



Revista de la Facultad de Medicina

ISSN: 2357-3848

ISSN: 0120-0011

Universidad Nacional de Colombia

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Revista de la Facultad de Medicina, vol. 68, no. 1, 2020, January-March, pp. 9-13  
Universidad Nacional de Colombia

DOI: 10.1544G/revfacmed.v68n1.71744

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Revista de la Facultad de Medicina

## ORIGINAL RESEARCH

DOI: <http://dx.doi.org/10.15446/revfacmed.v68n1.71744>

Received: 16/04/2018 Accepted: 05/06/2018

# Differences in pain measurement between nurses and physicians in a teaching hospital

*Diferencias en la medición del dolor entre enfermeros y médicos en un hospital universitario*

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## Abstract

**Introduction:** In clinical practice, the administration of opioid analgesics depends on pain intensity records from nurses because they are responsible for determining the severity of the patient's complaints; however, discrepancies regarding pain measurement are often observed between physicians and nurses, which can lead to an inadequate use of analgesics.

**Objective:** To carry out a comparison of pain intensity measurements made by staff physicians and nurses in a teaching hospital during the first 24 hours of hospital stay of patients with movement-related pain.

**Methods and methods:** Retrospective, cross-sectional study. Data were obtained from the pharmacy database and medical records (opioids prescribed for 1 month, pain intensity, and medication management). The medical records of 634 in patients who were prescribed at least 1 dose of an opioid analgesic were reviewed.

**Results:** The average pain score provided by physicians (5.4/10; SEM=0.17) was significantly higher than the average pain score reported by nurses (3.5/10; SEM=0.15) ( $p<0.05$ ). The intra-class correlation coefficient was 0.371 (95%CI: 0.138-0.563), indicating poor agreement between measurements.

**Conclusion:** A poor agreement between pain measurements made by physicians and nurses during the first 24 hours of hospital stay was found. Bearing in mind that pain measurement is essential for achieving an appropriate treatment, the jointly provision of pain management education programs to doctors and nurses should be considered, so that they assess pain intensity similarly, thus improving the management of inpatients and their quality of life.

**Keywords:** Analgesics, Opioid; Prescriptions; Pain Management (MeSH).

Moyano-Acevedo JR, Molina-Arteta BM, Matute-Gonzales E, Camargo-Sánchez L. Differences in pain measurement between nurses and physicians in a teaching hospital. Rev. Fac. Med. 2020;68(1):9-13. English. doi: <http://dx.doi.org/10.15446/revfacmed.v68n1.71744>.

## Resumen

**Introducción.** En la práctica clínica, la administración de analgésicos opioides depende de los registros de intensidad de dolor realizados por los enfermeros, ya que estos son los responsables de determinar la intensidad de las quejas de los pacientes. Sin embargo, a menudo se observa que existen discrepancias entre médicos y enfermeros profesionales respecto a la medición del dolor, lo que puede llevar a un uso inadecuado de analgésicos.

**Objetivo.** Comparar las intensidades de dolor de pacientes con dolor asociado al movimiento y registradas por médicos y enfermeros de un hospital universitario durante las primeras 24 horas de hospitalización.

**Materiales y métodos.** Estudio retrospectivo de corte transversal. La información se obtuvo de las historias clínicas y de la base de datos de la farmacia del hospital (opioides prescritos por 1 mes, intensidades de dolor y uso de medicamentos). Se revisaron las historias clínicas de 634 pacientes a los que se les recetó al menos 1 dosis de opioide durante su estancia hospitalaria.

**Resultados.** El puntaje promedio de dolor registrado en el grupo de médicos fue significativamente mayor (5.4/10, SEM=0.17) que el registrado en el grupo de enfermeros (3.5/10; SEM=0.15) ( $p<0.05$ ). El coeficiente de correlación intra-clase fue 0.371 (IC95%: 0.138-0.563), lo que indica una pobre concordancia entre las mediciones de médicos y enfermeros.

**Conclusiones.** Se observó una pobre concordancia entre la medición del dolor realizada por los enfermeros y los médicos del hospital. Teniendo en cuenta que la medición del dolor es fundamental para lograr un tratamiento adecuado, debe considerarse ofrecer programas de educación en manejo del dolor a médicos y enfermeros de manera conjunta para que su medición sea uniforme, lo que mejorará el manejo de los pacientes hospitalizados y, por tanto, su calidad de vida.

