CAHIERS MAGELLANES-NS
Volume 07 Issue 1
2025

ISSN:1624-1940
http://magellanes.com/

EVALUATING THE KNOWLEDGE AND ATTITUDES TOWARD POSTOPERATIVE PAIN MANAGEMENT AMONG MEDICAL STUDENTS AND INTERNS IN SAUDI ARABIA.

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Abstract

Background: This article discuses diverse aspects of post-operative pain which is unpleasant emotional and sensory experience brought on by prospective or existing tissue damage and adversely impact the healing process of an individual. It covers topics like overview of pain, major cusses of pain and post-operative pain management. This study aims to evaluate level of knowledge and the attuited toward pain management among medical interns and medical students in Saudi Arabia. **Methodology:** This cross-sectional survey study was conducted in KSA from July 2024 to December 2024. This study plans to recruit participant through Saudi universities and Hospitals. The inclusion criteria are male and female medical interns and students from all provinces in the Kingdom of Saudi Arabia who consented to participate in the study and filled out the questionnaire were included in this criterion. The general public who is not a medical intern or student, who is not a member of the Saudi Arabian medical field, and who declined to engage in this study were the exclusion criteria. A formula based on prevalence estimation, a 95% confidence level, and a 5% acceptable error was used to determine the minimum target sample size, which is 384. **Results:** The study included a total of 394 participants. We found that only 11.9% of participants demonstrated a high level of knowledge about effective pain management strategies, with a moderate knowledge level of 53.6%. Additionally, only 14.7% exhibited positive attitudes towards pain management, while 37.6% reported low attitudes. **Conclusion:** The findings of this study underscore the urgent need for enhanced educational initiatives focused on postoperative pain management within medical training programs in Saudi Arabia.

Keywords: knowledge, post-operative pain management, Saudi Arabia.

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Introduction:

The International Association for the Study of Pain, pain is an unpleasant sensory and emotional sensation caused by actual or potential tissue damage [1]. Also, the pain is an important complaint that triggers a variety of diagnoses and treatment-seeking behaviors. Performing surgery has been identified as the primary source of pain among the four main reasons. postoperative pain (POP), is said to negatively affect a person's healing process [2]. Pain is a major symptom that surgical patients suffer despite technical advancements in medication, surgical procedures, and peri-operative care, with 86% of patients experiencing severe pain. POP reaches its peak during the first 36 hours after surgery and then starts to steadily decline by the third postoperative day [3].

The incidence of POP is estimated to range from 47% to 100%, presenting a significant challenge across all ages, races, genders, economic statuses, and geographical locations [4]. Despite advancements, ineffective postoperative pain relief remains a prevalent issue in healthcare, with estimates suggesting that approximately 50% to 75% of patients experience inadequate pain management following surgery [5]. In the United States, 80% of patients reported experiencing POP after surgery [6]. In Africa, a study conducted in Nairobi found that the prevalence of POP was 58% within 30 minutes and 55.3% after 24 hours. In Ethiopia, the prevalence of moderate to severe POP pain ranges from 30.5% to 91% [6]. Over the past 3 to 4 decades, studies have consistently shown that 20% to 80% of surgical patients experience untreated pain. Pain is recognized as a serious public health issue in all developed countries [7].

A national survey conducted in China concluded that one of the major reasons for the suboptimal pain management is due to the lack of available anesthesiologists in those hospitals [8]. Another reason can be the inadequacy of knowledge and poor attitudes among nurses in regard to pain management [9]. A Study conducted in Nepal, estimated the existing knowledge about pain management among nurses to be 50.34% which is significantly low when compared to the level of knowledge among nurses from USA and Norway [10]. In a similar study conducted in Saudi Arabia, the mean level of knowledge and attitudes self-reported by the nurses was 52% reflecting also a poor level of knowledge in regard to post-operative pain management. Furthermore, a study conducted to measure the attitude and knowledge of nurses in regards to Patient controlled analgesia (PCA), reflected a very poor attitude toward this pain management technique among nurses [11].

