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Survey of Knowledge and Attitude of Pain in Anesthesia Residents of Thailand

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Abstract

Background: Pain is common and a leading cause of disability and reduced quality of life. Inadequate treatment of pain can lead to physical, psychological, and social consequences, and achieving optimal pain management remains a significant challenge worldwide. Barriers to proper pain management include the attitudes and knowledge of healthcare providers. These barriers can significantly impact the quality of care provided to pain patients.

Methods: This survey was conducted using the Knowledge and Attitudes Survey Regarding Pain (KASRP) questionnaire among 114 anesthesia residents from six major medical schools in Thailand.

Results: Most of the residents were female (76.3%), with a mean age of 29 ± 1.8 years. Almost all participants provided correct answers regarding multimodal analgesia (98.2%), opioid conversion and titration (95.6%), and the importance of beliefs about pain (94.7%). However, they had a low rate of correct answers for treating patients based on self-report rather than behavior (13.2%) and recognizing the incidence of opioid-induced respiratory depression in severe cancer patients on increasing doses of morphine (16.7%). Younger age (< 30 yr) and residency experience in pain rotation were associated with a statistically higher rate of correct answers.

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Conclusion: The participating anesthesia residents demonstrated correct knowledge and attitudes regarding pain and pain management. However, they also exhibited areas of incorrect knowledge and attitudes that need to be addressed and improved.

Keywords: anesthesia, anesthesia residents, attitudes, education, KASRP, pain

Introduction

Pain is a very common symptom and a major reason for visiting a doctor, accounting for 40% of primary care visits.[1] It is also the leading cause of Emergency Department visits.[2] Physicians play a significant role in the assessment and management of various types of pain. A survey study conducted in Malaysia using the Knowledge and Attitudes Survey Regarding Pain (KASRP) questionnaire revealed that 41.7% of respondents scored less than 60% on pain knowledge. The study also found that male medical officers performed better than their female counterparts, with anesthesiologists achieving the highest mean scores. The authors concluded that there is a notable lack of knowledge and appropriate attitudes toward pain assessment and management.[3] A similar survey conducted in Jordan used the KASRP to evaluate healthcare providers' knowledge and attitudes. Although doctors had greater knowledge about pain compared to nurses, both groups demonstrated low levels of knowledge and negative attitudes concerning pain management.[4] In a survey from Iran, fewer than half of healthcare providers who volunteered to complete the questionnaire responded correctly. Only 9.3% of respondents believed they had received sufficient education about pain and its management.[5]

Regarding cancer pain management, Nimmaanrat S, et al. found that approximately half of the surveyed interns had positive attitudes toward managing cancer pain, but a significant number had incorrect knowledge. The majority (83.9%) of interns identified lack of knowledge as a barrier to effective cancer pain management.[6] Another study by Nimmaanrat S, et al. involving interns showed that only 55.7% could correctly answer just two or three out of five questions related to pain assessment, and only one-third had knowledge of opioid dependence. Their attitudes toward cancer pain management were described as moderately satisfactory.[7]

A South Korean survey revealed that although many physicians believed they were well taught in pain management, many of them had negative attitudes and insufficient knowledge regarding the management of cancer pain. The levels of attitude and knowledge were related to their specialties and personal experiences. Fear of tolerance risk, drug addiction, side effects of opioids, and a knowledge deficit about opioids were the most important barriers to effective cancer pain management.[8] A study using the Knowledge, Attitude, and Practice (KAP) model was conducted to assess differences in KAP regarding cancer pain management among three different healthcare professionals (medical staff, residents, and nurses) in a community teaching hospital.

Medical staff had the highest knowledge, though this was not statistically significant. Medical staff and nurses had more positive attitudes compared to residents. Nurses had the best practice performance, generally shown by higher awareness and consistency in pain evaluation and documentation.[9]

Regarding chronic non-cancer pain (CNCP) management, a survey conducted among Taiwanese medical officers demonstrated that board-certified pain specialists treated more outpatients with CNCP compared to non-pain board-certified doctors. Pain specialists were less likely to skip or decrease both the dosage and duration of opioid prescriptions. On the other hand, non-pain board-certified doctors had significantly less knowledge and more negative attitudes toward opioid prescriptions. One of the major perceived barriers was inadequate knowledge of pain management among all doctors.[10]

Although survey studies were conducted at different times and in different countries across the continents, they revealed very similar findings: negative attitudes and inadequate knowledge toward pain and its management. This survey aimed to evaluate the knowledge and attitudes of anesthesia residents throughout Thailand using the KASRP and to identify the factors related to their knowledge and attitudes toward pain and its management. The results of this survey will be used to improve pain education in the Anesthesia Residency Training Program in Thailand, with the goal of providing better pain treatment to Thai patients at large.

