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Examining Sociodemographic Influences on Pain Medication During the Initial Orthopedic Postoperative Day in Kirkuk City (Azadi, Kirkuk Teaching Hospital)

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Abstract

Introduction: This dissertation investigates pain from a neurobiological perspective, categorizing it into three distinct types: nociceptive pain, inflammatory pain, and the psychosocial factors influencing pain perception. Nociceptive pain serves as an early-warning mechanism, alerting individuals to harmful stimuli, while inflammatory pain enhances sensitivity after tissue damage, promoting healing. Despite their protective roles, both types of pain require effective management to prevent chronic issues.

Methods: A descriptive cross-sectional study was conducted at Kirkuk Teaching Hospital and Azadi Teaching Hospital involving 195 patients who underwent emergency orthopedic surgery. Data were collected using a semi-structured questionnaire and a Visual Analog Scale (VAS) to assess pain intensity at 2-, 12-, and 24-hours post-surgery. The study examined various sociodemographic factors, surgical details, and pain management strategies to identify their influence on postoperative pain perception.

Results: The study revealed that a significant proportion of patients reported high pain levels (8/10) on the VAS, with males showing higher satisfaction levels with pain management compared to females. The most commonly used analgesics were acetaminophen and nefopam, often in combination. The duration of surgery correlated with the number of pain medications used, indicating that longer procedures necessitate more intensive pain management. Notably, sociodemographic factors did not significantly influence pain perception among the patient population.

Conclusion: The findings underscore the necessity for tailored pain management strategies in orthopedic settings, considering the unique demographics of patients in Kirkuk. Effective pain management protocols that utilize simpler analgesics may enhance patient satisfaction and recovery outcomes. Future research should focus on the long-term effects of these strategies and explore the reasons behind the lack of significant sociodemographic influences on pain perception.

Keywords: Acute abdominal conditions, ultrasound, abdomen pain, emergency department

Introduction

From a neurobiological standpoint, what is pain? Pain can actually be understood as three distinct phenomena, although both we and many healthcare professionals often overlook this differentiation. The first type is pain that serves as an early-warning mechanism, crucial for detecting and reducing exposure to harmful or damaging stimuli. This is the sensation we experience when we touch something that is excessively hot, cold, or sharp. Since this type of pain relates to the detection of harmful stimuli, it is referred to as nociceptive pain.[1]

For many years, research on nociceptive pain focused primarily on sensory neurons and spinal cord circuits, as it was challenging to study how the brain processes pain signals in anesthetized animals, where effective anesthesia is defined by the absence of pain-related responses. However, advancements in functional imaging with human volunteers and patients have enabled researchers to identify the brain regions activated by nociceptive inputs, as discussed by Schweinhardt and Bushnell.[2]

The second type of pain is also adaptive and serves a protective function. It increases sensory sensitivity following unavoidable tissue damage, aiding in the healing process by discouraging physical contact and movement. This heightened sensitivity, known as pain hypersensitivity or tenderness, helps prevent further injury and supports recovery, as seen with surgical wounds or inflamed joints, where normally harmless stimuli can trigger pain. This type of pain arises from the immune system's activation due to tissue injury or infection, and is referred to as inflammatory pain; it is a key characteristic of inflammation. Although this pain is beneficial, it should still be managed in patients experiencing ongoing inflammation, such as those with rheumatoid arthritis or severe injuries.[3]

Evaluating the intensity of pain is crucial for effective pain management. A systematic approach to assessment, measurement, and re-evaluation enhances the ability of nurses and healthcare teams to alleviate patients' pain, improve comfort and satisfaction during hospital stays, and enhance physiological, psychological, and physical recovery after surgery. To ensure consistency in pain assessments, nurses should employ specific data collection methods (objectifying pain). Besides quantitative measures, nurses also perform qualitative evaluations of pain, which encompass descriptions of the pain, its duration, frequency, timing, and the patient's reactions to it.[4]

In a previous epidemiological study of fractures among patients in Kirkuk City showed fractures were more common in age group of 20-40 years, with males accounting for 75% of cases compared to 25% for females. Moreover, Individuals living in urban areas

experienced a higher incidence of fractures, while those in rural areas had fewer cases. Additionally, fractures were more prevalent among workers and individuals with flexible jobs. Upper limb fractures occurred more frequently than those of the lower limbs and axial skeleton, with the radius and tibia being the most commonly fractured bones. The majority of fractures were linked to falls, followed by road traffic accidents.[5]

Among the important factors that manipulate pain, Surgical trauma can release various inflammatory mediators, such as prostaglandins and cytokines, which can sensitize sensory nerve endings and result in pain. Typically, this process diminishes as the wound heals over time. However, in some instances, it is believed that the inflammatory response may continue, such as in cases of ongoing inflammation surrounding a mesh repair.[6]

A considerable amount of the differences in how individuals respond to both acute and chronic pain stimuli, such as those experienced during surgery, may be attributed to genetic factors. In fact, a genetic influence has been identified in certain types of migraines.[7]

A systematic review was conducted to explore the psychosocial factors associated with persistent postoperative pain following various surgical procedures. The review identified 36 studies of adequate quality for meaningful analysis. It found that depression, "psychological vulnerability" (with varying definitions across studies), and stress are likely associated with persistent postoperative pain. On the other hand, neuroticism, gender, and low education levels were deemed unlikely predictors. The study found insufficient evidence to draw conclusions regarding anxiety, self-control, vitality, self-perception, expectations, sense of control, and social support. A key takeaway from this analysis was the recognition of numerous low-quality studies, underscoring the necessity for more prospective, well-designed, and adequately powered research.[8]

In a critical review of Debra B. Gordon *et al.* about gaps in practice guidelines for acute postoperative pain. This includes the methods and timing for educating patients perioperatively, nonpharmacological treatments, techniques for both peripheral and central neuraxial analgesia, monitoring how patients respond to treatment, and models for organizing care delivery. While evidence strongly supports a multimodal analgesic approach, there are numerous potential treatment combinations, with relatively few having been thoroughly evaluated.[9]

To manage postoperative pain following orthopedic surgery, various strategies have been employed. One of the most prevalent methods is the use of opioids. However, these can lead to several adverse effects, including nausea, vomiting, sedation, and constipation. Additionally, opioid use carries a risk of addiction and potential overdose. An alternative strategy for effective postoperative pain management is the use of peripheral nerve blocks, which studies have shown result in higher patient satisfaction regarding pain control when used in combination with other methods.[10]

Multimodal Analgesia (MMA), commonly known as "balanced analgesia," employs a combination of different analgesic medications, physical therapies, and cognitive techniques to target both peripheral and central nerve sites for pain management.[11]. It is widely recognized that joint replacement and spine surgeries are among the most painful surgical procedures postoperatively. In a multicenter study conducted by Arefaine et al. in 2020, it

was found that 70.5% of patients who underwent orthopedic emergency surgery experienced moderate to severe postoperative pain. The study also revealed that orthopedic patients with preoperative anxiety were 6.42 times more likely to suffer from moderate to severe postoperative pain compared to those without anxiety. Other significant factors included a history of preoperative anxiety, previous pain experiences, patient expectations regarding postoperative pain, the use of a tourniquet during surgery, the type of anesthesia used, and the duration of anesthesia.[12]

Aim of the study

In this study, we discuss the influences of sociodemographic factors on pain medication during the initial postoperative day. We focus on orthopedic department surgery of Kirkuk Teaching Hospital.

Materials and Methods

Study design

A Hospital based descriptive cross-sectional study design was conducted on the sociodemographic and influential factors of post-operative pain after emergency orthopedics surgery.

Study area and period

This study was conducted at two comprehensive specialized hospitals in the PACU, ICU and orthopedic ward Over a period of four months from November 2024 to February 2025 in Kirkuk hospitals including Kirkuk Teaching Hospital and Azadi Teaching Hospital. We preferred to conduct our research in these two comprehensive specialized teaching hospitals to get adequate sample sizes. The residence population has the same demographic and patient characters. At the same time; both areas of study are teaching hospitals for medical specialty and comparable educational levels of Anesthetists are working in those study areas.