**Palabras clave:** Analgésicos opioides; Prescripciones de medicamentos; Manejo del Dolor (DeCS).

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## Introduction

Many barriers prevent proper pain management, including poor pain measurement from health care professionals.<sup>1</sup> However, most data show that assessing pain is imperative for achieving good outcomes<sup>2,3</sup> and that it is necessary for choosing a treatment and evaluating its efficacy in the clinical setting. In other words, an effective treatment depends on proper evaluation.

In routine clinical practice, inpatients are asked about the intensity of their pain upon admission, during their stay at least once a day, and upon discharge from their hospital stay; the nurse in charge carries out this process. Analgesics are prescribed after the treating physician measures pain. The multidisciplinary approach to patient care requires agreement between the measurements provided by both professionals. However, said measurements may be misleading if the people involved have different perceptions about pain intensity of the patient.

According to the relevant literature, training received by physicians and nurses in pain management is deficient.<sup>4,5</sup> Previous studies have shown that there are significant differences in pain intensity assessment between doctors and nurses, and that said differences may lead to inadequate treatments because the interventions, for example, increase or reduce dosages of analgesics often based on the pain reports obtained from the nursing records. It should be noted that pain is not always measured and that this lack of reporting may also result in inadequate treatments.<sup>6</sup>

Contemporary analgesia takes into account many aspects that can generate pain, but the most important analgesic goals are those associated with painful movement,<sup>7</sup> given that its inadequate management may result in late recovery of mobility or previous functional status.

The presence of diverse types of pain is still problematic for many people around the world. For example, several studies report that 75% of the patients feel moderate/extreme pain during the immediate post-surgical period.<sup>8,9</sup> In low and middle-income countries, the prevalence of unspecified chronic pain ranges from 13% to 49.4%.<sup>10</sup> In Colombia, according to the 2014 National Pain Survey, the intensity of chronic pain was severe in 41% of the respondents, and 30% of those suffering from chronic pain did not receive treatment for it.<sup>11</sup> Furthermore, chronic pain affects people of all ages, and there are even studies on this type of pain in adolescents.<sup>12</sup>

The objective of the present study was to carry out a comparison of pain intensity measurements made by staff physicians and nurses in a teaching hospital during the first 24 hours of hospital stay of patients with movement-related pain.

## Materials and methods

This is a retrospective and cross-sectional study on the pain measurements reported by physicians and nurses over a one-month period in patients hospitalized in a university hospital that serves most medical and surgical specialties. According to a hospital policy, pain must be assessed during the hospital stay (admission and follow up). To this end, a form that includes the following opioid analgesics is used: hydromorphone, morphine, and tramadol; parenteral pethidine; transdermal and parenteral fentanyl; and oral codeine, hydrocodone, methadone, and oxycodone.

Routine treatment of pain in patients hospitalized in this teaching hospital includes multimodal analgesia based on non-steroidal anti-inflammatory drugs, paracetamol, and short-acting opioids through different routes of administration and based on the therapeutic guidelines considered as most appropriate for each patient. At the end of the first 24 hours of hospitalization, each patient is asked about their level of pain while performing physical activity or moving their bodies (sitting or walking after surgery for the first time or upon admission to the floor in the case of non-surgical patients), using a scale from 0 to 10, being zero absence of pain and 10 the worst imaginable pain. The staff doctor and the nurse manager record these reports independently.

For this study, data on socio-demographic characteristics, clinical diagnosis, prescriptions, prescriber, opioid analgesic, and pain (type, duration, and intensity as recorded by the staff physician or graduated nurse) were retrieved from the electronic database of the hospital pharmacy and from the patients' medical records. The quality of the information collected was assured by training the team responsible for this task by conducting a pilot study and by double-checking the information. In case of disagreement regarding the data collected, the researchers who reviewed the databases resolved them through consensus.

This retrospective study was conducted in a 190-bed teaching hospital. The study population consisted of 634 patients who were hospitalized for surgical and non-surgical treatment and who were prescribed at least 1 dose of opioid analgesic (codeine, hydrocodone, hydromorphone, fentanyl, methadone, morphine, oxycodone, pethidine, or tramadol). Patients who were not prescribed any of these opioids, as well as pediatric (younger than 18 years old) and obstetric patients, were excluded.

