Original Article

Exploratory Study of Patient Perceptions of Pain Management in Emergency Department

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Abstract

Background: For many patients, acute pain is a common reason for seeking treatment in the emergency department. Patients' perceptions of pain management have become an important criterion for quality in healthcare. Inadequate pain management in emergeny departments is still problematic. Challenges of pain management are related to lack of pain management knowledge, and emergency department crowding.
Aim: The present study describes and explains patients' perceptions of acute pain management in Emergency Department.
Methodology: Explanatory, descriptive study design was used. Data were collected using a newly developed and tested questionnaire completed by 114 voluntary patients in one region university hospital emergency department. Descriptive statistics, reliability analysis, nonparametric tests, and exploratory factor analysis were used for data analysis.
Results: Generally, patients' perception was that nurses adequately treated their acute pain. Female patients were more satisfied with pain management than male patients. However, nearly 37 % of patients reported not receiving enough information about pain medication and perceived that emergency nurses did not ask all allergy information of 26% of patients. Nearly half of the patients reported that they received too little pain medication. Non-pharmacological pain management was mostly managed with postural care and ice therapy. Patients reported that listening to music and conversations with nurses reduced their acute pain, and nurses' professionalism had a positive effect on pain management.
Conclusions: Mainly, patients were generally satisfied with the nurses' pain management; however, emergency nurses should give more information about pain medications to patients, and offer more non-pharmacological pain management. Emergency department managers should regularly guarantee pain management education for emergency nurses.

Keywords: emergency department, patient, acute pain, pain management

Introduction

Pain is a subjective experience that is influenced by gender, cultural, and personal parameters (Michaelides & Zis, 2019). Acute pain exists mostly due to trauma, acute medical conditions or management; opposed to chronic pain, which lasts for at least three months (Michaelides & Zis, 2019). Pain management is a vital component of patient care, especially in the emergency department (ED). Pain is the most common reason for which patients present to the ED (Hachimi-Idrissi et al., 2020).

Despite the prevalence of acute pain, it is still often under-acknowledged, (Hachimi-Idrissi et al., 2020) and under-assessed (Pretorius, Searle & Marshal, 2016; Hadorn et al., 2016). Previous studies have shown that challenges in acute pain management are related to difficulties in pain assessment, knowledge deficits of the clinician, and high workload ED environment (Sampson, Fiona C., O'Cathain & Goodacre, 2020). Patients may wait for long periods of time to receive pain assessment, and analgesia is often reported as inadequate (Patrick et al., 2015). Inadequate interventions for acute pain have led to immediate and delayed negative consequences for ED patients. Therefore, appropriate pain management is a major indicator of the quality of pain care and patient satisfaction, regardless of healthcare setting (Brant et al., 2017). Most studies on patients' pain management in the ED, however, have been based on isolated measurements of pain rather than comprehensive measures of patient satisfaction upon ED discharge (Bhakta & Marco, 2013; Göransson et al., 2015).

The research questions were as follows: how are patients' pain managed in the ED? and how are the patients' background variables related to the management of their acute pain?

Background: Effective pain management is associated with improved patient satisfaction among ED patients. Satisfaction with pain management has been associated with effective communication between ED staff and patient (Bhakta & Marco, 2013). According to previous studies, patients have the right to be involved in all aspects of their pain management (Thorson et al., 2014; American College of Emergency Physicians, 2017; Ramia et al., 2017; European Society for Emergency Medicine, 2020).

There are a wide range of pharmacological and non-pharmacological pain management interventions available for use in the ED (Savoia et al., 2015). Pharmacological pain management interventions including both opioid and non-opioid medications and options with different routes of administration. Non-pharmacological interventions, such as cold and heat therapy, and positioning has been used in EDs (European Society for Emergency Medicine, 2020). Guidelines for the management of acute pain in emergency situations (European Society for Emergency Medicine, 2020) have been developed to improve pain management in the ED.

The current debate around of acute pain management are related to the challenges that emergency nurses face in assessing pain in the older adult population, (Gorawara-Bhat et al., 2017) lack of pain management knowledge, challenges in communication, and failure to follow guidelines. (Pretorius, Searle & Marshal, 2016; Schug, Palmer, 2016; Gorawara-Bhat et al., 2017). Studies of pain management are mainly derived from nurses' perceptions, pain management in older population, acute pediatric pain management, and postoperative pain management (Dongara et al., 2017; Drake, Williams, 2017; Mitra et al., 2018; Tyler et al., 2020). Less is known regarding patient perceptions of pain management among adult emergency patients (Friesgaard, Paltved & Nikolajsen, 2017). The aim of this study was to describe and explain patients' perceptions of acute pain management in the one university ED. In that university ED about 1500-2000 patients treated in one week and about 60 000 patients per year.

