



Adherence Level Of Medical Personnel In Implementing 2019 Postoperative Pain Management Guidelines

Nasrulloh¹, Hamzah², Arie Utariani³, Dedi Susila⁴

^{1, 2, 3, 4} Department of Anesthesiology and Reanimation, Faculty of Medicine Universitas Airlangga, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

ARTICLE INFORMATION

Received: August, 29, 2021
Revised: November, 17, 2021
Available online: May 2021

KEYWORDS

adherence, guidelines, pain management, postoperative pain

CORRESPONDENCE

E-mail: rul.anes@yahoo.com
anestesi.hamzah@gmail.com
arie_utariani@yahoo.co.uk
ddi_sus@yahoo.com

No. Tlp : +62813747882

A B S T R A C T

Inadequate pain management may increase the risk of complications and postoperative chronic pain. Postoperative Pain Management Guidelines of The Anesthesiology and Reanimation Department, Faculty of Medicine Universitas Airlangga/ Dr. Soetomo Hospital Surabaya were arranged in 2019. This study aims to describe the medical personnel's adherence to implementing postoperative pain management guidelines. This was a descriptive observational study with a retrospective design. Total sampling was carried out on the medical records of patients who underwent elective surgery and received postoperative acute pain management during March-May 2020. A total of 349 patients had moderate pain intensity (62.8%). The medical personnel's adherence with postoperative pain management guidelines was 88.0%. The details were as follows: 99.1% adherence in patients with mild pain, 82.6% in moderate pain, and 81.2% in severe pain. The multimodal analgesia was 12.3% in patients with mild pain, 83.6% in moderate pain, and 100% in severe pain. Most medical personnel have adhered to the postoperative pain management guideline and widely used in multimodal analgesia. There should be a systematic evaluation of guidelines implementation, patient satisfaction, and outcomes.

INTRODUCTION

According to the International Association for Study of Pain (IASP), pain is a subjective and acquired unpleasant sensory and emotional experience associated with actual or potential tissue damage or represents the damage condition (Treede, 2018). Postoperative pain is still frightening for patients who undergo surgery (Schroeder et al., 2016). According to data in the United States, pain perception is a significant source of anxiety in patients undergoing surgery, and this suggests postoperative pain management is far from satisfactory (Apfelbaum et al., 2003; Glowacki, 2015). More than 80% of patients undergoing surgery had acute postoperative pain, and about 75% of these patients experience moderate, severe, or extreme pain levels. Data in Dr. Soetomo General Hospital Surabaya, most patients (59.2%) experienced moderate-severe postoperative pain in the first 24 hours postoperatively (Suwiknyo et al., 2017). Inadequate pain management can interfere with the quality of life and functional recovery and increase postoperative complications and postoperative chronic pain risk (Kehlet et al., 2006). An American survey conducted for more than 20 years showed that only 1 in 4 patients got adequate postoperative pain management. This background makes pain crucial. Pain is the fifth vital sign in the

patient's assessment when undergoing inpatient care at the hospital, especially as a protocol in the Recovery Room.

Adequate pain management is dependent on the commitment of medical personnel in the hospital. There are many guidelines for perioperative pain management, arranged by the American Society of Anesthesiologists (ASA), the American Pain Society (APS), and the World Health Organization (WHO). Still, when these guidelines are not implemented, then pain therapy provision will not be adequate. Implementing pain management guidelines depends on medical personnel's adherence, facilities, and drugs in the hospital. Good local pain management guidelines should be adjusted to local wisdom and hospital conditions (Wels, 2012).

One highlighted thing is the uniformity of understanding and adherence among medical personnel in hospital facilities. The commitment to implementing pain guidelines by non-anesthetists and other medical personnel, such as nurses, is also an essential part of pain management services (Fitzgerald et al., 2017). Several studies also reported gaps regarding expectations of pain management implementation and medical staff adherence. Kerner et al., (2013) assessed inadequate pain management by health workers in internal medicine wards. Adherence to pain treatment guidelines was 29.3% of cases. Re-evaluation after treatment was 33.3%, and additional evaluation is only 22%. Another study was conducted by (Hakonsen et al., 2009) in patients with cancer pain in Scotland, United Kingdom. Adherence to the pain guideline criteria indicated that the overall adherence rate was 75%. However, it still showed a low level of adherence (29%) for inpatients service. There were adherence gaps between the inpatient and the outpatient palliative care, particularly to pain assessment.

