Original Article

Impact of a Clinical Therapeutic Intervention on Pain Assessment, Management, and Nursing Practices in an Intensive Care Unit: A before-and-after Study

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Received December 8, 2016; Revised January 30, 2018; Accepted January 31, 2018.

The authors received no financial support for this study. The authors gratefully acknowledge the support of the medical staff, the nursing staff, and the Charge Nurse of the Anaesthesiology and Critical Care Service of Lecco Hospital (formerly A. Manzoni Hospital).

1524-9042/$36.00
Published by Elsevier Inc. on behalf of the American Society for Pain Management Nursing
https://doi.org/10.1016/j.pmn.2018.01.007

Abstract:

Accurate pain assessment and management constitute a major challenge for medical and nursing staff in intensive care units (ICUs). A distinct recollection of pain is reported by high proportions of ICU patients. A clinical therapeutic intervention directed at improving pain assessment and management in critically ill patients who are unable to communicate was implemented at an Italian ICU. In this before-and-after study, data were collected before (T_0) and after (T_1) the adoption of a protocol involving pain assessment with an ad hoc behavioral pain scale and the administration of analgesics, rather than sedatives, to patients with intermediate to high pain scores. The main outcome measure was pain recollection a year after discharge; secondary outcome measures were the use and doses of sedatives and analgesics. A significantly ($p = .037$) smaller proportion of patients treated after protocol adoption recollected feeling severe pain compared with patients treated before the protocol was introduced. This group also received significantly ($p < .001$) fewer sedatives and significantly ($p = .0028$) more anti-inflammatory drugs and analgesics on an "as needed" basis. The administration of strong analgesics was similar in the two groups. The intervention was implemented in 70.5% of patients with intermediate to high pain scores. Appropriately trained ICU nurses have the potential to help adopt pain relief and prevention measures during nursing care and to contribute to the successful

management of sedation and analgesia. Further studies of larger patient samples are needed to monitor the stability of results over time and to explore the efficacy of the approach in other populations, such as pediatric and neonatal ICU patients.

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According to the International Association for the Study of Pain (IASP) and the World Health Organization, pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue injury, or described in terms of such damage" (Merskey & Bogduk, 1994). However, a more accurate description is that of a phenomenon characterized by combined perception and experience, where perception (nociception) is the sensory modality that enables potentially harmful stimuli to be received and conveyed to the central nervous system, and experience, which as such is wholly private (the actual experience of pain), is the psychic state connected with the perception of an unpleasant sensation (Mannion & Wolf, 2000).

In 85% of cases, intensive care unit (ICU) patients are administered sedatives to relieve pain, anxiety, and the agitation resulting from mechanical ventilation (Bambi, Rodriguez, Lumini, Lucchini, & Rasero, 2015). Oversedation may be the result of inappropriate or careless pain management, whereas undersedation involves the risks of self-extubation, cardiovascular problems, and physical injury (Bambi et al., 2015; Jarzyna et al., 2011). Sedation levels should match patient characteristics and their disease state (Jarzyna et al., 2011; Johansson, Bergbom, Waye, Ryherd, & Lindahl, 2012). Up until the 20th century the problem of pain assessment in ICUs, though keenly felt, was still comparatively neglected. Follow-up studies using the ICU Memory (ICUM) tool (Jones, Humphris, & Griffiths, 2000) have found strong memories of pain in patients discharged from ICUs. According to international guidelines (Herr et al., 2006), pain, physiological parameters, and behavioral responses to pain stimuli should be assessed in critically ill patients who are unable to communicate.

Accurate pain assessment and management in critically ill patients with cognitive alterations who are unable to communicate constitute a major challenge for the medical and nursing staff of ICUs. There is currently no universally accepted tool for assessment of pain in these patients (Herr et al., 2006; Pudas-Tähkä, Axelin, Aantaa, Lund, & Salanterä, 2009; Topolovec-Vranic et al., 2010). Validated scales are strongly recommended to determine whether patients whose clinical condition prevents them from reporting their suffering, feel pain (Barr et al., 2013; Georgiou, Hadjibalassi, Lambrinou, Andreou, & Papathanassoglou, 2015; Herr et al., 2006). However, there is no indication in the literature that these tools are consistently used in practice. Research into instruments capable of assessing behavioral and physiological parameters as pain indicators in ICU patients is quite recent (Keane, 2013; Pudas-Tähkä et al., 2009). In their systematic review, Pudas-Tähkä et al. (2009) found that only two of the five available ICU pain assessment tools had been tested for validity and reliability and used in multiple studies: the Behavioral Pain Scale (BPS) (Payen et al., 2001) and the Critical-Care Pain Observation Tool (CPOT) (Gélinas, 2010; Gélinas, Harel, Fillion, Puntillo, & Johnston, 2009). An exploratory survey of 173 Italian ICUs, carried out in 2015, found that only 24% used an ad hoc pain assessment scale in sedated and intubated patients, whereas 76% used inadequate or nonvalidated scales (Damico, Tonella, Murano, & Coppadoro, 2016).

Gélinas, Arbour, Michaud, Vaillant, and Desjardins (2011) described the implementation of the CPOT in a medical-surgical ICU. Nurses received a 90-minute standardized training course, which included a lecture with handouts, practice with patient videos, and the creation of an ICU clinical support team to provide feedback and answer questions related to the tool's use. The CPOT was incorporated into the ICU flow sheet prior to conducting the study. Thirty patient charts per time point were assessed before and 3 and 12 months after CPOT adoption (90 charts). Data analysis revealed an increase in the frequency of daily pain assessments per patient from pre-implementation (median: 3 times) to 3 months (median: 10.5 times) and 12 months (median: 12) post-implementation. Pain reassessments following analgesic and/or sedative administration also increased, from 10% to 43% and 59%, respectively. Sedative use decreased significantly ($p < .05$) (Gélinas et al., 2011).

In 2014, the CPOT was validated again and found to be useful and reliable (Buttes, Keal, Cronin, Stocks, & Stout, 2014). The tool has also been validated in Italy (Stefani et al., 2011).

According to some studies (Hajiesmaeili & Safari, 2012; Weyant et al., 2017), pain in critically ill patients continues to be largely underestimated and not managed appropriately, despite the availability of guidelines and recommendations (Barr et al., 2013) and the organization of intensive awareness campaigns. It is widely recognized that pain experienced