Methods:

Questionnaire development and testing; Since there were no existing questionnaires suitable for this study, an acute pain management questionnaire was developed by the authors (Table 2a and 2b). The content of this questionnaire was based on the current acute pain management literature and previous research (Göransson et al., 2015; Dowding et al., 2016; Pretorius, Searle & Marshal, 2016). The questionnaire was divided into four sections, with a total of 44 questions. The sections were: demographic, pain assessment, pain management

(pharmacological and non-pharmacological), and perceived barriers to pain management. The respondents were asked to answer each question using a five-point Likert scale. Each question ranged from 1 (strongly agree) to 5 (strongly disagree) and were supplemented with open-ended questions. The present article was based replies from the pain management section, which contained 23 multiple-choice questions, and another article focused on acute pain assessment.

Prior to the pilot study and the actual study, eight emergency nursing experts from different EDs evaluated the content validity of this questionnaire. These nurses reviewed the questionnaire and provided feedback on its readability, structure, and functionality using a pre-made evaluation form (Polit, Beck & Owen, 2007). The evaluations were calculated using the full-form reliability index S-CVI/Ave, (Polit, Beck & Owen, 2007) which yielded a reliability value 0.82 (Polit, Beck & Owen, 2007). Feedback was positive, with no changes being required.

In the pilot study, 10 patients had the opportunity to provide their opinions regarding the clarity and comprehensiveness of the questionnaire, it which was conducted within the ED prior to the actual study (Polit, Beck & Owen, 2007). Based on the pilot study, there was no need for modifications and the actual study was conducted using the same questionnaire. As no changes were made to the form, the results of the pilot study were also included in the analysis of the results.

Data collection: This descriptive and explanatory study was comprised of patients with acute pain (n = 114) who entered an ED. Data was collected from September – November 2020 by paper questionnaire. The participants were informed verbally, and with written information.

Inclusion criteria for patients included: (1) aged > 18 years, (2) presence of acute pain, (3) self-reported pain score of 1 or higher on a scale of 1–10, (4) Glasgow Coma Scale (GCS) <15, (5) cognitive ability not severely impaired due to drug use, (6) no diagnosed memory disease, (7) ability to understand and speak Finnish language, and (8) ability to give consent to participate.

Data analysis: The sample size was defined by using Power Analysis to determine the smallest sample size suitable for detecting the expected effect size of 0.3. The level of statistical significance *P* value was set at 0.05 and effect size of 80%, which indicated a sample size of 71 participants (Burns & Grove, 2009). In total, 114 patients responded to the survey. The data were analysed through descriptive analysis, non-parametric tests (Kruskal-Wallis and Mann-Whitney U tests), comparative statistics and exploratory factor analysis (EFA). The level of significance was set at $P \leq 0.05$ (Burns & Grove, 2009). The background variables, respondents' ages and acute pain in current time, were reclassified in the analysis phase.

EFA was used to analyse the theoretical structure of variables measuring pain management. Based on the eigenvalue higher than one, the factor analysis resulted total of four factors. The cut-off points for removing a variable from a factor was specificity $r < 0.3$ (Field, 2017). According to the EFA, there were 23 observed pain variables constructed into four factors (later: mean sum variables): 'pharmacological pain management' (three items), 'non-pharmacological pain management' (six items), challenges in acute pain management' (five items) and, 'patients' perceptions of professional competence' (five items).

Reliability of the mean sum variables was tested, and calculated Cronbach's alpha coefficients ranged between 0.72–0.86. From the original items (N=23) one mean sum variable (four questions) was omitted because the Cronbach's alpha coefficients was 0.467 and showed weak correlations (Burns, Grove, 2009). The omitted questions were considered separately in the result analysis. Normal distribution of the mean sum variables was tested using the Kolmogorov-Smirnov test, and they did not follow normal distributions. The Mann-Whitney U (U-test) and Kruskal-Wallis (H-test) tests were used to detect differences between the background characteristics and mean sum variables. The level of significance was set at $P \leq 0.05$ (Field, 2017). The data were analysed using IBM SPSS® version 25.00 for Windows (IBM).