There are relatively few studies evaluating medical students' understanding of post-operative pain management, even though it is crucial for those who want to become anesthesiologists or work in surgical fields.

Objectives:

This study aimed to assess the knowledge and attitude of postoperative pain management among medical interns and medical students in Saudi Arabia.

Methodology:

Study design and Setting:

This study is a cross-sectional survey was carried out from July 2024 to December 2024**.** The participants of the study were medical students and interns from various universities across different regions in Saudi Arabia.

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Sample size:

Calculations were performed to ascertain the minimal number of responses needed to create a representative sample for the total population by using Raosoft sample size calculator. Maintaining an indication percentage of0.50, and margin of error of 5% and a 95% confidence interval (CI), 384 was the estimated sample size**.**

Inclusion and Exclusion criteria:

The inclusion of this criteria were the medical interns and medical students in the Saudi Arabia, male and female, from all provinces of the Kingdom of Saudi Arabia who agreed to participate in this study and has been completed the questionnaire. Exclusion criteria were the general population who is not a medical intern or a medical student, who is not a part of medical interns or medical students in the Kingdom of Saudi Arabia and who didn't agree to participate in this study

Method for data collection, instrument and score system:

An English self-administered questionnaire was used to gather data. The survey was split into two sections. The first section asked questions on general demographics, such as age, gender, and the level of education (undergraduate or intern). the second section are used to evaluate students' knowledge and attitudes regarding POP management. A higher total score denotes a higher level of knowledge and favorable attitudes toward POP management. Poor attitudes were equated with poor knowledge on this scale.

Scoring system:

in all, 24 statements served to assess the participants' degree of knowledge and attitudes. 3 statements for demographic 13 for knowledge, 8 for attitudes. 5 point is given for strongly agree and one point is given for strongly disagreeing. for scoring we used a five-point Likert scale. The maximum score was 105 and divided as follows: the original Bloom's cut-off point, 80.0%-100.0%, 60.0%-79.0% and 59.0%, the participants divided into three groups based on their scores.

Knowledge score varied from 0 to 65 points and was classified into three levels as follows: those with a scores of 52 or above were classified as **having high level of knowledge**, those with scores between 38 and 51 as having **moderate level of knowledge,** and those with scores a score of 37 or below as having **poor level of knowledge.**

Attitudes scores varied from 0 to 40 and were classified into three levels as follows: **positive attitude** for those with score of 32 and above, **fair attitude** for those with scores between 24 and 31, and **negative attitude** for those with scores of 23 or below.

Pilot test: The questionnaire was administered to 20 individuals to assess its clarity and the feasibility of the study. The data collected from this pilot study were excluded from the final analysis.

Analyzes and entry method: Upon completing the data collection process, the collected data were

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categorized and recorded. The data were then processed and analyzed using SPSS version 20. Each questionnaire was reviewed for completeness, coded, and entered into INTR OP INFO version7. Finally, the results were presented using various graphs, tables, and descriptive statements.

Results:

Table (1) displays various demographic parameters of the participants with a total number of (394). The average age of participants is 22.8 years and note a high number (31.7%) of participants aged 22 to 23 years. There is a real concentration of participants in this age group, followed closely by those aged 21 years or younger, reflecting the predominance of younger participants. It appears there has been an imbalance in gender representation as females make up 54.8% of the cohort, potentially distorting the outcome of the study. The Western region has a higher representation with 33.8%, followed by 3.0% for the Northern region. The data also shows that many participants are towards the final stages of study; 29.2% in the sixth year and 22.6% as interns, pointing to increasing attention to advanced educational stages. Furthermore, the current average academic performance is good: a majority (43.9%) of participants scored as excellent, indicating high academic achievement in the cohort.

