Pain from zero to ten: effects of a pain monitoring program for nurses

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Chapter 1

Introduction
INTRODUCTION

Nurses are responsible for pain relief, along with physicians and other health care providers. In the care of patients with pain, in addition to physicians, nurses have an important role in the assessment of pain, observation of symptoms and reactions, conducting pain relief treatment by means of both pharmacological and non-pharmacological methods, identifying the need for change in pain management, education of patients, evaluation of the meaning of the pain experienced by the patients, and evaluation of the effectiveness of the pain treatment. One example of the important tasks that nurses perform in pain management is that of the administration of analgesics. These are prescribed by physicians, but often with a range of choice concerning dosage and frequency of administration. Consequently, in addition to other health care providers, nurses are responsible for adequate pain control. However, achieving optimal pain relief remains difficult. Despite many technological advances, inadequate treatment of pain is still widely reported. Because nurses are deeply involved in pain management it is evident that any attempts to improve pain treatment should also address the nurses.

In order to clarify the complicated practice of nursing, the nursing process with regard to pain can be divided into five major phases: 1) assessment, 2) formulating the nursing diagnosis, 3) planning, 4) implementation of interventions, and 5) evaluation. This breakdown of the nursing process helps to clarify which nursing activities need to be improved. Although these phases of the nursing process are described here separately, it is emphasized that in practice these activities often overlap each other.

Nursing problems in the assessment and management of pain

The first phase of the nursing process is assessment of patient's pain. Adequate assessment of pain is necessary to carry out the other steps, and is the first stage in understanding and achieving the goal of relieving pain. Clinical experience and the literature show that assessment of pain is not done systematically, and sometimes not at all. This implies that communication between nurses and patients about pain leaves much to be desired. Reported percentages of patients lacking good communication with nurses about their pain range from 17 to 57%. In case of poor assessment, nurses may not always know that a patient is in pain, or misjudge the intensity of the pain. Many reports have shown a discrepancy between nurses' observations and patients' self-reports of pain.

The second phase involves the formulation of a nursing diagnosis: this should be based on a pain anamnesis and should comprise a health problem, etiological factors, and signs and symptoms. If the pain anamnesis is lacking, it is difficult for nurses to formulate their
diagnosis related to pain (e.g. obstipation, fear for addiction, non-adherence with prescribed pain medication, lack of knowledge etc.)\textsuperscript{9,13}

Based on the nursing diagnosis, pain reducing interventions are planned in the \textit{third phase} of the nursing process. Documentation is an essential tool in the planning of the interventions as this facilitates communication among nurses, and between nurses and patients. Several studies indicate inadequate pain documentation.\textsuperscript{16,20,22,30-32} Camp et al.\textsuperscript{21} reported that nurses document less than 50\% of what the patient has reported.

The \textit{fourth phase} of the nursing process involves the implementation of pain reducing interventions. These interventions range widely from e.g. administering analgesics to educating patients, or giving a massage. Studies have shown that nurses rarely use non-pharmacological pain treatments such as massage and relaxation;\textsuperscript{1,13} and frequently withhold medication until the prescribed interval expires;\textsuperscript{5,33} or administer less medication than was actually prescribed.\textsuperscript{5,20,22,23,34} Consequently, only around 40\% of the maximum ordered analgesics is administered to patients.\textsuperscript{30,35-37} Inadequate administration of pain medication is partly caused by nurses having inadequate knowledge about pain and pain management,\textsuperscript{1,5,38-43} in particular concerning opioid analgesic drugs.\textsuperscript{44-51}

The \textit{fifth phase} is the evaluation of patients' pain. Nurses need feedback about the patient's pain and this can only be obtained from each individual patient.\textsuperscript{52} To facilitate this a number of measures have been developed, ranging from simple numeric scales to multidimensional pain measures. In daily nursing practice, however, multidimensional scales are less feasible for nurses as they are time consuming. Therefore, unidimensional scales are preferred. But because pain is not always systematically assessed, nurses often lack feedback on the efficacy of pain treatment.

