

Cross-sectional study: healthcare professionals' perspective on pediatric pain assessment and management

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Abstract

Introduction and Objectives: Pain is recognized as the fifth vital sign. Although guidelines on pain have increased greatly, two thirds of hospitalized children report experiencing uncontrolled pain. Our goal was to evaluate the knowledge of a pediatric healthcare team on pain assessment/management in all pediatric sectors. **Methods:** Cross-sectional study among doctors and nurses of all pediatric departments in a secondary hospital, July 2022. Statistical significance was analyzed concerning "career type" and "years of experience". Statistically significant p values were < 0.05. **Results:** A total of 81 out of 122 (66%) professionals answered (42% doctors; 58% nurses). Of these, 48% worked in the emergency department and 24% in intensive care. The median score was 12 out of 14 (86%) questions on a survey. Questions with lower scores concerned opioids. A total of 77% reported using pain assessment scales "often/always": 75% named the appropriate scale for children aged four to six/over six, but only 44% could identify that for children under four years of age. Nurses use scales more frequently ($p < 0.05$). One third of those surveyed believed pain was only "sometimes" well treated. Three quarters used non-pharmacological interventions regularly, especially nurses ($p = 0.01$). Participants were highly confident using morphine (78%), fentanyl (69%), and ketamine (63%). Experienced doctors were more confident ($p = 0.001$). The most commonly chosen for mild, moderate, and severe pain were paracetamol/ibuprofen, ketorolac/tramadol, and fentanyl/ketamine, respectively, in accordance with current guidelines. **Discussion:** Theoretical knowledge was satisfactory; however, opioid training must be prioritized. There is a lack of experience with the application of scales for evaluating pain in children under four years of age. High levels of experience were noted in sedoanalgesia. Constant training is needed to guarantee professionals are highly experienced and to ensure the best treatment and care.

Keywords: Pediatric pain. Sedoanalgesia. Pain assessment. Pain awareness. Professionals' perspective. Hospital survey.

Estudo transversal: perspectiva dos profissionais de saúde sobre a avaliação e o manejo da dor pediátrica

Resumo

Introdução e Objetivos: A dor é o quinto sinal vital. Embora a evidência em abordagem da dor tenha aumentado, 2/3 das crianças hospitalizadas refere dor não controlada. Pretendemos avaliar o conhecimento e experiência dos profissionais na abordagem/tratamento da dor pediátrica nos vários departamentos. **Métodos:** Estudo transversal, incluindo médicos e

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enfermeiros de todos os departamentos de pediatria, num hospital secundário (julho de 2022). Análise estatística com foco na “profissão” ou “anos de experiência”. P *value* estatisticamente significativo < 0,05. **Resultados:** 81/122 (66%) profissionais participaram (42% médicos; 58% enfermeiros). 48% trabalham em urgência e 24% em cuidados intensivos. Num questionário teórico, a mediana de resultados foi 12 em 14 (86%) questões. Questões sobre opióides obtiveram resultados inferiores. 77% referiram usar escalas de dor “frequentemente/sempre”: 75% assinalou a correta para crianças com idades de “4-6”/ “> 6” e 44% para “< 4” anos. Enfermeiros usam escalas mais frequentemente ($p < 0,05$). Um terço dos inquiridos considerou que a dor era “às vezes” tratada. 3/4 utiliza medidas não farmacológicas, maioritariamente enfermeiros ($p = 0,01$). Os participantes mostraram-se confiantes na utilização de morfina (78%), fentanil (69%) e cetamina (63%). Médicos seniores referiram maior confiança ($p = 0,001$). Os fármacos escolhidos para tratamento da dor ligeira, moderada e grave foram, respetivamente: paracetamol/ibuprofeno; cetorolac/tramadol; fentanil/cetamina – de acordo com a literatura recente. **Discussão:** O conhecimento teórico revelou-se satisfatório, sendo necessário desmistificar o receio dos opióides. Observou-se menos conhecimento na utilização de escalas para avaliação da dor em idades < 4 anos. Observou-se elevada confiança em sedoanalgesia. O treino constante dos profissionais é essencial para garantir melhor reconhecimento e tratamento da dor.

Palavras-chave: Dor pediátrica. Sedoanalgesia. Reconhecimento da dor. Alerta/sensibilização para a dor pediátrica. Perspetiva dos profissionais. Questionário hospitalar.

Keypoints

What is known

- Very few surveys have analyzed professionals' perspectives and current practices in pediatric pain management, often excluding doctors.
- Despite training in objective pain assessment, it is unclear if methods chosen by professionals are age-appropriate in practice.
- Pediatric pain evidence is advancing rapidly, yet it remains uncertain whether current practices and knowledge adequately reflect this progress.