A study reported that adherence level to pain management before invasive treatment in neonates increases after implementing strict protocols, socialization, and counseling (Sari, 2016). Postoperative pain management guidelines at Dr. Soetomo General Hospital, Surabaya, were made in 2019. There was no evaluation of medical personnel's adherence to implementing this guideline. This study analyzes the level of medical personnel adherence in implementing postoperative pain management guidelines at Dr. Soetomo General Hospital, Surabaya.

METHOD

Study Design

This research was a descriptive observational study with a retrospective design that analyzed medical personnel's adherence in implementing the 2019 postoperative pain management guidelines for the Department of Anesthesiology and Reanimation, Faculty of Medicine Universitas Airlangga/Dr. Soetomo General Hospital, Surabaya. This research was conducted at the Inpatient Medical Record Installation at Dr. Soetomo General Hospital, Surabaya.

Population and Sampling Technique

The sample was the medical records of patients who had undergone elective surgery and received postoperative acute pain management at Dr. Soetomo from March 2020 to May 2020. A total of 349 patient medical records met the criteria by total sampling. The research data included age, sex, Physical Status-American Society of Anesthesiologists (PS ASA), anesthesia technique, type of surgery, and procedure duration.

Subject Criteria

The sample selection in this study met the following inclusion criteria: (1) Medical records of inpatients aged 18 years to 60 years, did elective surgery at Dr. Soetomo General Hospital, Surabaya, with a duration of postoperative care ≥ 24 hours, with PS ASA Score 1-2. (2) The authors can read medical records. Meanwhile, the exclusion criteria were an incomplete medical record.

Study Procedures

The classifications of medical personnel's adherence to pain management guidelines were into adherence and non-adherence, for each category of pain intensity influenced by the type of surgery. Medical personnel's adherence level was assessed by looking at RM 30sK (Anesthesia Status) in medical records. The adherence category, defined as therapy with one analgesic for mild pain; treatment with \geq two analgesics for moderate to severe pain. The non-adherence category was medical personnel who are not providing analgesic therapy for mild pain; give \leq one analgesic therapy for moderate-severe pain. The data presentation was in tables and graphs.

RESULT

Subjects Characteristics

The research data included age, gender, PS ASA, anesthesia technique, type of operation, operation duration, and pain intensity.

Table 1 Subject Characteristic

Variables	Frequency	Percentage
Gender		
Male	141	40.4%
Female	208	59.6%
Age (years old)	Mean: 40.64	
PS ASA		
1	60	17.2%
2	289	82.8%
Total	349	100%
Anesthesia Technique		
CSEA	21	6.0%
GA Epidural	41	11.7%
GA Intubation	197	56.4%
GA LMA	12	3.4%
GA Mask	6	1.7%
GA TIVA	9	2.6%
GA Tracheostomy	1	0.3%
PNB	3	0.9%
SAB	56	16.0%
SAB + Obturator Block	3	0.9%
Operation Duration (minutes)		
Oral and Maxillofacial Surgery	10	2.9%
Plastic Surgery	12	3.4%
Neurosurgery	5	1.4%
General Surgery	100	28.7%
Thoracic and cardiovascular surgery	9	2.6%
Ophthalmology	22	6.3%
Obstetric & Gynecologi	69	19.8%
Orthopaedic	69	19.8%
ENT	29	8.3%
Urology	24	6.9%
Pain Intensity		
Mild	114	32.7%
Moderate	219	62.8%
Severe	16	4.6%

Almost half of the subjects were male (40.4%). The mean age of them was 40.64 years old. Most of them were patients with mild systemic disease (82.8%) and classified into PS ASA II. General Anesthesia (GA) with intubation technique (56.4%) was the most used technique. General surgery (28.7%) was the most performed surgery in this study. Most of the subjects (62.8%) experienced moderate pain after underwent a surgical procedure.