Source and study population

Study population

All patients who have undergone any type of emergency trauma surgeries at both comprehensive Specialized Hospitals operation theatre was our source population. All patients who have undergone emergency orthopedic surgery at operation theatres of both comprehensive teaching hospitals within the study period were included. Orthopedic prevalence is (14%) among all traumatic surgery operation according to trauma registry. [13] While measuring the 95% confidence interval of the Kirkuk population (N=1,950,000) is determined to be sample size => 185. Our study the sample size is > 185 (n=195).

Inclusion criteria

All emergency orthopedics surgical patients, age above 10 years having orthopedic surgery under anesthesia during the study period were included.

Exclusion criteria

Patients who were discharged before the first 24 h post-operatively, Glasgow Coma Scale <14, documented cognitive disability, uncooperative patients and any difficulty with communication were excluded.

Dependent variables

•Postoperative pain & satisfaction level with pain medication.

Independent variables

- Socio-demographic variables: Age, gender, residency locality, occupation, gross house income, educational status.
- Preoperative patient related variables: Pain scale, fracture type, history of trauma related surgery, history of other site soft tissue injury, initial postoperative history of analgesia intake, type of pain killer usage, number of pain killer usage, patient satisfaction level of acute or chronic pain.
- Intraoperative related variables: Duration of surgery, length ofrecovery, site of surgery, type of anesthesia and duration of anesthesia.
- Postoperative related factors: type of analgesics used post-operatively, number of painkiller usage.

Operational definition

Visual Analogue Scale: It is a pain assessment tool for measuring subjective or behavioral phenomenon in which a subject selects from gradient of alternatives as no pain to worst imaginable pain arranged in linear fashion and measured with 100 mm ruler and it is validated as no pain (0-5 mm), mild pain (6-40 mm), moderate pain (41-74 mm), severe pain (75-100 mm). Based on VAS score; 0-5 mm = No Pain, 6-40 mm = Mild Pain (nagging, annoying, interfering little with daily activity), 41-74 mm = Moderate Pain (interferes significantly with daily activity) and 75-100 mm = severe pain (disabling; unable to perform daily activity). Both VAS and NRS are most widely used, reliable and valid pain assessment tools in the perioperative period. However; NRS have been criticized as it doesn't provide ratio-level scaling of pain. VAS pain assessment tool involves patients placed a mark on the line at a point that best represented their pain to provide an estimate of their pain. VAS has excellent statistical properties, including ratio-level scaling [17]. For our data collection purposes, with full explanation to the patient about the scoring mechanism, we preferred VAS score as the main postoperative pain assessment tool in our study.

Data collection procedure

Before data collection, four B Sc anesthetists were selected for data collection at both setups. Then after; training had been given. The data collection procedures include chart review and interview- based questionnaire. The data collectors assessed the pain severity at 2, 12, 24 h postoperatively using VAS at rest and movement through direct interview. The supervisor controlled the data quality and its completeness at the end of data collection for each participant in the first hospital. Whereas one of the data collectors acts as a supervisor in the second teaching hospital to check completeness and quality of data.

Data Collection Tools

A pre-tested, semi-structured questionnaire was developed regarding the incidence and associated factors of pain after emergency orthopedic surgery. A visual analog scale (VAS) was incorporated into the post-operative pain assessment tool at specific time intervals: 2 hours, 12 hours, and 24 hours after surgery. Patients were instructed to rate their pain using the VAS after surgery. Information such as patient age, sex, ASA status, procedure type, diagnosis, type of analgesic used, and duration of surgery was extracted from the table. Additional information was obtained through direct patient interviews. Data collection

continued for 120 consecutive days. Post-operative pain data were collected from a total of 200 emergency orthopedic surgery patients, with a response rate of 95.7%.

Data Management Quality

A preliminary data validation was conducted on 5% of the calculated eye volume. These patients were not included in the main study. The collected data were checked for legitimacy, accuracy, and clarity. After the initial validation, the appropriate questionnaire was modified appropriately. Prior to the procedure, patients were trained to use the Visual Acuity Rating Scale (VAS) for new failure. Finally, the data was cleaned and reviewed before analysis.

Ethical consideration

Participation in the study was voluntary and anonymous. Along with the questionnaire, Respondents confirmed their voluntary participation in the study by verbal approval to the researchers**.** The study was conducted in accordance with the approval of the Ethics Committee of an Al-Qalam University College research committee.

Statistical analysis

The collected data were analyzed by the SPSS 2025 software package (SPSS, Chicago, IL USA). Data of the studied sampled were presented as frequency tables for the demographic distribution. Quantitative variables presented as mean ± SD and frequencies for categorical variables. Differences between groups were tested, as appropriate. $P < 0.05$was considered to be statistically significant. Correlation between group were tested using bivariate spearman correlation, as appropriate $P<0.05$ was considered to be statistically significant.

Demographic characteristic of the studied sample:

The study involved 195 patients with traumatology attending the teaching hospital in Kirkuk governorate (Kirkuk & Azadi) hospital. the studied sample consist of 147 males (75%) & 48 females (25%) (fig 1)

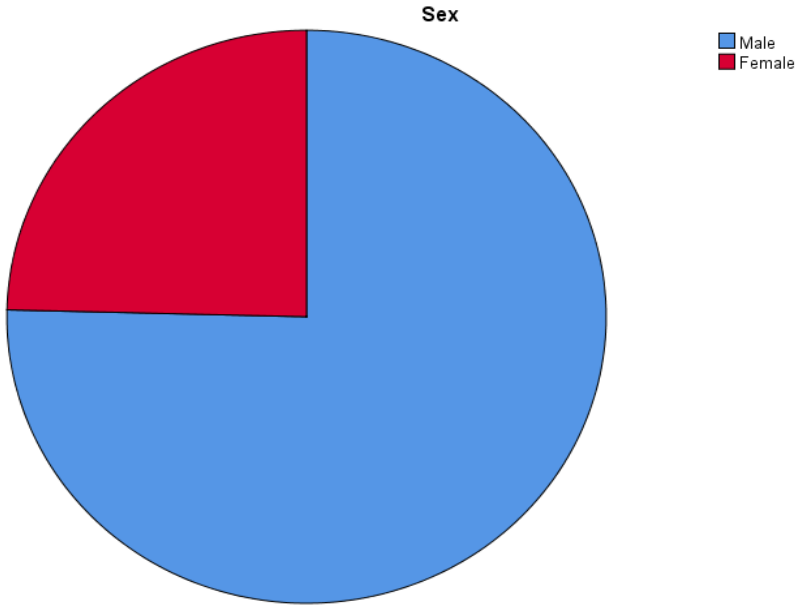


Fig 1. Gender distribution of the studied sample

The age of the studied sample divided into nine age group from less than 10 years to more than 90 years. (Table 1) Among the studied sample, the majority (43%) of them were at the third decade of their life. While (41%) of them were at the second decade of their life. The third (33%) of them were at the fourth decade of their life. (fig2)

Table 1. The age distribution of the studied group.

