



Overview of Anesthesia Ready Time (ART) in Anesthesia Services at the Central Surgery Department of the Islamic Hospital in Banjarnegara

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ABSTRACT

The effectiveness of the services provided to patients by medical personnel in IBS can influence how much time is spent on anesthesia services. Bukittinggi Regional Hospital started operating room services in January 2019 and found that 81.91% of elective surgery services were delayed. Anesthesia Ready Time can standardize anesthesia services in hospitals. This study aims to determine the description of anesthesia ready time in anesthesia services at IBS RSI Banjarnegara. The research method uses quantitative data with a descriptive observational approach. The sampling technique used was purposive sampling, the number of samples according to the inclusion criteria was 128 respondents from elective surgery patients using spinal anesthesia and general anesthesia, as well as the ASA I-IV status classification. The data collection technique is observation using ART. The results of the study showed that ART was in the good category, with 114 respondents consisting of 45 respondents with general anesthesia and 69 respondents with spinal anesthesia. Conclusion: Anesthesia services at IBS RSI Banjarnegara are categorized as good, according to international measurements using ART.

Keywords : *Anesthesia faktor pause, Anesthesia ready time, Anesthesia service, ASA status, Type of anesthesia*

1. INTRODUCTION

Case of Delayed Elective Surgery Services in January 2019 at Dr. Achmad Mochtar Regional Public Hospital (RSAM) in Bukittinggi revealed that 81.91% of elective surgery services were delayed because the surgeon and anesthesiologist arrived late compared to the scheduled time. The delay rate for surgery starting in February 2019 was 81.81%, similar to that of January (Sukma *et al.*, 2020). One of the main strategies in healthcare services to improve hospital quality is by enhancing the quality of care, reducing treatment costs, and optimizing the time spent in serving the community, especially for patients undergoing surgery (Rothstein & Raval,

2018). One of the crucial aspects in improving healthcare quality is the enhancement of healthcare services in hospitals, ensuring professional and optimal care. To increase efficiency in the ICU, one of the steps is to assess the use of anesthesia service time for patients.

Perioperative anesthesia services involve monitoring, managing, and evaluating patients before, during, and after anesthesia, as well as providing intensive therapy and pain management based on scientific knowledge to address issues through education, research, and evidence-based practice (Kemenkes, 2011). Inefficient use of time in the operating room can be detrimental to patients. Patients may

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experience long waits in the pre-anesthesia area, and surgical and anesthesia teams waiting for each other due to delays in the arrival of the anesthesia team or surgeon. Therefore, standardization is needed to evaluate the anesthesia team and establish time measurements for various anesthesia procedures.

Anesthesia Ready Time can serve as a standard for anesthesia services in hospitals. ART has been found to be a useful auditing tool in the field of anesthesia, with implications for improving operating room efficiency (Prabowo *et al.*, 2018). An anesthesia specialist requires varying amounts of time for anesthesia, depending on the complexity of each patient's anesthesia. Factors that influence ART include anesthesia technique (general anesthesia and spinal anesthesia), ASA status (ASA I-IV), invasive procedures (placement of CVC, IV lines, NGT, and urinary catheters), as well as factors that may hinder ART (both anesthesia and non-anesthesia factors) (Prabowo *et al.*, 2018; Zafar *et al.*, 2006).

The categorization of ASA physical status is found to assist perioperative physicians in simplifying the physiological status of patients to predict the surgical risk for patients. ASA physical status represents the patient's condition before surgery, determining the anesthesia drugs to be used and the equipment preparation, as indicated by the ASA (Doyle *et al.*, 2022). After determining the ASA status, the type of anesthesia to be used is decided. Anesthesia and resuscitation are medical specialties that focus on managing pain, patient discomfort, and other unexpected sensations (Mangku dan Senaphati, 2017).

The objective evaluation of operating room performance requires a thorough examination. Often, issues arise between anesthesia and surgical personnel during anesthesia and surgery services, which can reduce patient satisfaction, as well as that of anesthesia and surgical experts (Chen *et al.*, 2016). The unproductive use of time in the operating room, such as anesthesiologists waiting for the surgery to start or surgeons waiting when the equipment is ready but the patient isn't yet prepared for anesthesia, can often be a factor that leads to disputes between

anesthesiologists and surgeons. ART is known as the measurement of anesthesia induction time and the duration of anesthesia until the patient is ready for surgery. Patients declared ready for surgery must meet the criteria for adequate anesthesia depth and stable hemodynamic monitoring (Prabowo *et al.*, 2018)

Various studies on ART have been conducted in several countries, but the assessment of ART is not yet widely found and applied in Indonesia. ART can serve as an evaluation of anesthesia services in hospitals, ensuring that patients do not have to wait too long during surgical preparations (Lai *et al.*, 2017). Research of this kind is necessary because ART can serve as a standard for anesthesia services. There have been few studies in Indonesia addressing ART, making it a potential advancement in the field of anesthesia services in the country.

