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ORIGINAL RESEARCH **PAIN MANAGEMENT**

Evaluation of post-elective surgery acute pain management profiles using the APS-POQ-R questionnaire: an observational study

Suwarman [1], Dedi F. Yadi [2], Supri Suryadi [3]*, Prapanca Nugraha [4]

Author affiliations:

1. Suwarman, Department of Anesthesiology & Intensive Therapy, Faculty of Medicine, Universitas Padjadjaran / Dr. Hasan Sadikin General Hospital, Bandung 40161, West Java, Indonesia; E-mail; suwarman@unpad.ac.id; {ORCID:0000-0002-1960-2736}
2. Dedi F. Yadi, Department of Anesthesiology & Intensive Therapy, Faculty of Medicine, Universitas Padjadjaran / Dr. Hasan Sadikin General Hospital, Bandung 40161, West Java, Indonesia; E-mail: dedifyadi@yahoo.com; {ORCID:0000-0003-0642-4261}
3. Supri Suryadi, Department of Anesthesiology & Intensive Therapy, Faculty of Medicine, Universitas Padjadjaran / Dr. Hasan Sadikin General Hospital, Bandung 40161, West Java, Indonesia; E-mail: supri19001@mail.unpad.ac.id; {ORCID:0000-0003-0852-0281}
4. Prapanca Nugraha, Department of Surgery, Faculty of Medicine, Universitas Padjadjaran / Dr. Hasan Sadikin General Hospital, Bandung 40161, West Java, Indonesia; E-mail: prapanca18001@mail.unpad.ac.id; {ORCID:0000-0001-9701-342X}

***Corresponding Author:** Supri Supriyadi, E-mail: supri19001@mail.unpad.ac.id; Phone: +6281385149596

ABSTRACT

Background & objective: Acute postoperative pain affects 80% of the patients undergoing elective surgery, which raises the risk of morbidity and lowers patient satisfaction with medical care. Various modalities have been employed to make the patient pain free. We studied post-elective surgery acute pain management profiles at a tertiary hospital in West Java, Indonesia to present an overview.

Methodology: The American Pain Society Patient Outcome Questionnaire—Revised (APS-POQ-R) was used in this descriptive observational study. All patients who underwent elective surgery at a tertiary hospital in West Java, Indonesia between March and April 2023 and fulfilled the inclusion criteria, e.g., age from 18 to 65 y, fully conscious, able to communicate in Bahasa Indonesia, willing to participate, were included in the study. Within 24 h following the elective surgery, patients in the inpatient wards underwent interviews. Patients with impaired cognitive function, psychiatric disorders or uncooperative drug addiction, and patients who were planned for intensive care were excluded. Data was analyzed using SPSS version 26. The distribution of the data was examined using the Kolmogorov-Smirnov test. The data was analyzed for the mean ± standard deviation, range or median and range.

Results: About 161 people participated in the study. The majority of participants (60.9%) reported having moderate pain, and 59% with moderate nausea as a side effect of pain medication. Mild emotional status impairment and restricted activities were also observed. Eighty-one percent of the individuals reported having knowledge regarding pain management. With a median score of 8, patient satisfaction was at a favorable level. It is believed that 80% of patients respond well to pain treatment. The degree of patient participation was low.

Conclusions: Despite various post-operative changes, the majority of respondents expressed great satisfaction with their pain management. Improved patient cooperation is therefore, necessary, in addition to encouraging non-pharmacological pain management and providing sufficient pain management information.

Abbreviations: NRS - Numeric Rating Scale; ODS - One Daycare Surgery; PNB - peripheral nerve block; VAS - Visual Analog Scale;

Keywords: APS-POQ-R questionnaire, patient satisfaction, postoperative pain management

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1. INTRODUCTION

It is one of the fundamental requirements of a standard healthcare to monitor the effectiveness of post-surgical pain management, and also to take appropriate measures to enhance it.[1] Inadequately managed acute post-surgical pain is associated with increased morbidity, functional handicap and an impaired quality of life. It also leads to delayed recovery, prolonged opioid use, and increased cost related to healthcare and pain management.