Age in year		Frequency	Percent
	Age less than 10 years old	28	14.4
	10-19 yrs old	41	21.0
	20-29 yrs old	43	22.1
	30-39 yrs old	33	16.9
	40-49 yrs old	16	8.2
	50-59 yrs old	19	9.7
	60-69 yrs old	9	4.6
	70-79 yrs old	5	2.6
	90 years old & more	1	0.5
	Total	195	100.0

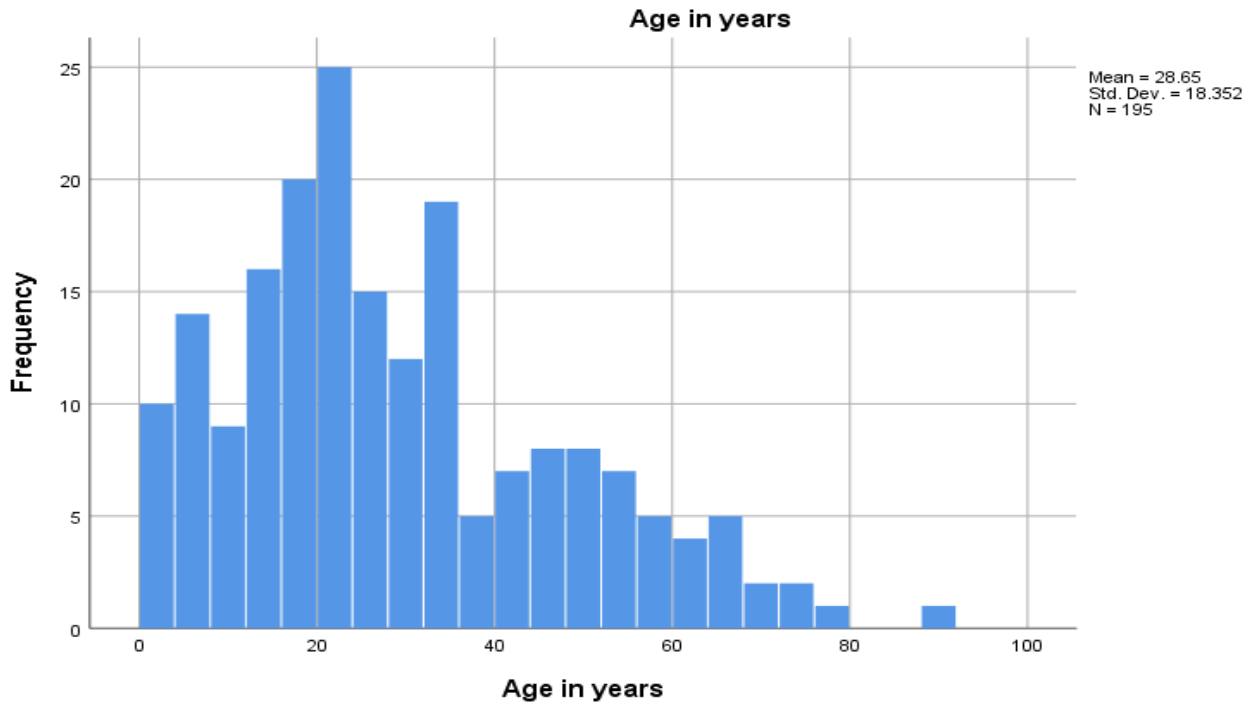


Fig 2. Age distribution of the studied sample

The residency for the studied sample were living in rural area of Kirkuk governorate (38%) while (62%) of them lived at the urban locality of Kirkuk governorate. (Fig 3) The detailed locality frequency for the studied sample were shown in a simple bar chart. (Fig 4)

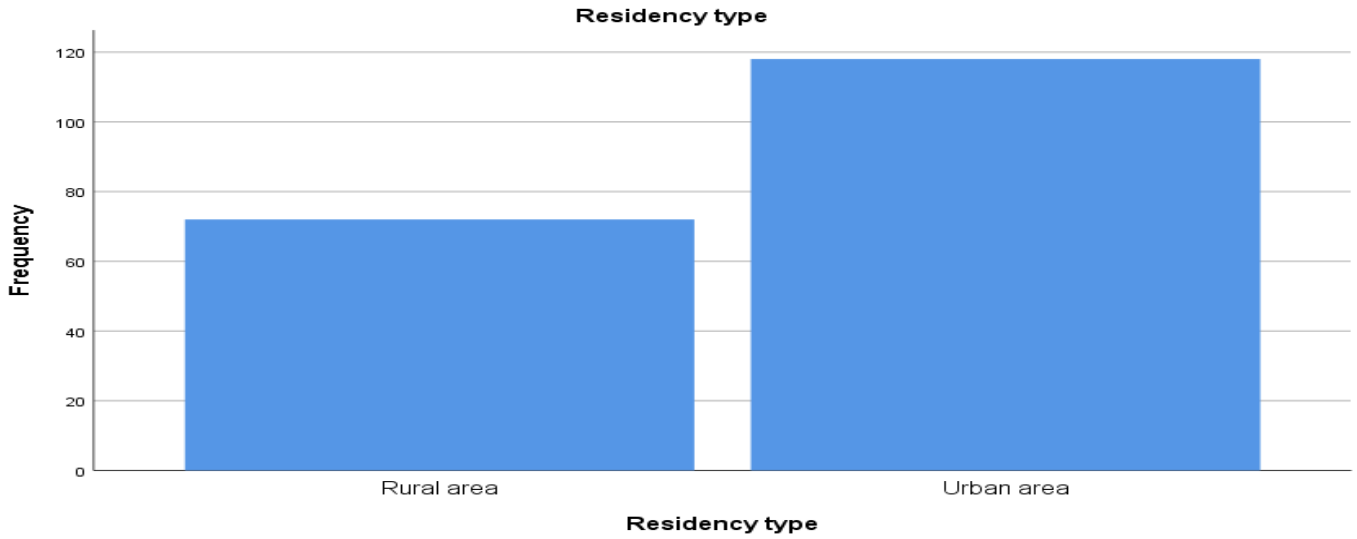


Fig 3. The distribution of the residency types among the studied sample.

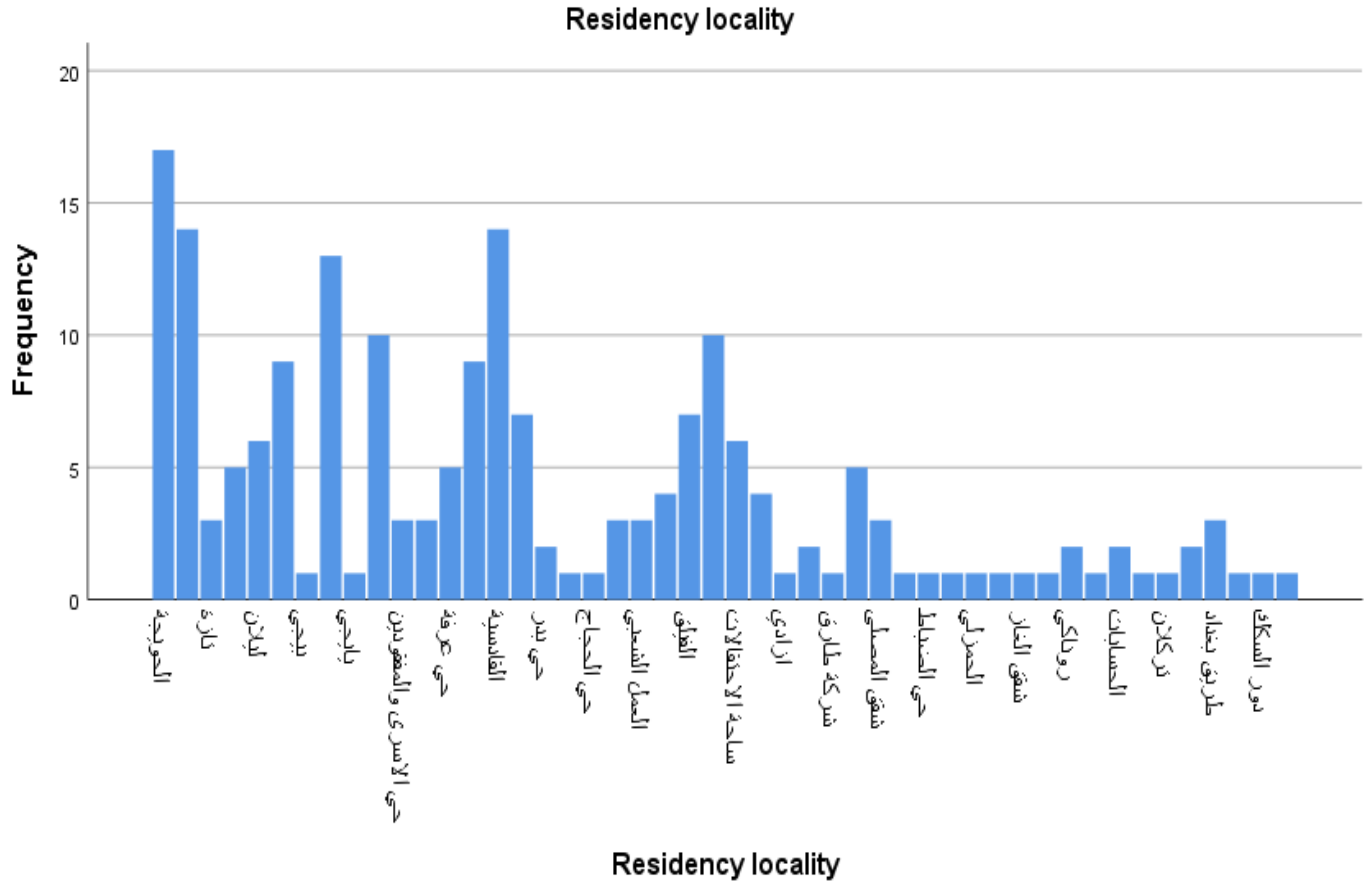


Fig 4. The distribution of the residency locality among the studied sample.