Table (1): Sociodemographic characteristics of participants (n=394)

Parameter		***No.***	***Percent (%)***
Age (Mean:22.8, STD:3.2)	21 years or less	112	28.4
	22 to 23	125	31.7
	24 years old	88	22.3
	25 years or more	69	17.5
Gender	Female	216	54.8
	Male	178	45.2
Region of residence	Northern region	12	3.0
	South region	36	9.1
	Center region	110	27.9
	Eastern region	103	26.1
	Western region	133	33.8
Year of educational program	1st	44	11.2
	2nd	48	12.2
	3rd	17	4.3
	4th	43	10.9
	5th	38	9.6
	6th	115	29.2
	intern	89	22.6
Current average rank	Excellent	173	43.9
	Very good	117	29.7
	Good	94	23.9
	Weak	10	2.5

As shown in figure 1, many participants in the total sample size of 394 stated they were opposed to intramuscular administration as a method of choice. For example, 33 respondents (about 8.4%) strongly

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agreed, 70 respondents (approximately 17.7%) agreed for a total of 26.1 percent in favor. On the other hand, 119 people (30.2) were neutral. But the weight of opinion came from those who steadfastly refused intramuscularly, with 101 respondents (25.6 per cent) disagreeing and 71 (18.0 per cent) very much disagreeing, adding up to 172 participants (43.7 per cent) who did not favor intramuscularly.

Figure (1): Illustrates the preferred rule of administration of narcotic pain relievers among participants.