Distribution of the First Analgesic Modality

A drug administration in the first analgesic modality was 348 patients, and there was no drug administration only in one patient. Of the 348 patients, the first analgesic modality was metamizole in 164 patients (47.1%) and ketorolac in 135 patients (38.8%). In contrast, the least used drug was Ropivacaine, in 1 patient with a percentage of 0.3%. There were two patients with each Dynastat and novalgine administration (0.5%).

Table 2. Distribution of the first analgesic modality

First Analgesic Modality	Frequency	Percentage	Drug's Name	Frequency	Percentage
Drug Administration	348	99.7%	Dynastat	2	0.5%
			Ketorolac	135	38.8%
			Metamizole	164	47.1%
			Novalgine	2	0.5%
			Paracetamol	44	12.6%
			Ropivacain	1	0.3%
Without drugs	1	0.3%			

Distribution of The Second Analgesic Modality

A drug administration in the second analgesic modality was 163 patients, 51 epidural patients, and no drug administration in 135 patients. Paracetamol and tramadol were the most used drugs, while the least used were ketorolac and metamizole. For epidural patients, 45 patients had ropivacaine administration (88.2%), and six patients had morphine administration (11.8%).

Table 3. Distribution of the second analgesic modality

Procedure	Frequency	Percentage	Drug	Frequency	Percentage
Drug Administration	163	46.7%	Fentanyl	17	10.4%
			Ketorolac	4	2.5%
			Metamizole	4	2.5%
			Oxycodon	7	4.3%
			Paracetamol	67	41.1%
			PNB	7	4.3%
			Tramadol	57	35.0%
Epidural	51	14.6%	Morphin	6	11.8%
			Ropivacain	45	88.2%
Without Drugs	135	38.7%			

Analysis of Pain Management Guidelines Adherence in Each Pain Intensity Category

Almost all medical personnel (88.0%) adhered to the guidelines in providing postoperative analgesia therapy. In comparison, 12% of them did not adhere to the postoperative pain management guidelines.

Table 4. Distribution of Adherence

Adherence	N	Percentage
Adhere	307	88.0%
Non Adhere	42	12.0%

The distribution of adherence to postoperative pain management guidelines based on the pain category showed that in patients with mild pain, the adherence rate was in 113 cases (99.1%). In contrast, one case (0.9%) did not adhere to the guideline. There were an 82.6% adherence and 17.4% non-adherence in patients with moderate pain category. For patients with severe pain levels, as many as 16 patients with an adherence rate of 13 cases (81.2%).

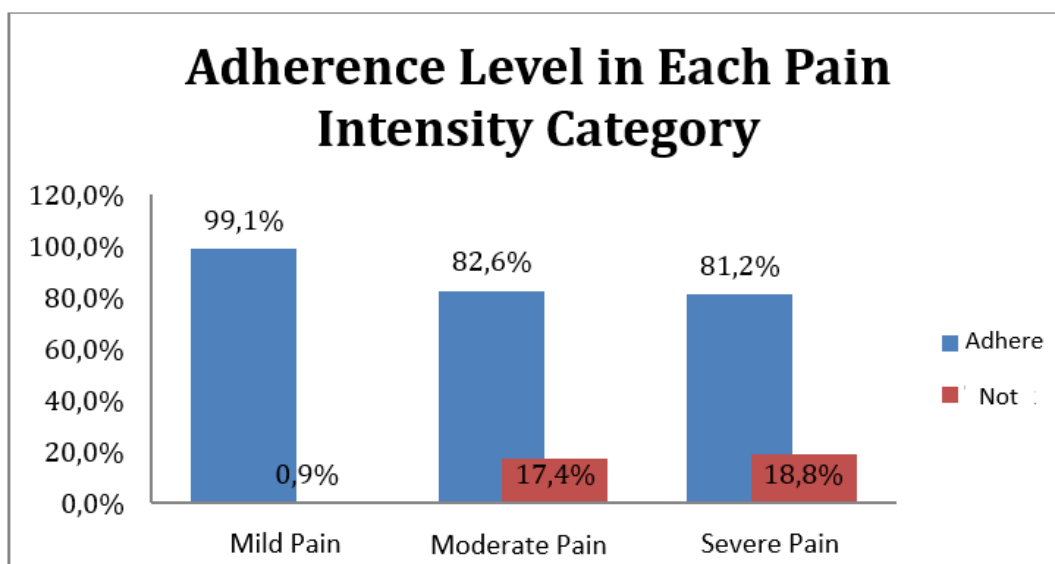


Figure 1. Medical personnel's adherence to postoperative pain management guideline in each pain intensity category