Methods

This prospective descriptive cross-sectional survey using the KASRP, conducted via Google Forms, was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Thailand (REC 65-038-8-1) on 12/03/2022 and registered with ClinicalTrials.gov (ClinicalTrials.gov Identifier: NCT05369923) on 23/08/2022 before data collection commenced. Informed consent was waived because this survey involved no more than minimal risk. At the beginning of the survey via Google Forms, participants were invited to participate and asked to voluntarily commit to answering the survey by clicking the "accept" button. The anonymity of the data was maintained in accordance with the Declaration of Helsinki.

Participants

Anesthesia residents from six major medical schools throughout Thailand were invited to participate in this survey via Google Forms. Each resident had the freedom and right to refuse participation.

Knowledge and attitudes survey regarding pain

The KASRP is a 37-item questionnaire consisting of 21 true-or-false questions and 16 multiple-choice questions. Its purpose is to assess the knowledge and attitudes of healthcare providers regarding pain. It is principally used as a pre- and post-test measure and can evaluate learning outcomes following educational programs on pain. The KASRP

tool was developed in 1987 and has been extensively used since its inception. It has undergone several revisions over the years to align with advancements in pain management practices. Its content validity has been established through reviews conducted by pain specialists. The tool's content is based on recognized pain management standards, including guidelines from the American Pain Society, the World Health Organization, and the National Comprehensive Cancer Network. The construct validity of the KASRP has been demonstrated by comparing scores of nurses across various levels of expertise, including students, new graduates, oncology nurses, graduate students, and senior pain experts. The tool effectively distinguishes between different levels of expertise. Test-retest reliability ($r > 0.80$) was established through repeated testing in a continuing education class of nursing staff (n = 60). Internal consistency reliability (Cronbach's alpha $r > 0.70$) was confirmed, with items addressing both knowledge and attitude domains.[11]

Statistical analysis

This study evaluated participants' knowledge and attitudes toward pain and its management by measuring the total number of correct answers on the KASRP questionnaire. Linear regression models were used to identify factors associated with participants' scores. Given the exploratory nature of the study, a backward stepwise method was employed to select potential factors. The Akaike Information Criterion (AIC) was chosen as the variable selection criterion.

Results

Descriptive information for the 114 anesthesia residents participating in this survey is presented in Table 1. Many of them were female (76.3%). The mean age was 29 ± 1.8 yr. After graduation, they worked for 2.6 ± 1.1 yr before joining the anesthesia residency training program. Third-year residents participated the most (43.0%), while first-year residents participated the least (23.7%).

Table 2 presents the rate of correct answers for each question. For questions 1-22

Table 1 Descriptive information of the anesthesia residents (n = 114)

Variables	Data
Gender, n (%)	
Female	87 (76.3)
Male	27 (23.7)
Age (yr), (mean ± SD)	29.0 ± 1.8
Age group, n (%)	
25-30 yr	100 (87.7)
> 30 yr	14 (12.3)
Duration of work experience as a doctor (since graduation) prior to anesthesia training (yr) (mean ± SD)	2.6 ± 1.1
Year of anesthesia training, n (%)	
1st	27 (23.7)
2nd	38 (33.3)
3rd	49 (43.0)
Experience with rotation in the acute and chronic pain during anesthesia training, n (%)	22 (19.3)
None	15 (13.2)
Acute pain	3 (2.6)
Chronic pain	74 (64.9)
Acute + chronic pain	
KASRP score (39 items with a total score of 41) (mean ± SD)	29.0 (4.8)

KASRP: Knowledge and Attitudes Survey Regarding Pain

(true-or-false), the top five correct answers were for questions 7 (98.2%), 14 (95.6%), 13 (94.7%), 22 (93.0%), and 21 (92.1%). Conversely, the top five incorrect answers were for questions 17 (38.6%), 4 (48.2%), 16 (49.1%), 6 (57.9%), and 3 and 8 (67.5%). In regarding to multiple-choice question, the top five correct answers were for questions 26 (96.5%), 24 (94.7%), 31 (93%), 25 (89.5%) and 37 (78.1%) while the top five incorrect answers were for questions 38b (13.2%), 28 (16.7%), 36 (33.3%), 39b (34.2%) and 38a (47.4%). (Table 3)