Ethical considerations : The study was granted ethical approval by the University Hospital Ethical Board (an institutional review board, IRB) in 2020 (permission no. HUS/1056/2020). Participation was voluntary and based on respondents' anonymity and informed consent. Participants were assured of their confidential participation and guaranteed that all data collected in this study would be pseudonymised and the results would not be associated with any participating individuals (General Data Protection

Regulation, 2016; Finnish National Board on Research Integrity, TENK., 2021). The study was conducted according to the Declaration of Helsinki (Declaration of Helsinki, 2018).

Results

Patient characteristics: The study involved 114 ED patients. Most of these participants were women (n = 67, 59%) and the mean age of the patients was 40.8 years. The majority of the participants (n = 43, 47 %) were married, with most having achieved a master's degree (n = 39, 34%) as their educational qualification. In addition, more than half (n = 60, 52%) of the participants were employees in their working life. The average score based on the NRS to assess the intensity of pain perceived by the patients was 5.46 [SD = 1.9]. None of the patients had long-term painful illnesses (Table 1).

Patients' perceptions the effect of pharmacological pain management : A vast majority 86% (n = 99) of patients reported that they received pain management timely. Nearly 63% (n = 71) reported that they received enough information about the administered pain medication. Over half (n = 66, 54%) of the patients reported that pain medicine should be received when pain was mild, and more than half (n = 75, 66%) reported that pain medicine should be received when moderate pain was present. Most of the patients (n = 96, 84%) reported that pain medicine should be received when pain was severe (Table 2a).

Over half (n = 64, 55%) of the patients reported that they had symptoms before a new medication dose. Furthermore, 65% (n= 72) of the patients reported that taking strong medications is not meaningful. Nearly half (n= 54, 48%) of the patients reported that they received too little pain medication (Table 2a).

Patients' perceptions of non-pharmacological pain management interventions and challenges in acute pain management: Nearly 64% (n = 73) of the patients stated that sitting reduced their acute pain. The majority of the ED patients (n = 83, 73%) reported that lying down reduced their acute pain. Over 65% (n = 73) of the ED patients reported that postural care reduced their acute pain. Over half (n = 61, 58%) of the patients reported that their pain was managed with ice therapy. Nearly 52% (n = 55) of patients reported that heat packs reduced their pain. The majority of ED patients (n = 77, 73%) reported that conversations with nurses or doctors reduced their acute pain. (Table 2b).

Patients' perceptions of professional competence : The majority of the patients (n = 91, 80%) reported that ED nurses adequately treated their acute pain (Table 2a). Most of the patients (n = 95, 86%) were satisfied with the nurses' pain management (Table 2b). Nearly 74% (n = 83) of the patients reported that they were asked allergy information (Table 2a). The majority of the patients (n= 100, 88%) reported that ED nurse professionalism had a positive effect on pain assessment and treatment (Table 2a, Table 2b).

Relationship between background and pain variables: One of the sum variables was 'pharmacological pain management'. Patient' gender had a statistically significant relationship with the 'pharmacological pain management' variable (U -test, $P = 0.011$). Women were more satisfied with pharmacological pain management than men. Also, situation in working life had a statistically significant relationship with the pharmacological pain management. Those patients who were employed were more satisfied with pharmacological pain management than those participants who were in different positions in working life. Age (H- test, $P = 0.5$), marital status (H- test, $P = 0.5$), education level (H- test, $P = 0.6$), or acute pain in current time (based on NRS scores) (H- test, $P = 0.5$) were not statistically significant with pharmacological pain management (Table 3).

One of the sum variables was 'non-pharmacological pain interventions'. Neither age (H- test, $P = 0.8$), gender (U- test, $P = 0.9$), marital status (H- test, $P = 0.4$), education level (H- test, $P = 0.6$), situation in working life (H- test, $P = 0.4$), nor acute pain in current time based on (NRS scores) (H- test, $P = 0.3$) were not statistically significantly related to non-pharmacological pain interventions (Table 3).

Another sum variable was 'challenges in acute pain management'. Neither age (H- test, $P = 0.4$), gender (U- test, $P = 0.4$), marital status (H- test, $P = 0.5$), education level (H- test, $P = 0.6$), situation in working life (H- test, $P = 0.3$), nor acute pain in current time based on NRS scores (H- test, $P = 0.2$) were not statistically significantly related to the challenges in acute pain management (Table 3).