Analysis of Multimodal Analgesia in Each Pain Intensity Category

The total distribution of multimodal analgesia in the study sample was 213 (61.0%). Meanwhile, multimodal analgesia usage in moderate and severe pain cases was 199 cases (84.7%).

Table 5. Distribution of Multimodal Analgesic Usage

Multimodal Analgesia	Total		Moderate and Severe Pain	
	N	Percentage	N	Percentage
Yes	213	61.0%	199	84.7%
No	136	39.0%	36	15.3%

The distribution of multimodal analgesia based on the pain intensity showed that in 114 patients with mild pain, 14 cases used multimodal analgesia (12.3%). For patients with moderate pain levels, 183 of 219 patients used multimodal analgesia (83.6%). In all 16 patients with severe pain levels, multimodal analgesia was used (100%).

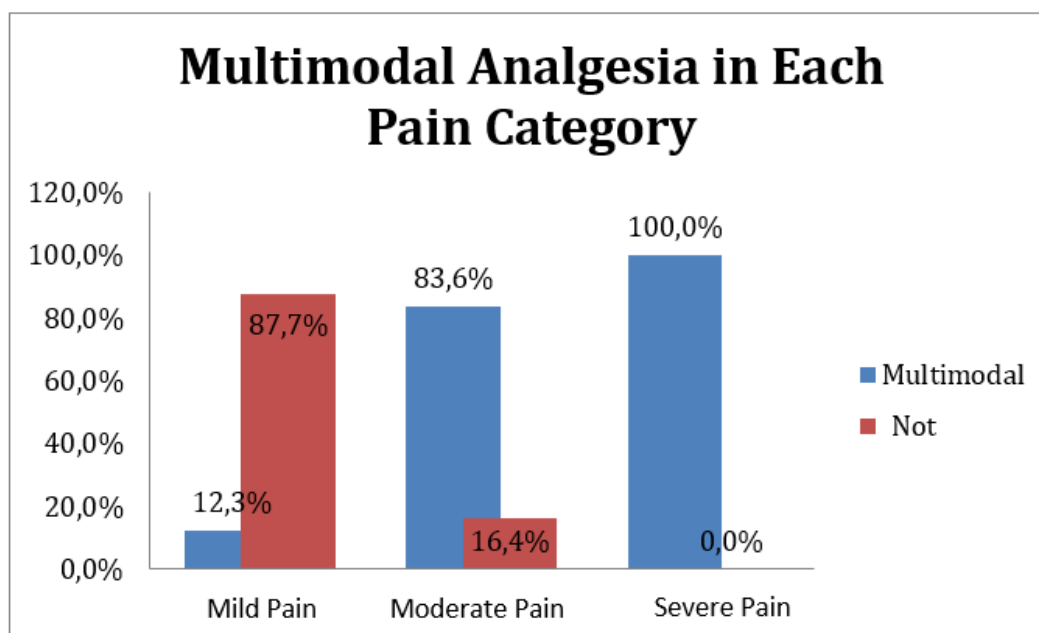


Figure 2. Distribution of multimodal analgesia usage in each pain intensity category

DISCUSSION

The characteristics of the subjects certainly affect pain manifestations. In this paper, age and sex were two essential variables that influenced pain. This result is in line with Wandner et al., (2012), which reported that age was an important variable affecting pain in both children and adults. In this study, the mean ages of the subjects were 40.64 years old. A study by Nasir & Ahmed (2020) about postoperative pain management perception stated similar data. In their study, the average patient's age was 42.97 ± 13.05 years old. Research by Chae et al., (2019) found significant differences between the sex of patients and postoperative pain relief also analgesic need. Young female patients needed higher doses of analgesics than elderly patients. The long operative duration correlated with postoperative pain and analgesic consumption (Gagliese et al., 2008). Meanwhile, another study showed no correlation between the type of surgery and postoperative pain outcomes (Ip et al., 2009; Mamie et al., 2004).

