Acute and chronic postoperative pain: knowledge of anesthesiologists and surgeons in Northeastern Brazil about its definition and prevention

Dor aguda e crônica pós-operatória: conhecimento de anestesiologistas e cirurgiões/cirurgiãs do Nordeste do Brasil sobre sua definição e prevenção

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ABSTRACT

BACKGROUND AND OBJECTIVES: Chronic postoperative pain (CPP) can be defined as pain that continues for two or more months after surgery, after ruling out other causes. In Brazil, there is a lack of reliable data regarding the incidence of acute and chronic postoperative pain, as well as its impact on patients. The aim of this study was to evaluate the knowledge of anesthesiologists and surgeons regarding the management of CPP.

METHODS: This cross-sectional observational study was conducted using an online questionnaire distributed to a non-probabilistic convenience sample of anesthesiologists and surgeons. The questionnaire, administered through Google Forms™, consisted of 22 questions covering sociodemographic information, self-assessment of knowledge, therapeutic management of postoperative pain, and the perceived need for further training. Chi-square test or Fisher's Exact test was used to analyze the data.

RESULTS: The main sociodemographic findings indicate a gender difference (p=0.03) among surgeons. Of 109 participants, most did not have expertise or specialization in pain management (p=0.02) and obtained knowledge about pain and analgesia only after undergraduate courses (p=0.013). Surgeons provided more incorrect answers about the definition of acute pain (p<0.001) and chronic pain (p=0.003) than anesthesiologists. Most participants claim to remember at least two risk factors for the development of chronic pain in surgical patients (p=0.001). Participants did not recommend the use of antidepressants (p=0.024) or antiepileptics (p=0.013) for the treatment of acute pain. Anesthesiologists considered strong opioids adequate to control acute pain (p<0.001). In relation to chronic pain, 70.7% of surgeons and 89.7% of anesthesiologists believed that antiepileptic drugs could be effective in managing this type of pain (p=0.018). Longer training time was related to less study of pain during undergraduate education (p=0.041).

CONCLUSION: Surgeons and anesthesiologists showed substantial deficits in knowledge about postoperative pain. It is necessary to reassess the inclusion of the pain subject in medical curricula, and a more practical approach to the topic could greatly benefit future professionals working in this field.

Keywords: Anaesthesiologists, Knowledge, Pain, Postoperative, Surgeons.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor pós-operatória crônica (DPC) pode ser definida como uma dor que persiste por dois ou mais meses após a cirurgia, após a exclusão de outras causas. No Brasil, faltam dados confiáveis sobre a incidência de dor pós-operatória aguda e crônica, bem como seu impacto nos pacientes. O objetivo deste estudo foi avaliar o conhecimento de anestesiologistas e cirurgiões sobre o manejo da DPC.

MÉTODOS: Este estudo observacional transversal foi realizado por meio de um questionário online distribuído a uma amostra não probabilística de conveniência de anestesiologistas e cirurgiões. O questionário, administrado por meio do *Google Forms*™, consistia em 22 questões abrangendo informações sociodemográficas, autoavaliação do conhecimento, manejo terapêutico da dor pós-operatória e percepção da necessidade de treinamento adicional. O teste Qui-quadrado ou o Exato de Fisher foi utilizado para analisar os dados.

RESULTADOS: Os principais achados sociodemográficos indicaram diferença de sexo (p=0,03) entre os cirurgiões. Dos 109 participantes, a maioria não possuía expertise ou especialização no manejo da dor (p=0,02) e obtiveram conhecimento sobre dor e analgesia somente após a graduação (p=0,013). Os cirurgiões forneceram mais respostas incorretas sobre a definição de dor aguda (p<0,001) e dor crônica (p=0,003) do que os anestesiologistas. A maioria dos participantes afirmou se lembrar de ao menos dois fatores de risco para o desenvolvimento de dor crônica em pacientes cirúrgicos (p=0,001). Os participantes não reco-

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HIGHLIGHTS

- There is a clear gap in medical training regarding the management of postoperative pain.
- Improved education and understanding of pain-related concepts among anesthesiology and surgery professionals is needed.
- There is an urgent need to re-evaluate the inclusion of pain content in the curricula of medical courses.

