Hussain Bakhsh et al, 2020;1(2):089–095.
https://doi.org/10.24911/SJEMED.72-1573211770



ORIGINAL ARTICLE

# Patient satisfaction with acute pain management for opioid naive population in a Saudi emergency department

Hussain Bakhsh[1*], Amina Alkhalaf[1], Raneem Bukhari[1], Elham Alshehri[1], Arwa Alkhalaf[2]

## ABSTRACT

**Background:** Pain is the most compelling factor that leads people to visit the emergency department (ED).

We aimed to assess patient satisfaction with the management of acute pain in the ED of a tertiary academic hospital, where opioid agents are used on a minimal and limited basis.

**Methods:** This cross-sectional study was conducted over 2 months. A modified questionnaire was administered by telephone to adult patients who had complained of pain and received analgesics in the ED. Multivariate correlational analysis was performed to identify the predictors of patient satisfaction.

**Results:** We included 76 patients (mean age, 40.88 ± 15.47 years) of these, 65 (85%) received non-opioids, while 11 (14%) received an opioid analgesic. Fifty (65%) of total patients thought they had received enough analgesics. Mean initial pain score was 8.11 ± 1.93 while that at discharge was 4.38 ± 3.03. Multivariate regression showed that ED diagnosis [coefficient = −0.23; 95% confidence interval (CI) −0.43, −0.40], chronic analgesic use (coefficient =1.25; 95% CI 0.21, 2.28), type of analgesic administered (coefficient = −1.11; 95% CI −2.66, 0.43), initial pain score (coefficient = 0.39; 95% CI 0.07, 0.71), pain score at discharge (coefficient = −0.51; 95% CI −0.74, −0.29), perception of enough analgesics (coefficient = 2.30; 95% CI 0.97, 3.63), and staff helpfulness (coefficient = 0.19; 95% CI 0.02, 0.38) were significantly associated with patient satisfaction. The type of analgesic was not significantly associated with patient satisfaction (model $R^2$ = 0.54).

**Conclusion:** Our findings indicate that the use of opioid agents did not significantly increase the patients' satisfaction scores. Adjusting patient satisfaction predictors, including the type of analgesic used, will help in optimizing the patients' experience.

**Keywords:** Acute pain management, patient satisfaction, emergency department, analgesics, opioids.

## Introduction

Pain is the most compelling factor that leads people to visit the emergency department (ED). Data show that undertreating acute pain in ED is a worldwide concern although pain relief is recognized as a human right by the World Health Organization [1–7]. In the United States of America (USA), it is reported that the epidemic of opioid use is growing, and it is considered as common practice to administer opioids for patients with acute pain in the ED [8,9]. A white paper position statement for the American Academy of Emergency Medicine showed that during the past 20 years physicians' increased administration of opioids—as first line agent—was motivated by the pro-opioid campaigns from pharmaceutical companies, regulatory agencies, and physicians continuing medical education [10–12]. In contrast, it is a common practice in Saudi Arabia to administer non-opioids as first-line agents for acute pain management.

The consequences of under treatment of acute pain are serious and in the long term, may lead to chronic pain syndrome or psychological consequences [13,14]. Under

**Correspondence to:** Hussain Bakhsh
*Department of Clinical Pharmacy, College of Pharmacy, King Abdulaziz University, Jeddah, Saudi Arabia.
**Email:** hbakhsh84@gmail.com
*Full list of author information is available at the end of the article.*
**Received:** 09 November 2019 | **Accepted:** 30 March 2020

treatment of acute pain could be due to the lack of both education on pain assessment and clinical practice guidelines [6,15]. In a multicenter study in the USA and Canada, Todd et al. [7] noted that among patients that visit the ED, only half experience clinically significant pain reduction, with nearly 74% being discharged from the ED while still complaining of moderate to severe pain. In Saudi Arabia Rifat et al. [16] reported that 25% of patients did not receive analgesia in the ED and 25% did not receive analgesics upon discharge, with narcotics and non-narcotics used equally. It has also been reported that nurses in Saudi Arabia learned to over-identify patients with pain as probable substance abusers, and often tended to not administer opioids [17].