What is added

- Building on nurses' practices, doctors should enhance care by integrating non-pharmacological interventions and consistently applying pain assessment scales.
- Professionals demonstrate high confidence in sedoanalgesia management, likely reflecting the team's commitment to regular training and staying current.
- Analgesia choices for each pain level align with literature; prioritizing training in pain assessment and safe opioid management remains essential.

Background

Pain is defined as an unpleasant sensory and emotional experience associated with potential tissue damage¹. It is one of the most common complaints reported by hospitalized patients and one of the main reasons for seeking medical help². It has been recognized as the fifth vital sign for almost 30 years³, and an increasing volume of scientific research on its routine assessment has been published¹.

Pain is a subjective symptom and must be identified, localized, quantified, and reassessed⁴⁻⁶. Children's pain is often not recognized^{6,7}, although it is known to have harmful physiological effects, including in newborns' brain development^{8,9}. The inability to communicate verbally may exclude children from appropriate pain-relieving treatment, especially infants, neonates, and children with cognitive impairment^{4,6,9,10}. Although there is no universal tool, there are several pain assessment scales which consider children's particularities and must be used accordingly^{6,11,12}. Therefore, children often depend on well-trained care-providing teams to

make an accurate pain evaluation and to decide on the appropriate interventions¹²⁻¹⁵.

Pain can be a symptom but also a consequence of medical procedures. Preventing and monitoring pain is crucial, mainly in emergency departments and intensive care units^{13,16,17}. Several protocols and guidelines have been published nationally and internationally^{5,16-23}. It is known that an integrated approach using both pharmacological and non-pharmacological interventions increases the effectiveness of pain relief. This is displayed in current protocols of sedoanalgesia, including those for urgent procedures^{5,13,16,17,22,23}.

Assessment of health professionals' awareness of patients' pain has exposed serious discrepancies in practitioners' training and clinical practices^{9,15,24}. Moreover, two thirds of hospitalized children still report uncontrolled pain at some point in their admission²⁵⁻²⁷. Although only a few enquiries have been carried out to analyze professionals' perspectives and current practices, they have shown that there are gaps in clinical knowledge and that protocols are not always followed. Since, after educational interventions, changes were

observed in both doctors' and nurses' practices, more research and investment into formal training shall be provided^{1,9,24}.

Fifteen years ago, a small survey was conducted in our department to promote awareness of pain and its management in pediatrics and the need for training (*data not published*). The main goal of the present study is to evaluate the current theoretical knowledge and practical experience in pain assessment and treatment of doctors and nurses working in a pediatric department of a level II hospital. It is our aim to assess the professionals' level of expertise in non-pharmacological and pharmacological interventions in sedoanalgesia, as well as their perspectives on the current pain management approach in their departments.

Material and methods

Study population

Cross-sectional study among doctors and nurses working in the pediatric department of a secondary hospital, in July 2022, including the inpatient ward (IW), emergency department (ED), outpatient clinic (OC), and neonatal and pediatric intensive care unit (NPICU).

Data collection

A survey was developed and divided into the following fields: "demographic and professional data"; "theoretical knowledge evaluation: myths on pain management in children"; "pain assessment and evaluation"; "non-pharmacological interventions"; and "pharmacological interventions and sedoanalgesia". The survey included 14 closed questions (one true or false, seven multiple-choice, and six ranking questions), and three open-ended questions. It was filled in voluntarily and anonymously by all participants.

Statistical analysis

Descriptive analysis was carried out. Data from the six ranking questions was presented using five-point Likert scale charts (Figs. 1 and 3). A chi-square test, Fisher's exact probability test, and T-test were used to study relationships between independent variables while Mann-Whitney and Kruskal-Wallis tests analyzed dependent variables. If samples had a dimension higher than 30, a normal distribution was accepted according to the central limit theorem. Homogeneity of variances was analyzed with Levene's test.

The statistical significance was analyzed concerning the type of career (doctors versus nurses) and several variables: scores achieved in the theoretical knowledge evaluation; number of non-pharmacological interventions mentioned (student's t-distribution); perspective on pain recognition and treatment in their department; levels of confidence using sedoanalgesia drugs (Mann-Whitney U test); choice of method to evaluate pain; and practices concerning a eutectic mixture of local anesthetics - lidocaine/prilocaine (EMLA®) (chi-square test, Fisher's exact probability test). The same variables were also studied regarding the years of experience of both doctors and nurses, separately: scores achieved in the theoretical knowledge evaluation; perspective on pain recognition and treatment in the department; number of non-pharmacological interventions mentioned; levels of confidence managing sedoanalgesia drugs (Kruskal Wallis tests and Mann-Whitney U test); choice of method to evaluate pain; and EMLA® practices (chi-square test, Fisher's test). P values of < 0.05 were considered statistically significant.