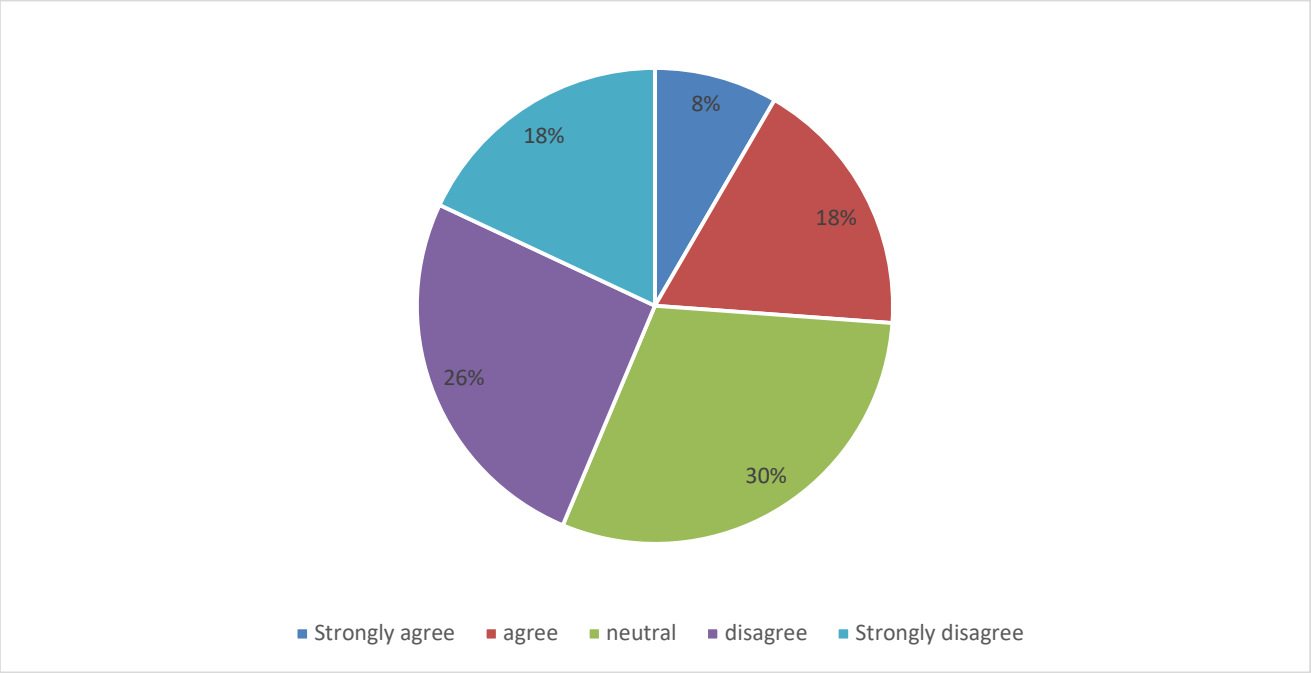

Table (2) shows a spectrum of knowledge and attitudes of medical students and interns regarding postoperative pain management among a total sample of 394 participants. A source of contention appears in views of the administration of narcotic pain relievers, with 26.2 percent in agreement that it is not preferred in intramuscular administration, and 30.2 percent neutrality, implying uncertain adherence to current educational protocol. We can see the moderate acknowledgement of the patient understanding of self-reporting pain, with 41.1 that agrees that the most accurate judging of pain intensity is from the patient but a fourth of those 25% being neutral or disagreeing. Furthermore, given the risks that addiction poses with narcotic use, survey participants nearly all (43.7%) answered neutrally to the statement that less than 25% of patients taking narcotics around the clock become addicted.

Table (2): Parameters related to knowledge toward postoperative pain management among medical students and interns (n=394).

Parameter		***No.***	***Percent (%)***
The preferred rule of administration of narcotic pain relievers to patients with pain could not be intramuscular	Strongly agree	33	8.4
	agree	70	17.8
	neutral	119	30.2
	disagree	101	25.6

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	Strongly disagree	71	18.0
Patients receiving narcotics on a PRN(as needed) basis may be likely to develop clock-watching behaviors	Strongly agree	29	7.4
	agree	69	17.5
	neutral	152	38.6
	disagree	78	19.8
	Strongly disagree	66	16.8
The most accurate judge of the intensity of the patient's pain is the patient.	Strongly agree	67	17.0
	agree	95	24.1
	neutral	102	25.9
	disagree	75	19.0
	Strongly disagree	55	14.0
If a patient (and/or family member) reports that a narcotic is causing euphoria, she/he should be given a lower dose of the analgesic.	Strongly agree	45	11.4
	agree	108	27.4
	neutral	110	27.9
	disagree	82	20.8
	Strongly disagree	49	12.4
Increasing analgesic requirements are signs that the patient is becoming tolerated to the narcotic.	Strongly agree	65	16.5
	agree	108	27.4
	neutral	97	24.6
	disagree	78	19.8
	Strongly disagree	46	11.7
Less than 25% of patients receiving narcotics around the clock become addicted	Strongly agree	29	7.4
	agree	88	22.3
	neutral	172	43.7
	disagree	59	15.0
	Strongly disagree	46	11.7
Patients having severe chronic pain often need higher dosages of pain medications than patients with acute pain	Strongly agree	51	12.9
	agree	76	19.3
	neutral	114	28.9
	disagree	84	21.3
	Strongly disagree	69	17.5
Although there is evidence of that narcotics can cause respiratory depression, we still must use it.	Strongly agree	51	12.9
	agree	112	28.4
	neutral	118	29.9
	disagree	62	15.7
	Strongly disagree	51	12.9
Estimation of pain by a physician or a nurse is less valid measure of pain compared to patient's self-report	Strongly agree	40	10.2
	agree	88	22.3
	neutral	132	33.5
	disagree	75	19.0
	Strongly disagree	59	15.0
Giving narcotics on a regular schedule is preferred over PRN (as needed) schedule for continuous pain	Strongly agree	35	8.9
	Agree	88	22.3
	Neutral	128	32.5

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	Disagree	83	21.1
	Strongly disagree	60	15.2
The most suitable dose of morphine for a patient in pain is a dose that best controls the symptoms; there is no maximum dose (ie, a level that must not be exceeded) for morphine.	Strongly agree	26	6.6
	agree	80	20.3
	neutral	111	28.2
	disagree	76	19.3
	Strongly disagree	101	25.6
Lack of pain expression does not mean lack of pain.	Strongly agree	52	13.2
	agree	111	28.2
	neutral	116	29.4
	disagree	64	16.2
	Strongly disagree	51	12.9
In the postoperative setting, increasing analgesic use is more likely due to the body's response to the surgical trauma rather than psychological factors	Strongly agree	44	11.2
	agree	101	25.6
	neutral	129	32.7
	disagree	63	16.0
	Strongly disagree	57	14.5

As shown in figure (2), Analysis of given data (394 respondents in total sample size) reveals impressive findings in relation to how people perceive the association of pain expression with experiencing pain. Particularly, out of our 52 respondents (approximately 13.2%) who are strong in their agreement regarding the assertion that the lack of pain expression does not equate to a lack of pain, or 111 respondents (28.2%), combined 41% of respondents acknowledge the intricacies of pain expression. On the other hand, 64 persons (16.4 per cent) disagree, while 51 (12.9 per cent) strongly disagree, implying that about 29.3 per cent of them have an opposite view. At the same time, a large group of 116 participants (29.4%) is neutral, emphasising the need to investigate these nuances of pain communication in relation to assessment and treatment.