Patient satisfaction is a vital metric in the ED, as it influences the outcome for both patients and health care providers, and increases the likelihood of adherence to instructions given at discharge [7,18]. Positive patient experiences are associated with effective communication with health care providers, the empathetic nature of the providers, and rapid pain management [19]. A literature review found that pain management was among the five main factors involved in patient satisfaction with their ED experience [20]. Patient satisfaction was found to be higher when pain was well managed, and this has become an important factor when assessing pain management strategies [21,22].

To our knowledge, patient satisfaction with acute pain management in the ED has not been studied in Saudi Arabia, a country where using non-opioid analgesics rather than opioids is common practice. This study aims to assess patient satisfaction with the analgesics received in the ED.

## Subjects and Methods

This study had a cross-sectional design and was conducted among patients discharged from the ED within one week between November 2017 and January 2018. A telephone survey was used to collect data, and patients were called in the afternoon and evening. We made sure that we were speaking to the patient and that we were transferred to them when the call was answered by someone else. Every question that the patients had was answered, to ensure that the most reliable responses were obtained. Patients gave their verbal consent to participate in this study, after being informed about the study's goal, use, and impact and after being assured that their identity would remain anonymous. This study was approved by the biomedical research ethics committee of the hospital where the study was carried out.

This study was conducted in the ED of a tertiary academic hospital in Saudi Arabia. The ED has a total capacity of 44 beds, and the average annual number of visits is about 40,000. The hospital collects and generates electronic records for patients visiting the ED who are discharged each day.

Through systematic screening of hospital records, adult patients above 18 years of age who were complaining of pain with primary diagnosis for admission to the ED was pain, who received analgesics in the ED, and were discharged within 24 hours, were identified and included in this study. This ED record was generated every few days, and the authors investigated each patient record to make sure they fit our inclusion criteria. We excluded patients with languages other than English or Arabic or any cognitive impairments, patients that were hospitalized, who received analgesics only on prescription at discharge, or who were receiving chronic analgesia, because we aimed to measure the initial pain score and its improvement or lack thereof upon discharge, after having received treatment in the ED. We excluded patients with chronic analgesia conditions because we could not know the sensitivities and tolerance of their analgesics, and/or how often they received analgesics, and we found it conflicting to compare these patients to those who received analgesia in the ED for acute pain, considering the different factors that could be affected in these patients' satisfaction with their pain.

Our questionnaire was based on the study by Fallon et al. [23]. They used a standardized questionnaire for demographic and clinical information. Their questionnaire was developed through an iterative process, with modification where necessary to provoke simple answers and no formal validation. The primary outcome question was directly taken from the standardized Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, a patient satisfaction survey developed by the Centers for Medicare and Medicaid Services in the USA. This survey is used to gain insight into patients' perceptions of health care institutions, which includes patients giving feedback on quality of care with regard to their pain. We used the question from the HCAHPS survey about how often their pain was well controlled, for our patients upon discharge from the ED. This is considered as a measurement of patient satisfaction, as it asks about the entire visit rather than a few hours after certain treatments, as in a previous study [24,25]. We further modified the questionnaire to suit the population, as not all opioids (such as oxycodone) are generally available or accessible in EDs in Saudi Arabia. Also, intravenous acetaminophen is readily available and affordable, making it the replacement for the other opioids in the questionnaire. Our modified questionnaire included 20 items.

Variables collected included age, sex, nationality, marital status, language, length of stay in the ED, and location of pain. In addition, pertinent history, such as smoking, chronic pain, and mental health conditions, was also collected. Patients were asked about chronic analgesics consumption and if they used analgesics on a regular basis, were categorized to either opioids or non-opioids. Patients were asked questions about their pain and satisfaction with the care provided during their ED visit. Questions regarding pain levels were measured on an

11-point numeric scale, with 0 = no pain and 10 = worst possible pain.

The primary outcome question was taken directly from the HCAHPS survey: "How often was your pain well controlled in the ED?" Where patients respond on a 0–10 scale (0 = never, 10 = always). This is similar to the question in the HCAHPS survey concerning patient satisfaction with pain management. A score of 8 or greater on this scale is regarded as optimal and is used as a realistic target at our institution. Patients were then divided into optimal and suboptimal groups based on their responses to this question.