All the analysis was done using the *Statistical Package for the Social Sciences* (SPSS) 28®.

Study definitions

Pain assessment scales: valid tools recognized to be effective in assessing acute pain. All share a common numeric scale relying on the clinical observation of a child (physiological and behavior scales) or on children's self-report, according to age and cognitive development¹¹.

Non-pharmacological interventions: actions used as a complement to analgesic drugs to reduce pain perception and anxiety associated with painful procedures¹⁷⁻¹⁹.

Pharmacological interventions: analgesics that can be administered in mild, moderate, or severe pain.

Sedoanalgesia: integration of both analgesics and sedatives to achieve a reduction in severe pain and a decrease in the level of consciousness and perception, maintaining stable vital signs and a patent airway¹⁷⁻¹⁹.

Results

Demographic data and professional experience

Eighty-one (81/122; 66%) answers were obtained anonymously from doctors and nurses of a pediatric department in a secondary hospital. Among them, 42%

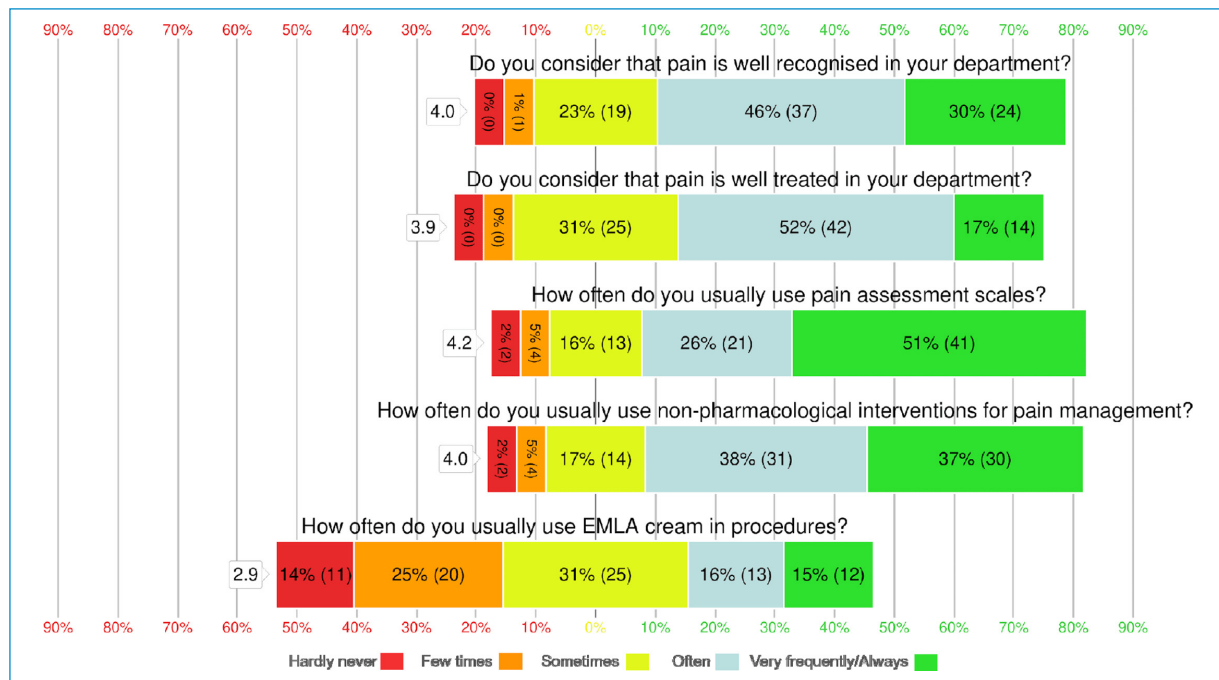


Figure 1. Healthcare workers' perspective on pediatric pain recognition, assessment, and management in day-to-day routines. Five-point Likert scale (1: Hardly ever; 2: Rarely; 3: Sometimes; 4: Often; 5: Very frequently/Always) chart showing the opinion of healthcare workers on the effectiveness of pain recognition and treatment in their workplace, as well as how frequently pain assessment scales are used to quantify pain, non-pharmacological interventions, and EMLA® cream in day-to-day work routines.

were doctors and 58% were nurses, with a female:male ratio of 7:1. They were distributed across several departments and most of them worked in more than one department: 48% in the ED (either as a permanent team or working ED shifts); 40% in the IW; 30% in the OC; and 24% in the NPICU. Regarding their professional experience, 44% had more than 20 years of service and a quarter had started their professional activity in the last five years. Specifically, 62% of the nurses had more than 20 years of professional experience, but 41% of the doctors were junior doctors (< 5 years) (Table 1).