The 2019 Postoperative Pain Management Guideline of Department Anesthesiology and Reanimation Faculty of Medicine Universitas Airlangga/ Dr. Soetomo General Hospital uses the principle of multimodal analgesic therapy. This study analyzed analgesic drugs using whether suitable with the guidelines or not. The use of analgesic modalities is a multimodal approach (drug use and or action more than one). It is following the particular guidelines that every operation must get analgesia depends on pain intensity.

The first analgesia in the guideline is Nonsteroidal anti-inflammatory drugs (NSAIDs) or paracetamol. It found that in our study, the most widely used NSAIDs were metamizole and ketorolac. There were 85.9% of metamizole and ketorolac administration in patients undergoing surgery. Nonsteroidal anti-

inflammatory drugs are the most widely used primary therapy for chronic and acute pain, mild or moderate postoperative pain. In mild intensity postoperative pain, NSAIDs are often used alone. This modality is often combined with adjuvants or opioids (multimodal analgesia) in severe postoperative pain (Cosmo & Congedo, 2015). The most used second analgesic drugs modality in postoperative pain management were paracetamol and tramadol.

Meanwhile, the least used were ketorolac and metamizole. For epidural patients, 45 patients had ropivacaine administration (88.2%), and six patients had morphine administration (11.8%). According to The American Pain Society Guidelines, the use of multimodal analgesia with more than one analgesic drug targets different mechanisms of action on the nervous system. Multimodal analgesia may combine with non-pharmacological interventions to effectively reduce pain compared to a single modality. Anesthetists can combine regional anesthetics techniques combined with systemic opioids and other analgesics as part of a multimodal approach to postoperative pain (Chou et al., 2016).

Most of the samples had multimodal analgesic therapy. The use of multimodal analgesia was 61% in all surgery cases. It was 83,6% in moderate pain and 100% in severe pain. Meanwhile, most of the sample (87.7%) used one type of analgesic drug for mild pain; This is because, in the category of mild pain, there is no need for multimodal analgesics. 17.4% non-adherence to the moderate pain category guidelines because the therapy provided only one type of analgesia. 18.8% non-adherence to the severe pain category guidelines because the patients received two analgesics types but with the same drug class. Our study's findings differ from the Hakonsen et al., (2009) study, which reported a 100% adherence rate for moderate/severe pain.

Pain management guideline adherence evaluated from Anesthesia Status in medical records refers to the category of pain from surgery. Based on the adherence level, 88% of medical personnel provided postoperative analgesic therapy based on the guidelines. This study's findings are consistent with Sauaia et al., research. They analyzed medical personnel adherence to postoperative pain management protocols in elderly patients and found 62% of the subjects were adherent. However, 87% of patients were satisfied with their treatment (Sauaia et al., 2005).

Meanwhile, there were about 12% who did not adhere. A few medical records showed non-adherence of anesthesiology residents, which showed the absence of analgesic therapy for mild pain and only analgesic therapy for moderate-severe pain. This condition is because patients respond adequately even though only one type of analgesic. Another cause is some new medical personnel who have not received the socialization about postoperative pain management guidelines made in 2019.

Another study also emphasized the importance of increasing adherence to postoperative pain management in all medical personnel. Improved compliance, especially in local post-operative pain management guidelines, appears to be an effective method for optimizing postoperative pain control in patients

(Dürango et al., 2016). Guidelines for postoperative pain control help establish basic pain management parameters, and it is necessary to ensure that medical personnel adheres to evidence-based standards. Further postoperative pain management will emphasize the role of communication between patients and medical personnel (Kuusniemi & Pöyhä, 2016).