The final sum variables was 'professional competence'. Neither age (H- test, $P = 0.8$),

marital status (H- test, P = 0.8), education level (H- test, P = 0.8), situation in working life (H- test, P = 0.9), nor acute pain in current time based on NRS scores (H- test, P = 0.4) were not statistically significantly related to the professional competence (Table 3). There were, however, clinically significant differences between gender (U- test, P = 0.06) and the sum variable 'professional competence'.

Table 1. Sociodemographic characteristics of patients (n = 114, n, %)

Characteristics		n	%
Gender	Female	67	59
	Male	47	41
Age (years) (mean 40.8)	Under 24	19	17
	25–39	38	33
	40–58	41	36
	59 and older	16	14
Marital status	Married	53	47
	Cohabitation	33	28
	Unmarried	15	13
	Divorced	10	9
	Widow	3	3
Educational level	Master's	39	34
	Vocational	34	30
	Comprehensive school	18	16
	College	14	12
	Bachelor's	9	8
Working life situation	Employee	60	53
	Lower officer	13	11
	Pensioner	12	11
	Student	10	9
	Senior officer	8	7
	Unemployed	6	5
	Enterpreneur	5	4
Acute pain in current time (NRS 0–10) (n = 111; mean 5,46)	0–3	17	15
	4–7	80	70
	8–10	14	12
	Missing value	3	3
Long-term painful illnesses	No	110	97
	Yes	0	0
	Missing value	4	4

Abbrevations: NRS, numerical rating scale

Table 2a. Patients' perceptions of pharmacological pain management (n = 114, n, %)

Items	Strongly agree, n (%)	Partially agree, n (%)	Do not know, n (%)	Partially disagree, n (%)	Strongly disagree, n (%)	Missing value n (%)
I received pain management timely	56 (49.1)	43 (37.7)	0 (0)	7 (6.1)	2 (1.8)	6 (5.3)
The emergency department staff adequately treated my pain	56 (49.1)	35 (30.7)	2 (1.8)	13(11.4)	2 (1.8)	6 (5.3)
I received enough information about pain medication	36 (31.6)	35 (30.7)	6(5.3)	25 (21.9)	4 (3.5)	8 (7.0)
Pain medication should be given when pain is mild	22 (19.3)	40 (35.1)	6 (5.3)	24 (21.1)	9 (7.9)	13 (11.4)
Pain medication should be given when pain is moderate	31 (27.2)	44 (38.6)	7 (6.1)	21 (18.4)	4 (3.5)	7 (6.1)
Pain medication should be given when pain is severe	54 (47.4)	42 (36.8)	1 (0.9)	10 (8.8)	1 (0.9)	6 (5.3)
Pain medication should be given when pain returns	49 (43.0)	47 (41.2)	4 (3.5)	6 (5.3)	1 (0.9)	7 (6.1)
I was feeling sick before I received a new dose of analgesic	21 (18.4)	43 (37.7)	7 (6.1)	18 (15.8)	10 (8.8)	15 (13.2)
Taking strong medicine is not meaningful	32 (28.1)	40 (35.1)	9 (7.9)	13 (11.4)	17 (14.9)	3 (2.6)
I was given too much pain medicine	15 (13.2)	39 (34.2)	3(2.6)	21 (18.4)	35 (30.7)	1 (0.9)
I was given too little pain medicine	24 (21.1)	30 (26.3)	8 (7.0)	16 (14.0)	35 (30.7)	1 (0.9)
I was asked allergy information	47 (41.2)	36 (31.6)	3 (2.6)	17 (14.9)	9 (7.9)	2 (1.8)

Note: Range: 1= fully agree, 5 = fully disagree

Table 2 b. Patients' perceptions of non-pharmacological pain interventions (N = 114, n, %)