The most widely used tool for evaluating the quality of postoperative pain management is the American Pain Society Patient Outcome Questionnaire—Revised (APS-POQ-R). It covers topics such as the degree of pain and how it is managed, how it affects activities and emotional state, what side effects come with therapy, how simple it is to obtain information, how involved and satisfied patients are, and how non-pharmacological methods of pain management work. It uses a Numeric Rating Scale (NRS) ranging from 0 to 10 to assess all these parameters.[2]

After a surgical operation, acute postoperative discomfort affects almost 80% of the patients.[3] Postoperative pain includes both exertional and resting pain. Resting pain is mostly moderate with an average Visual Analog Scale (VAS) of 3-4 within the first two to three days after surgery. It usually goes away a week later. Pain on walking and coughing are examples of exertional pain that manifests two to three days following surgery. According to the United Kingdom (UK) data from 2018–2019, 48% and 19% of patients experience moderate and severe pain, respectively within 24 h following surgery.[4] The number of surgeries at a tertiary hospital in West Java, Indonesia was recorded at 20,000-24,000 per year.[5]

The etiology of acute postoperative pain is multifactorial.[6–9] Acute pain following surgery can be caused by inflammation or nerve damage from the procedure.[10] Peripheral and central sensitization responses will be triggered by tissue damage from surgery, which will result in the emergence of feelings of fear, anxiety, and frustration.[4,11–14] According to a prior study, orthopedic and obstetric surgery patients experienced the most pain one day after surgery.[15] A number of factors, such as routine pain assessment, logical treatment, multidisciplinary participation in treatment decision-making, and patient involvement in service evaluation, are used to evaluate the effectiveness of postoperative pain management.

We aimed to provide an overview of post-elective surgery acute pain management profiles at our tertiary hospital in West Java, Indonesia.

2. METHODOLOGY

The profile of acute pain management following elective surgery is described in this descriptive cross-sectional observational study in accordance with the STROBE guideline.[16] All patients who underwent elective surgery at our tertiary hospital in West Java, Indonesia between March and April 2023, and who satisfied the inclusion criteria—that is, patients between the ages of 18 and 65 y, fully conscious, able to communicate in Bahasa Indonesia, willing to participate—were included in the study. Patients with impaired cognitive function, psychiatric disorders or uncooperative drug addiction, and patients who were planned for postoperative intensive care or who underwent One Daycare Surgery (ODS) were excluded. Patients who were transferred to the intesive care unit (ICU) using breathing support equipment and thus could not communicate well after surgery, patients who canceled the surgery, and patients who died within 24 h post-surgery would be disqualified.

The sample size was determined using a total sampling technique. An accuracy level (α) of 5% and a confidence level of 95% were used, then a value of Z = 1.96 was obtained. The calculation showed a minimum sample size of 116 patients for this study. The study was conducted after obtaining approval No. DP.04.03/X.2.2.1/5672/2023 from the ethics and research committee with the ethical approval number No. LB.02.01/X.6.5/72/2023.

The research patients were selected one day prior to the surgery using the consecutive sampling method during an pre-anesthesia visit. Each patient signed and provided information on a consent form. Those who declined to take part in the study would still receive their regular medical attention. A visit was conducted within 24 h post-surgery in the inpatient ward by a team of surveyors. The surveyor team interviewed each subject then the information was directly filled in the APS-POQ-R-based Google form. Data was then collected and analyzed using SPSS version 26. The distribution of the data was examined using the Kolmogorov-Smirnov test. If the data were normally distributed, the mean, standard deviation, and range were displayed; if not, the median and range were utilized.

RESULTS

The study was conducted on 161 patients. The average age was 43.12 ± 13.101 y. Majority of them were female (53.4%). High school graduates made up the majority of patients (78.3%) (Table 1). Up to 100 patients (62.1%) had never had surgery or anesthesia before; 51 (31.7%) patients had surgeries on their heads and necks, 40 (24.8%) had surgeries on their lower abdomens, and 35 (21.7%) had surgeries on their limbs (Table 2).