The ethnicity of the studded sample was summarized in table 2. There were (74%) Arabic ethnicity while (19%), (7%) were Kurdish & Turkmen consequently. (fig 5)

Table 2. The ethnicity distribution of the studied group.

		Frequency	Percent	Valid Percent
	Arabic	144	73.8	73.8
	Kurdish	37	19.0	19.0
	Turkmen	14	7.2	7.2
	Total	195	100.0	100.0

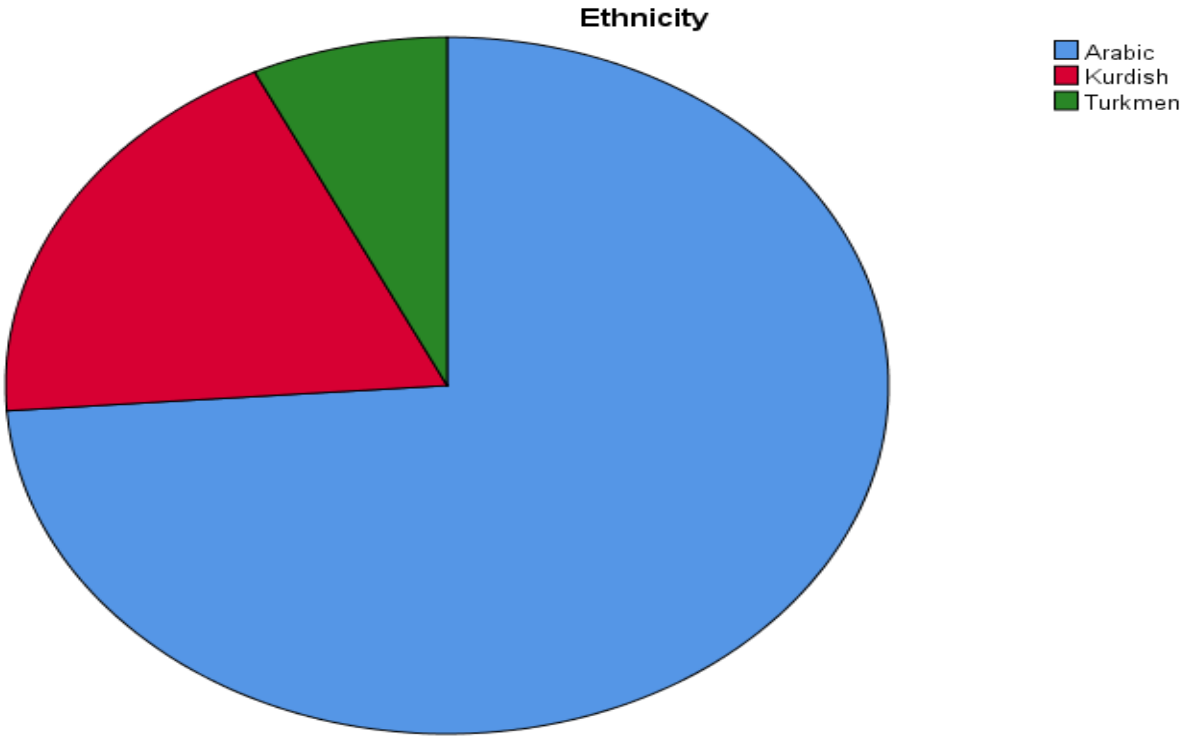


Fig 5. The ethnicity distribution of the studied sample.

The education of the studied sample was summarized in table 3. The majority of the them were illiterate (36.4%). (Fig 6)

Table 3. The education distribution of the studied group.

Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
	1-Illiterate	71	36.4	36.4	36.4
	2-Primary school	56	28.7	28.7	65.1
	3-Intermediate school	35	17.9	17.9	83.1
	4-High school	8	4.1	4.1	87.2
	5-University	25	12.8	12.8	100.0
	Total	195	100.0	100.0	

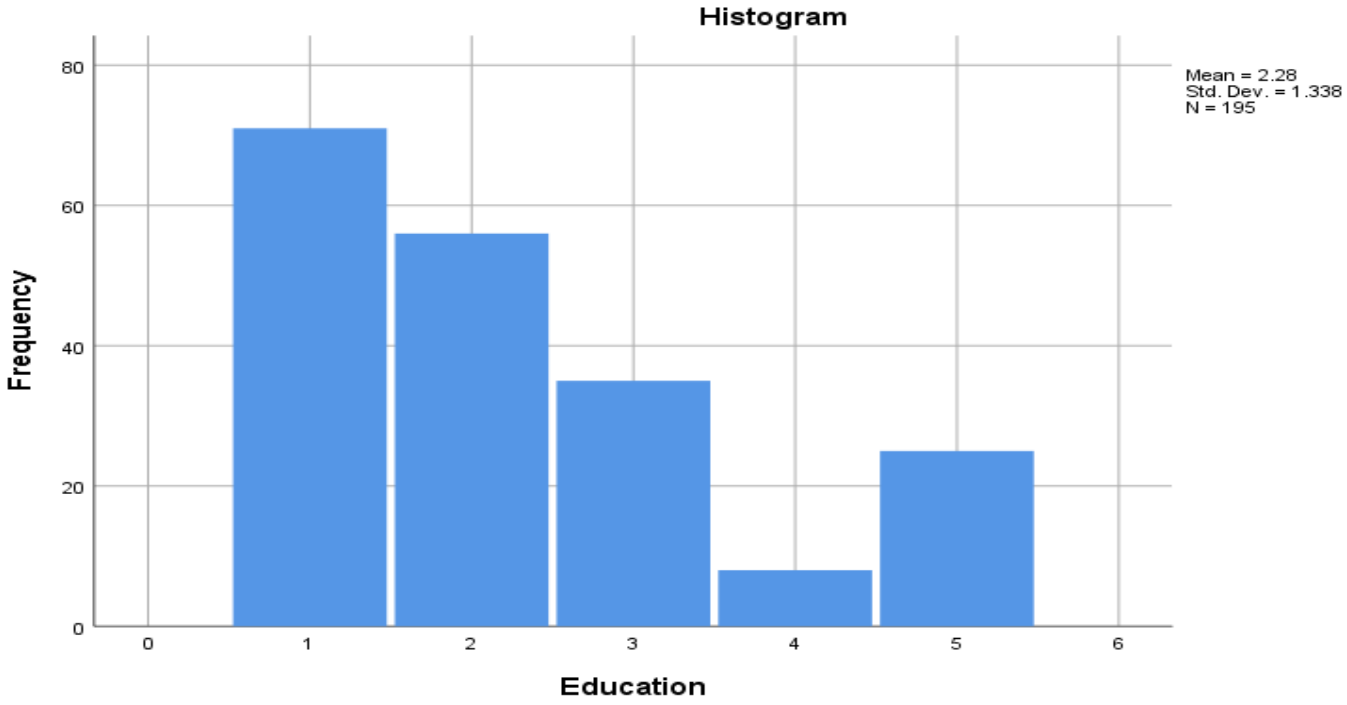


Fig 6. The education distribution of the studied sample.