Based on previous research conducted by Babita Gupta (2011), the study identified factors causing delayed surgery, which include inadequate planning, deficiencies in team communication, and a shortage of trained operating room staff (Gupta *et al.*, 2011). Research conducted by Saeed U Zafar (2006) yielded results from a sample of 300, with 78% of the samples already meeting international benchmark times. The primary cause of surgery delays was attributed to anesthesia procedures performed by students (24.6%) (Kodali *et al.*, 2014). A study by Prabowo (2018) found that the ART in the emergency operating room at Dr. Soetomo Hospital approached international benchmark times (Prabowo *et al.*, 2018)

Based on the preliminary study at RSI Banjarnegara, subjective data were obtained from an interview with one of the anesthesia providers at RSI Banjarnegara. It was revealed that there are four anesthesia providers, two specialized anesthesia doctors, and three operating rooms.

The general objective of this research is to understand the overview of Anesthesia Ready Time (ART) in anesthesia services at the Central Surgery Department (IBS) of the Islamic Hospital in Banjarnegara.

2. RESEARCH METHOD

This research employs a quantitative approach with a descriptive observational method. The study aims to depict the Anesthesia Ready Time (ART) in anesthesia services at the Central Surgery Department (IBS) of RSI Banjarnegara. The research is conducted in the IBS facility of RSI Banjarnegara. Data collection commenced on March 27 to April 20, 2023. The study population consists of patients undergoing general and spinal anesthesia, totaling 189 patients at RSI Banjarnegara, with a sample of 128 respondents selected using purposive sampling. The selected sample should meet the inclusion criteria, which are patients undergoing elective surgery using general or spinal anesthesia, and the exclusion criteria, which are patients undergoing local anesthesia and emergency surgery. Various data are required for the research; hence, the research instrument used to record and collect data is an observation sheet to measure the time elapsed from patient sign-in to patient time-out, considering anesthesia depth.

The research began with the researcher seeking preliminary study approval, in the form of a cover letter signed by the Rector of Harapan Bangsa University and addressed to the Director of RSI Banjarnegara. Subsequently, the researcher identified the study population and collected research data in March 2023. This involved recording patient identities, noting the type of anesthesia used, the respondents' ASA status, calculating the required ART from sign-in to time-out, recording the invasive procedures used, and observing factors hindering ART on the observation sheet. Following data collection, data processing was carried out using SPSS software version 25. In terms of research ethics for case studies using both primary and secondary data, the following principles must be adhered to :

a. Anonymity

The researcher does not include the respondents' full names on the data collection sheets to ensure the confidentiality of respondents' identities.

b. Beneficence and Non-Maleficence

The research conducted must maximize the benefits and minimize harm or disadvantage to the research respondents.

c. Justice

The costs and benefits of participation in the research should be distributed evenly among all respondents, and all respondents should receive equal treatment.

d. Confidentiality

The researchers will ensure the confidentiality of data collected from the respondents.

The variable in this study is a single variable, namely the description of Anesthesia Ready Time (ART) in anesthesia services at IBS. In this research, only univariate analysis is employed to describe the frequency distribution of ART time based on ASA status, anesthesia type, invasive procedures, and factors hindering ART. This research has been granted ethical approval by the Research Ethics Committee of Harapan Bangsa University under letter number B.LPPM-UHB/1595/03/2023.

3. RESULT AND DISCUSSION

3.1 Research Result

Table 1. Frequency Distribution of IBS Characteristics at RSI Banjarnegara

Characteristics of Respondents	N	%
Type of Anesthesia		
General Anesthesia	50	39.1
Spinal Anesthesia	78	60.9
Total	128	100
ASA Status		
ASA I-II	106	82.8
ASA III-IV	22	17.2
Total	128	100
ART		
	N	%
Good	114	89.1
Less Good	14	10.9
Total	128	100

Based on the results in Table 1, it is evident that the frequency of anesthesia types is as follows: 50 respondents (39.1%) received general anesthesia, while 78 respondents (60.9%) received spinal anesthesia. According

to the data in the ASA status table, 106 respondents (82.8%) were classified as ASA I-II, and 22 respondents (17.2%) were classified as ASA III-IV. Lastly, the ART table indicates that 114 respondents (89.1%) had good ART, while 14 respondents (10.9%) had less good ART.