Table 2 The rate of correct answers for each true-or-false question (n = 114)

True-or-false questions	Correct answer	n (%)
1. Vital signs are always reliable indicators of the intensity of a patient's pain.	F	85 (74.6)
2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.	F	82 (71.9)
3. Patients who can be distracted from pain usually do not have severe pain.	F	77 (67.5)
4. Patients may sleep in spite of severe pain.	T	55 (48.2)
5. Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.	F	78 (68.4)
6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.	T	66 (57.9)
7. Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.	T	112 (98.2)
8. The usual duration of analgesia of 1-2 mg morphine IV is 4-5 h.	F	77 (67.5)
9. Opioids should not be used in patients with a history of substance abuse.	F	90 (78.9)
10. Elderly patients cannot tolerate opioids for pain relief.	F	98 (86.0)
11. Patients should be encouraged to endure as much pain as possible before using an opioid.	F	95 (83.3)
12. Children less than 11 yr old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.	F	102 (89.5)
13. Patients' spiritual beliefs may lead them to think pain and suffering are necessary.	T	108 (94.7)
14. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.	T	109 (95.6)
15. Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.	F	78 (68.4)
16. Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.	T	56 (49.1)

Table 2 The rate of correct answers for each true-or-false question (n = 114) (cont.)

True-or-false questions	Correct answer	n (%)
17. If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.	F	44 (38.6)
18. Anticonvulsant drugs such as gabapentin (neurontin) produce optimal pain relief after a single dose.	F	101 (88.6)
19. Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment.	T	94 (82.5)
20. Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.	T	101 (88.6)
21. The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.	T	105 (92.1)
22. Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.	T	106 (93.0)

Table 3 The rate of correct answers for each multiple-choice question (n = 114)

Multiple choice questions	Correct answer	n (%)
23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is a. intravenous b. intramuscular c. subcutaneous d. oral e. rectal	d	78 (68.4)
24. The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset, such as trauma or postoperative pain is a. intravenous b. intramuscular c. subcutaneous d. oral e. rectal	a	108 (94.7)
25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? a. codeine b. morphine c. meperidine d. tramadol	b	102 (89.5)

Table 3 The rate of correct answers for each multiple-choice question (n = 114) (cont.)

Multiple choice questions	Correct answer	n (%)
26. A 30 mg dose of oral morphine is approximately equivalent to: a. morphine 5 mg IV b. morphine 10 mg IV c. morphine 30 mg IV d. morphine 60 mg IV	b	110 (96.5)
27. Analgesics for post-operative pain should initially be given a. around the clock on a fixed schedule b. only when the patient asks for the medication c. only when the nurse determines that the patient has moderate or greater discomfort	a	83 (72.8)
28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 mo. Yesterday the patient was receiving morphine 200 mg/h IV. Today he has been receiving 250 mg/h intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is a. < 1% b. 1-10% c. 11-20% d. 21-40% e. > 41%	a	19 (16.7)
29. The most likely reason a patient with pain would request increased doses of pain medication is a. The patient is experiencing increased pain. b. The patient is experiencing increased anxiety or depression. c. The patient is requesting more staff attention. d. The patient's requests are related to addiction.	a	85 (74.6)
30. Which of the following is useful for treatment of cancer pain? a. ibuprofen (motrin) b. hydromorphone (dilaudid) c. gabapentin (neurontin) d. all the above	d	80 (70.2)
31. The most accurate judge of the intensity of the patient's pain is a. the treating physician b. the patient's primary nurse c. the patient d. the pharmacist e. the patient's spouse or family	c	106 (93.0)
32. Which of the following describes the best approach for cultural considerations in caring for patients in pain: a. There are no longer cultural influences in the U.S. due to the diversity of population. b. Cultural influences can be determined by an individual's ethnicity (e.g., Asians are stoic, Italians are expressive, etc). c. Patients should be individually assessed to determine cultural influences. d. Cultural influences can be determined by an individual's socioeconomic status (e.g., blue collar workers report more pain than white collar workers).	c	71 (62.3)

Table 3 The rate of correct answers for each multiple-choice question (n = 114) (cont.)