**Interventions to improve nurses' pain assessment and management**

Various efforts to improve the way nurses handle patients' pain have focused on implementation of daily pain assessment,\textsuperscript{53-57} or educating nurses about pain management.\textsuperscript{13,58-64} The results of these studies show that implementation of daily pain assessment or education alone is rarely sufficient to improve nurses' pain management behavior in the long term. Although education lead to an improvement in pain knowledge, it may not lead to an improvement in nurses' pain management behavior. In itself daily pain assessment may not be sufficient to enable nurses to apply effective pain reducing interventions. Instead, initiatives that combine pain education of nurses with implementation of daily pain assessment seem to be more effective.\textsuperscript{25,65-76} However, most of these studies on nurses consisted of small and homogenous populations in one setting, and none of them investigated the effect of the interventions on the different phases of the nursing process. Moreover, almost all of the studies were conducted in a setting where the
emphasis was on research. Thus, it remains to be seen whether these interventions also work in a routine clinical setting. Finally, the long-term effects of these interventions for nurses are often unknown, thus it remains unclear how long the effects may last.

**Intervention: the Pain Monitoring Program for nurses**

In this thesis a Pain Monitoring Program (PMP) for nurses was developed, implemented and evaluated. The PMP aims to overcome the barriers that prevent adequate pain management and consists of a combined educational and behavioral-related intervention: educating nurses about pain and pain management, and implementing daily pain assessment by means of a numeric rating scale. Great care was taken to develop an intervention that was user-friendly for nurses and patients, and easy to integrate in routine nursing practice.

Education is necessary to reveal and undermine misconceptions, prejudices and inadequate attitudes that nurses may have about pain management, and to enable them to effectively use the pain information given by patients. The pain education program is a 3-hour session addressing daily pain assessment, pain treatment with analgesics and the use of non-pharmacological pain treatment (Table 1). During the pain education program, the rationale and principles of daily pain assessment are explained.

<table>
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<th>Table 1</th>
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<td><strong>1 Introduction</strong></td>
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Welcome and introduction  
Pain Knowledge Questionnaire-Dutch-language version and Pain Attitude Inventory  
Definitions of Pain  
- Nurses’ role in pain management  
- Function of pain  
Pain theories  
- Gate control theory  
- Circle of Loeser  
Classification of types of pain  
- Acute versus chronic pain  
- Non-malignant versus malignant pain |
| **2 Instruction in Daily Pain Assessment** | 
Assessment tools  
- Unidimensional  
- Multidimensional  
Numeric rating scale  
- Advantages and disadvantages  
- Discussion case  
Implementation of daily pain assessment |
| **3 Pain Management** | 
WHO-analgesic ladder  
- NSAIDs and other non-opioids  
- Opioids  
Side effects of opioid analgesia  
- Constipation  
- Nausea and vomiting  
- Sedation  
Guidelines for pain control  
Myths and misconceptions related to the use of opioids  
Non-pharmacological pain treatments  
- Psychosocial interventions  
- Improving comfort and rest  
- Relaxation and distraction  
- Massage  
- Application of heat and cold |
Daily pain assessment is essential in understanding the patients’ pain experience and assists nurses with the initial and the ongoing assessment and management of pain. Based on pain assessment, a pain diagnosis can be determined and pain interventions can be planned and conducted. Therefore, during the education program nurses are instructed to assess pain twice a day by means of a numeric rating scale from 0 to 10 (0 indicates ‘no pain at all’ and 10 indicates ‘the worst possible pain’). Validity and reliability of the numeric rating scale is well established. Nurses chart the pain scores on the vital sign sheet, so that both nurses and physicians can easily determine patients’ pain intensity, as well as the effectiveness of pain treatment (Figure 1).

Recently, there is a growing emphasis on creating a research-based nursing practice. The need for ‘evidence-based medicine’ and ‘evidence-based nursing’ is based on the assumption that this will improve the quality of care. However, a frequently heard remark about nursing research is that the results are often not applicable in nursing practice. Even if research results are implemented in nursing practice, guarantees for long-term changes are not always found. To determine whether this was the case for the PMP, after the effects of the PMP on nurses and patients were established in the main study, a follow-up study was performed in five hospitals. To support the implementation of the PMP an extensive
manual was developed. The Continuous Quality Improvement process was used as a framework for the implementation and the follow-up of the PMP. This process consists of an ongoing evaluation in which nursing practice is evaluated in relation to professional nursing standards. Therefore, it was important to check nurses' compliance with daily pain assessment. Bedside teaching, regular follow-ups, reminders for nurses, and asking the unit head nurses to check daily pain assessments at the end of the day shift, were other implementation strategies.