The occupation of the studied sample was summarized in table 4. Most of the studied sample were unskilled manual (83.1%). (Fig .7)

The studied sample (n=195) were orthopedic patients at their first postoperative day. Pain scale was 8/10 in (55%) of male patients & (56%) of female patients consequently. (Table 5) The satisfaction level was (72%) for males as comparable to (64%) for females. (Table 6)

Table 4. The occupation distribution of the studied group.

Occupation				
		Frequency	Percent	Valid Percent
	1-Unskilled manual	162	83.1	83.1
	2-Skilled manual	21	10.8	10.8
	3-Semi-Skilled manual	7	3.6	3.6
	4-Skilled professional	3	1.5	1.5
	5-Associate professional	2	1.0	1.0
	6-Highly skilled professional	0	0	0
	Total	195	100.0	100.0

Fig 7. The occupation distribution of the studied sample Pain characteristic of the studied sample:

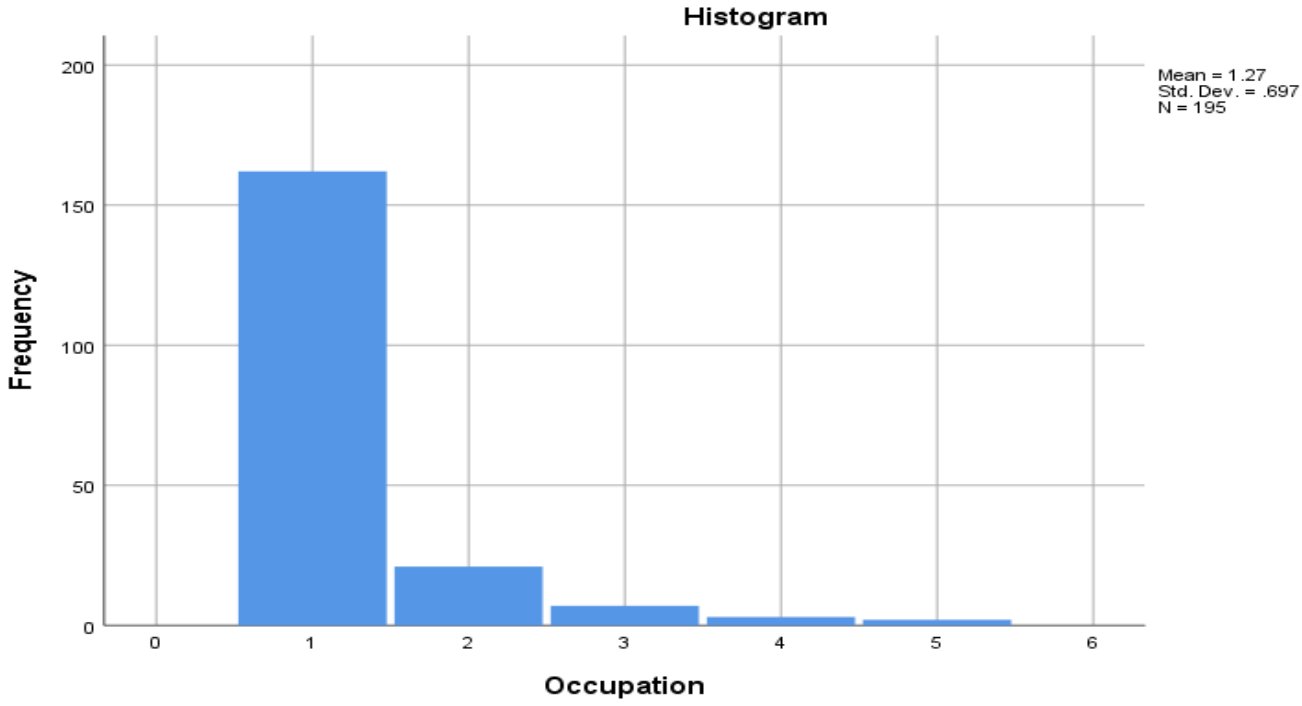


Table 5. Sex * Pain scale Cross tabulation

		Pain scale						Total
		4	5	6	7	8	9	
Sex	Male	1	2	3	30	82	29	147
	Female	1	0	2	9	27	9	48
Total		2	2	5	39	109	38	195

Table 6. Sex * Satisfaction with pain Cross tabulation

		Satisfaction with pain			
		Neither satisfied nor unsatisfied	Satisfied	Very satisfied	Total
Sex	Male	37	106	4	147
	Female	15	31	2	48
Total		52	137	6	195

The pain medication had been used in the initial postoperative day was distributed as below in table 7. The highest pain medication usage was acetaminophen & nefopam. (Fig 8) Among the studied sample (0.5%) were using only one pain medication, while (44.1%) were using combination of two pain medications at a time. The rest were using three pain medication or more around (40%), (15.4%) consequently. (Fig 9).

Table 7. The distribution of pain medications frequencies among the student sample

	Frequency	Percent
Nefopam	1	.5
Acetaminophen & diclofenac	14	7.2
Acetaminophin & nefopam	70	35.9
Acetaminophen, diclofenac & nefopam	42	21.5
Acetaminophen, diclofenac & tramadol	26	13.3
Acetaminophen, nefopam & tramadol	9	4.6
Acetaminophen, nefopam, ibuprofen & tramadol	3	1.5
Acetaminophen, diclofenac, nefopam & tramadol	22	11.3
Acetaminophen, diclofenac, nefopam, tramadol & morphine	3	1.5
Acetaminophen, diclofenac, nefopam, ibuprofen & tramadol	2	1.0
Acetaminophen & ibuprofen	1	.5
Diclofenac & tramadol	1	.5
Tramadol, morphine & meperidine	1	.5
Total	195	100.0