Theory knowledge evaluation

The survey contained one true or false question, with 14 statements, to evaluate basic theoretical knowledge in pediatric pain management. The median of correct answers was 12 out of 14 (86%) with a minimum score of 8/14 (57%) and a maximum of 14/14 (100%). The percentages of respondents who classified each statement correctly can be seen in table 2. All participants correctly classified phrase number six as false (*"Infants feel less pain compared to adolescents"*). The sentences with the least correct answers were numbers eight, 10 and 11, all concerning the features of opioid

drugs. Among these, the statement with the lowest percentage of correct answers (54%) was number eight. (*"Fentanyl is 100 times more potent than morphine"*). Concerning the final scores, no statistical differences were found either between doctors and nurses, or across the years of professional experience ($p > 0.05$).

Pain recognition, assessment, and evaluation in children

Healthcare workers were first questioned about their perspective on the current pathway in pediatric pain management followed in their department. As seen in figure 1, 76% believed that pain was "often" or "always" well recognized and 69% believed it was "often" or "always" well treated, in their workplace. Almost one third of the surveyed professionals considered pain to be "sometimes" well treated. Tendentially, pain was therefore considered to be better recognized than treated. On statistical analysis, this tendency was predominantly observed amongst doctors, when compared to nurses, although with no statistical significance ($p > 0.05$). Among doctors, it was statistically significant that doctors with more than five years of experience considered pain to be well recognized more often than

Table 1. Demographic data and professional experience

Variables	Doctors n (%)	Nurses n (%)	Total n (%)
	34 (42%)	47 (58%)	81 (100%)
Gender			
Female	28 (82%)	43 (91%)	71 (88%)
Male	6 (18%)	4 (9%)	10 (12%)
Professional experience (years)			
< 5	14 (41%)	5 (11%)	19 (23%)
5-10	8 (23%)	3 (6%)	11 (13%)
10-20	5 (15%)	10 (21%)	15 (19%)
> 20	7 (21%)	29 (62%)	36 (44%)
Pediatric department division*			
ED	23 (68%)	16 (34%)	39 (48%)
NPICU	8 (24%)	23 (68%)	19 (24%)
OC	20 (59%)	7 (15%)	27 (33%)
IW	27 (50%)	15 (32%)	32 (40%)

*The total value is more than 81 (100%) as several worked in more than one department section.

ED: emergency department; IW: inpatient ward; NPICU: neonatal and pediatric intensive care unit; OC: outpatient clinic.

Table 2. True or false questions on theoretical knowledge and respective scores per statement

Questions	Scores (%)
1. Pain is felt with less intensity by premature infants due to their immature pain processing pathways. (F)	99
2. Pain assessment scales are useful even in emergency situations. (T)	95
3. Repeated exposure to painful procedures promotes tolerability. (F)	98
4. Drugs should be administered via the least invasive route. (T)	85
5. If analgesic medication is used, non-pharmacological interventions are not needed. (F)	98
6. Infants feel less pain compared to adolescents. (F)	100
7. Midazolam is an analgesic drug. (F)	98
8. Fentanyl is 100 times more potent than morphine. (T)	54
9. Opioids should be avoided due to the risk of drug dependence. (F)	84
10. Respiratory depression associated with morphine is a rare side effect. (T)	67
11. Neuropathic pain has a good response to opioids. (F)	58
12. EMONO is recommended for use in mild to moderate painful short procedures. (T)	91
13. Analgesics should not be taken regularly and in fixed intervals. (F)	94
14. Psychosocial and cultural factors affect the efficacy of non-pharmacological interventions. (T)	91

EMONO: 50%-50% equimolar mixture of oxygen and nitrous oxide; F: false; T: true.

junior doctors ($p = 0.015$). No statistical differences were found among nurses ($p > 0.05$).

Regarding pain assessment, 77% reported using pain assessment scales “often” or “always” in their day-to-day clinical evaluation (Fig. 1).

Focusing on different patient ages and the presence of cognitive impairment, doctors and nurses were questioned about which method they usually used to quantify pain for each category (Fig. 2).

“Clinical observation/examination” was the most commonly chosen method (74%) to evaluate pain in newborns. In the other groups, pain assessment scales were considered the preferred approach, ranging from 73% for children with cognitive impairment to 91% for children aged over six. Doctors and nurses very commonly chose more than one method, and “asking parents” was an option chosen by 46 to 59% of the respondents across all categories.