Differences in means between the optimal and suboptimal pain management groups were examined, controlling for different demographic and pain management satisfaction variables. Bivariate analysis was conducted using a number of *t*-tests. In cases where the variables had more than two categories, analysis of variance was used. To identify predictors of patient satisfaction, we conducted a multivariate analysis through a correlational design where the analysis assumptions were met. The dependent variable is the answer to the primary question measuring controlled pain (above or equal to 8 or lower than 8), and independent variables are the pain satisfaction questions, the ED diagnosis (pain location), type of analgesic received, and chronic analgesic use.

Similar to the work by Fallon et al. [23] we fixed the power level at 80%, given a moderate-large effect of 0.20 and a nominal type error rate of 0.05. The power analysis suggested a sample size of 76 patients. All statistical analyses were done using IBM SPSS Statistics V21.0.

## Results

A total of 114 patients' contact information was collected. In 38 cases, contact phone numbers were not reachable or had no response, and the total number of patients included was 76, giving a response rate of 66%. Tables 1 and 2 show demographic and clinical characteristics of the respondents, along with the confidence intervals (CIs) of differences between (among) categories for each variable.

The mean age of included patients was 40.88 ± 15.47 years, and 44 (57%) were female. The percentage of respondents who spoke Arabic was 72 (94%) of the respondents spoke Arabic, while 4 (5%) spoke English. The length of stay in the ED averaged 4.84 ± 3.54 hours. Sixty-three (82%) had a negative medical history, 7 (9%) were smokers, and 6 (7%) had chronic pain conditions. The sample is representative of the general population's religious affiliation, with Islam being the dominant religion among patients in the study ED. Fifty-three (69%) of the respondents did not use analgesics on a chronic basis, while 20 (26%) used a non-opioid analgesic, and only 3 (3%) used an opioid (Table 1). Mean differences in pain management satisfaction scores (outcome variable) were not statistically significant for any of the demographic variables.

Diagnosis in the ED included abdominal pain in 19 (25%), chest pain in 14 (18%), low back pain in 14 (18%), flank pain and renal colic in 12 (15%), pain in limbs and/or hands in 6 (7%), joint pain in 4 (5%). Sixty-three (82%) of the respondents wanted to receive analgesics in the ED, while 13 (17%) did not wish to

***Table 1.*** *Demographic characteristics.*

| | | Sample Descriptive N (%) | Sub-optimal (*n* = 39) n (%) | Optimal (*n* = 37) n (%) | Mean Difference in controlled pain Mean Difference [95% CI] |
|---|---|---|---|---|---|
| **Gender** | Male | 32 (42.1%) | 18 (46%) | 14 (38%) | −0.21 [−1.71, 1.28] |
| **Age (mean ± SD)** | | 40.88 ± 15.47 | 42.97 ± 15.15 | 38.68 ± 15.72 | −4.29 [−11.36, 2.76] |
| **Marital status** | Married | 28 (36.8%) | 16 (41%) | 12 (32.4%) | −0.32 [−1.82, 1.17] |
| | Single | 18 (23.7%) | 7 (18%) | 11 (29.7%) | −0.05 [−1.87, 1.77] |
| | Unknown | 29 (38.2%) | 16 (41%) | 14 (38%) | 0.37 [−1.18, 1.92] |
| **Language** | Arabic | 72 (94.7%) | 36 (92.3%) | 36 (97.3%) | 1.22 [−3.18, 5.62] |
| | English | 4 (5.3%) | 3 (7.7%) | 1 (2.7%) | |
| **Nationality** | Saudi | 52 (68.4%) | 28 (71.8%) | 24 (64.8%) | −0.32 [−1.91, 1.27] |
| | Others | 24 (31.6%) | 13 (33.33%) | 11(29.7%) | |
| **Past history** | Negative medical history | 63 (82.9%) | 31 (79.4%) | 32 (86.4%) | −0.16 [−2.08, 1.77] |
| | Smoker | 7 (9.2%) | 4 (10.2%) | 3 (8%) | 0.65 [−1.26, 2.56] |
| | Chronic pain | 6 (7.9%) | 4 (10.2%) | 2 (5.4%) | −0.44 [−4.56, 3.68] |
| **Chronic analgesic use** | None | 53 (69%) | 26 (66.7%) | 27 (73%) | 0.39 [−1.32, 2.11] |
| | Non-opioid | 20 (26.3%) | 12 (30.7%) | 8 (21.6%) | −0.82 [−2.68, 1.03] |
| | Opioid | 3 (3.9%) | 1 (2.5%) | 2 (5.4%) | 2.01 [−1.17, 5.18] |
| **Length of stay at ED (mean** ± SD) | | 4.84 ± 3.5 | 4.95 ± 3.13 | 4.73 ± 3.97 | −0.22 [−1.86, 142] |