Table 1: Characteristics of study patients (n = 161)

Variables	Result
Age (y)	43.12 ± 13.101 (19.00-64.00)
Sex	
• Male	75 (46.6)
• Female	86 (53.4)
Education Level	
• Without any education	1 (0.6)
• Primary school graduate	6 (3.7)
• Elementary school graduate	15 (9.3)
• High school graduate	126 (78.3)
• Undergraduate	13 (8.1)

Note: Numerical data are normally distributed, and thus presented with a mean ± SD, and range. Categorical data is presented as n (%)

Table 2: History of previous surgery and anesthesia, type of current surgery / anesthesia (n = 161)

Variable	Result
Previous surgery and anesthesia	61 (37.9)
Type of current surgery	
• Head and Neck	51 (31.7)
• Thorax	6 (3.7)
• Upper Abdomen	20 (12.4)
• Lower Abdomen	45 (28.0)
• Extremity	35 (21.7)
• Spine	4 (2.5)
Current anesthesia technique	
• General Anesthesia	121 (75.2)
• Regional Anesthesia (Spinal, Epidural, or PNB)	37 (23.0)
• Combination (GA + Epidural Anesthesia)	3 (1.9)

Note: Categorical data is presented as n (%).

Out of the 161 patients, 121 (75.2%) used general anesthesia, 37 (23%) had regional anesthesia, and 3 (1.9%) patients were given combined anesthesia (Table 2).

Table 3: Characteristics of preoperative analgesics

Variables	n = 161
Preoperative analgesics	
• Paracetamol	5 (3.1)
• NSAID	16 (9.9)
• Opioid	3 (1.9)
• Epidural	3 (1.9)
• None	134 (83.2)
Intraoperative analgesics	
• Opioid	127 (78.9)
• Epidural	13 (8.1)
• PNB	2 (1.2)
• Opioid + Paracetamol	3 (1.9)
• PNB + Paracetamol	1 (0.6)
• Spinal	15 (9.3)
Postoperative analgesics in recovery room	
• Paracetamol	2 (1.2)
• NSAID	4 (2.5)
• Opioid	37 (23.0)
• Opioid + NSAID	38 (23.6)
• Opioid + Paracetamol	3 (1.9)
• Epidural	15 (9.3)
• PNB	8 (5.0)
• PNB + Paracetamol	2 (1.2)
• None	52 (32.3)
Postoperative analgesics in inpatient care room	
• Paracetamol	5 (3.1)
• NSAID	9 (5.6)
• Opioid	3 (1.9)
• Opioid + NSAID	103 (64.0)
• Epidural	8 (5.0)
• Epidural + Paracetamol	7 (4.3)
• NSAID + Paracetamol	1 (0.6)
• Opioid + Paracetamol	14 (8.7)
• PNB + Opioid + NSAID	8 (5.0)
• PNB + Opioid + Paracetamol	2 (1.2)
• PNB + Paracetamol	1 (0.6)

Note: Categorical data is presented as n (%).

Preoperative analgesics most frequently used were non-steroid anti-inflammatory drugs (NSAIDs), commonly paracetamol. No preoperative analgesic was given to 134

Table 4: APS-POQ-R questionnaire outcomes

Variables	Median	Range (min-max)
The pain degree		
• Least pain within 24 h	1.00	0.00-3.00
• Most severe pain within 24 h	4.00	2.00-9.00
• The percentage of experiencing the most severe pain within 24 h	2.00	0.00-6.00
The effect of pain on activity		
• In-bed activities	3.00	0.00-8.00
• Out-of-bed activities	3.00	0.00-8.00
• Falling asleep	3.00	0.00-8.00
• Staying asleep	3.00	0.00-8.00
The effect of pain on emotional status		
• Anxiety	3.00	1.00-7.00
• Depression	2.00	1.00-7.00
• Fear	3.00	1.00-8.00
• Helplessness	2.00	1.00-8.00
Side effects		
• Nausea	1.00	0.00-5.00
• Drowsiness	0.00	0.00-4.00
• Pruritus	0.00	0.00-2.00
• Dizziness	0.00	0.00-4.00
The pain management perception		
• Percentage of pain relief success	8.00	2.00-10.00
• Participation level	2.00	1.00-9.00
• Satisfaction level	8.00	4.00-10.00

Note: Numerical data presented as median and range.

patients (83.2%). The most used intraoperative analgesics were opioids. Spinal was used in 15 (9.3%),

and epidural in 13 (8.1%) patients. The most used postoperative analgesia in the recovery room was the combination of opioids and NSAIDs, followed by opioids, and epidural analgesia. In the inpatient ward, the combination of opioids and NSAIDs was the most commonly used postoperative analgesia, followed by opioids and paracetamol, NSAIDs, and epidural analgesics (Table 3).