Items:	Strongly agree n (%)	Partially agree, n (%)	Do not know, n (%)	Partially disagree, n (%)	Strongly disagree, n (%)	Missing value, n (%)
Sitting reduced my pain	40 (35.1)	33 (28.9)	1 (0.9)	25 (21.9)	11 (9.6)	4 (3.5)
Lying down reduced my pain	34 (29.8)	49 (43.0)	3 (2.6)	14 (12.3)	9 (7.9)	5 (4.4)
Postural changes relieved my pain	36 (31.6)	37 (32.5)	4(3.5)	18 (15.8)	13 (11.4)	6 (5.3)
Cold treatment relieved my pain	25 (21.9)	30 (26.3)	27 (23.7)	14 (12.3)	9 (7.9)	9 (7.9)
Heat treatment relieved my pain	25 (21.9)	30 (26.3)	27 (23.7)	14 (12.3)	9 (7.9)	9 (7.9)
Conversation with a nurse or doctor relieved my pain	28 (24.6)	49 (43.0)	11 (9.6)	13 (11.4)	5 (4.4)	8 (7.0)
The presence of relatives affected my pain	12 (10.5)	36 (31.6)	29 (25.4)	14 (12.3)	7 (6.1)	16 (14.0)
Listening to music affected my pain	26 (22.8)	37 (32.5)	21 (18.4)	15 (13.2)	10 (8.8)	5 (4.4)
I am satisfied with the treatment of pain, which I received in an emergency department	48 (42.1)	47 (41.2)	9 (7.9)	0 (0.0)	7 (6.1)	3 (2.6)
I have the right to expect complete painlessness because of treatment	20 (17.5)	55 (48.2)	9 (7.9)	28 (24.6)	1 (0.9)	1 (0.9)
Nurses' professionalism had a positive effect on pain assessment and treatment	58 (50.9)	42 (36.8)	2 (1.8)	0 (0.0)	12 (10.5)	0 (0.0)

Note: Range: 1= fully agree 5 = fully disagree

Table 3. Relationships between background variables and pain variables (H- test, Mean, U-test)

	Pharmacological pain management	Non-pharmacological pain interventions	Challenges in acute pain management	Professional competence
Age [1] (years)	0.41	0.89	0.45	0.86
Under 24 25-39 40-58 60 and older				
Gender[3]	**0.01****	0.93	0.37	**0.06***
Women	**2.2**[2]			1.7[2]
Men	**2.7**[2]			2.1[2]
Marital status[1]	0.54	0.48	0.45	0.75
Educational level[1]	0.64	0.58	0.59	0.80
Situation in working life[1]	**0.04****	0.50	0.38	0.93
Employee	1.3[2]			
Lower officer	2.5[2]			
Pensioner	2.8[2]			
Student	2.5[2]			
Senior officer	1.8[2]			
Unemployed	2.8[2]			
Entrepreneur	1.9[2]			
Acute pain in [1]current time	0.10	0.60	0.10	0.06*

Range: 1= fully agree 5 = fully disagree, * *P* -value < 0.1, ** *P* -value < 0.05, considered significant and bolded.

Kruskal-Wallis test, [2] mean, [3] Mann- Whitney U -test

Discussion

This study addresses patients' perceptions of acute pain management in the ED. Pharmacological interventions are essential for the management of pain in the ED, however non-pharmacological treatments should not be underestimated (European Society for Emergency Medicine, 2020). The result of this study showed that patients were mainly satisfied with the pain management provided by nurses. However, there was a lack of information provided regarding pharmacological pain management and non-pharmacological pain management. This study revealed that patients' acute pain management in the ED is not at the level it should be.

Patient' gender and situation in working life were significantly related to 'pharmacological pain management'. Women were more satisfied with pharmacological pain management than men. Those patients who were employed was the group most satisfied with pharmacological pain management. The majority of patients reported that they received timely pain management. However, the finding that patients did not received enough information about pain medication is consistent with a previous study concerning pharmacological pain management (Pierik et al., 2015). For this reason, ED leaders should assess pain management education for emergency nurses and focus the education on pharmacological pain management. However, according to standard acute pain management guidelines, for some patients, too much detailed information may increase anxiety and uncertainty, so it is important that the sharing of information is

regulated to the individual patient's coping strategy (Schug et al., 2016).

In this study, over half of the patients reported that pain medication should have when received when pain was mild or moderate, and most of the patients reported that need for pain medication when pain is severe or returns. In previous studies, although patients had evaluated their pain as moderate to severe, only a small number of patients were given analgesics (Dale & Bjornsen, 2015, Mura et al., 2017). A previous study has also shown that opioids are often recommended for moderate - to- severe pain, and the rate of administration is high (Chang et al., 2018).

Over half of the patients reported they had symptoms before a new medication dose was administered. Furthermore, in this study, it is notable that a relatively high percentage of patients reported that taking strong medications is not meaningful. Previous studies have also shown that patients do not always desire opioids while in pain, and this might have an impact on patients' acute pain management (Pierik et al., 2015). If necessary, and if patient declines analgesics, ED nurses should ensure that refusal is made after the patient has had the opportunity to comprehend the possible consequences (Pierik et al., 2016). An additional result of this study includes that, nearly half of the patients reported that they received too little pain medication. Similar to, previous studies, only 42–60% of all patients received analgesia (Berben et al., 2011; Simpson et al., 2013). These results indicate that patients' pharmacological pain management appears to be under-treated.