Figure (2): Illustrates what lack of pain expression means among participants

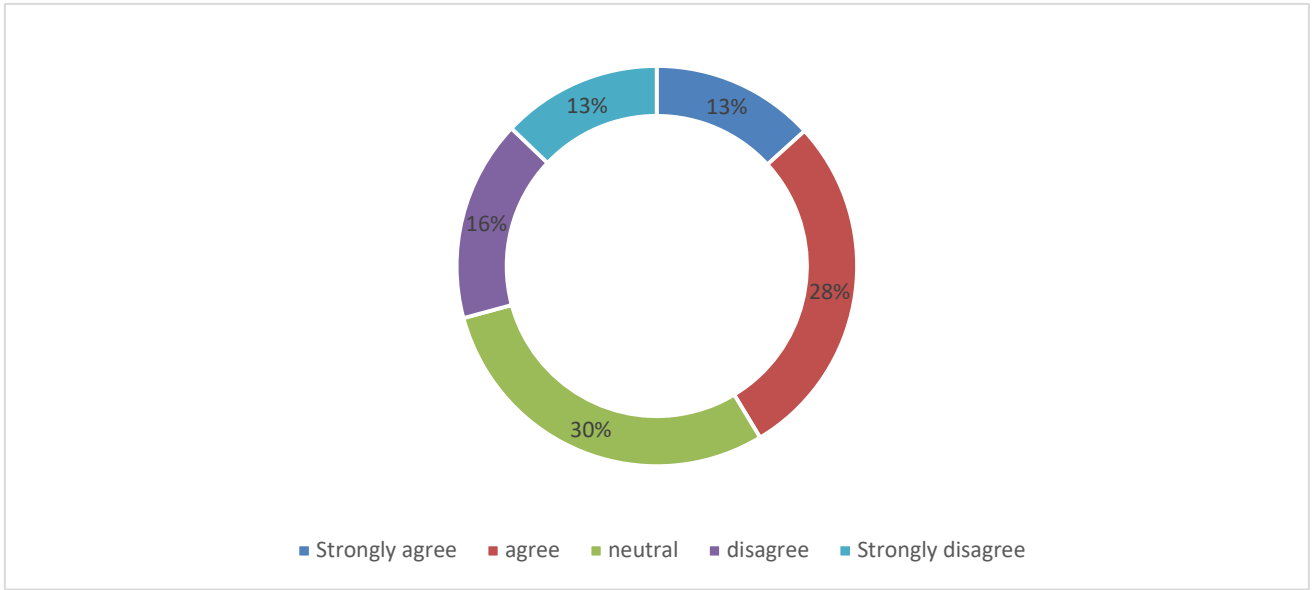

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Table 3 presents data that indicate a wide field of attitudes among medical students and interns regarding postoperative pain management, but also areas of agreement and controversy on major points. What is notable is there is a large proportion of respondents who disagreed or strongly disagreed that placebos are accurate instruments to determine genuine pain (45.2%). If this is the case, a reluctance may be found to use placebo, associated with the modern development of ethical considerations in pain management. Additionally, in terms of timing of analgesic administration, there is hesitation not to let patients suffer pain prior to intervention, for which 36.3 percent disagree. Significance also lies in the acknowledgment that patients might not always communicate their pain clearly: 38.8 percent of participants agreed with this statement.

Table (3): Participants' attitudes toward postoperative pain management among medical students and interns (n=394).