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mendaram o uso de antidepressivos (p=0,024) ou antiepilépticos (p=0,013) para o tratamento da dor aguda. Os anestesiologistas consideraram os opioides fortes adequados para o controle da dor aguda (p<0,001). Em relação à dor crônica, 70,7% dos cirurgiões e 89,7% dos anestesiologistas acreditam que os fármacos antiepilépticos podem ser eficazes no controle desse tipo de dor (p=0,018). O maior tempo de formação foi relacionado a um menor estudo da dor durante a graduação (p=0,041).
CONCLUSÃO: Cirurgiões e anestesiologistas mostraram déficits substanciais no conhecimento sobre dor pós-operatória. É preciso reavaliar a inclusão do tema da dor nos currículos médicos, e uma abordagem mais prática do tema pode beneficiar muito os futuros profissionais que atuam nessa área.
Descritores: Anestesiologistas, Cirurgiões, Conhecimento, Dor, Pós-operatório.

INTRODUCTION

Pain is highly prevalent in medical settings, impacting not only patients but also their families and friends, and resulting in substantial economic burdens on society. Even occasional pain alone can have a devastating impact on an individual's quality of life, while chronic pain can severely affect the health and productivity of patients[1]. Chronic postoperative pain (CPP) is widely acknowledged as a prevalent and multifaceted issue following various surgical procedures[2]. It affects approximately 10% of patients who undergo surgery and typically initiates as an acute postoperative pain that proves challenging to manage, eventually transitioning into a persistent and neuropathic pain condition[3]. Insufficient knowledge, alongside a range of prejudices, beliefs, and attitudes, can have a negative impact on pain recognition and management. Cultural factors, particularly among older individuals, can contribute to preconceived notions about pain and influence its understanding and treatment.
Given that CPP is often challenging to treat, prevention remains as the most effective management approach, both in early and late stages[4]. This can be achieved through various strategies, including minimizing surgical trauma and potential nerve injuries, preventing structural compression, enhancing the management of chronic diseases like diabetes mellitus, implementing appropriate pre, peri, and postoperative analgesia, and promoting early mobilization[5].
Therefore, this subject presents a significant challenge for anesthesiologists and surgeons. To enhance patient management in the perioperative period and anticipate the occurrence of postoperative pain, ongoing research efforts are being conducted on this topic on a daily basis[6]. Consequently, there is a crucial need to educate the medical community, enabling the implementation of effective measures and minimizing unnecessary and inappropriate surgeries[7].
In the existing literature, there is a limited number of studies examining the foundational knowledge of professionals involved in pain management, and even fewer studies specifically focusing on CPP[8]. Therefore, the aim of this study was to evaluate the knowledge of anesthesiologists and surgeons regarding the management of CPP.

METHODS

This primary observational cross-sectional study with an analytical nature was conducted from January 2021 to February 2022. A non-probabilistic convenience sample of physicians specializing in anesthesiology or surgery in the city of Fortaleza, Brazil, was targeted through the distribution of an online questionnaire. Individuals who did not practice anesthesiology or surgery were excluded from the survey. Approval for this study was obtained from the Human Research Ethics Committee of the University of Fortaleza (Opinion Number: #4834076). This study followed the STROBE guidelines.
Data collection was carried out utilizing a 22-question online questionnaire, containing objective questions, administered through Google Forms™. The selection of the Google Forms online questionnaire platform was based on several advantages associated with it, including the ability for participants to access it from any location and at any time, the minimal utilization of hard disk space, the fact that it is free to use, its user-friendly interface, and the absence of programming knowledge requirement. Implementing the data or opinion survey through an electronic form and address facilitates use, and once respondents complete the questionnaire, their answers are immediately visible on the Google Forms page, allowing for efficient coordination by the research team.
The data collection instrument included sociodemographic questions to characterize the sample. Additionally, it contained questions regarding the self-assessment of knowledge on the topic, including clinical definitions of acute and CPP, therapeutic management approaches for such conditions, the time frame when the participants acquired their knowledge, an assessment of the need for specific training on the subject, and an evaluation of the effectiveness of potential measures to enhance knowledge adequacy. The data collected were organized using the Microsoft Excel software, creating the database for further analysis.