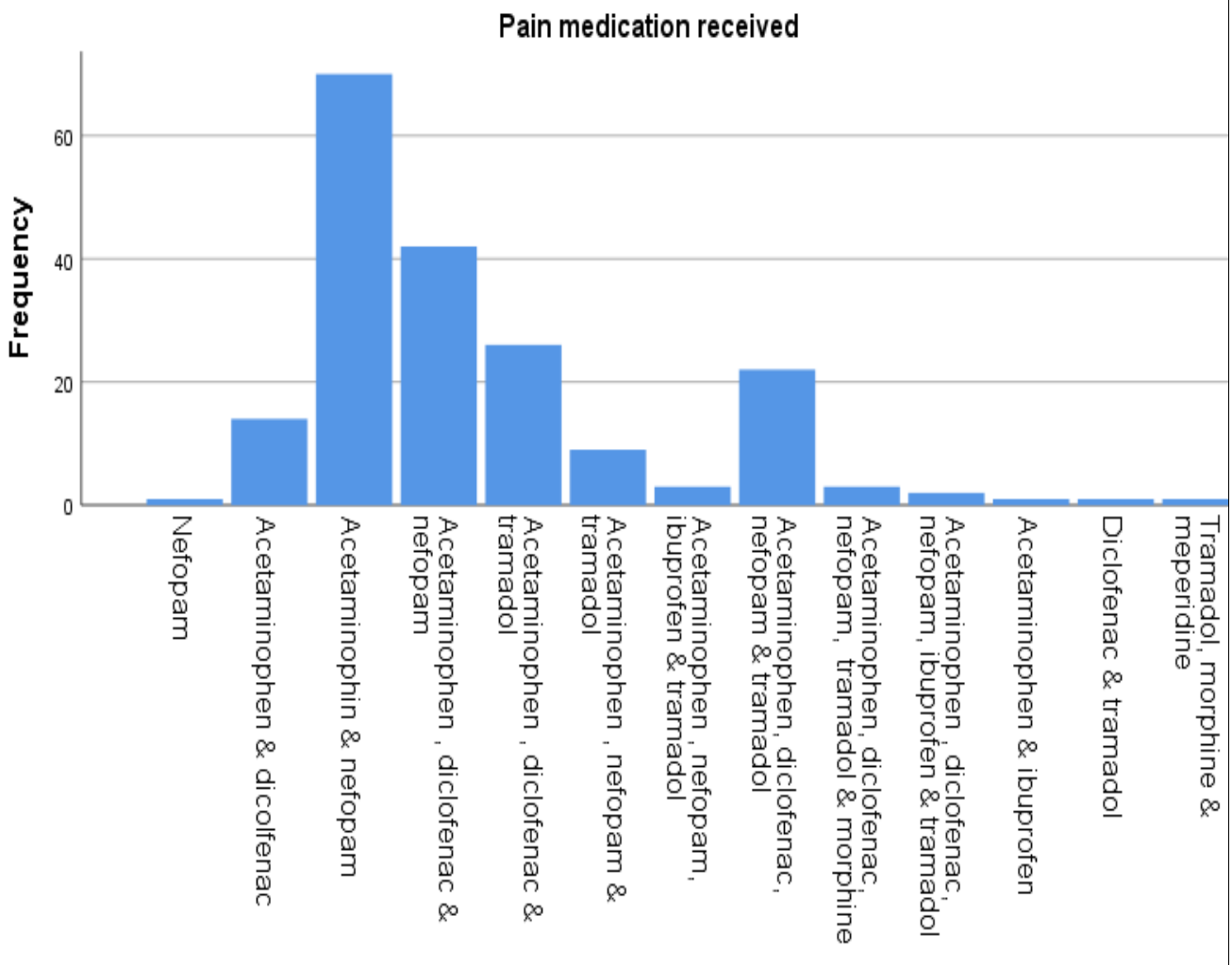


Fig 8. The distribution of pain medications usage frequency in the initial postoperative day

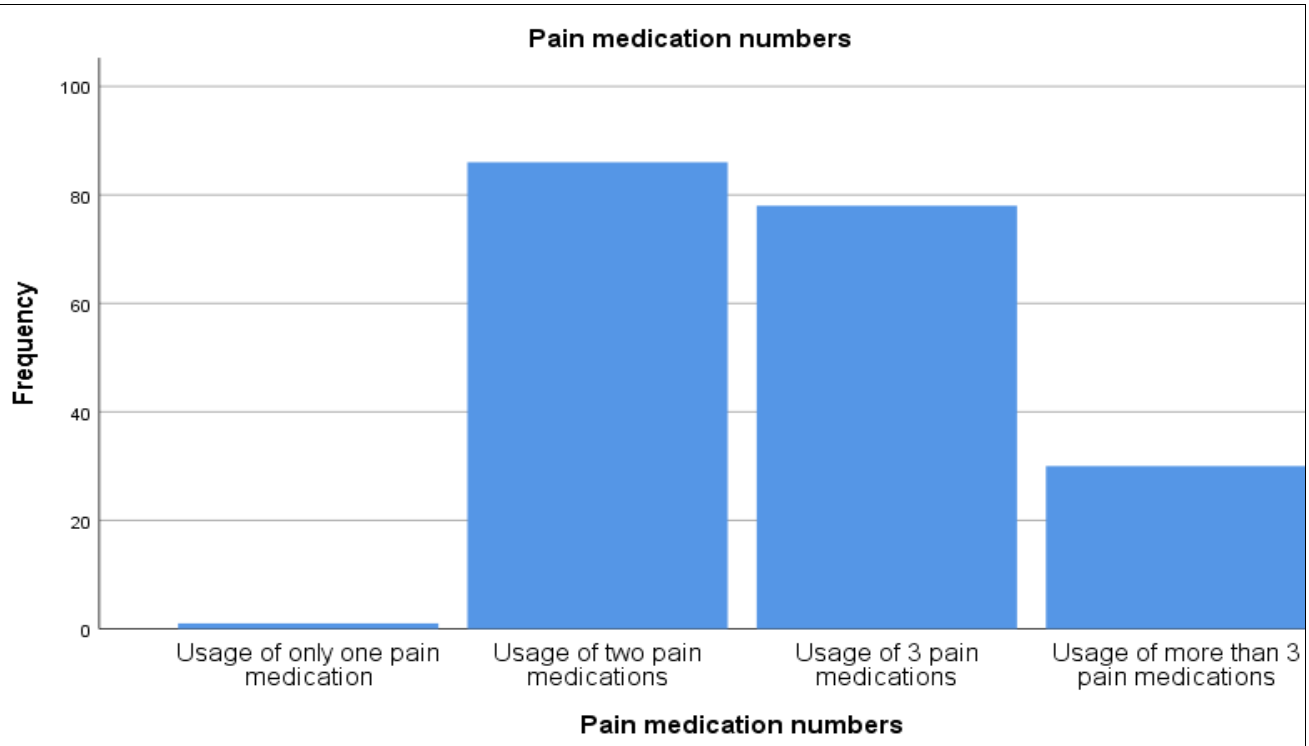


Fig 9. The distribution of pain medications number intake in the initial postoperative day.

The surgery duration characteristic of the studied sample

The operation time for the studied sample range from 15 min to 105 min. The highest time percentage was 60-75 minutes duration with a (42.1%). (Fig 10) The recovery time ranged from 20 minutes to 60 minutes. Most of the studied sample were at their 30 minutes recovery time with a percentage of (60.5%). (Fig 11)