Parameter		***No.***	***Percent (%)***
It is not useful to give a placebo to patients in pain to assess if they are genuinely in pain.	Strongly Agree	35	8.9
	Agree	59	15.0
	Neutral	122	31.0
	disagree	108	27.4
	Strongly disagree	70	17.8
It is not recommended to let patients experience some discomfort before giving the next dose of pain medications.	Strongly Agree	32	8.1
	Agree	84	21.3
	Neutral	134	34.0
	disagree	96	24.4
	Strongly disagree	48	12.2
When a patient in pain is receiving analgesic medication on a PRN basis, it is appropriate for the patient to request pain medications before the pain returns	Strongly Agree	25	6.3
	Agree	74	18.8
	Neutral	155	39.3
	disagree	73	18.5
	Strongly disagree	67	17.0
Patients may not always provide clear cues about their pain.	Strongly Agree	37	9.4
	Agree	116	29.4
	Neutral	129	32.7
	disagree	60	15.2
	Strongly disagree	52	13.2
Although the fact that Children cry all the time; Children in pain should receive appropriate pain medications, rather than just diversional activities	Strongly Agree	44	11.2
	Agree	96	24.4
	Neutral	157	39.8
	disagree	57	14.5
	Strongly disagree	40	10.2
Distraction, for example, by the use of music or relaxation can decrease the perception of pain.	Strongly Agree	38	9.6
	Agree	97	24.6
	Neutral	140	35.5
	disagree	68	17.3
	Strongly disagree	51	12.9

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Optimal pain management is a patient's right even if total pain relief not achievable.	Strongly Agree	67	17.0
	Agree	97	24.6
	Neutral	106	26.9
	disagree	71	18.0
	Strongly disagree	53	13.5
For effective treatment of pain, it is necessary to continuously assess the pain and the efficacy of the therapy	Strongly Agree	101	25.6
	Agree	77	19.5
	Neutral	117	29.7
	disagree	55	14.0
	Strongly disagree	44	11.2

Table 4 demonstrates the knowledge levels of a sample of 394 individuals regarding postoperative pain management, which was concerning. Only 11.9 percent of respondents had achieved a high level of knowledge regarding the best ways to deal with effective pain relief post-surgery. In contrast 53.6% displayed a moderate level of knowledge, indicating awareness about HIV and the strategies of prevention, but insufficient knowledge for optimum patient care to warrant additional advocacy. However, 34.5% of respondents fell into poor knowledge category.

Table (4): Shows knowledge toward postoperative pain management score results.

	Frequency	**Percent**
High knowledge level	47	11.9
Moderate knowledge level	211	53.6
Low knowledge level	136	34.5
Total	394	100.0

Table 5 shows the data presented in order to elucidate distribution in attitudes to post operative pain management by a sample of 394 individuals. Notable observation is that a large share of participants, around 47.7%, had a moderate attitude level implying a balance of views toward pain management practices. However, only 14.7% of them showed having a high attitude level, implying that many of them think of the methodologies that are now used as highly useful methods. This was alarmingly high, 37.6 percent of respondents had a low attitude, meaning that they also had concerns or dissatisfaction with the current postoperative pain management strategies.

Table (5): Shows attitude toward postoperative pain management score results.

	Frequency	**Percent**
High attitude level	58	14.7
Moderate attitude level	188	47.7
Low attitude level	148	37.6
Total	394	100.0

Table (6) shows that knowledge level toward postoperative pain management has statistically significant relation to age (P value=0.046), and year of educational program (P value=0.0001). It also shows statistically insignificant relation to gender, residential region, current average rank. Participants aged 24 years and interns were found to have higher knowledge than others.

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Table (6): Relation between knowledge level toward postoperative pain management and sociodemographic characteristics.