On a median NRS scale of 1, the lowest level of postoperative pain after 24 h was measured. Twenty percent of the patients reported having the most severe pain, with a median NRS score of 4. The median scale for the impact of pain on in-bed activities, out-of-bed activities, falling asleep and staying asleep was 3. According to how pain affected emotional status, the median scale for fear and anxiety was 3, whereas the median scale for depression and helplessness was 2. Within the pain management side effects component, the median score for nausea was 1, whereas the median score for other side effects was 0. With a median scale of 80%, the perception component of pain management displayed the success rate of therapy. Table 4 displays the median patient participation and satisfaction scores, which were 2 and 8, respectively.

In the first 24 h following surgery, the majority of patients (60.9%) reported moderate pain, while 7 patients (4.3%) reported severe pain. Approximately 120 (74.5%) reported mild impairment during bedtime activities. According to the emotional status results, majority of the patients experienced mild anxiety, while 12 (7.5%) experienced severe anxiety. Mild and severe depression was experienced by 87.6% and 1.9% of the patients respectively. Regardin pain-related fear, and majority experienced mild pain. The feeling of helplessness was also mild in the majority of the patients. Moderate nausea was reported by 59.0%, and severe nausea bu 1.9%; and 101 patients (62.7%) reported mild drowsiness as a result of the pain management side effects (Table 5).

Based on the results of the APS-POQ-R, 129 patients (80.1%) had received information regarding pain management to be provided. One hundred and ten (68.3%) of the patients reported using non-pharmacological pain relief as well. The most often utilized technique was deep breathing, which was employed by 64 patients (39.8%); relaxation techniques by 9 patients (5.6%); cold compresses 6 patients (3.7%); diversionary techniques (e.g., watching television, reading, etc.) by 30 patients (18.6%); and worship/prayer was performed by 10 patients (6.2%) (Table 6).

On a median scale of 8, patient satisfaction was found to be comparable for both sexes. One subject reported having no education, reporting a level of satisfaction of 9. Other patients from graduate-level education from primary school to undergraduates reported 7.0 to 8.5 level of satisfaction. Patients who underwent head and neck surgery reported a level of satisfaction 8.0, while those who underwent thoracic surgery reported a level of satisfaction of 7.5, depending on the type of current surgery. Patients with upper abdominal, lower abdominal, extremities, and spinal surgery reported similar levels of satisfaction. Patients under general anesthesia, regional anesthesia, and combined anesthesia reported similar levels of satisfaction based on the type of current anesthesia technique (Table 7).

Table 5: Postoperative acute pain management outcomes

Variables	Pain management outcomes [n (%)]			
	Severe	Moderate	Mild	Absent
Most severe pain was felt in the first 24 h	7 (4.3)	98 (60.9)	56 (34.8)	0 (0.0)
In-bed activities pain	8 (5.0)	28 (17.4)	120 (74.5)	5 (3.1)
Out-of-bed activities pain	15 (9.3)	57 (35.4)	79 (49.1)	10 (6.2)
Pain while sleeping	7 (4.3)	36 (22.4)	113 (70.2)	5 (3.1)
Pain-related anxiety	12 (7.5)	46 (28.6)	103 (64.0)	0 (0.0)
Pain-related depression	3 (1.9)	17 (10.6)	141 (87.6)	0 (0.0)
Pain-related fear	4 (2.5)	48 (29.8)	109 (67.7)	0 (0.0)
Pain-related helplessness	4 (2.5)	20 (12.4)	137 (85.1)	0 (0.0)
Nausea	3 (1.9)	95 (59.0)	63 (39.1)	0 (0.0)
Drowsiness	2 (1.2)	58 (36.0)	101 (62.7)	0 (0.0)
Pruritus	0 (0.0)	0 (0.0)	15 (9.3)	146 (90.7)
Dizziness	0 (0.0)	6 (3.7)	53 (32.9)	102 (63.4)
The percentage of pain relief	131 (81.4)	22 (13.7)	8 (5.0)	0 (0.0)