***Table 2.*** *Clinical characteristics.*

| | | Sample descriptive N (%) | Sub-optimal (*n* = 39) n (%) | Optimal (*n* = 37) n (%) | Mean Difference in controlled pain mean difference [95% CI] |
|---|---|---|---|---|---|
| **ED diagnosis (pain location)** | | | | | |
| **Abdominal pain** | | 19 (25%) | 10 (20.6%) | 9 (24.3%) | −0.26 [−1.88, 1.35] |
| **Chest pain** | | 13(17.1%) | 6 (15.4%) | 7 (18.9%) | 0.71 [−1.09, 2.52] |
| **Low back pain** | | 12(15.8%) | 9 (23.1%) | 3 (8.1%) | −1.37 [−3.84, 1.09] |
| **Flank pain** | | 12 (15.8%) | 9 (23.1%) | 3 (8.1%) | −1.97 [−4.12, 0.18] |
| **Limb and hand pain** | | 5 (6.6%) | 1 (2.6%) | 4 (10.8%) | 0.63 [−4.28, 5.54] |
| **Joint pain** | | 5 (6.6%) | 2 (5.1%) | 3 (8.1%) | −0.22 [−5.32, 4.87] |
| **Unspecified pain** | | 7 (9.2%) | 1 (2.6%) | 6 (16.2%) | 3.17 [0.72, 5.62][a] |
| **Neck pain** | | 2 (2.6%) | 0 | 2 (5.4%) | 1.63 [−2.97, 6.24] |
| **Dysphagia** | | 1 (1.3%) | 1 (2.6%) | 0 | −3.45 [−9.90, 2.99] |
| **Pain satisfaction questions** | | | | | |
| **Analgesic in ED** | Non-opioid | 65 (85.5%) | 34 (87%) | 31 (83.7%) | −1.01 [−2.96, 0.94] |
| | Opioid | 11 (14.5%) | 5 (12.8%) | 6 (16.2%) | |
| **Prescription at discharge** | Yes | 39 (51.3%) | 18 (46%) | 21 (56.7%) | 0.79 [−0.67, 2.26] |
| | No | 37 (48%) | 21(30.7%) | 16 (43.2%) | |
| **Analgesic desired** | Yes | 63 (82.9%) | 32 (82%) | 31 (83.7%) | −0.43 [−1.95, 1.08] |
| | No | 13 (17.1%) | 7 (18%) | 6 (16.2%) | |
| **Enough analgesic given** | | 50 (65.8%) | 16 (41%) | 34 (91.8%) | 3.48 [2.02, 4.94][a] |
| **Initial pain score (mean** ± SD) | | 8.11 ± 1.93 | 7.97 ± 1.88 | 8.24 ± 2 | 0.27 [−0.62, 1.16] |
| **Lowest pain score (mean** ± SD) | | 6.33 ± 2.82 | 6.62 ± 2.69 | 6.03 ± 2.96 | −0.58 [−1.88, 0.71] |
| **Pain score at discharge (mean** ± SD) | | 4.38 ± 3.03 | 5.44 ± 2.98 | 3.27 ± 2.69 | −2.16 [−3.47, −0.86][a] |
| **Staff helpfulness (mean** ± SD) | | 7.33 ± 3.15 | 6.23 ± 3.63 | 8.49 ± 2 | 2.25 [0.90, 3.61][a] |

[a]Statistically significant at alpha 0.05.

receive any. Most respondents (65 or 85%) received a non-opioid analgesic in the ED, while 11 (14%) received an opioid analgesic. The mean initial pain score was 8.11 ± 1.93, which at discharge had decreased to 4.38 ± 3.03. Regarding the primary outcome question "How often was your pain well controlled?", the mean score was 6.41 ± 3.21 (Table 2). Based on the scores given in response to the primary questions, patients were divided into an optimal pain management group (scores of 8 and above) and a suboptimal pain management group (scores of less than 8).