No experiments on human or animal subjects were performed. This study was approved by the institutional ethics committee through Minutes n° CCEI-1647-2011 (24/10/2011). Likewise, the principles of the Declaration of Helsinki<sup>13</sup> and the regulations of Resolution 8430 of 1993 for conducting health research in humans were followed.<sup>14</sup>

## Statistical analysis

A descriptive analysis was conducted using measures of central location and dispersion for continuous variables, and the Student's t test was used to compare continuous variables. Mean, standard deviation ( $\sigma$ ), and maximum and minimum values were calculated for quantitative variables. If variables were not distributed symmetrically, the median and interquartile ranges were calculated. Qualitative variables were expressed as absolute percentages and relative frequencies. The chi-square test was used to compare proportions and to estimate the intra-class correlation coefficient. Analyses were performed for a 2-sided type I error level of 0.05 using the statistical package R.

## Results

As mentioned above, the study population consisted of 634 hospitalized patients, of which 387 (61.9%) were female. Regarding age ranges, 354 (55.5%) were 18 to 50 years old, 169 (26.7%) 51-70, and 111 (17.%) were

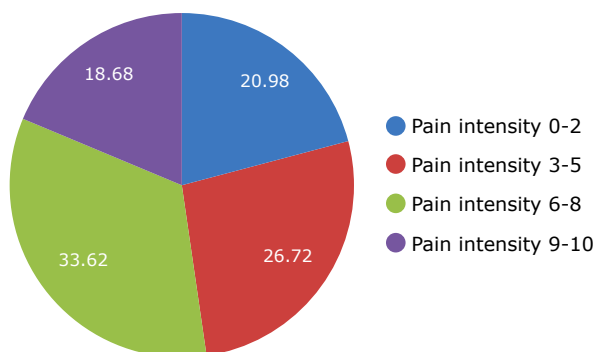
older than 70 years old. The most frequent diagnoses were diseases of the musculoskeletal system ( $n=100$ ), trauma in different body regions ( $n=94$ ), non-specific systemic symptoms ( $n=8$ ), digestive system disorders ( $n=70$ ), genitourinary system diseases ( $n=57$ ), and neoplasms ( $n=51$ ).

### Distribution of pain intensity measurements

Physicians recorded the pain intensity measurements on admission of 349 patients (55.1%), while nurses did so in 275 patients (43.4%). It should be noted that in 10 patients (1.5%) it was not possible to determine who did this assessment. It was found that, on average, physicians rated pain intensity significantly higher than nurses: the physicians' mean intensity was 5.45/10 ( $\sigma$ : 0.17) (95%CI: 5.13-5.78), while the nurses' mean pain intensity was 3.55/10 ( $\sigma$ : 0.15) (95%CI: 3.25-3.86). The intra-class correlation coefficient was 0.371 (95%CI: 0.138-0.563), indicating poor agreement between pain measurements made by physicians and nurses. Opioids were prescribed for the treatment of acute pain in 578 (91.1%) patients, chronic pain in 35 (5.5%), and cancer pain in 17 (2.7%). Finally, their prescription was not undetermined in 4 cases (0.6%).

### Prevalence of pain

On a scale from 0 to 10, the scores of the 349 patients whose pain intensity was measured by doctors on admission were as follows: 73 (20.9%) reported a 0-2 score; 94 (26.9%), a 3-5 score; and 182, (52.15%) reported severe to unbearable pain ( $\geq 6$ ) (Figure 1).

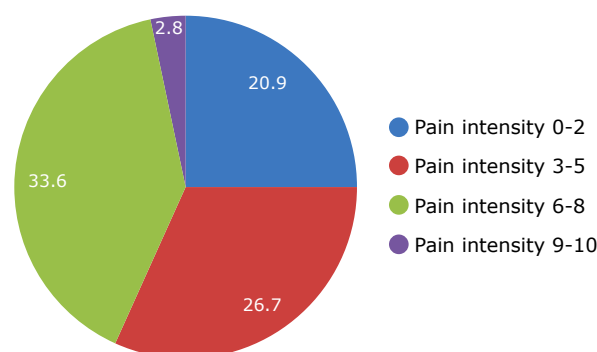


**Figure 1.** Distribution of first pain intensity (%) assessment by physicians in 349 patients.  
Source: Own elaboration

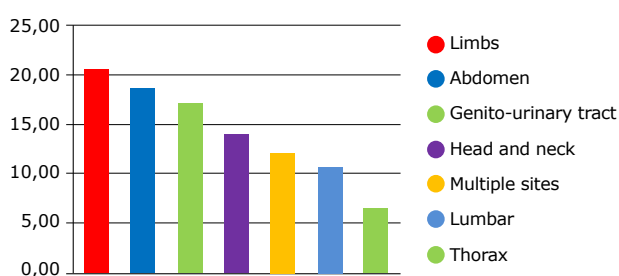
On the other hand, the following scores were found for the 275 patients whose pain intensity measurement on admission was performed by nurses: 120 (43.6%) reported a score 0-2; 84, (30.5%) said their pain was 3-5; and 71 (25.7%) reported they were experiencing severe to unbearable pain ( $\geq 6$ ) (Figure 2).