The literature points to several factors associated with the adherence of medical personnel in implementing specific practice guidelines. A study by Wulandari & Lisum (2019) showed the correlation between compliance to pain reassessment documentation with the nurse's age, years of service, and attitude. Monitoring all nurses in documenting pain reassessments according to existing standard operating procedures/guidelines is also required. The study by Houghty et al., (2019) also stated a similar thing. The factors that affected medical personnel's adherence to the guidelines were lack of facilities and training. A supportive environment such as training carried out by the education department at the hospital supports a positive attitude. Our study's limitation was the absence of an analysis of the factors that affected medical personnel's adherence to pain management guidelines. It should be a concern for further research

CONCLUSION

Medical personnel has adhered to the 2019 Postoperative Pain Management Guidelines in most patients who undergo surgery. Most of the patients with moderate to severe pain category had received multimodal analgesic therapy. After conducting this study, we recommend counselling and resocialization regarding postoperative pain management guidelines considering there is still medical personnel that provides single modal therapy in patients undergoing surgery with moderate-severe pain. Systematic follow-up/evaluation is crucial for successfully implementing postoperative pain management guidelines in the hospital wards. Further research should analyze the correlation between medical personnel's adherence level in implementing the Postoperative Pain Management Guidelines with the level of pain and patient satisfaction and the effectiveness/outcome of implementing the postoperative pain management guideline.

REFERENCE

- Apfelbaum, J. L., Gan, T. J., & Chen, C. (2003). *Postoperative Pain Experience: Results from a National Survey Suggest Postoperative Pain Continues to Be Undermanaged*. 534–540. <https://doi.org/10.1213/01.ANE.0000068822.10113.9E>
- Chae, K. L., August, R., Park, S. Y., Hong, J. I., Yim, W. J., Lee, S. C., & Chung, C. J. (2019). *The effect of gender and age on postoperative pain in laparoscopic cholecystectomy: a prospective observational study*. 364–369.
- Chou, R., Gordon, D. B., Leon-casasola, O. A. De, Rosenberg, J. M., Bickler, S., Brennan, T., Carter, T., Cassidy, C. L., Chittenden, H., Degenhardt, E., Griffith, S., Manworren, R., Mccarberg, B., Montgomery, R., Murphy, J., Perkal, M. F., Suresh, S., Sluka, K., Strassels, S., ... Wu, C. L. (2016).