Results of bivariate analysis to compare the means of the optimal and suboptimal patient groups with each variable are shown. The mean differences show that optimal group patients were more likely to perceive that they had taken enough medication (34 *vs.* 16, 95% CI 2.02, 4.94), gave a higher score on staff helpfulness (8.49 ± 2.00 *vs.* 6.23 ± 3.63, 95% CI 0.90, 3.61), and had lower pain scores at discharge (3.27 ± 2.69 *vs.* 5.44 ± 2.98, 95% CI −3.47, −0.86). Generally, there were no differences in the means of the optimal and suboptimal pain management satisfaction groups; they differed only in terms of the three aforementioned variables.

The multivariate analysis model contained an outcome variable (controlled pain) and predictors (ED diagnosis, chronic analgesic use, analgesic in the ED, initial pain score, pain score at discharge, enough analgesic given, and staff helpfulness), as shown in Table 3. The predictors were all significant, with the exception of the type of analgesic administered in the ED. The findings suggest that the predictors explain 54% of the variance in the outcome variable. The model fits very well, with an $F_{7,68} = 11.16$ and a $p$-value < 0.001.

***Table 3.*** *Multivariate regression analysis of pain satisfaction.*

| Variable | B | 95% CI | *p* |
|---|---|---|---|
| **ED diagnosis (pain location)** | −0.23 | [−0.43, −0.4] | 0.02 |
| **Chronic analgesic use** | 1.25 | [0.21, 2.28] | 0.02 |
| **Analgesic in the ED** | −1.11 | [−2.66, 0.43] | 0.16 |
| **Initial pain score** | 0.39 | [0.07, 0.71] | 0.02 |
| **Pain score at discharge** | −0.51 | [−0.74, −0.29] | 0.00 |
| **Enough analgesic given** | 2.30 | [0.97, 3.63] | 0.00 |
| **Staff helpfulness** | 0.19 | [0.02, 0.38] | 0.035 |

Model $R^2 = 0.54$.

## Discussion

Our key finding is that patient satisfaction scores were not significantly related to the type of analgesic received in the ED. Of the total sample, 31 (40%) had optimal satisfaction scores with their non-opioid pain management, while 34 (44%) did not have optimal satisfaction scores with their non-opioid pain management. We also found that 6 (7%) of the total sample had optimal satisfaction scores

with their opioid pain management, while 5 (6%) did not have optimal satisfaction scores with their opioid pain management. This finding supports the non-inferiority of the non-opioid analgesics versus codeine and oxycodone in acute pain treatment in the ED [26].

Generally, administering or dispensing opioids for acute pain in the ED is not a common practice in Saudi Arabia. Pain under treatment may affect patients' satisfaction, which may have consequences such as non-adherence with the physician's instructions. However, wholesale use of opioids for acute pain management would also not have good consequences. Achieving patient satisfaction is very challenging when it comes to pain management. Although prescribing regulations for opioids allow ED physicians to discharge patients on opioid treatment, they tend to be extremely cautious about doing so, preserving this for restricted patient populations. This in turn raises concerns as to whether patients' pain is adequately managed in Saudi Arabian EDs, where the patients are opioid-naïve.

Another finding is that staff helpfulness assisted in attaining optimal patient satisfaction with pain management, which in line with the findings of Fallon et al. [23], who reported that the predictors for patient satisfaction with pain management in the ED include staff helpfulness, patient's perception of enough analgesics, and ED diagnosis. Another study showed similar findings and demonstrated a strong link between satisfaction and compassionate staff interactions in the ED [27]. Previous literature has highlighted the importance of practitioners' responsiveness to patients' complaints of pain and communication with patients [7,19,20,28]. This finding raises the need to educate ED practitioners on the importance of continuous interactions with patients in pain. Enhancing pain management satisfaction through these adjustable variables—initial pain score, pain score at discharge, perception that enough analgesics were given, and staff helpfulness—through proper assessment and management of pain is mandated.