Table 6: APS-POQ-R questionnaire elements on postoperative acute pain management information

Variables	Result
Information about pain management	
• Received	129 (80.1)
• Not received	32 (19.9)
Non-pharmacological method use	
• Yes	110 (68.3)
• No	51 (31.7)
Type of non-pharmacological method used	
• Deep breathing	64 (39.8)
• Relaxation	9 (5.6)
• Cold compress	6 (3.7)
• Diversion	30 (18.6)
• Worship/prayer	10 (6.2)
How helpful is pain management information	
• Median (min-max)	7.00 (1.00-10.00)
Health practitioners suggest non-pharmacological methods	
• Sometimes	148 (91.9)
• Never	13 (8.1)

Note: Numerical data are not normally distributed, and thus presented with a median value and range. Categorical data is presented with the amount and percentage.

4. DISCUSSION

The APS-POQ-R is a clinically practical instrument with adequate psychometric properties to help clinicians perform a standardized measurement of the quality of pain management within 24 h after surgery for Quality Improvement (QI). According to this study, the most commonly used analgesics before surgery were intravenous NSAIDs, followed by intravenous opioids during surgery, and a combination of opioids and intravenous NSAIDs after surgery. A 2018 study conducted at the same hospital revealed that the most popular postoperative analgesic technique was a mix of intravenous ketorolac and pethidine.[17] According to the American Pain Society, NSAID and opioid combination therapy provides a better postoperative analgesic effect than either treatment alone.[18] Another study showed that epidural analgesia gives a better postoperative analgesic effect within 72 h than intravenous analgesia in abdominal surgery.[19] In the present study, however, only 15 patients (9.3%) were given epidural analgesia. In a number of surgical procedures, peripheral nerve block (PNB) has been demonstrated to reduce the need for opioids and postoperative pain.[20] PNB is becoming more and more popular as an analgesic due to these benefits. Eleven participants (6.8%) in this study used PNB as a pain reliever after surgery. While single-shot PNB is safer and easier to use than continuous PNB, its blockade duration may not always be sufficient to manage pain within 24 h after surgery. [21]

Table 7: Satisfaction level based on patient's characteristics

Variables	Satisfaction Level Median (min-max)
Sex	
• Male	8.00 (4.00-10.00)
• Female	8.00 (4.00-10.00)
Education level	
• Without any education	9,00 (9,00)
• Primary school graduate	8.50 (7.00-10.00)
• Elementary school graduate	8.00 (5.0-10.00)
• High school graduate	8.00 (4.00-10.00)
• Undergraduate	7.00 (5.00-10.00)
History of previous surgery/anesthesia procedure	
• Yes	8.00 (4.00-10.00)
• None	8.00 (4.00-10.00)
Type of current surgery	
• Head and neck	8.00 (4.00-10.00)
• Thorax	7.50 (6.00-9.00)
• Upper abdomen	8.00 (4.00-10.00)
• Lower abdomen	8.00 (5.00-9.00)
• Extremity	8.00 (6.00-10.00)
• Spine	8.00 (7.00-10.00)
Anesthesia technique	
• General anesthesia	8.00 (4.00-10.00)
• Regional anesthesia	8.00 (5.00-10.00)
• Combined anesthesia	8.00 (7.00-8.00)

Note: Numerical data are not normally distributed, and thus presented as median and range.