Multiple choice questions	Correct answer	n (%)
33. How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? a. < 1% b. 5 - 15% c. 25 - 50% d. 75 - 100%	b	71 (62.3)
34. The time to peak effect for morphine given IV is a. 15 min b. 45 min c. 1 h d. 2 h	a	88 (77.2)
35. The time to peak effect for morphine given orally is a. 5 min b. 30 min c. 1 - 2 h d. 3 h	c	63 (55.3)
36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: a. sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued b. Impaired control over drug use, compulsive use, and craving c. The need for higher doses to achieve the same effect. d. a and b	a	38 (33.3)
37. Which statement is true regarding opioid induced respiratory depression: a. More common several nights after surgery due to accumulation of opioid. b. Obstructive sleep apnea is an important risk factor. c. Occurs more frequently in those already on higher doses of opioids before surgery. d. Can be easily assessed using intermittent pulse oximetry.	b	89 (78.1)
Case Studies Two patient case studies are presented. For each patient you are asked to make decisions about pain and medication. **Directions:** Please select one answer for each question.		
38. Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.		
38 A. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain. 0 1 2 3 4 5 6 7 8 9 10 No pain Worst Pain	8	54 (47.4)

Table 3 The rate of correct answers for each multiple-choice question (n = 114) (cont.)

Multiple choice questions	Correct answer	n (%)
38 B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q 1 h PRN pain relief." Check the action you will take at this time. 1. Administer no morphine at this time. 2. Administer morphine 1 mg IV now. 3. Administer morphine 2 mg IV now. 4. Administer morphine 3 mg IV now.	4	15 (13.2)
39. Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.		
39 A. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain: 0 1 2 3 4 5 6 7 8 9 10 No pain Worst Pain	8	85 (74.6)
39 B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q 1 h PRN pain relief." Check the action you will take at this time: 1. Administer no morphine at this time. 2. Administer morphine 1 mg IV now. 3. Administer morphine 2 mg IV now. 4. Administer morphine 3 mg IV now.	4	39 (34.2)

When comparing the rate of correct answers among three years of residency training, significant differences were found for questions 6, 26, 28, and 39B. Regarding question 6 ("Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months"), first-year residents provided the correct answer more frequently than senior residents. Regarding question 26, which asked about the equivalent dose of oral and intravenous morphine, all second- and third-year residents answered correctly, while nearly all first-year residents (85.2%) provided the correct answer. Regarding question 28, which asked about the likelihood of respiratory depression in a cancer patient who had increased their morphine dose, the most senior residents had the highest rate of correct answers (28.6%), followed by 13.2% of second-year residents, while none of the junior residents answered

correctly. Regarding question 39B, which asked about the management of a case with acute postoperative pain, half of the second-year residents answered correctly, compared to 30.6% of the most senior residents and 18.5% of the junior residents. (Table 4)

Table 5 explores the factors associated with the number of correct answers. It reveals that sex, duration of work since graduation and prior to anesthesia training, and the year of anesthesia training did not correlate with participants' scores. However, age emerged as a significant factor: residents aged over 30 yr scored lower (-6.1 points) compared to those aged 25-30 yr. Residency experience in pain rotation also influenced scores. Specifically, participants with both acute and chronic pain rotations experience scored 3.1 points higher.

Table 4 Percentage of correct answers per year among residents (n = 114)

Questions	Year of residency training, n (%)			*P*-value
	1st	2nd	3rd	
1	22 (81.5)	29 (76.3)	34 (69.4)	0.50
2	18 (66.7)	24 (63.2)	40 (81.6)	0.13
3	16 (59.3)	23 (60.5)	38 (77.6)	0.14
4	17 (63.0)	16 (42.1)	22 (44.9)	0.20
5	14 (51.9)	28 (73.7)	36 (73.5)	0.11
6	21 (77.8)	18 (47.4)	27 (55.1)	0.044*
7	27 (100.0)	37 (97.4)	48 (98.0)	> 0.90
8	22 (81.5)	22 (57.9)	33 (67.3)	0.13
9	22 (81.5)	31 (81.6)	37 (75.5)	0.70
10	22 (81.5)	33 (86.8)	43 (87.8)	0.70
11	22 (81.5)	33 (86.8)	40 (81.6)	0.80
12	24 (88.9)	33 (86.8)	45 (91.8)	0.70
13	26 (96.3)	35 (92.1)	47 (95.9)	0.80
14	24 (88.9)	36 (94.7)	49 (100.0)	0.055
15	16 (59.3)	26 (68.4)	36 (73.5)	0.40
16	11 (40.7)	16 (42.1)	29 (59.2)	0.20
17	7 (25.9)	14 (36.8)	23 (46.9)	0.20

Table 4 Percentage of correct answers per year among residents (n = 114) (cont.)