Parameters		***Knowledge level***		***Total (N=394)***	***P value****
		High or moderate knowledge level	**Low knowledge level**		
Gender	Female	145	71	216	0.449
		56.2%	52.2%	54.8%	
	Male	113	65	178	
		43.8%	47.8%	45.2%	
Age	21 years or less	65	47	112	0.046
		25.2%	34.6%	28.4%	
	22 to 23	84	41	125	
		32.6%	30.1%	31.7%	
	24 years old	67	21	88	
		26.0%	15.4%	22.3%	
	25 years or more	42	27	69	
		16.3%	19.9%	17.5%	
Residential region	Northern region	6	6	12	0.291
		2.3%	4.4%	3.0%	
	South region	24	12	36	
		9.3%	8.8%	9.1%	
	Center region	74	36	110	
		28.7%	26.5%	27.9%	
	Eastern region	74	29	103	
		28.7%	21.3%	26.1%	
	Western region	80	53	133	
		31.0%	39.0%	33.8%	
Year of educational program	1st	16	28	44	0.0001
		6.2%	20.6%	11.2%	
	2nd	35	13	48	
		13.6%	9.6%	12.2%	
	3rd	9	8	17	
		3.5%	5.9%	4.3%	
	4th	21	22	43	
		8.1%	16.2%	10.9%	
	5th	26	12	38	
		10.1%	8.8%	9.6%	
	6th	82	33	115	
		31.8%	24.3%	29.2%	
	Intern	69	20	89	
		26.7%	14.7%	22.6%	
Current average rank	Excellent	118	55	173	0.258
		45.7%	40.4%	43.9%	

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	Very good	73	44	117	
		28.3%	32.4%	29.7%	
	Good	63	31	94	
		24.4%	22.8%	23.9%	
	Weak	4	6	10	
		1.6%	4.4%	2.5%	

P value was considered significant if ≤ 0.05.

Table (7) shows that attitude level toward postoperative pain management has statistically significant relation to gender (p value=0.011), age (P value=0.003), residential region (P value=0.001), and year of educational program (P value=0.0001). It also shows statistically insignificant relation to current average rank. Participants of female gender, aged 24 years, and interns were found to have better attitude than others.

Table (7): Attitude toward postoperative pain management in association with sociodemographic characteristics.

Parameters		***Attitude level***		***Total (N=394)***	***P value****
		High or moderate attitude level	**Low attitude level**		
Gender	Female	147	69	216	0.011
		59.8%	46.6%	54.8%	
	Male	99	79	178	
		40.2%	53.4%	45.2%	
Age	21 years or less	54	58	112	0.003
		22.0%	39.2%	28.4%	
	22 to 23	84	41	125	
		34.1%	27.7%	31.7%	
	24 years old	63	25	88	
		25.6%	16.9%	22.3%	
	25 years or more	45	24	69	
		18.3%	16.2%	17.5%	
Residential region	Northern region	7	5	12	0.001
		2.8%	3.4%	3.0%	
	South region	22	14	36	
		8.9%	9.5%	9.1%	
	Center region	76	34	110	
		30.9%	23.0%	27.9%	
	Eastern region	76	27	103	
		30.9%	18.2%	26.1%	
	Western region	65	68	133	
		26.4%	45.9%	33.8%	
Year of educational program	1st	16	28	44	0.0001
		6.5%	18.9%	11.2%	
	2nd	25	23	48	

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		10.2%	15.5%	12.2%	
	3rd	9	8	17	
		3.7%	5.4%	4.3%	
	4th	25	18	43	
		10.2%	12.2%	10.9%	
	5th	23	15	38	
		9.3%	10.1%	9.6%	
	6th	76	39	115	
		30.9%	26.4%	29.2%	
	Intern	72	17	89	
		29.3%	11.5%	22.6%	
Current average rank	Excellent	114	59	173	0.149
		46.3%	39.9%	43.9%	
	Very good	66	51	117	
		26.8%	34.5%	29.7%	
	Good	62	32	94	
		25.2%	21.6%	23.9%	
	Weak	4	6	10	
		1.6%	4.1%	2.5%	

P value was considered significant if ≤ 0.05.

Discussion:

This study aimed to assess medical students and interns knowledge and attitudes regarding post operative pain management in Saudi Arabia. Significance of this investigation is especially important when considering that effective pain management improves patient satisfaction and recovery post-surgery. Lack of adequate pain management continues to be an issue despite the progress in surgical technique and analgesic options with one study suggesting that substantial proportions of the surgical patients are suffering from moderate to severe post-operative pain [1, 2]. Our finding of gap in knowledge and attitude among surveyed cohort for pain management is consistent with other similar studies in other health care settings.