The type of analgesic used was not significant in reaching optimal pain control according to our multivariate analysis, indicating that use of opioid agents did not statistically increase patient satisfaction scores. A previous study conducted a project that reduced opioid prescription rates in an ED from 22% to 14% in 1 year and found that patient satisfaction scores were not negatively influenced [29]. A study by Duncan et al. [30] conducted in light of the opioids epidemic in the United States of America, assessed patient satisfaction scores after implementation of an alternative to an opioid-first approach in their pain management, and found that >20% reduction in opioid use in 1 year did not have an influence on patient satisfaction scores. This is also in agreement with the findings of Schwartz et al. [31] in which patient satisfaction scores were not related to administration of any specific type of analgesics. This finding is in line with a previous Cochrane Review that reported that when comparing oral opioids or combinations of paracetamol and opioids with nonsteroidal anti-inflammatory analgesics, the former did not provide better pain management and may result in increased adverse events; however, the low quality of this evidence was declared [32]. A more recent randomized controlled trial compared oral paracetamol alone with combination analgesics (codeine, ibuprofen, and paracetamol), and found that the combination was not superior to paracetamol alone, for both pain reduction after 60 minutes and the need for rescue analgesia. In the combination group, more adverse events were also reported [33].

We also found that patients scored a mean of 6.41 ± 3.21 when describing their pain control in the ED (0 = never and 10 = always), with a score of above 8 regarded as optimal; therefore, we can say that overall satisfaction with pain management was less than optimal. Despite this finding, almost half of our patients (37 or 48%) achieved optimal satisfaction scores. The reasons for this finding are unclear. While under-treatment of pain has been mentioned before, knowing patients' satisfaction regarding their whole experience with pain management in the ED is a different outcome. Assessing the factors that could affect patient satisfaction, including the type of analgesic used, will help in optimizing the patients' experience. This goes along with more emphasis on better pain management strategies by the medical team, and organizations to develop the proper guidance.

## Limitations

Limitations of this study are potential recall bias, subjectivity of pain scoring, and cultural and religious influences on pain tolerance. Patients with prescriptions upon discharge (39 or 51%) may have influenced their pain scoring. We only included patients whose primary diagnosis was pain and received analgesics, not those who were admitted to the ED with other primary diagnoses, these patients' other conditions could have affected their satisfaction scores.

## Conclusion

Predictors of patients' satisfaction with pain management were documented, despite minimal opioid use for acute pain in this ED in Saudi Arabia. Our findings indicate that the use of opioid agents did not significantly increase the patients' satisfaction scores. Education and training on appropriate acute pain management in the ED might help to standardize acute pain management practice. Conducting this survey on patients just before they leave the ED would minimize recall bias. More powered research is needed to confirm these findings.

**Previous publications**
This study's abstract has been presented in the 2018 American College of Clinical Pharmacy (ACCP) Global Conference on October 22, 2018 in Seattle, USA.
This study's abstract has also been published in the Journal of the American College of Clinical Pharmacy in December 2018, volume 1 issue 2, ACCP abstract section, page 181. Retrieved from: https://accpjournals.onlinelibrary.wiley.com/doi/10.1002/jac5.1059

**List of Abbreviations**

| | |
|---|---|
| ED | Emergency department |
| USA | United states of America |
| HCAHPS | Hospital Consumer Assessment 132 of Healthcare Providers and Systems |

**Conflict of interest**
The authors declare that there is no conflict of interest regarding the publication of this article.

**Funding**
None.

**Consent for publication**
Informed consent was obtained from all individual participants included in the study.

**Ethical approval**
Ethical approval for this study was obtained from the Unit of biomedical ethics and research in King Abdulaziz University, Faculty of Medicine on August 14, 2017. (Approval number: 388-17).