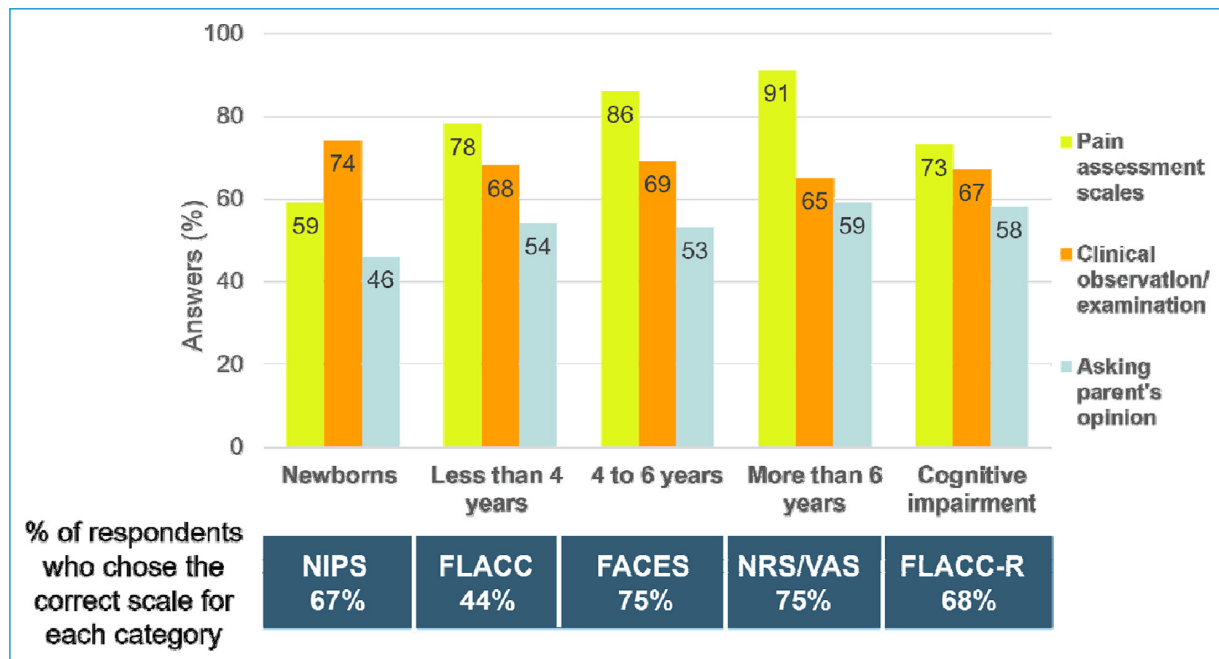


Figure 2. Methods for evaluating or quantifying pain in daily clinical practice. Healthcare workers were questioned about the method they used most in their daily routine to assess pain in children, according to their age and neurocognitive development. Below the graph, among those who chose to use pain assessment scales for each category, we analyzed how many chose the correct scale. FACES: facial clinimetric evaluation scale; FLACC: face, legs, activity, cry and consolability scale; FLACC-R: revised face, legs, activity, cry and consolability scale; NIPS: neonatal infant pain scale; NRS/VAS: numerical rating scale/visual analogic scale.

Finally, we analyzed who selected the most suitable pain assessment scale for each group, among those who stated that they used specific scales for each category. For the “children aged four to six years old” and “over six years old” sets, a correct answer for the proper scale was obtained in 75%. On the other hand, smaller percentages of correct answers were observed concerning the appropriate pain scale for “newborns” (67%) and “children aged under four years old” (44%) (Fig. 2).

Across all five categories of patients, it was statistically significant that nurses used pain assessment scales more often, while doctors relied more on clinical examination and parents’ opinions ($p < 0.05$). No differences were found between professionals with differing years of experience ($p > 0.05$).

Non-pharmacological interventions in pediatric pain management

Three quarters of the participants answered that they “often” or “always” used non-pharmacological interventions in their approach to pain (Fig. 2). In an open-ended question, overall, 24 different interventions were described by doctors and nurses and 83% wrote at

least three. The most commonly mentioned interventions were “non-nutritive and nutritive suction” (56%), “positioning and handling” (49%), “distraction” (46%), “music therapy” (40%), and “glucose 30%” (36%). It was statistically significant ($p = 0.01$) that nurses cited a higher number of interventions compared to doctors. No differences were found between years of experience ($p > 0.05$).