Our results show that only 11.9% of our participants showed a high level of knowledge regarding the use of effective postoperative pain management strategies. These findings are consistent with findings by Al-Sayaghi et al., that nurses in Saudi Arabia have seen similar deficiencies in knowledge and attitudes with respect to pain management [13]. In addition, the study of Kahsay and Pitkäjärvi pointed out that healthcare professionals found great difficulties in understanding how to manage a patient's pain, as a prevalent problem which exists in various healthcare systems [14]. As noted by Al-Sayaghi et al., our study found the moderate knowledge level (53.6%) observed reflects that many participants have gained awareness of some pain management strategies, but their understanding is still insufficient to ensure quality patient care, which is in agreement with Al-Sayaghi et al.'s call for additional educational interventions [13].

Our study regarding attitudes revealed that only 14.7% of participants showed a high level of positive attitudes towards postoperative pain management while 37.6 % showed low attitudes toward postoperative pain management. This is especially worrying because positive attitude are essential for the success of practices in pain management. Studies have previously shown that healthcare professionals' attitudes play a major role in the practices they take to managing pain. For example, in

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resource limited settings, Kahsay and Pitkäjärvi (14), discovered that emergency nurses applying their attitudes towards pain management hampered their ability to care adequately. A survey by Briggs et al. in the UK similarly demonstrated former inadequate training and negative appropriate to proficiency for taking care of the ache management concerning healthcare professionals causing suboptimal sufferer capabilities.

Our findings furthermore point to an interesting gender difference in attitudes toward postoperative pain management: female participants have better attitudes than male participants. This outcome is consistent with the findings of Al-Sayaghi et al. who reported that gender was an important determinant of how nurses in Saudi Arabia perceive the workplace based on their attitudes toward available resources [12]. Despite it being a complex issue, the influence of gender on healthcare professionals' attitude towards pain management needs to be further explored, as it may be a representation of wider social norms and requirements about gender roles in caregiving.

Additionally, the study showed that knowledge levels were strongly related to age and educational year, with higher knowledge levels in younger people and older people who were further along in educational stages. This is consistent with previous research linking educational attainment and knowledge of pain management practice. For example, in low back pain among adolescents in Saudi Arabia, Alotaibi's study showed a positive relationship between educational level and better knowledge and attitudes towards pain management [16]. Such findings suggest that as medical students enhance their education, they should gain more thorough knowledge of pain management, and that if pain management education was to be incorporated into medical curricula, it could be at the expense of other important components.

However, this study has gained valuable insights but it is first necessary to recognize some of the limitations. The cross-sectional nature of the data precludes establishing knowledge, attitude and demographic variables as determinants of behavior. Furthermore, considering that we limit this study to only a single geographical region, some of the results might not be transposed to other regions within Saudi Arabia or to other cultural contexts. Longitudinal designs utilizing pre/post measures of knowledge and attitude as well as potential impact of treatment efforts on medical student and intern pain management practice should be included as future research.

Conclusion:

This study's findings have implications on the urgent call for more educational efforts towards postoperative pain management in medical training programs in Saudi Arabia. Knowledge and attitudes gaps among medical students and interns observed are a call for overall approach to pain management education including evidence-based practice in pain management in presence of barriers to efficient pain management. Helping healthcare professionals develop a greater understanding of pain management principles will immensely assist in enhancing patient results and acceptance in postoperative care.

Acknowledgement:

We acknowledge all of the volunteers who provided samples for this research.

Ethical approval:

After fully explaining the study and emphasizing that participation is optional, each participant gave their informed consent. The information gathered was safely stored and utilized exclusively for study.

ISSN:1624-1940
http://magellanes.com/

Funding:

This study was not supported by any outside sources.

Conflict of interests:

The authors declare no conflict of interest.

Informed consent:

Written informed consent was acquired from each individual study participant.

Data and materials availability:

All data associated with this study are present in the paper.

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