The effectiveness of the Pain Resource Nurse Program to improve pain management in the hospital setting: A cluster randomized controlled trial

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A R T I C L E   I N F O

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A B S T R A C T

Background: The Pain Resource Nurse program is a widely disseminated, evidence-based, nursing staff development program, designed to improve pain management in hospitals. The program has shown promising results, but has never been tested with a rigorous research design.

Objectives: Our objective was to test the effectiveness of the Pain Resource Nurse program. Hypothesized outcomes included improvements in nurses’ knowledge, attitudes, and assessment practices, and in patients’ participation in decision-making, adequacy of pain management, pain severity, time spent in severe pain, pain interference, and satisfaction.

Design: Cluster randomized controlled trial.

Setting: A 650-bed university hospital in Iceland

Participants: The sample consisted of a) patients \( \geq 18 \) years of age, native speaking, hospitalized for at least 24 h, alert and able to participate; and b) registered nurses who worked on the participating units.

Methods: Twenty three surgical and medical inpatient units were randomly assigned to the Pain Resource Nurse program (n = 12) or to wait list control (n = 11). The American Pain Society Outcome Questionnaire and the Knowledge and Attitudes Survey were used to collect data from patients and nurses respectively. Baseline data (T1) for patients were collected simultaneously on all units, followed by data collection from nurses. Then randomization took place, and the Pain Resource Nurse program was instituted. Ten months later, follow up (T2) data were collected, after which the nurses on the control group units received the Pain Resource Nurse program.

Results: At baseline, data were collected from 305 of the 396 eligible patients and at follow up from 326 of the 392 eligible nurses, a 77% and 83% response rate respectively. At baseline, 232 of 479 eligible nurses responded and at follow-up 176 of the eligible 451 nurses responded, a 49% and 39% response rate, respectively. A nested mixed model analysis of covariance revealed that the intervention was successful in changing pain assessment practices, with pain assessment using standardized measures increasing from 13% to 25% in the intervention group while decreasing from 21% to 16% in the control group. None of the other hypothesized improvements were found.

Conclusions: The Pain Resource Nurse program was successful in improving nurses’ use of standardized measures for pain assessment. No effects were found on patient outcomes; pain was both prevalent and severe at both time points. Only minimal improvements were noted in response to this evidence-based staff development program. Changes in pain management practices remain a challenge in clinical settings.

What is already known about the topic?

\begin{itemize}
  \item Pain is prevalent in the hospital setting and many patients experience severe pain
  \item Multiple complex interventions to improve pain management in the hospital setting have shown limited results
  \item The Pain Resource Nurse Program has shown promising results in quality improvement studies, but has never been put to a rigorous test
\end{itemize}
What this paper adds

- The Pain Resource Nurse Program, aimed to improve pain management in hospitals, increased documentation of standardized pain assessment
- Despite being a complex intervention, targeting various aspects of pain management, the intervention did not have effects on patient outcomes
- The strict control of a randomized trial provides challenges when used to test complex, clinical interventions. A process evaluation might be helpful to obtain a more nuanced understanding of the actual changes that took place.

1. Introduction

The under-treatment of pain is a global problem in post-operative pain (Maier et al., 2010), cancer pain (van den Beukel-van Everdingen et al., 2007), and chronic pain (Breivik et al., 2006). Despite the availability of numerous resources to facilitate pain management, pain remains prevalent and severe in hospitals (Maier et al., 2010; Sawyer et al., 2010). Lack of knowledge and attitudinal barriers among health professionals (Gunnarsdottir et al., 2003), patients (Gunnarsdottir et al., 2003; Jacobsen et al., 2009), and the general public (Gunnarsdottir et al., 2005, 2008) contribute to the under-treatment of pain. Health professionals’ worries about regulations and supervision of medication use (IASP, 2008), the lack of prioritizing pain within health institutions, and the lack of support for teamwork in pain management (Gordon et al., 2005) impede effective pain control. Pain assessment is a cornerstone of effective pain management and the failure to assess pain hinders adequate treatment (Bourdillon et al., 2012; Purser et al., 2014).

