinical setting – lessons learned. J Nurs Manag 2004;12:194–200.
[18] Simons J, MacDonald LM. Changing practice: implementing validated paediatric pain assessment tools. J Child Health Care 2006;10:160–76.
[19] Zeppetella G. Impact and management of breakthrough pain in cancer. Curr Opin Support Palliative Care 2009;3:1–6.
[20] Zeppetella G, Ribeiro MD. Opioids for the management of breakthrough (episodic) pain in cancer patients. Cochrane Database Syst Rev 2006:Cd004311.
[21] Davies AN, Dickman A, Reid C, Stevens AM, Zeppetella G. The management of cancer-related breakthrough pain: recommendations of a task group of the Science Committee of the Association for Palliative Medicine of Great Britain and Ireland. Eur J Pain 2009;13:331–8.
[22] Haugen DF, Hjermstad MJ, Hagen N, Caraceni A, Kaasa S. Assessment and classification of cancer breakthrough pain: a systematic literature review. Pain 2010;149:476–82.
[23] Rhiner MI, von Gunten CF. Cancer breakthrough pain in the presence of cancer-related chronic pain: fact versus perceptions of health-care providers and patients. J Supportive Oncol 2010;8:232–8.
[24] Rustoen T, Geerling JI, Pappa T, Rundstrom C, Weisse I, Williams SC, Zavratnik B, Wengstrom Y. How nurses assess breakthrough cancer pain, and the impact of this pain on patients' daily lives – results of a European survey. Eur J Oncol Nurs 2013;17:402–7.
[25] Fitch MI, McAndrew A, Burlein-Hall S. A Canadian online survey of oncology nurses' perspectives on the defining characteristics and assessment of breakthrough pain in cancer. Can Oncol Nurs J 2013;23:85–99.
[26] Crawford CL, Boller J, Jadalla A, Cuenca E. An integrative review of pain resource nurse programs. Crit Care Nurs Quarterly 2016;39:64–82.
[27] Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N. Lost in knowledge translation: time for a map? J Contin Educ Health Prof 2006;26:13–24.
[28] Yazici Sayin Y, Akyolcu N. Comparison of pain scale preferences and pain intensity according to pain scales among Turkish Patients: a descriptive study. Pain Manag Nurs 2014;15:156–64.
[29] de Rond M, de Wit R, van Dam F. The implementation of a Pain Monitoring Programme for nurses in daily clinical practice: results of a follow-up study in five hospitals. J Adv Nurs 2001;35:590–8.
[30] Zhang CH, Hsu L, Zou BR, Li JF, Wang HY, Huang J. Effects of a pain education program on nurses' pain knowledge, attitudes and pain assessment practices in China. J Pain Symptom Manage 2008;36:616–27.
[31] Phelan C. An innovative approach to targeting pain in older people in the acute care setting. Contemp Nurse 2010;35:221–33.
[32] Ger LP, Chang CY, Ho ST, Lee MC, Chiang HH, Chao CS, Lai KH, Huang JM, Wang SC. Effects of a continuing education program on nurses' practices of cancer pain assessment and their acceptance of patients' pain reports. J Pain Symptom Manage 2004;27:61–71.
[33] Ang E, Chow YL. General pain assessment among patients with cancer in an acute care setting: a best practice implementation project. Int J Evid Based Healthc 2010;8:90–6.
[34] Lewen H, Gardulf A, Nilsson J. Documented assessments and treatments of patients seeking emergency care because of pain. Scand J Caring Sci 2010;24:764–71.
[35] Todd KH, Ducharme J, Choiniere M, Crandall CS, Fosnocht DE, Homel P, Tanabe P. Pain in the emergency department: results of the pain and emergency medicine initiative (PEMI) multicenter study. J Pain 2007;8:460–6.
[36] Erlenwein J, Studer D, Lange JP, Bauer M, Petzke F, Przemeck M. Process optimization by central control of acute pain therapy: implementation of standardized treatment concepts and central pain management in hospitals. Anaesthesist 2012;61:971–83.
[37] Pretorius A, Searle J, Marshall B. Barriers and enablers to emergency department nurses' management of patients' pain. Pain Manag Nurs 2015;16:372–9.
[38] Frank-Stromborg M, Christensen A, Do DE. Nurse documentation: not done or worse, done the wrong way – Part II. Oncol Nurs Forum 2001;28:841–6.
[39] 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.
[40] Gordon DB, Rees SM, McCausland MR, Pellino TA, Sanford-Ring S, Smith-Helmenstine J, Danis DM. Improving reassessment and documentation of pain management. Jt Comm J Qual Patient Saf 2008;34:509–17.
[41] Wengstrom Y, Geerling J, Rustoen T. European Oncology Nursing Society breakthrough cancer pain guidelines. Eur J Oncol Nurs 2014;18:127–31.
[42] Adamsen L, Tewes M. Discrepancy between patients' perspectives, staff's documentation and reflections on basic nursing care. Scand J Caring Sci 2000;14:120–9.
[43] Krebs EE, Bair MJ, Carey TS, Weinberger M. Documentation of pain care processes does not accurately reflect pain management delivered in primary care. J Gen Intern Med 2010;25:194–9.
[44] Steindal SA, Sorbye LW, Bredal IS, Lerdal A. Agreement in documentation of symptoms, clinical signs, and treatment at the end of life: a comparison of data retrieved from nurse interviews and electronic patient records using the Resident Assessment Instrument for Palliative Care. J Clin Nurs 2012;21:1416–24.
[45] World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA 2013, 310:2191-4.