Table 2. Overview of ART by Anesthesia Type at IBS RSI Banjarnegara in 2023

Anesthesia Type	ART					
	Good		Less Good		Total	
	N	%	N	%	N	%
General Anesthesia	45	35.2	5	3.9	50	39.1
Spinal Anesthesia	69	53.9	9	7.0	78	60.9
Total	114	89.1	14	10.9	128	100

Based on the results in Table 2, the overview of ART by anesthesia type at IBS in RSI Banjarnegara reveals that good ART was observed in 45 respondents (35.2%) for general anesthesia and 69 respondents (53.9%) for spinal anesthesia. Less good ART was found in 5 respondents (3.9%) for general anesthesia and 9 respondents (7.0%) for spinal anesthesia.

Table 3. Description of ART based on ASA status in IBS RSI Banjarnegara 2023

ASA Status	ART					
	Good		Less Good		Total	
	N	%	N	%	N	%
ASA I-II	95	74.2	11	8.6	106	82.8
ASA III-IV	19	14.8	3	2.3	22	17.2
Total	114	89.1	14	10.9	128	100

Based on the results in Table 3, the overview of ART by ASA status at IBS in RSI Banjarnegara reveals that good ART was observed in 95 respondents (74.2%) for ASA I-II status, while for ASA III-IV status, it was observed in 19 respondents (14.8%). Less good ART was found in 11 respondents (8.6%) for ASA I-II status and in 3 respondents (2.3%) for ASA III-IV status.

Table 4. Overview of Invasive Procedures among Respondents at IBS RSI Banjarnegara in 2023

Invasive Procedure	N	%
IV Line Placement	53	41.4
NGT Placement	6	4.7
Urinary Chateter Placement	69	53.9
Total	128	100

Based on the results in Table 4, the overview of invasive procedures among respondents at IBS in RSI Banjarnegara shows that 53 respondents (41.4%) underwent IV line placement, 6 respondents (4.7%) underwent NGT placement, and 69 respondents (53.9%) underwent urinary catheter placement.

Table 5. Overview of Factors Affecting Hindered ART at IBS RSI Banjarnegara in 2023

Factors Affecting Hindered ART		N	%
Anesthesia Factors	Still an Issue with Blood Pressure Monitor	20	15.6
	Still an Issue with SpO2 Monitor	25	19.5
	Waiting for the Anesthesiologist	3	2.3
	Preparation of Anesthesia Medication	31	24.2
	Positioning the Patient for Anesthesia Induction	49	38.3
Total		128	100
Non-Anesthesia Factors Before Induction	Waiting for the Surgeon to Arrive	82	64.1
	Waiting for the Pediatric Nurse	7	5.5
	Preparation of Surgical Instruments	39	30.5
	Total	128	100
Non-Anesthesia Factors After Induction and Before Incision	Drapping	39	30.5
	Positioning the Patient	51	39.8
	Waiting for the Surgeon	38	29.7
Total		128	100

Based on the results in Table 5, the factors affecting hindered ART are divided into

two categories: anesthesia factors and non-anesthesia factors. Among the anesthesia factors, the following were observed: still an issue with blood pressure monitor in 20 respondents (15.6%), still an issue with SpO2 monitor in 25 respondents (19.5%), waiting for the anesthesiologist in 3 respondents (2.3%), preparation of anesthesia medication in 31 respondents (24.2%), and positioning the patient for anesthesia induction in 49 respondents (38.3%).

The non-anesthesia factors are divided into two categories: non-anesthesia factors before induction and after induction but before incision. Among the non-anesthesia factors before induction, the following were observed: waiting for the surgeon to arrive in 82 respondents (64.1%), waiting for the pediatric nurse in 7 respondents (5.5%), and preparation of surgical instruments in 39 respondents (30.5%). Meanwhile, among the non-anesthesia factors after induction but before incision, the following were observed: draping in 39 respondents (30.5%), positioning the patient in 51 respondents (39.8%), and waiting for the surgeon in 38 respondents (29.7%).

3.2 Research Discussion

1. Based on the results from Table 1, in the distribution of anesthesia types at IBS RSI Banjarnegara in 2023, from 128 respondents, it was found that spinal anesthesia was the most commonly used type, with 78 respondents (60.9%). The research also revealed that more respondents underwent urology and OB/GYN surgeries. Spinal anesthesia also had fewer side effects compared to general anesthesia. Regarding the characteristics of ASA status, ASA I-II was more common, with 106 respondents (82.8%). The findings of this research are consistent with a study by Lupei (2014), which also showed that the ASA status for the majority of surgeries was ASA II, accounting for 72% of the total sample (Lupei et al., 2014).