Pharmacological interventions and sedoanalgesia procedures

Firstly, the participants were questioned about the usefulness of EMLA® topical cream. In two closed questions (Yes/No), 96% considered EMLA® cream to be an important approach in acute medical procedures in the emergency department and 91% were of the opinion that it must be included in protocols for painful invasive procedures. No differences were found between types of career and years of experience regarding these two questions ($p > 0.05$). The frequency of use of EMLA® cream was also analyzed (Fig. 1).

Regarding routes for drug administration, an open-ended question was used to enquire about which drugs could be used intranasally for sedoanalgesia procedures

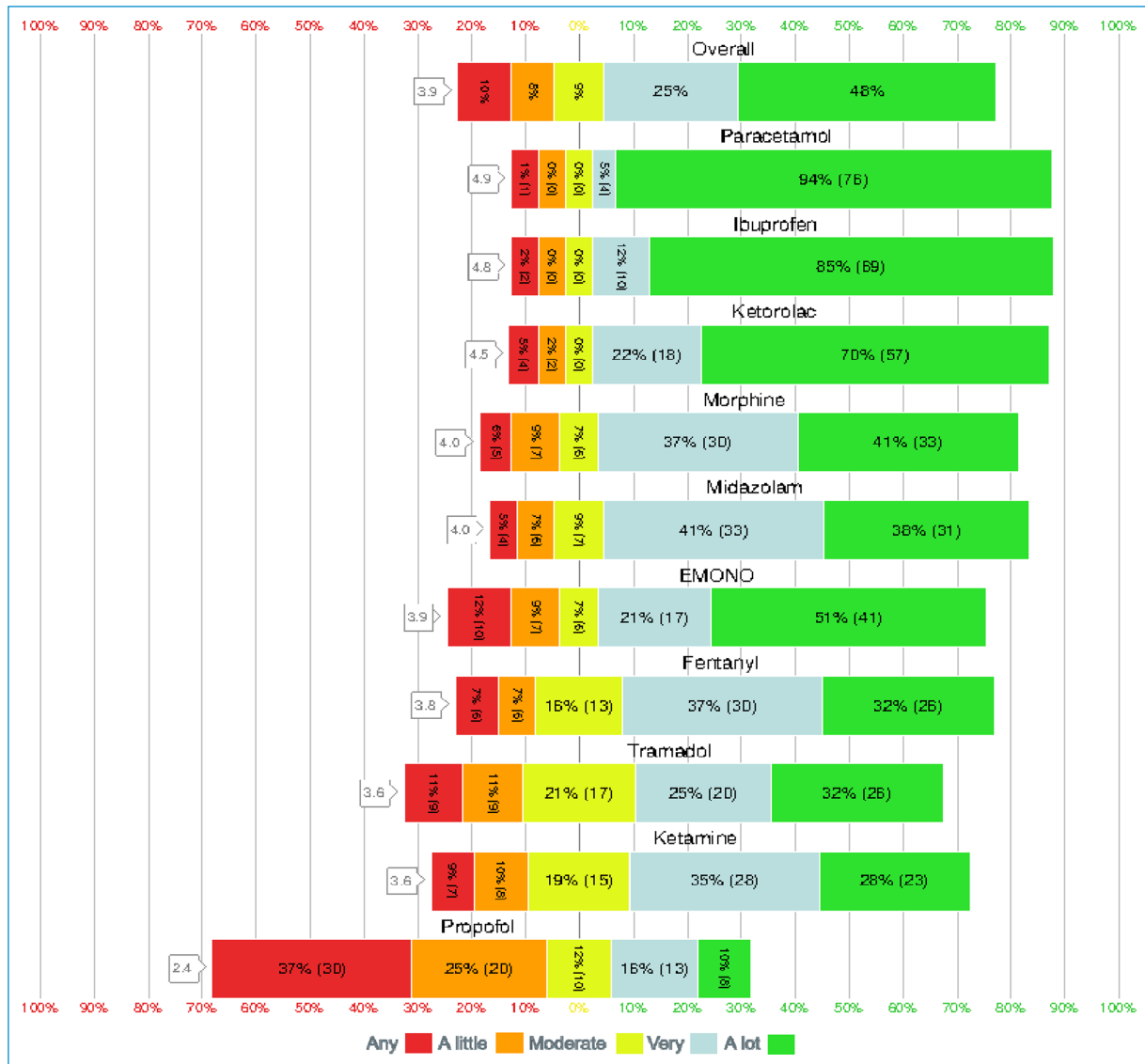


Figure 3. Healthcare workers' levels of confidence using drugs in sedo analgesia procedures. Levels of confidence in managing several medications used in sedoanalgesia were rated by doctors and nurses. Data was displayed as a five-point Likert scale chart (Levels of confidence: 1 = Not confident; 2 = Somewhat confident; 3 = Moderately confident; 4 = Quite confident; 5 = Very confident). EMONO: 50%-50% equimolar mixture of oxygen and nitrous oxide.