According to the Donabedian model (Donabedian, 1988) and the Institute of Medicine (The Institute of Medicine, 2001), quality pain management comprises the structures, processes, and outcomes of care, set in the context of safe, effective, patient-centred, efficient, timely, and equitable practices (Zoega et al., 2016). Multifaceted interventions are needed to improve pain care. Several studies have evaluated educational interventions to achieve the broad aim of improving pain management practices (Gunnarsdottir and Grettarsdottir, 2011; Ista et al., 2013), but few have shown significant improvements. Comprehensive interventions, that include organizational commitment, structured support, access to resources and feedback in addition to education, have been shown to be more effective than education alone (Dahl et al., 2003; Stevenson et al., 2006) in improving pain management. While effective pain treatment requires input from many professionals (Gordon et al., 2005), training nurses in pain management has been shown to be efficacious (Paice et al., 2006) perhaps because nurses have a multifaceted role in pain management (Ferrell et al., 1993; Vallerand et al., 2011).

The Pain Resource Nurse program was developed at the City of Hope National Medical Center in the United States in 1992. The intent of the program is to train a selected group of staff nurses on inpatient units to function as peer resources for pain management. Pain Resource Nurses function as role models in pain assessment and management, interact with staff at the unit level to solve pain management problems, disseminate new information about pain management, and function as change agents (Ferrell et al., 1993). The Pain Resource Nurse program has been implemented in numerous hospitals, primarily in the United States (Dahl et al., 2003), with promising results seen in quality improvement projects directed toward outcomes such as nurses’ knowledge and attitudes (Ferrell et al., 1991; McMillan et al., 2005; Paice et al., 2006), increased pain management education for patients and relatives (Ferrell et al., 1991), fewer patients in pain, and improved patient satisfaction (Paice et al., 2006).

But the effectiveness of the Pain Resource Nurse program has never been evaluated with a rigorous research design. Such testing is vital because the most common interventions to improve the quality of pain management and patient outcomes involve staff development programs and education (Gordon et al., 2002). Therefore, the primary objective of this study was to test the effectiveness of the Pain Resource Nurse Program in a cluster randomized controlled trial. Individual hospital units were randomized to either receive the intervention or to serve as a wait list control. A cluster trial was used because the program targeted hospital units as opposed to individual nurses or patients. It was hypothesized that the Pain Resource Nurse program, compared to wait-list control, would improve nurses’ knowledge, attitudes, and practices, increase patients’ participation in decision making about pain management and the proportion of patients receiving adequate pain management. It was further hypothesized that the Pain Resource Nurse program would reduce patients’ pain severity, time spent in severe pain, and pain interference, and would increase patient satisfaction.

2. Methods

2.1. Setting and sample

The setting was a 650-bed hospital, Landspítali – The National University Hospital of Iceland. Support from relevant executives at the hospital was secured. The project was presented to the head nurses in the participating units to ensure their cooperation and support.

Twenty three inpatient (24-h service) medical and surgical units formed the clusters of the study. Intensive care units were excluded. The sample consisted of a) patients: ≥ 18 years, Icelandic speaking, hospitalized for at least 24 h, who had not had surgery during that time, were alert and able to participate according to the judgment of the head nurse on the unit; and b) registered nurses who worked on the participating units. Data were collected from patients, nurses, medical records, the hospital’s data warehouse, and the medication software Therapy®.

2.2. Design

This was a cluster randomized controlled trial. Baseline measures were collected from patients admitted to the participating units in January 2011 (T1). Data were collected simultaneously on all units on two days, a week apart, after which a survey questionnaire was sent to all nurses working on the participating units. Data were collected on two days, rather than one, to ensure that data would not be collected on one > unusual day on the units. Following data collection from patients, questionnaires were sent to nurses. After blocking by type of unit (medical versus surgical), units were randomized to receive the Pain Resource Nurse program (intervention) (n = 12) or to wait-list control (n = 11) by the primary investigator and the Pain Resource Nurse coordinator, using a randomization table. Ten months later, in November 2011 (T2), follow up data were collected from patients and nurses following the same protocol, after which the control group received the intervention.

2.3. Data collection procedures

The head nurses of each unit were informed of the data collection some weeks in advance, but were notified of the specific dates a few days prior to data collection. No other members of the staff were notified ahead of time as to precisely when the data collection would occur. This was done to limit the possibility of staff changing their practice due to knowing they were being studied.

The head nurse, or substitute, screened all patients on the morning of data collection, to determine if they met eligibility criteria, and asked the patient whether a member of the research team could describe the study. Interested patients met with a member of the research team who explained the study and obtained signed informed consent. Patients either filled out the questionnaires themselves or, if needed, were
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