According to the results of this study, 98 (60.9%) patients experienced moderate pain in 24 h

postoperatively. The outcomes are consistent with a 2016 American study that found acute postoperative pain affected 80% of the patients undergoing surgical procedures.[22] Within 24 h following surgery, 48% and 19% of the patients, respectively, reported experiencing moderate and severe pain, according to another study done in the UK in 2020.[23] Pain following surgery may have a detrimental emotional impact on patients and limit their activities. The majority of study participants reported having mild cases of anxiety, depression, and fear. Unlike earlier studies carried out in Malaysia, the majority of participants stated that they suffered from severe anxiety and depression in response to the pain. They also discovered that within 24 h of surgery, every subject had excruciating pain.[24] The difference in these studies is due to the subjective nature of pain involving emotional experiences. The patients' in and out of bed activities were restricted due to the pain and emotional impairments. Besides that, 130 (80.8%) patients in the present study used postoperative opioids as analgesics and 95 (59%) of them experienced moderate nausea. Side effects related to the administration of opioid agonist analgesics include dizziness, nausea, vomiting, itching, and respiratory depression. Despite these changes, patients gave positive ratings on a median scale of 80% for pain management and the effectiveness of therapy in reducing pain within 24 h after surgery. They also gave an 8 out of 10 rating for patient satisfaction. Adequate information regarding the pain management given to the patients and non-pharmacological pain management methods might contribute to this outcome. On a median scale of 2, the degree of patient participation was low; however, the patient's involvement in the decision-making process is critical to the effective management of acute postoperative pain.[1] Clinical practice requires constant attempts to enhance communication and include patients as partners in the planning of services. These results highlight the importance of focusing on patient involvement factors in order to improve care quality.

In addition to the actual pain experience, a number of other factors can influence a patient's degree of satisfaction with pain management. As such, evaluating patient satisfaction on its own, is not as reliable in determining the caliber of pain treatment. The study's findings demonstrated that all participants were satisfied, as evidenced by their high score eight. While some patients appeared to respond in the opposite way—that is, rated their level of satisfaction as high even though they were in moderate pain—this was most likely due to the patients' reasonable expectations regarding the pain they would experience following surgery. This result was in line with other research conducted at various centers across the nation, with individual satisfaction levels accounting for the majority of the variation.

According to this study, primary school graduate patients scored 8.5 on the median satisfaction scale, whereas undergraduate patients scored 7.0 on the same scale. It was found that the reported level of satisfaction decreased with increasing educational level. This result is consistent with a 2014 German study in which highly educated patients demand higher quality care objectively but feel subjectively let down by the high standards they had.[24] Based on the theoretical construction of satisfaction with health services in general, it can be assumed that satisfaction with postoperative acute pain

management is an emotional reaction that arises from the link between experience and expectations. These experiences and expectations are influenced by personal characteristics including demographic characteristics, health status, personality type, and patients' preferences. Furthermore, patients with and without prior surgery or anesthesia procedures, as well as patients with various types of surgery and anesthesia techniques, had comparable satisfaction levels, according to this study.

The association of satisfaction with pain reduction and participation has been reported previously.[25] In some healthcare centers, patients who feel severe pain give a higher satisfaction response than patients who do not feel severe pain. This may be because patients only experience mild-moderate pain or do not expect their pain to decrease further. Additionally, it was discovered in this study that the participants who participated less frequently expressed greater satisfaction.

5. LIMITATIONS

The APS-POQ-R was used at the authors' hospital, and this was the first study to evaluate its use. The study's findings can be applied to improve the quality of postoperative acute pain management in other hospitals, thereby increasing patient satisfaction. Not every pertinent feature that might affect satisfaction is evaluated by the questionnaire. It does not evaluate the patient's expectation of perceived pain, comorbid diseases, the level of pain prior to surgery, or the patient's preoperative health status.[2]

6. CONCLUSION

In summary, the majority of surgical patients had various changes within the first 24 h following surgery, including moderate-intensity pain, limited activities in and out of bed, mild emotional impairments, and pain management side effects, primarily nausea. These changes were based on the APS-POQ-R-based assessment. However, the majority of patients were content with the way their pain was managed. It was believed that 80% of patients responded well to pain management. But after that, patient collaboration needs to be enhanced in addition to encouraging non-pharmacological pain management and providing enough information about pain management.

7. Data availability

The numerical data generated during this research is available with the authors.

8. Acknowledgement

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9. Conflict of interest

The study utilized the hospital resources only, and no external or industry funding was involved.

10. Authors' contribution

SW: Conceptualization, methodology, data curation, writing – review & editing, supervision

DF, PN: Validation, formal analysis, investigation, data curation, writing – review & editing, supervision

SS: Conceptualization, methodology, formal analysis, data curation, writing – original draft, project administration

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