**Author details**
Hussain Bakhsh[1], Amina Alkhalaf[1], Raneem Bukhari[1], Elham Alshehri[1], Arwa Alkhalaf[2]
[1]Department of Clinical Pharmacy, College of Pharmacy, King Abdulaziz University, Jeddah, Saudi Arabia
[2]Faculty of Educational Graduate Studies, King Abdulaziz University, Jeddah, Saudi Arabia

**References**

1. Berben SA, Meijs TH, van Dongen RT, van Vugt AB, Vloet LC, Mintjes-de Groot JJ et al. Pain prevalence and pain relief in trauma patients in the Accident & Emergency department. Injury. 2008;39(5):578–85. https://doi.org/10.1016/j.injury.2007.04.013
2. Ducharme J, Tanabe P, Homel P, Miner JR, Chang AK, Lee J et al. The influence of triage systems and triage scores on timeliness of ED analgesic administration. Am J Emerg Med. 2008;26(8):867–73. https://doi.org/10.1016/j.ajem.2007.11.020
3. National Database of Nursing Quality Indicators. The journey to improve pain quality in NDNQI hospitals. Nurs Qual News. 2012;13(3):5–8.
4. Pierik JG, MJ IJ, Gaakeer MI, Berben SA, van Eenennaam FL, van Vugt AB et al. Pain management in the emergency chain: the use and effectiveness of pain management in patients with acute musculoskeletal pain. Pain Med. 2015;16(5):970–84. https://doi.org/10.1111/pme.12668
5. Stalnikowicz R, Mahamid R, Kaspi S, Brezis M. Undertreatment of acute pain in the emergency department: a challenge. Int J Qual Health Care. 2005;17(2):173–6. https://doi.org/10.1093/intqhc/mzi022
6. Tcherny-Lessenot S, Karwowski-Soulie F, Lamarche-Vadel A, Ginsburg C, Brunet F, Vidal-Trecan G. Management and relief of pain in an emergency department from the adult patients' perspective. J Pain Symptom Manag. 2003;25(6):539–46.
7. Todd KH, Ducharme J, Choiniere M, Crandall CS, Fosnocht DE, Homel P et al. Pain in the emergency department: results of the pain and emergency medicine initiative (PEMI) multicenter study. J Pain. 2007;8(6):460–6. https://doi.org/10.1016/j.jpain.2006.12.005
8. Centers for Disease Control and Prevention (CDC) CDC grand rounds: prescription drug overdoses - a U.S. epidemic. MMWR Morb Mortal Wkly Rep. 2012;61(1):10–3.
9. Mazer-Amirshahi M, Mullins PM, Rasooly I, van den Anker J, Pines JM. Rising opioid prescribing in adult U.S. emergency department visits: 2001–2010. Acad Emerg Med. 2014;21(3):236–43. https://doi.org/10.1111/acem.12328
10. Motov S, Strayer R, Hayes BD, Reiter M, Rosenbaum S, Richman M et al. The treatment of acute pain in the emergency department: a white paper position statement prepared for the american academy of emergency medicine. J Emerg Med. 2018;54(5):731–6. https://doi.org/10.1016/j.jemermed.2018.01.020
11. Morone NE, Weiner DK. Pain as the fifth vital sign: exposing the vital need for pain education. Clin Ther. 2013;35(11):1728–32. https://doi.org/10.1016/j.clinthera.2013.10.001
12. Motov SM, Nelson LS. Advanced concepts and controversies in emergency department pain management. Anesthesiol Clin. 2016;34(2):271–85. https://doi.org/10.1016/j.anclin.2016.01.006
13. Holbrook TL, Galarneau MR, Dye JL, Quinn K, Dougherty AL. Morphine use after combat injury in Iraq and post-traumatic stress disorder. N Engl J Med. 2010;362(2):110–7. https://doi.org/10.1056/NEJMoa0903326
14. Platts-Mills TF, Flannigan SA, Bortsov AV, Smith S, Domeier RM, Swor RA et al. Persistent pain among older adults discharged home from the emergency department after motor vehicle crash: a prospective cohort study. Ann Emerg Med. 2016;67(2):166–76 e1. https://doi.org/10.1016/j.annemergmed.2015.05.003
15. Ducharme J. Acute pain and pain control: state of the art. Ann Emerg Med. 2000;35(6):592–603.
16. Rifat S. Rehmani. Pain practices in a Saudi emergency department. Saudi Med J. 2010;31(5):539–44.
17. Mohammed N. Knowledge and attitudes of pain management by nurses in Saudi Arabian emergency departments : a mixed methods investigation. Doctoral dissertation. Sydney, Australia: University of Western Sydney; 2012. Available from: https://researchdirect.westernsydney.edu.au/islandora/object/uws:34184.
18. DeLaney MC, Page DB, Kunstadt EB, Ragan M, Rodgers J, Wang HE. Inability of physicians and nurses to predict

patient satisfaction in the emergency department. West J Emerg Med. 2015;16(7):1088–93. https://doi.org/10.5811/westjem.2015.9.28177