(analgesic and sedatives). Most participants answered midazolam (93%) and/or fentanyl (72%); another drug cited was ketamine (15%).

Confidence levels and the professionals' experience in sedoanalgesia were evaluated. Overall, high levels of confidence were observed (Fig. 3). More specifically, paracetamol, ibuprofen, and ketorolac were drugs that 90% of participants felt "quite" or "very" confident in using. Other drugs, including midazolam (79%), morphine (78%), and a 50%-50% equimolar mixture of oxygen and nitrous oxide (EMONO) (72%) were also observed to be associated with high levels of confidence ("quite"/"very"), followed by fentanyl (69%) and

ketamine (63%). Propofol was the drug with the lowest rates of confidence, with 62% answering as being "not confident" or "somewhat confident".

It was statistically significant that higher levels of confidence were found in nurses compared to doctors, while managing propofol ($p = 0.002$), tramadol ($p = 0.024$), morphine ($p = 0.003$), and midazolam ($p = 0.048$). Furthermore, it was statistically significant that doctors with more than five years of professional experience were more confident compared to junior doctors in regard to using most drugs, namely: tramadol, morphine, midazolam ($p = 0.001$); fentanyl, propofol ($p = 0.002$); and ketamine ($p = 0.011$). No statistical differences,

regarding professional experience and confidence levels, were found among nurses ($p > 0.05$).

Finally, the last open-ended question, exclusively directed at the medical team, asked which were the most appropriate analgesics to control mild, moderate, and severe pain. Doctors ($n = 34$) chose paracetamol ($n = 33$; 97%), ibuprofen ($n = 32$; 94%), and ketorolac ($n = 1$; 3%) to manage mild pain; ketorolac ($n = 34$; 100%), tramadol ($n = 20$; 59%), and opioids ($n = 3$; 9%) to handle moderate pain; and morphine ($n = 32$; 94%), fentanyl ($n = 27$; 79%), ketamine ($n = 16$; 47%), ketorolac ($n = 8$; 24%), and tramadol ($n = 7$; 21%) to treat severe pain.

Discussion

A significant percentage of professionals answered the survey. Also, a considerable fraction of these takes care of patients in acute and urgent conditions, in ED or NPICU, managing acute pain every day (Table 1). This is a substantial representation of the state of the art of pain assessment and management in this pediatric department.

On theoretical evaluation (Table 2), the questions were more difficult compared to the survey conducted 15 years ago in the same department (*data not shown*), and higher scores were obtained in the present survey. Furthermore, in the present survey, almost no one agreed with the following statements: “*infants feel less pain than adolescents*”, “*analgesics should not be taken regularly*”, and “*midazolam is an analgesic drug*”. These statements are major myths regarding pediatric pain, and we can affirm that they are no longer current beliefs, compared to other series²⁸⁻³².

Overall, the median of corrected answers (86%) was satisfactory and higher than previous surveys in literature³¹⁻³⁶, although it is difficult to compare due to the heterogeneity of the surveys. As seen in various series^{15,31-33,35}, opioid-related questions had a lower percentage of correct answers. Training in opioid management must be a priority, in relation to drug characteristics, adverse effects, and equivalence dosing across different types^{31,35}.

Regarding the professionals' perspective on pain management in their departments (Fig. 1), they were more likely to consider pain to be well recognized than well treated. This perspective was more prevalent among nurses and junior doctors, in contrast with senior doctors. This might be explained by the fact that the former are more closely involved in daily, direct, patient care, highlighting the need for more consistent/frequent follow-up on the effectiveness of pain relief

prescriptions for any given patient, thus guaranteeing the pairing of recognition to treatment^{22,23}.

On assessment (Fig. 2), the use of scales was very frequent (77%) and higher than in other cohorts³⁷. However, when asked to choose the appropriate scale for each category, the lowest rates of correct answers were seen for children under four years old, including neonates, as stated by Moutte, et al.³⁷. Most children going to the ED are in this age group³⁸. As they are in the preverbal stage of development or still have difficulty voicing their feelings, they completely rely on the caregiving team and their parents for the interpretation of their discomfort. Therefore, this subjective information (also highly used by our professionals, as seen in the analysis) is crucial, but it must be structured and converted into an objective assessment using accurately validated item-based scales of pain assessment, such as NIPS or FLACC^{10,11}.

Physicians are less trained in this structured assessment³⁷, compared to nurses, as observed in our results, which is a concern considering therapeutic regimens are mainly this group's responsibility.