**OUTLINE AND RESEARCH QUESTIONS**

The focus of this thesis was to develop, implement and evaluate a PMP for nurses. Therefore, two studies are described in this thesis. In the first study, a quasi-experimental design with a non-equivalent control group was used to evaluate the program. Two groups of patients were defined: the control group of patients who received the regular medical and nursing care, and the intervention group of patients whose nurses had completed the pain education program and whose pain was assessed twice daily by nurses. The main study was conducted in three hospitals; one university and two general hospitals. In each hospital, both medical and surgical wards participated. In total, 240 nurses from nine wards and 703 patients participated: 358 control group patients and 345 intervention group patients. To study the effects of the PMP on all kinds of pain problems, patients with acute pain and with chronic pain were included, as well as patients with malignant and non-malignant pain. Thus, four pain categories could be distinguished: 1) acute malignant pain, 2) chronic malignant pain, 3) acute non-malignant pain, and 4) chronic non-malignant pain. Included patients were interviewed twice, i.e. at the beginning and at the end of hospitalization.

The second study consisted of a follow-up study that was performed in five hospitals, which focused on implementation of the PMP in clinical practice with minimal assistance and in which long-term effects were monitored and evaluated. A total of eleven wards (six medical, four surgical and one mixed) with 277 nurses and 115 physicians participated. A pretest-post-test design without a control group was used.

Based on the nursing process, several variables were chosen to study the effects of the PMP. A distinction was made between process and outcome variables. Process variables involve what is actually done by the nurses, e.g. how many times nurses have asked for patients' pain scores.
By means of outcome variables, the effects of the provided care was monitored. Outcome measures were further divided into professional (i.e. nurses) and patient outcomes. An overview of these variables is given in Figure 2.

The main study is described in Chapters 2 to 6. In Chapter 2, the educational part of the PMP is outlined and its effects on nurses' knowledge and attitude are reported. The research question addressed in this chapter is:

- What is the effect of the PMP on nurses' pain knowledge and attitude towards pain management?

Chapter 3 presents the value of daily pain assessment from both the nurses' and patients' perspective. The process of implementing daily pain assessment and the feasibility of daily pain assessment is described. The research questions in Chapter 3 are:

- What is the compliance of nurses with daily pain assessment?
- What is the opinion of nurses about daily pain assessment and what variables are related to that opinion?
- What is the opinion of patients about daily pain assessment? Do they experience problems in giving a pain score and which variables are related to these problems?

Chapter 4 describes the effects of the PMP on professional outcome variables. The effects of the PMP on communication of patients with their health care providers (nurses and physicians), nurses' pain assessment, and documentation are described. The research
questions addressed in Chapter 4 are:

- What is the effect of the PMP on communication between patients and nurses and between patients and physicians?
- What is the effect of the PMP on the agreement between patients’ and nurses’ pain ratings?
- What is the effect of the PMP on documentation of patients’ pain in the nursing records?

In Chapter 5, the effects of the PMP on nurses’ pharmacological pain management is discussed. Several outcomes were distinguished to evaluate the administration of analgesics by nurses: the prescribed analgesics by physicians, the administered analgesics by nurses, and the discrepancy between the ordered and administered analgesics. The research questions addressed in Chapter 5 are:

- What is the effect of the PMP on the extent to which nurses administer analgesics?
- What is the effect of the PMP on the discrepancy between ordered and administered analgesics?

Chapter 6 presents the patient outcomes. The main outcome variable in this study is patients’ pain. Patients’ characteristics for predicting change in pain intensity were also investigated. The three research questions in Chapter 6 are:

- What is the effect of the PMP on patients’ pain?
- Which patients benefit most from the PMP?
- Which characteristics predict change in pain intensity?

Chapter 7 addresses the implementation of the PMP in clinical practice. Because the utilization of research results in clinical practice is important, it was investigated whether implementation of daily pain assessment was feasible in a clinical setting, where the emphasis was not on research and where no extra assistance to implement the PMP was available. The long-term effects of the pain education program on nurses’ pain knowledge and attitude were also evaluated, as well as the knowledge and attitude of physicians towards pain management. The research questions addressed in Chapter 7 are:

- Can the PMP be implemented in a clinical setting with minimal assistance?
- What are the long-term effects of the PMP on nurses’ pain knowledge and attitude?
- What is the knowledge and attitude of physicians towards pain management?

Finally, Chapter 8 presents the conclusions and general discussion. In addition to the main conclusions and discussion of the results, implications for clinical practice and research are presented. A summary in English and Dutch concludes the thesis.
Introduction

Chapters 2 to 7 of this thesis have been published or are submitted for publication. There is some repetition of information regarding design, methodology and description of the intervention and the patient population. In order to increase readability, some changes in the layout have been made.

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