Opioids used for managing severe pain (visual analog scale score,  $>6/10$ ) were tramadol (43.0%), morphine (35.8%), hydromorphone (12.6%), fentanyl (5.3%) and pethidine (3.3%).

According to the medical records, pain was classified based on the duration of the symptoms as acute ( $n=578$ ), chronic ( $n=35$ ), cancer pain ( $n=17$ ), and undefined ( $n=4$ ). Limbs were the body part in which pain was most frequently located (Figure 3).



**Figure 2.** Distribution of first pain intensity (%) assessment by nurses in 275 patients.  
Source: Own elaboration.



**Figure 3.** Pain location during the worst pain intensity according to the patients' medical records.  
Source: Own elaboration

### Discussion

This study reports several relevant findings. One of them is the disagreement in pain intensities reported by each professional group, which reaches a significant difference of 1.5/10 ( $\sigma$ : 0.2). This difference is particularly marked during the worst moment of pain, and is potentially linked to analgesics prescription: some patients may not receive analgesics because the nursing group does not deem them necessary, or may receive them because doctors consider that pain intensity ranges from severe to unbearable. These disagreements in the measurement of pain intensity have been previously documented and the result is poor pain management.<sup>15</sup>

Pain affected most patients admitted to the hospital, but pain relief in this setting was inadequate. In fact, in the sample studied here, 25% to 47% patients presented severe to unbearable pain during their hospital stay, that is, after undergoing triage. The most influential factor to this situation may be the lack of systematic pain measurement, which may require a personal or institutional improvement process, as previously reported in other scenarios.<sup>16</sup> In this research, pain intensity was reported in only 55.1% of the patients seen by doctors and in 43.4% of the patients seen by nurses. Background and personal conditions, in addition to pain education, make a difference in pain measurement and treatment.<sup>17</sup>

Another relevant finding was the need to improve pain control through a better evaluation of the intensity assessment made by physicians and nurses and better prescription practices of opioid analgesic treatment after assessing the reports of patient pain. Only just over half of patients had their pain intensity assessed by their physician and even less by nurses. It should be noted

that, in patients with severe pain, tramadol, an analgesic comparatively less potent than other opioids, was the drug most frequently prescribed, indicating that the intensity of pain was not a variable that defined the selection of the opioid to be prescribed.

In daily practice, nurses play an essential role in pain measurement because they tend to have more contact with patients than physicians. However, this study detected lack of measurements by nurses; both physicians and nurses should assess the pain of their patients. The lack of correlation between the rating of pain intensity by the nurses and physicians may reflect the lack of a systematic approach to pain measurement and suggests the need for unified training for both professional groups, which may lead to better accessibility to timely pain measurement and efficient analgesic administration. Effective physician-nurse communication may help build strong professional relationships, keep things working, and make people feel included.

In the hospital setting, measurement of pain intensity could give way to more effective treatments.<sup>18</sup> As mentioned before, pain documentation needs to be improved through institutional educational programs for nurses and doctors, accompanied by pain monitoring and treatment. Therefore, postoperative pain measurement and treatment remain a priority challenge for physicians and nurses.

In addition to pain measurement, this research focused on opioid analgesics because they are essential in the pharmacological management of severe pain. In fact, their use can be increased or reduced according to the intensity of pain. Although it may seem redundant, it is worth stressing that these drugs have an essential role in pain management, although opiophobia has been identified as a barrier to proper pain control.

Face-to-face education, as well as other educational initiatives,<sup>19</sup> can modify professional behavior<sup>20</sup> and improve the process of drug prescription for patients with severe pain and their adherence to management guidelines, while preventing abuse and drug addiction.<sup>21</sup> The results of this study describe the patterns of prescription and this knowledge may encourage hospitals to provide prescribers with friendly face-to-face education as a first step to achieve a similar assessment of pain intensity by physicians and nurses.

## Conclusion

Bearing in mind that pain measurement is essential for providing an appropriate treatment, the jointly provision of pain management education training programs for both doctors and nurses should be considered, so that they assess pain intensity similarly, thus improving the management of inpatients and their quality of life.

## Conflicts of interest

None stated by the authors.

## Funding

None stated by the authors.

## Acknowledgments

None stated by the authors.

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