Focusing on treatment, non-pharmacological measures are already highly widespread in the department (Fig. 1), differing from other hospitals³². However, they must be included in doctors' daily practices as they are in nurses' routines. Several studies showed the major role of these measures on promoting a synergic effect with the analgesics and in reducing the levels of anxiety compared to the simple and harsh restraint of a child^{32,39,40}.

Topical analgesia was considered by the respondents to be a very important measure to be included in protocols of acute procedures in ED, but, overall, the frequency of using EMLA® (Fig. 1) was much lower than what we expected, and in lower rates compared to what is proposed in protocols^{21,22}. This might be explained by the fact that, in urgent procedures, it can be difficult to guarantee its placement within the time needed to ensure effectiveness. However, whenever possible, the need for EMLA® should be predicted and anticipated in a timely manner.

The intranasal route was shown to be widely known by our respondents, in line with the most recent literature which states that the most efficient treatment should be administered by the least invasive route^{16,21}.

High levels of confidence in managing sedoanalgesia drugs were seen across departments (Fig. 3), except for propofol, which is understandable as it is more commonly used in NPICU procedures. However, we cannot disregard that this is subjective data and that professionals in several other series stated they feel a

lack of experience in managing these drugs^{32,41}. Our results also highlighted the relevance of training, as junior doctors had lower rates of confidence, which is also supported by a few other studies^{31,34}.

On the other hand, the high levels of confidence, even with opioids and ketamine, might positively reflect the team's concern to provide training and to update practices according to the most recently established protocols.

Professionals also reported high confidence levels in managing EMONO, a commonly used analgesic for short-term procedures with minimal adverse effects⁴². This confidence likely reflects the ease of administration with a non-intravenous route, which is particularly appealing for pediatric care^{42,43}. The well-established effectiveness and safety profile of EMONO could support its adoption as a standardized practice in pediatric medical institutions⁴³.

Nurses demonstrated higher confidence levels in their responsibilities related to sedoanalgesia compared to doctors. However, a direct comparison may be challenging since each professional has different responsibilities within the procedure. Nurses primarily focus on the technique and the route of administration, whereas the medical team is mainly responsible for assessing indications, monitoring efficacy, dosing, interactions, and adverse effects.

Finally, regarding the last question in the survey, addressed specifically to the medical team, the drugs chosen for the treatment of mild, moderate, and severe pain were in accordance with recent international and national guidelines¹⁶⁻²³, endorsing updated practices.

The main limitation of this study is that it is a single-center cross-sectional study. Also, as the survey was designed specifically for this department, it is difficult to compare it with other series. Finally, although an effort was made to make the survey as simple and objective as possible, we are analyzing data that depends on the healthcare professionals themselves, which may induce bias due to individual perspectives.

Conclusions

This study represents one of the first surveys regarding pediatric pain management and assessment, directed at both nurses and doctors, to have ever been conducted in Portugal. Overall, our series showed a good level of knowledge and experience in this topic, which is a major difference in comparison with several other series, as previously discussed. However, we concluded that: constant training on opioid management and sedoanalgesia is needed to guarantee high

levels of experience with all drug classes; non-pharmacological and topical interventions should be regularly included in protocols and urgent procedures; and more guidance is needed on the use of structured pain assessment scales to elicit an objective assessment of pain, especially for younger children, aged under four years old. Pain should be managed in multidisciplinary teams, with doctors and nurses working together, to ensure adequate recognition, treatment, and reassessment of pain, thus guaranteeing the best quality of care for our children.

Previous presentations

This research was presented at the National Pediatric Meeting (Congresso Nacional de Pediatria), in Porto, Portugal, as an oral presentation organized by the Portuguese Pediatric Society on the October 28, 2022.

Author contributions

B. Saraiva, I. Gomes: Conception and design of the study, report, review or other type of work or paper; Acquisition of data either from patients, research studies, or literature; Analysis or interpretation of data either from patients, research studies, or literature; Drafting the article; Critical review of the article for important intellectual content; Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work. All the other authors: Conception and design of the study, report, review or other type of work or paper; Acquisition of data either from patients, research studies, or literature; Critical review of the article for important intellectual content; Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work.

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None.

Conflicts of interest

None.

Ethical considerations

Protection of humans and animals. The authors declare that the procedures followed complied with the ethical standards of the responsible human experimentation committee and adhered to the World Medical Association and the Declaration of Helsinki. The procedures were approved by the institutional Ethics Committee.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's confidentiality protocols, obtained informed consent from patients,

and received approval from the Ethics Committee. The SAGER guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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