Questions	Year of residency training, n (%)			*P*-value
	1st	2nd	3rd	
19	22 (81.5)	32 (84.2)	40 (81.6)	> 0.90
20	22 (81.5)	34 (89.5)	45 (91.8)	0.40
21	25 (92.6)	33 (86.8)	47 (95.9)	0.30
22	23 (85.2)	36 (94.7)	47 (95.9)	0.20
23	15 (55.6)	28 (73.7)	35 (71.4)	0.30
24	26 (96.3)	37 (97.4)	45 (91.8)	0.60
25	23 (85.2)	35 (92.1)	44 (89.8)	0.70
26	23 (85.2)	38 (100.0)	49 (100.0)	0.003*
27	19 (70.4)	28 (73.7)	36 (73.5)	> 0.90
28	0	5 (13.2)	14 (28.6)	0.002*
29	18 (66.7)	31 (81.6)	36 (73.5)	0.40
30	16 (59.3)	26 (68.4)	38 (77.6)	0.20
31	24 (88.9)	34 (89.5)	48 (98.0)	0.20
32	16 (59.3)	28 (73.7)	27 (55.1)	0.20
33	17 (63.0)	25 (65.8)	29 (59.2)	0.80
34	20 (74.1)	30 (78.9)	38 (77.6)	0.90
35	13 (48.1)	21 (55.3)	29 (59.2)	0.70
36	6 (22.2)	14 (36.8)	18 (36.7)	0.40
37	20 (74.1)	30 (78.9)	39 (79.6)	0.80
38A	11 (40.7)	18 (47.4)	25 (51.0)	0.70
38B	2 (7.4)	6 (15.8)	7 (14.3)	0.60
39A	22 (81.5)	30 (78.9)	33 (67.3)	0.30
39B	5 (18.5)	19 (50.0)	15 (30.6)	0.024*

Table 5 Factors associated with correct answers (n = 114)

Factors	Regression coefficient	95% CI	*P*-value
Sex	1.6	-0.22, 3.5	0.084
Male			
Female			
Age group (yr)			< 0.001*
25-30	-	-	
> 30	-6.1	-8.5, -3.6	
Duration of work since graduation prior to anesthesia training	-0.66	-1.44, 0.13	0.100
Year of residency training			0.150
1st	-	-	
2nd	1.60	-0.79, 3.99	
3rd	2.23	-0.04, 4.51	
Experience of pain rotation			0.018*
Acute pain	2.1	-0.67, 5.0	
Chronic pain	-0.08	-5.2, 5.1	
Acute + chronic pain	3.1	1.1, 5.2	

Discussion

This prospective, descriptive, cross-sectional survey utilized the KASRP to evaluate attitudes and knowledge about pain and its management among Thai anesthesia residents. The findings revealed that the residents demonstrated an understanding of some key concepts, including multimodal analgesia, opioid conversion and titration, the biopsychosocial model of pain, scheduling analgesics for postoperative pain, sedation assessment in opioid-treated patients, patient self-report as a gold standard for pain intensity measurement, and equianalgesia.

The survey showed that Thai anesthesia residents demonstrated a good grasp of several important aspects of pain management. These included advanced topics such as multimodal analgesia (a combination of analgesics with different mechanisms of action and techniques aimed to target different sites along the pain pathway)[12], opioid titration (also known as opioid switching; a clinical strategy that involves transitioning a patient from one opioid to another for enhancing pain relief or reducing adverse effects)[13], and the biopsychosocial model of pain (a comprehensive framework of pain as a complex experience resulting from the interplay of biological, psychological, and social factors)[14]. These concepts are critical for effective pain management, as they ensure a comprehensive approach to both the physical and psychological aspects of pain. The recognition of patient self-report as the gold standard for pain intensity measurement and the application of equianalgesia (different doses of various

opioids which produce similar levels of pain relief)[15] further illustrate that these residents are aware of best practices in pain management.

Furthermore, it is important to emphasize that the residents demonstrated a correct understanding of opioid titration[16,17] and the monitoring of sedation levels, as excessive sedation typically precedes opioid-induced respiratory depression[18]. There two points are critical in clinical practice while using opioids for any patient. Not only did we identify correct knowledge and attitudes, but we also uncovered incorrect responses. We would like to emphasize five items where the participating residents answered correctly less than 40% of the time. These include misunderstandings such as avoiding opioid use when the cause of pain is unknown or under investigation, the likelihood of a patient with persistent cancer pain developing respiratory depression when using high and increasing doses of intravenous morphine, the inability to differentiate between physical and psychological dependence, and judging a patient's pain based on pain behaviors rather than their self-reported pain intensity.