19. Smith RJ, Rhodes K, Paciotti B, Kelly S, Perrone J, Meisel ZF. Patient perspectives of acute pain management in the era of the opioid epidemic. Ann Emerg Med. 2015;66(3):246–52 e1. https://doi.org/10.1016/j.annemergmed.2015.03.025
20. Welch SJ. Twenty years of patient satisfaction research applied to the emergency department: a qualitative review. Am J Med Qual. 2010;25(1):64–72. https://doi.org/10.1177/1062860609352536
21. Gordon DB, Pellino TA, Miaskowski C, McNeill JA, Paice JA, Laferriere D et al. A 10-year review of quality improvement monitoring in pain management: recommendations for standardized outcome measures. Pain Manag Nurs. 2002;3(4):116–30. https://doi.org/10.1053/jpmn.2002.127570
22. Hanna MN, Gonzalez-Fernandez M, Barrett AD, Williams KA, Pronovost P. Does patient perception of pain control affect patient satisfaction across surgical units in a tertiary teaching hospital? Am J Med Qual. 2012;27(5):411–6. https://doi.org/10.1177/1062860611427769
23. Fallon E, Fung S, Rubal-Peace G, Patanwala AE. Predictors of patient satisfaction with pain management in the emergency department. Adv Emerg Nurs J. 2016;38(2):115–22. https://doi.org/10.1097/tme.0000000000000096
24. Downey LV, Zun LS. Pain management in the emergency department and its relationship to patient satisfaction. J Emerg Trauma Shock. 2010;3(4):326–30. https://doi.org/10.4103/0974-2700.70749
25. HCAHPS. (2015). Hospital consumer assessment of healthcare providers and systems. Baltimore, MD: Centers for Medicare & Medicaid Services. Available from: http://www.hcahpsonline.org
26. Graudins A, Meek R, Parkinson J, Egerton-Warburton D, Meyer A. A randomised controlled trial of paracetamol and ibuprofen with or without codeine or oxycodone as initial analgesia for adults with moderate pain from limb injury. Emerg Med Australas. 2016;28(6):666–72. https://doi.org/10.1111/1742-6723.12672
27. Brown T, Shetty A, Zhao DF, Harvey N, Yu T, Murphy M. Association between pain control and patient satisfaction outcomes in the emergency department setting. Emerg Med Australas. 2018;30(4):523–9. https://doi.org/10.1111/1742-6723.12945
28. Sun BC, Adams J, Orav EJ, Rucker DW, Brennan TA, Burstin HR. Determinants of patient satisfaction and willingness to return with emergency care. Ann Emerg Med. 2000;35(5):426–34.
29. Guarisco J, Salup A. Reducing opioid prescribing rates in emergency medicine. Ochsner J. 2018;18(1):42–5.
30. Duncan RW, Smith KL, Maguire M, Stader DE, 3rd. Alternatives to opioids for pain management in the emergency department decreases opioid usage and maintains patient satisfaction. Am J Emerg Med. 2019;37(1):38–44. https://doi.org/10.1016/j.ajem.2018.04.043
31. Schwartz TM, Tai M, Babu KM, Merchant RC. Lack of association between Press Ganey emergency department patient satisfaction scores and emergency department administration of analgesic medications. Ann Emerg Med. 2014;64(5):469–81. https://doi.org/10.1016/j.annemergmed.2014.02.010
32. Jones P, Dalziel SR, Lamdin R, Miles-Chan JL, Frampton C. Oral non-steroidal anti-inflammatory drugs versus other oral analgesic agents for acute soft tissue injury. Cochrane Database Syst Rev. 2015(7):CD007789. https://doi.org/10.1002/14651858.CD007789.pub2
33. Gong J, Colligan M, Kirkpatrick C, Jones P. Oral paracetamol versus combination oral analgesics for acute musculoskeletal injuries. Ann Emerg Med. 2019;74(4):521–9. https://doi.org/10.1016/j.annemergmed.2019.05.030