Statistical analysis

Descriptive statistics were employed to present categorical data as absolute counts and relative frequencies expressed as percentages. In the analytical statistics, chi-square test or Fisher's Exact test (depending on expected frequencies in 2x2 cross-tables) was utilized to compare the frequencies of categorical variables between professional categories and training durations. The Chi-square test alone was employed to assess the association with training time. Statistical significance was determined at $p<0.05$. All analyses were conducted using IBM SPSS Statistics for Macintosh, Version 23.0 (Armonk, NY: IBM Corp.™).

RESULTS

Main sociodemographic findings of this study revealed that 75.6% (n=31) of the surgeons (n=41) and 47.1% (n=32) anesthesiologists (n=68) were male, respectively, (p=0.03). In terms of expertise or specialization in pain management,

100% of the surgeons and 79.4 % of the anesthesiologists did not possess such qualifications (p=0.02). Out of the 109 participants, only 14 individuals had any form of specialization or expertise in pain, all of whom were anesthesiologists, as presented in table 1.

In response to inquiries regarding the acquisition of knowledge on pain and analgesia during or after graduation, or both, 48.8% of surgeons obtained this knowledge solely after graduation, while 66.2% of anesthesiologists reported the same (p=0.013). In terms of the definition of pain, 43.9% of surgeons provided an incorrect response, compared to 11.8% among anesthesiologists (p<0.001). Similarly, regarding the definition of chronic pain, 41.5% of surgeons and 16.2% of anesthesiologists provided incorrect definitions (p=0.003). When asked if they could recall at least two risk factors for the development of chronic pain in surgical patients, 75.6% of surgeons claimed they could, as did 97.1% of anesthesiologists, despite these factors not being mentioned in the questionnaire itself (p=0.001) (Table 2).

None of the surgeons and 11.8 % of the anesthesiologists recommended the use of antidepressants for the treatment of acute pain (p=0.024). Similarly, none of the surgeons and 14.7 % of the anesthesiologists suggested the use of antiepileptics for the management of acute pain (p=0.013). In contrast, 36.6% of surgeons and 77.9% of anesthesiologists regarded strong opioids as suitable for acute pain control, with a significant difference between the two groups (p<0.001) (Table 3).

In relation to chronic pain, 70.7% of surgeons and 89.7% of anesthesiologists believed that antiepileptic drugs could be effective in managing chronic pain (p=0.018), as indicated in table 4.

Table 1. Sociodemographic and professional characteristics according to occupational category.

	Occupational Category		
	Surgeons (n=41)	Anesthesiologists (n=68)	p-value*
Gender			0.003
Male	31 (75.6)	32 (47.1)	
Female	10 (24.4)	36 (52.9)	
Time since graduation (years)			0.495
Up to 2	9 (22)	19 (27.9)	
3 to 4	7 (17.1)	17 (25)	
5 to 6	8 (19.5)	8 (11.8)	
> 6	17 (41.5)	24 (35.3)	
Do you have a pain practice area or specialization in pain?			0.002
No	41 (100)	54 (79.4)	
Yes	0 (0)	14 (20.6)	
Did you study pain and analgesia as an undergraduate?			0.674
No	21 (51.2)	32 (47.1)	
Yes	20 (48.8)	36 (52.9)	

Data expressed as absolute count and percentages in parentheses.
*Chi-square and Fisher's Exact tests were used.

When queried about whether they had studied pain and analgesia during their undergraduate education, 46.4% of professionals who graduated up to 2 years ago responded negatively, as did 25.0% of those who graduated 2 to 4 years ago, 62.5% of those who graduated 5 to 6 years ago, and 58.5% of those who graduated 6 or more years ago (p=0.041) (Table 5).

Table 2. Knowledge of professionals regarding pain according to occupational category.