In current medical practice, the withholding of opioid prescriptions in patients with acute abdominal pain due to fear of masking pathology has been pervasive. However, it has been demonstrated that analgesic administration does not lead to adverse events or diagnostic delays. It has been proposed that providing opioids for pain management in patients presenting to emergency rooms with acute abdominal pain is both safe and humane.[19] Similarly, a systematic review found that the use of opioids in patients with acute abdominal pain significantly alleviates discomfort without impacting treatment decisions.[20] A more recent systematic review concluded that untreated acute abdominal pain in emergency rooms leads to significant patient discomfort and emphasized that every patient should receive sufficient and timely pain control. Adequate and prompt pain management should no longer be withheld or delayed and should be initiated even before a diagnosis, following an assessment of relevant pain characteristics.[21]

It has been shown that parenteral opioid titration for patients with cancer pain is not associated with ventilatory depression as evidenced by the absence of significant changes in end-tidal carbon dioxide level or oxygen desaturation in non-oxygen dependent patients.[22] A retrospective cross-sectional study of 15,753 patients with acute or chronic pain, including both cancer and non-cancer pain, found that 0.57% experienced opioid-induced respiratory depression (OIRD).[23] In general, while the risk of OIRD exists, it is low in non-opioid-naive patients. Therefore, providing an adequate dose of opioids for patients with severe cancer pain is essential.

Even the term dependence has come to be used interchangeably with addiction in everyday language, opioid (physical) dependence differs from addiction (psychological dependence).[24] According to the Diagnostic and Statistical Manual of Mental Disorders (DSM–5) criteria, signs and symptoms of opioid withdrawal, which indicate physical dependence, include insomnia, pupillary dilation, lacrimation, photophobia, rhinorrhea, piloerection ('goose flesh'), myalgia, nausea/vomiting, diarrhea, autonomic hyperactivity (tachypnea, hyperreflexia, tachycardia,

sweating, hypertension, hyperthermia), and yawning.[25] The DSM-5 criteria for diagnosing opioid use disorder include using opioids in larger amounts or over a longer period than intended; difficulty controlling opioid use; spending significant time obtaining, using, or recovering from opioids; cravings for opioids; continued opioid use leading to failure in fulfilling major obligations; continued use despite social or interpersonal problems; giving up important activities due to opioid use; using opioids in risky situations; continued use despite associated health problems; tolerance; and withdrawal.[26]

Assessing pain intensity is a fundamental aspect of patient care, and a patient's self-report remains the gold standard for pain measurement. This approach is widely endorsed across various medical disciplines.[27,28] Pain intensity measurement is a complex process, and it is recognized that observed pain behaviors do not always align with a patient's self-reported pain levels.[29] Hence, it is highly advisable to carefully listen to the patient's self-reported description of their pain experience, as their verbal account often provides the most accurate and reliable measure of their pain intensity and the impact it has on their daily life.

Assessing the factors associated with correct answers in this survey, it was found that certain demographic and experiential factors, such as younger age and experience in both acute and chronic pain rotations, were found to be significantly associated with higher levels of knowledge in pain management. Younger residents, who may be more familiar with current guidelines and trends, and those with experience in pain rotations, tended to score better on the KASRP. This aligns with previous research that suggests targeted training in pain management, especially during residency, can positively impact the knowledge and attitudes of healthcare providers.[30] Furthermore, continuing education programs focused on international guidelines and routine professional development are also essential to improve healthcare providers' attitudes toward effective pain management.[31]

Conclusion

The anesthesia residents displayed appropriate knowledge and attitudes toward pain and its management. However, certain gaps in their knowledge and attitudes were identified, highlighting the need for improvement. A higher rate of correct answers was observed among younger residents and those with residency experience in pain rotation.

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Conflicts of interest

The authors declare no conflict of interests.

Authors' contribution

S.N. initiated the study idea and was responsible for the study design, proposal writing,

Ethics Committee application, data collection, data interpretation, manuscript writing, and submission for publication.
W.S. conducted data analysis and contributed to data interpretation.
R.C. performed the sample size calculation.
P.R., P.C., R.S., I.P. and S.M. were involved in data collection.
All authors reviewed the manuscript.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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