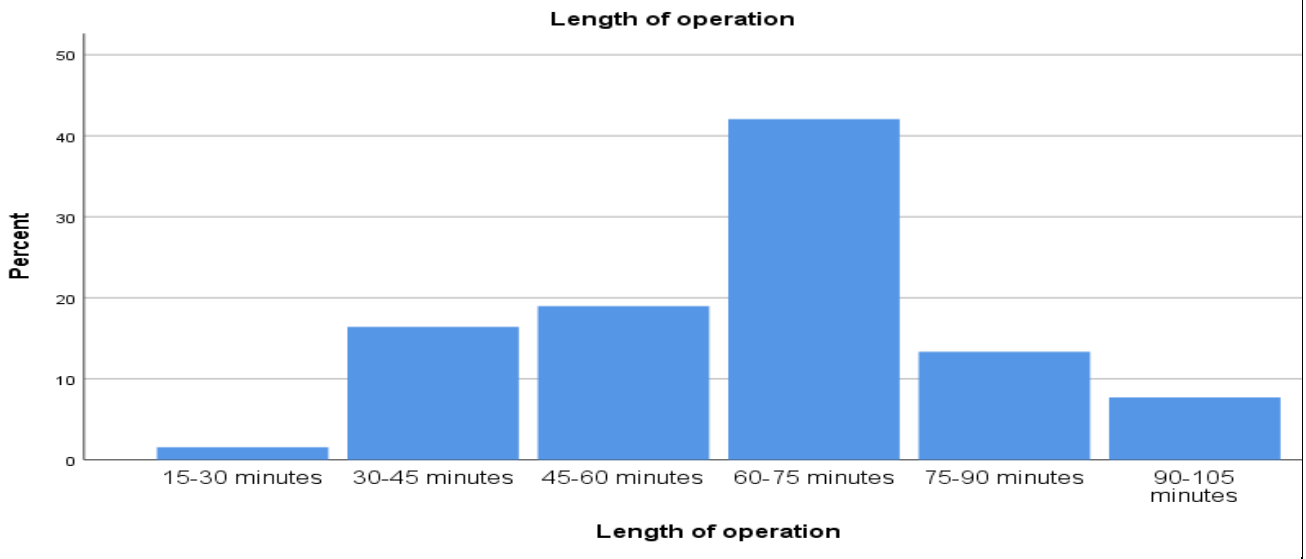


Fig 10. The distribution of the operation time for the studied sample

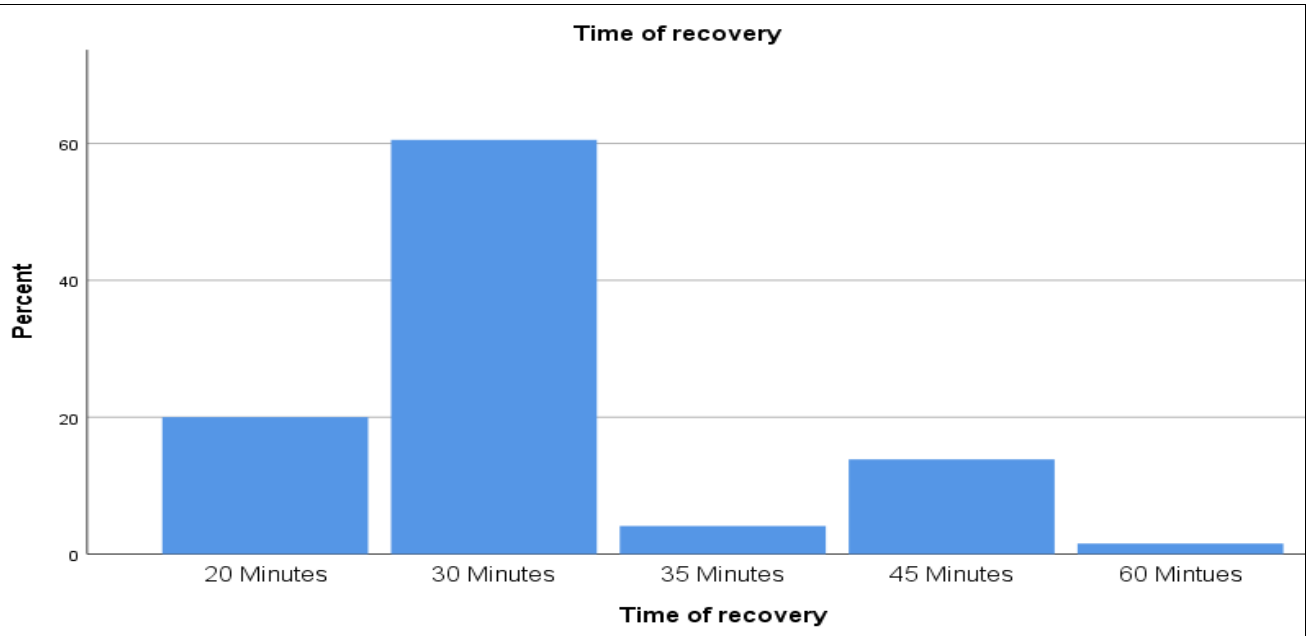


Fig 11. The distribution of the recovery time for the studied sample

The satisfaction distribution of the studied sample

The patient who did an orthopedic by using acetaminophen & diclofenac pain killer were more satisfied with their pain medication (M=4.14±0.535) as compared to quadrable pain medication usage of Acetaminophen, nefopam, ibuprofen & tramadol (M=3.33±0.577), P=0.007 (Table 8)

Table 8. The distributions of satisfaction with pain medication means & their corresponding pain medication ANOVA table association

Satisfaction with pain			
Pain medication received	**Mean**	**N**	**Std. Deviation**
Nefopam	**3.00**	**1**	**.**
Acetaminophen & diclofenac	**4.14**	**14**	**.535**
Acetaminophin & nefopam	**3.81**	**70**	**.490**
Acetaminophen, diclofenac & nefopam	**3.64**	**42**	**.485**
Acetaminophen, diclofenac & tramadol	**3.85**	**26**	**.368**
Acetaminophen, nefopam & tramadol	**3.44**	**9**	**.527**
Acetaminophen, nefopam, ibuprofen & tramadol	**3.33**	**3**	**.577**
Acetaminophen, diclofenac, nefopam & tramadol	**3.77**	**22**	**.429**
Acetaminophen, diclofenac, nefopam, tramadol & morphine	**3.67**	**3**	**.577**
Acetaminophen, diclofenac, nefopam, ibuprofen & tramadol	**4.00**	**2**	**.000**
Acetaminophen & ibuprofen	**3.00**	**1**	**.**
Diclofenac & tramadol	**4.00**	**1**	**.**
Tramadol, morphine & meperidine	**3.00**	**1**	**.**
Total	**3.76**	**195**	**.493**

ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with pain * Pain medication received	Between Groups (Combined)	6.402	12	.534	2.383	.007
	Within Groups	40.747	182	.224		
	Total	47.149	194			

Measures of Association

	Eta	Eta Squared
Satisfaction with pain * Pain medication received	.368	.136

The length of operation with usage of medication correlation of the studied sample

We ran a spearman correlation analysis between the length of orthopedic operation (M=2.70 ±.728) with numbers of pain killer usage(M=4.72±1.164). There was a weak correlation association in between the length of operation & their corresponding numbers of combination pain killer usage (r>0.17), P<.009 (Table 9)

Table 9. Bivariate spearmen correlation between numbers of pain medication & length of surgery

Descriptive Statistics

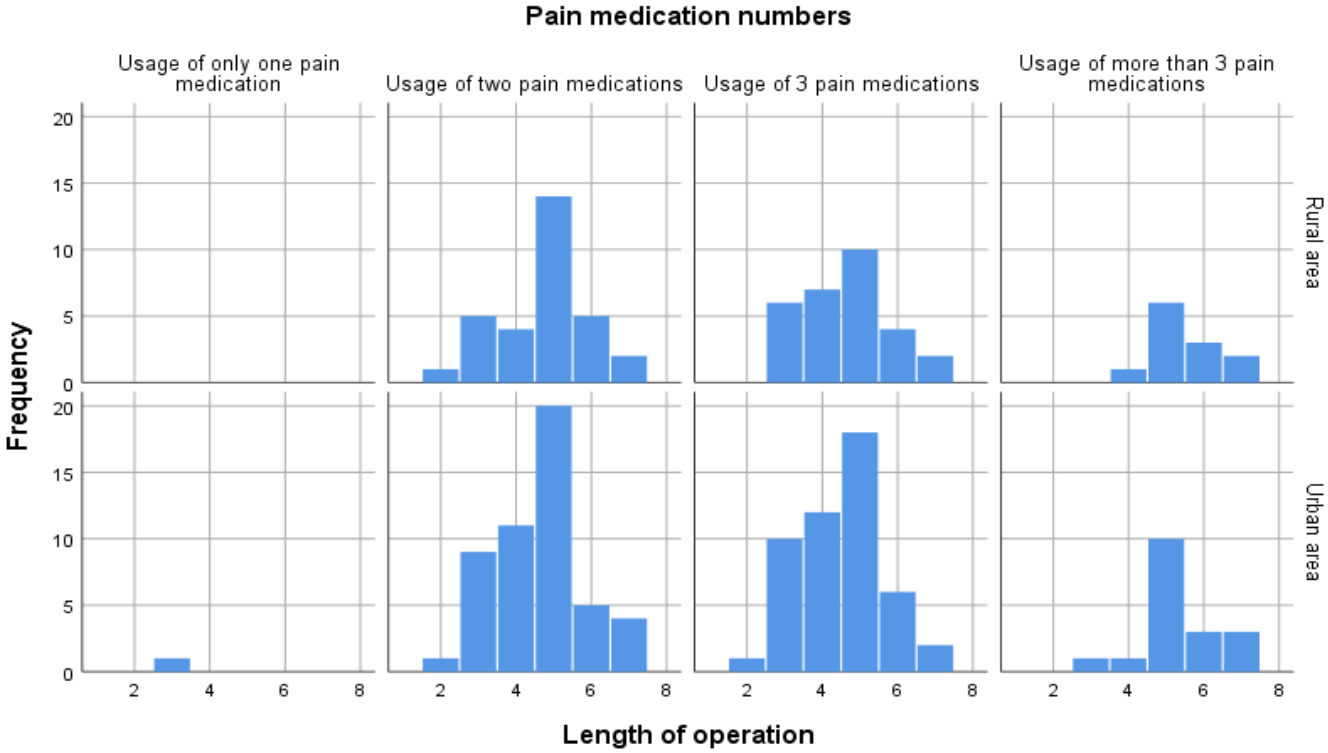
	Mean	Std. Deviation	N
Pain medication numbers	2.70	0.728	195
Length of operation	4.72	1.164	195

Correlations

		Length of operation	Pain medication numbers
Length of operation	Pearson Correlation	1	.170*
	Sig. (2-tailed)		.018
	N	195	195
Pain medication numbers	Pearson Correlation	.170*	1
	Sig. (2-tailed)	.018	
	N	195	195

*. Correlation is significant at the 0.05 level (2-tailed).