	Occupational Category		
	Surgeons (n=41)	Anesthesiologists (n=68)	p-value*
Do you consider the knowledge on pain and analgesia acquired during your graduation was sufficient for your medical practice?			0.314
No	34 (87.2)	50 (79.4)	
Yes	5 (12.8)	13 (20.6)	
Was your knowledge about pain and analgesia acquired during or after graduation?			0.013
During	4 (9.8)	12 (17.6)	
After	20 (48.8)	45 (66.2)	
Both	17 (41.5)	11 (16.2)	
What is the definition of pain?			<0.001
Nociceptive stimulus	18 (43.9)	8 (11.8)	
Unpleasant sensation and emotional experience	23 (56.1)	60 (88.2)	
How can acute pain be characterized?			0.125
Recent symptom of abrupt onset	35 (85.4)	64 (94.1)	
Sudden and long-lasting	6 (14.6)	4 (5.9)	
How can chronic pain be characterized?			0.003
Frequent and constant	17 (41.5)	11 (16.2)	
Persistent for months or years	24 (58.5)	57 (83.8)	
Is chronic pain a symptom or a disease?			0.341
Disease	29 (70.7)	42 (61.8)	
Symptom	12 (29.3)	26 (38.2)	
How can we evaluate pain?			0.125
Scales	35 (85.4)	64 (94.1)	
Complementary exams	6 (14.6)	4 (5.9)	
How can pain be measured?			0.255
Anamnesis	11 (26.8)	12 (17.6)	
Scales	30 (73.2)	56 (82.4)	
Can you recall at least 2 risk factors for chronic postoperative pain in the evaluation of your surgical patient?			0.001
No	10 (24.4)	2 (2.9)	
Yes	31 (75.6)	66 (97.1)	

Data expressed as absolute count and percentages in parentheses.
*Chi-square and Fisher's Exact tests were used.

Table 3. Drug indications for the treatment of acute pain according to occupational category.

	Occupational Category		
	Surgeons (n=41)	Anesthesiologists (n=68)	p-value*
Analgesics (e.g. dipyrone, paracetamol)	39 (95.1)	66 (97.1)	0.631
Non-steroidal anti-inflammatory drugs (e.g. ibuprofen, acetylsalicytic acid)	34 (82.9)	61 (89.7)	0.379
Antidepressants (e.g. amitriptyline, clomipramine)	0 (0)	8 (11.8)	0.024
Antiepileptics (e.g. topiramate, gabapentin)	0 (0)	10 (14.7)	0.013
Weak opioids (e.g. codeine, tramadol)	33 (80.5)	54 (79.4)	1.000
Strong opioids (e.g. morphine, oxycodone)	15 (36.6)	53 (77.9)	<0.001

Data expressed as absolute count and percentages in parentheses.
*Chi-square and Fisher's Exact tests were used.

Table 4. Drug indications for the treatment of chronic pain according to occupational category.

	Occupational Category		
	Surgeons (n=41)	Anesthesiologists (n=68)	p-value*
Analgesics (e.g. dipyrone, paracetamol)	22 (53.7)	36 (52.9)	1.000
Non-steroidal anti-inflammatory drugs (e.g. ibuprofen, acetylsalicytic acid)	6 (14.6)	7 (10.3)	0.550
Antidepressants (e.g. amitriptyline, clomipramine)	35 (85.4)	66 (97.1)	0.051
Antiepileptics (e.g. topiramate, gabapentin)	29 (70.7)	61 (89.7)	0.018
Weak opioids (e.g. codeine, tramadol)	25 (61)	38 (55.9)	0.690
Strong opioids (e.g. morphine, oxycodone)	16 (39)	35 (51.5)	0.238

Data expressed as absolute count and percentages in parentheses.
*Chi-square and Fisher's Exact tests were used.

Table 5. Sociodemographic and professional characteristics according to the time since graduation.

