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## Abstract

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## Nurses' role in improving the pain management in critically ill patients. Determinants and impact of the clinical therapeutic interventions on pain assessment, management and use of analgesia

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### Abstract

**Aim:** the overall aim of this doctoral research program was to expand knowledge on pain and to understand the impact of nursing practice on the improvement of pain assessment and management in critical ill patients.

**Methods:** we conducted 1) one longitudinal, observational study (including a total of 243 patients) to evaluate pain assessment in critical ill patients and to observe the presence of pain at rest and during nursing procedures; 2) one before and after study (including a total of 587 patients, 370 patients before and 217 after intervention) to test the efficacy of a clinical therapeutic intervention involving organizational changes in routine pain assessment and management aimed at improving pain management in critically ill, nonverbal ICU patients; 3) one before and after study (including a total of 261 patients, 126 patients before and 135 after intervention) to test the efficacy of an education program and the implementation of clinical practice guideline in order to reduce pain intensity for surgical patients treated in the ICU and to examine differences in ICU registered nurses' pain assessment practices and pain management practices.

**Results:** the pain incidence rate in 1,602 days of observation was 0.06 patient/day (59/1000 days of observation). The incidence rate of intense pain was 0.012 patient/day (12/1000 days of observation). Pain at rest was detected in 67 (27.6%) patients. Pain during procedures was found 134 (36.1%) times. In the 96 patients who were in pain the ICU stay (15.4 days + 7.8 vs 11.4 days + 5.6) and the days of mechanical ventilation (13.4 + 7.9 vs 9.7 + 4.9) was increased. The introduction of a pain management protocol, combined with standardized training can have a positive impact on nurses' role and in the reduction of pain among ICU patients. Indeed a significantly ( $p = .037$ ) smaller proportion of patients treated after a pain protocol adoption recollected feeling severe pain (one year after discharge) 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. Analysis of the data with respect to pain relief and prevention during some nursing care activities revealed a significant increase in the use of fentanyl citrate ( $p = .012$ ) and paracetamol ( $p = .02$ ). The overall use of anti-inflammatory drugs and analgesics on an as needed basis also increased significantly ( $p = .0028$ ) from 33.24% of patients ( $n=123$ ) pre-intervention to 45.62% ( $n = 99$ ) after protocol adoption. After a training intervention and the implementation of a pain management protocol, a significant reduction was observed in pain intensity scores collected at 6 hours ( $p=.016$ ), 12 hours ( $p<.001$ ) and 48 hours ( $p=.005$ ) also in surgical ICU patients. A significantly smaller proportion of patients treated after intervention received morphine ( $p=.036$ ) and propofol ( $p=.045$ ). Mechanical ventilation lasted longer before the intervention (3.67 days + 6.6 vs 2.44 days + 4.45) (MD = 1.23; 95% CI= -0.1541- 2.6141) ( $p=.0415$ ).

**Conclusion:** nurses play a key role in implementing programs aimed at improving pain management because pain symptom detection is a specific task of their job. Preventing or minimizing pain in adult critical ill patients should be the goal of the health care professionals who operate in ICU units. There is a great need for interdisciplinary education on pain assessment in the critical care setting. Suitably trained ICU nurses have the potential to exert a favorable influence on sedation and analgesia and on the adoption of pain relief interventions during nursing care activities.

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