The usage of more than two pain medications were higher in rural area as compared to urban area for the surgery duration 30-90 minutes as shown in below. (fig 12)



1<Less than 15 minutes, 2=15-30 minutes, 3-30-45 minutes, 4=45-60 minutes, 5=60-75 minutes, 6=75-90 minutes, 7=90-105 minutes

Fig 12. The distribution of pain killer numbers in between rural & urban area

Influences of sociodemographic factor on pain

Many sociodemographic factors have been studied against pain scale for the studied sample. There was no any significant correlation between these factors up on perception of pain. (Table 9)

Discussion

The study sample consisted of 195 patients primarily from the Kirkuk governorate, highlighting a significant gender disparity with 75% male and 25% female participants. This finding may reflect the demographics of trauma cases in the region, where males typically engage in higher-risk activities leading to injuries. A similar finding was noticed by N. Awaad (2022) paper, which revealed that multiple fractures are more seen among males (75%) more than females (25%). [14]

When it comes to age distribution, this study showed a predominance of younger individuals, particularly those in their twenties (22.1%) and thirties (16.9%). This trend suggests that younger populations may be more susceptible to traumatic injuries, possibly due to lifestyle factors such as increased physical activity or occupational hazards. While

N.Awaad (2022) paper revealed that multiple fractures are also more seen in age group (20 - 40) years, followed by age group less than 20 years

Table 9. Comparison of sociodemographic factors with pain scale distribution.

Pain scale		Residency type	Ethnicity	Education	Occupation	Annual house income	Sex	Age group
4	Mean	1.50	1.00	2.50	1.50	1.50	1.50	4.00
	N	2	2	2	2	2	2	2
	Std. D	.707	.000	2.121	.707	.707	.707	1.414
	P value	>0.05						
5	Mean	2.00	1.00	2.00	2.50	1.50	1.00	2.50
	N	1	2	2	2	2	2	2
	Std. D	.	.000	.000	2.121	.707	.000	2.121
	P value	>0.05						
6	Mean	1.75	1.20	1.60	1.40	1.40	1.40	1.80
	N	4	5	5	5	5	5	5
	Std. D	.500	.447	.548	.894	.548	.548	1.304
	P value	>0.05						
7	Mean	1.59	1.46	2.28	1.23	1.23	1.23	2.44
	N	37	39	39	39	39	39	39
	Std. D	.498	.682	1.337	.536	.427	.427	1.635
	P value	>0.05						
8	Mean	1.61	1.30	2.36	1.30	1.57	1.25	2.53
	N	108	109	109	109	109	109	109
	Std. D	.490	.585	1.391	.776	.614	.434	1.879
	P value	>0.05						
9	Mean	1.66	1.34	2.16	1.11	1.50	1.24	2.37
	N	38	38	38	38	38	38	38
	Std. D	.481	.627	1.285	.388	.647	.431	2.271
	P value	>0.05						
Total	Mean	1.62	1.33	2.28	1.27	1.48	1.25	2.48
	N	190	195	195	195	195	195	195
	Std. D	.486	.606	1.338	.697	.595	.432	1.892

In this study there is (62%) participants residing in urban areas, the data could imply better access to healthcare facilities, which might contribute to the higher representation of urban dwellers in trauma cases. The ethnic distribution shows a majority of Arabic patients (73.8%), which may reflect the population composition of the Kirkuk area. The study does not show any influence of residency & ethnicity on pain medication perception nor the number of medications had been received. In a similar study done on 2022 by lucy O'Sullivan et al. on top most common major orthopedic surgery had showed no differences between ethnicity & race in term of postoperative pain killer consumption. [15]

As far as education & occupation. The high percentage of illiteracy (36.4%) and unskilled manual laborers (83.1%) in the sample can indicate socioeconomic challenges that may affect health outcomes. Lower educational levels are often associated with limited health literacy, potentially impacting patients' understanding of pain management and postoperative care.

Clinical analysis of the study pain levels reported postoperatively were notably high, with a significant proportion of patients rating their pain at 8/10. This indicates a need for effective pain management strategies. The satisfaction levels with pain management were higher among males (72%) compared to females (64%), suggesting potential gender differences in pain perception or medication effectiveness.

Medication usage shows a varied approach to pain management, with acetaminophen and nefopam being the most commonly used medications. The reliance on combination therapies (44.1% using two pain medications) reflects an attempt to optimize pain control, but also raises concerns about the potential for increased side effects or complications.

The operation duration varied significantly, with most surgeries taking between 60-75 minutes. This duration correlates with the complexity of orthopedic procedures, which may impact recovery and pain management protocols. The correlation between the length of surgery and the number of pain medications used ($r = 0.170$, $P < 0.009$) reinforces the idea that longer surgeries may necessitate more intensive pain management.

The satisfaction level of the Patients treated with acetaminophen and diclofenac reported higher satisfaction levels (M=4.14) compared to those on more complex regimens. This finding suggests that simpler, more effective pain management strategies may lead to better patient outcomes and satisfaction.

Finally, the study did not show any influences of sociodemographic factors with pain perception for the studied sample. this finding consistent with a Srinivasan, M. L et al study (2021).[16]

Conclusion

Overall, the demographic data and pain management strategies employed in this study reveal critical insights into the characteristics of orthopedic patients in Kirkuk. The high levels of pain reported and the varied approaches to pain management underscore the need for tailored strategies that consider the unique demographics and needs of this population. Future research could explore the long-term outcomes of different pain management protocols and their impact on recovery and quality of life in orthopedic patients.

Recommendation

Targeted Interventions: Develop gender-specific educational programs focusing on safety and risk reduction in high-risk activities predominantly undertaken by males.

Focus on Younger Populations:

1. **Preventive Strategies**: Implement targeted prevention programs aimed at younger individuals (ages 20-40) to reduce the incidence of traumatic injuries. This could include awareness campaigns about safe practices in sports and occupational environments.

2. **Lifestyle Education**: Encourage lifestyle modifications that promote safety during physical activities, particularly among young adults.

Enhance Healthcare Access in Urban Areas:

1. **Resource Allocation**: Ensure that urban healthcare facilities are equipped to manage trauma cases effectively, considering the higher representation of urban dwellers.
2. **Community Outreach**: Engage in community outreach programs to educate urban populations about trauma prevention and pain management.

Socioeconomic Considerations:

1. **Health Literacy Programs**: Develop initiatives to improve health literacy among illiterate populations and unskilled laborers. This can enhance understanding of pain management and postoperative care.
2. **Support Services**: Provide support services that address the socioeconomic challenges faced by patients, potentially improving overall health outcomes.

Pain Management Strategies:

1. **Effective Protocols**: Establish standardized pain management protocols that prioritize the use of simpler, effective medications like acetaminophen and diclofenac, which have shown higher patient satisfaction.
2. **Monitor Pain Levels**: Regularly assess and document pain levels postoperatively to refine pain management strategies and ensure they meet patient needs.

Surgical Duration and Pain Management:

1. **Tailored Pain Management**: Consider the complexity and duration of surgical procedures when developing pain management plans. Longer surgeries may require more intensive pain management strategies.
2. **Research on Combination Therapies**: Investigate the efficacy and safety of combination therapies in pain management to minimize side effects while optimizing pain control.

Further Research:

1. **Explore Sociodemographic Influences**: Conduct additional research to explore why sociodemographic factors did not influence pain perception in this study. Understanding these dynamics can lead to more personalized care approaches.
2. **Longitudinal Studies**: Implement longitudinal studies to track pain management outcomes and patient satisfaction over time, providing insights into the long-term effectiveness of various strategies

ETHICAL APPROVAL

The research protocol was approved by the Ethical Research Committee of the Al-Qalam University College.

INFORMED CONSENT

Participants were aware of the purpose of the study and provided informed consent prior to the participations.

FUNDING: No funding

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Participants were aware of the purpose of the study and provided informed consent prior to accessing the questionnaire and participation.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

All data generated or analyzed during this study are included in this published article.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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AUTHORS CONTRIBUTION

Study conception and design: AN
Data collection: YA, JA,MN,RM,HM
Analysis and interpretation of results: AN
Draft manuscript: AN, YA, JA,MN,RM,HM .
All authors reviewed the results and approved the final version of the manuscript.

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