In this study, non-pharmacological pain management was partly provided to the ED patients. The results of this study showed that most ED patients reported that sitting and lying down reduced their acute pain. Over half of the ED patients reported that postural care reduced their acute pain. According to acute pain guidelines, mobilization should be started early following trauma to avoid long-term stiffness (Fusaro et al., 2014; Hachimi-Idrissi et al., 2020). An additional finding was that over half of the patients reported that was managed with ice therapy. This is consistent with a previous study in which most patients received cold packs; which reduces inflammation or compression for non-pharmacological pain management (Pierik et al., 2015). Half of the study participants reported that heat packs reduced their acute pain. There is limited evidence regarding the use of heat packs in acute pain management; however, some evidence exists supporting the use of heat for short-term reduction of pain in patients with acute low back pain (Fallon et al., 2016). Further studies are warranted due to the lack evidence regarding patients' perceptions of non-pharmacological pain management in the ED.

As a result of this study, the majority of ED patients reported that conversations with a nurse or doctor reduced their acute pain. This is consistent with a previous study which has shown that ED nurse or doctors' helpfulness were associated with better patient satisfaction in regards to pain management (Fallon et al., 2016). These results indicate that ED nurses and doctors should understand the importance of communication and patient satisfaction.

Previous studies have shown that music may reduce pain in acute care settings, and it is often due to its role in the relaxation process, but less is known about its effectiveness in EDs. In our study, approximately 58% of the patients reported that listening to music ameliorated their acute pain. These results are in consistent with previous studies that tested the effect of music on pain in an adult intensive care unit and postoperative units (Lim, Yobas & Chen, 2014; Nelson, Adamek & Kleiber, 2017; Richard-Lalonde et al., 2020; Sandvik et al., 2020). These results indicate that EDs should further research the effectiveness of music in acute pain patients.

In this study, there were clinically significant results related to gender and 'professional competence'. Females were more satisfied with nurses' professional competence than males. According to this study, most of the patients reported that ED nurses adequately treated their acute pain. A previous study revealed that if patients received enough analgesics, they were more satisfied with acute pain management (Fallon et al., 2016). This study provided optimistic data suggesting that patients were pleased with the pain management provided by nurses, which is not consistent with previous studies reporting under-treatment of pain patients. Inadequate pain management in the ED remains a challenge and there have been marginal reports of how pain management process can be improved in EDs (Sampson, F., Goodacre & O`Cathain, 2019; Sampson, F., O´Cathain & Goodacre, 2020). Previous research has shown that the challenges of acute pain management are related to patient behaviour, nurses' lack of knowledge

and time (Hadorn et al., 2016; Pretorius, Searle & Marshal, 2016; Mura et al., 2017; Hachimi-Idrissi et al., 2020).

In this study, more than 26% of patients reported that ED nurses did not asked about allergy information. Our findings suggest that ED nurses should pay more attention to patients' pain safety and ask regarding patient allergy history. Previous studies have shown that nurses' increased knowledge about pain and better attitudes toward patients may influence overall patient satisfaction (Brant et al., 2017). This study exhibited comparable results. Evidence indicated that ED nurse professionalism had a positive effect on pain assessment and treatment.

Limitations: This study has some limitations. First, this study concentrated on pain management within ED patients' perceptions. Other clinical areas may pose different challenges for pain management. The questionnaire used was developed for this study by the authors, and it might have had lower reliability. The contents of this questionnaire were based on the current literature and previous research. The instrument was not validated nor widely used. However, eight nurses from different EDs evaluated the content validity of this questionnaire using the full-form reliability index S-CVI/Ave. The questionnaire was also pilot tested, which enhances its content validity.

Conclusion: In summary, optimal pain management in the ED is necessary and humane. Overall, patients perceived that they received timely pain management and nurses adequately treated their acute pain. However, ED nurses should focus more on patients' provision of information regarding pain medications and offer more non-pharmacological pain management. Our study show that the undertreatment of pain in the ED is still a problem in need of solutions. Supplemental education in acute pain management is required for ED nurses. Further research is needed to investigate the organisational culture to determine reasons for the lack of non-pharmacological pain management in EDs.

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