- Management of Postoperative Pain: A Clinical Practice Guideline From the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council. *Journal of Pain*, 17(2), 131–157. <https://doi.org/10.1016/j.jpain.2015.12.008>
- Cosmo, G. De, & Congedo, E. (2015). The Use of NSAIDs in the Postoperative Period: Advantage and Disadvantages. *Journal of Anesthesia & Critical Care: Open Access*, 3(4). <https://doi.org/10.15406/jaccoa.2015.03.00107>
- Dürango, S., Åkeson, P. K., Jonsson, E., Nilsson, E., Åkeson, J., & Karlslund, P. (2016). Compliance with guidelines for postoperative pain management in infants and children Compliance with guidelines for postoperative pain management in infants and children. *International Journal of Healthcare Management*, 0(0), 1–6. <https://doi.org/10.1080/20479700.2015.1114710>
- Fitzgerald, S., Henrietta, T., & Gillian Halksworth-Smith. (2017). Assessment and management of acute pain in older people : barriers and facilitators to nursing practice. *Australian Journal Of Advanced Nursing*, 35(1), 48–57.
- Gagliese, L., Gauthier, L. R., Macpherson, A. K., Jovellanos, M., & Chan, V. W. S. (2008). *Correlates of Postoperative Pain and Intravenous Patient-Controlled Analgesia Use in Younger and Older*. 9(3). <https://doi.org/10.1111/j.1526-4637.2008.00426.x>
- Glowacki, D. (2015). Effective pain management and improvements in patients' outcomes and satisfaction. *Critical Care Nurse*, 35(3), 33–41. <https://doi.org/10.4037/ccn2015440>
- Hakonsen, G. D., Strelec, P., Campbell, D., Hudson, S., & Loennechen, T. (2009). Adherence to Medication Guideline Criteria in Cancer Pain Management. *Journal OfPain and Symptom Management*, 37(6), 1006–1018. <https://doi.org/10.1016/j.jpainsymman.2008.06.006>
- Houghty, G. S., Tambayong, J. M., & Tahulending, P. S. (2019). *Kepatuhan Perawat Dalam Melaksanakan Pengkajian Nyeri Pada Pasien Kanker*. 7(1), 1–8.
- Ip, H. Y. V., Abrishami, A., Peng, P. W. H., Wong, J., & Chung, F. (2009). Predictors of Postoperative Pain and Analgesic Consumption. *Anesthesiology*, 111(3), 657–677. <https://doi.org/10.1097/aln.0b013e3181aae87a>
- Kehlet, H., Jensen, T. S., & Woolf, C. J. (2006). Persistent postsurgical pain: risk factors and prevention. *Lancet*, 367(9522), 1618–1625. [https://doi.org/10.1016/S0140-6736\(06\)68700-X](https://doi.org/10.1016/S0140-6736(06)68700-X)
- Kerner, Y., Mha, R. N., Rn, Y. P., Shiyovich, A., Schlaeffer, P., & Mha, R. N. (2013). Original Article Adherence to Guidelines of Pain Assessment and Intervention in Internal Medicine Wards. *Pain Management Nursing*, 14(4), 302–309. <https://doi.org/10.1016/j.pmn.2011.06.005>
- Kuusniemi, K., & Pöyhiä, R. (2016). Present-day challenges and future solutions in postoperative pain management: Results from PainForum 2014. *Journal of Pain Research*, 9, 25–36. <https://doi.org/10.2147/JPR.S92502>
- Mamie, C., Bernstein, M., Morabia, A., Klopfenstein, C. E., Sloutskis, D., & Forster, A. (2004). Are there reliable predictors of postoperative pain? *Acta Anaesthesiologica Scandinavica*, 48(2), 234–242. <https://doi.org/10.1111/j.0001-5172.2004.00298.x>
- Nasir, M., & Ahmed, A. (2020). Knowledge About Postoperative Pain and Its Management in Surgical Patients. *Cureus*, 12(1), 1–9. <https://doi.org/10.7759/cureus.6685>
- Sari, T. K. (2016). *Introduction of a Neonatal Pain and Agitation Protocol at Neonatal Intensive Care Unit Dr. Soetomo*.
- Sauaia, A., Min, S. J., Leber, C., Erbacher, K., Abrams, F., & Fink, R. (2005). Postoperative pain

- management in elderly patients: Correlation between adherence to treatment guidelines and patient satisfaction. *Journal of the American Geriatrics Society*, 53(2), 274–282. <https://doi.org/10.1111/j.1532-5415.2005.53114.x>
- Schroeder, D. L., Hoffman, L. A., Fioravanti, M., Medley, D. P., Zullo, T. G., & Tuite, P. K. (2016). Enhancing Nurses' Pain Assessment to Improve Patient Satisfaction. *Orthopaedic Nursing*, 35(2), 108–117. <https://doi.org/10.1097/NOR.0000000000000226>
- Suwiknyo, Pangki, Christijogo, Sumartono, Susila, D., & Sulistiawan, S. (2017). *Hubungan Tingkat Kepatuhan Petugas Medis Dalam Menjalankan Panduan Tatalaksana Nyeri Pasca Operasi Dengan Kepuasan Pasien Dan Skor Nyeri Saat Keluar Rumah Sakit Di RSUD Dr.Soetomo Surabaya*. Universitas Airlangga.
- Treede, R.-D. (2018). The International Association for the Study of Pain. *Pain Reports*, 3, e643. <http://www.ncbi.nlm.nih.gov/pubmed/29756089>
<http://www.ncbi.nlm.nih.gov/pubmed/29756089>
- Wandner, L. D., Scipio, C. D., Hirsh, A. T., Torres, C. A., & Robinson, M. E. (2012). The Perception of Pain in Others: How Gender, Race, and Age Influence Pain Expectations. *The Journal of Pain*, 13(3), 220–227. <https://doi.org/10.1016/j.jpain.2011.10.014>
- Wels, D. (2012). Management of Postoperative Pain. *S Afr Fam Pract*, 54(3), 25–28. <https://doi.org/10.2165/00003495-198529040-00004>
- Wulandari, D., & Lisum, K. (2019). Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Perawat Melakukan Pendokumentasian Reassessment Nyeri. *Carolus Journal of Nursing*, 1(2), 95–104.