	Time since graduation				
	Up to 2 years (n=28)	3 to 4 years (n=24)	5 to 6 years (n=16)	> 6 years (n=41)	p-value*
Gender					0.618
Male	14 (50)	13 (54.2)	11 (68.8)	25 (61)	
Female	14 (50)	11 (45.8)	5 (31.3)	16 (39)	
Do you have a medical practice in pain or specialization in pain?					0.194
No	27 (96.4)	20 (83.3)	15 (93.8)	33 (80.5)	
Yes	1 (3.6)	4 (16.7)	1 (6.3)	8 (19.5)	
Did you study a subject that dealt with pain and analgesia during your undergraduate studies?					0.041
No	13 (46.4)	6 (25)	10 (62.5)	24 (58.5)	
Yes	15 (53.6)	18 (75)	6 (37.5)	17 (41.5)	

Data expressed as absolute count and percentages in parentheses.
*Chi-square and Fisher's Exact tests were used.

DISCUSSION

The current study revealed that most professionals involved in the management of pain in their daily practice acquired their knowledge on pain and analgesia after completing their undergraduate education, indicating a gap in the curriculum regarding the inclusion of this subject. Notably, all surgeons and a significant proportion of anesthesiologists lacked specialization in pain, suggesting a scarcity of professionals specializing in this field, possibly due to limited demand or limited educational opportunitie[9]. Furthermore, there were more positive responses regarding professionals' confidence in treating acute pain compared to their confidence in managing chronic pain.

The management of CPP poses a significant challenge in medical care. There appears to be a notable knowledge gap about this topic[10]. A study[11] involving anesthesiologists and anesthesiology residents reported that only 52% of participants believed that post-operative pain was adequately managed in their respective institutions. Additionally, the study found that over 50% of patients in those institutions experienced post-operative pain. Consequently, the study concluded that the surveyed medical professionals had insufficient knowledge regarding CPP and emphasized the need for curriculum reform and continued education to address this issue.

These findings align with the results of the present study, where nearly half of the respondents did not receive formal education on pain and analgesia during their undergraduate training. This is of particular importance, as effective pain management necessitates a comprehensive skill set encompassing both technical and humanistic aspects[12].

Previous study suggests that the knowledge gap in pain management may have cultural implications. In a descriptive study involving 194 participants, including 60 doctors and 134 fourth-or fifth-year medical students, a structured questionnaire was used to assess their knowledge on acute and chronic pain management[13]. The authors proposed that this observed knowledge gap may be closely related to the existing medical education system, as both medical students and practicing professionals obtained similarly low scores on the aforementioned questionnaire. This suggests a need to address the educational approach to pain management across different stages of medical training.

These findings align with the results of the present study, which revealed significant rates of fundamental errors, such as only 36.6% of surgeons considering strong opioids for acute pain control. Furthermore, the choice of drugs appears consistent between the two professional groups (anesthesiologists and surgeons). Most participants in this study suggested that placing greater emphasis on practical applications of the content would be effective in ensuring adequate knowledge for the clinical practice of pain management. This observation may indicate a systemic failure in medical education across many universities[14]. Given the gravity of the issue regarding insufficient education on pain control and the necessity for research in medical education with robust methodologies, further studies are warranted to provide guidance on targeted education in this field[15].

An important limitation of this study is its small sample size, which may restrict the generalizability of the findings to diverse populations. Furthermore, all respondents were practicing medicine in the northeastern region of Brazil, thereby not taking into account potential cultural and educational variations between different geographic regions within the country. The authors acknowledge these limitations and aim to address them in future research by conducting a more comprehensive study with a larger sample size and broader geographic representation.

CONCLUSION

Surgeons and anesthesiologists showed substantial deficits in knowledge about postoperative pain. It is necessary to reassess the inclusion of the pain subject in the medical curricula, and a more practical approach to the topic could greatly benefit future professionals working in this field.

AUTHORS' CONTRIBUTIONS

Ivna Silveira Sampaio
Data Collection, Research, Writing - Preparation of the Original, Writing - Review and Editing
Caio Fortier Silva
Research, Writing - Preparation of the Original
Adriana Rolim Campos
Conceptualization, Project Management, Methodology, Writing - Review and Editing, Supervision

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