The researcher assumes that RSI Banjarnegara is not a referral hospital, so there are fewer patients with ASA III-IV status. Meanwhile, in the distribution of ART at IBS

RSI Banjarnegara in 2023, the highest number of good ART instances was found, totaling 114 respondents (89.1%). This is in line with a study conducted by Prabowo (2018), where his research showed that the ART in the emergency operating room of RSUD Dr. Soetomo was approaching international benchmark times (Prabowo *et al.*, 2018).

2. Based on the research results in Table 2, the overview of ART among respondents based on the type of anesthesia from 128 respondents showed that the most common occurrence of good ART was in the spinal anesthesia type, with 69 respondents (53.9%). The study found that spinal anesthesia is frequently used due to its minimal side effects. According to theory, spinal anesthesia is a type of regional anesthesia often used because it is easy to administer and effective in providing sensory and motor nerve blockade, especially for lower limb surgeries (Santoso et al., 2023).

In addition, more respondents underwent urology and OB/GYN surgeries due to the hospital's specialized services, which are urology and neonatal obstetric essential or comprehensive emergency services (known as PONEK). Therefore, spinal anesthesia is frequently used. The primary reason for recommending spinal anesthesia in lower limb surgeries is to minimize the risk of aspiration and the danger of endotracheal intubation failure when performed under general anesthesia. (Flora *et al.*, 2014).

3. Based on the research results in Table 3, the overview of ART among respondents based on ASA status from 128 respondents showed that good ART was observed in 95 respondents (74.2%) for ASA I-II status. The findings of this research align with a study by Lupei (2014), which also indicated that the majority of surgeries were performed on patients with ASA II status, accounting for 72% of the total sample (Lupei et al., 2014). According to Cruz (2015), the assessment of anesthesia services can be performed starting from the preoperative preparation, induction, and post-operative handover time (Cruz et al., 2015). Additionally, the researcher assumes that the higher the ASA status of the patient, the more severe the patient's systemic disturbances will be. This requires extensive surgical preparation to set up

emergency anesthesia equipment and medications, as well as other preparations such as blood and fluid management to support the success of the operation.

In this study, during the pre-anesthesia assessment, the evaluation of a patient's ASA physical status is crucial for patients undergoing surgery or anesthesia. This is essential in the field of anesthesia to determine and select the appropriate anesthesia technique and medications based on the patient's physical status. This aligns with the research by Pramono (2018), where the goal of pre-anesthesia preparation is to ensure the patient's physical and mental condition is as optimal as possible, considering the patient's physical characteristics and preferences, and assessing the patient's physical condition using the ASA classification (Pramono, 2017). The determination of ASA status, if not done correctly, can have fatal consequences such as difficult intubation, incorrect surgical site marking, prolonged surgeries, and extended anesthesia (Nurcahyani, 2020).

4. Results from the study, based on Table 4, show the distribution of invasive procedures in the IBS RSI Banjarnegara in 2023. The most commonly performed invasive procedure among respondents was urinary catheterization, with 69 respondents (53.9%). This study found that more respondents underwent urological and OB/GYN surgeries. Consequently, urinary catheterization was the most frequently performed invasive procedure. The high number of patients with urinary catheters is not only due to urological patients with urinary system issues but also because respondents who received spinal anesthesia, which affects the lower extremities, needed urinary catheterization.

This aligns with a survey conducted in Mobalen's research (2019), which reported that more than 30 million urinary catheterizations are performed annually in the United States. Patients requiring long-term catheter care account for approximately 7.5% to 10%, and 10 % of acute patients require short-term catheter care. These numbers are expected to continue rising, reaching up to 25% (Mobalen *et al.*, 2019). Urinary catheterization is crucial before, during, or after surgery to empty the

bladder, reduce urinary retention, examine urine, relieve urinary incontinence, and accurately measure urine output. The occurrence of bladder injury and dysfunction can be prevented with urinary catheter use. However, the risk of urinary tract infections (UTIs) may increase with urinary catheter use, especially with continuous use (Suyanto & Amal, 2020).

The insertion of a urinary catheter is essential before, during, or after surgery to empty the bladder, reduce urinary retention, examine urine, relieve urinary incontinence, and accurately measure urine output. Incidents of bladder injury and dysfunction can be prevented with the use of urinary catheters. However, the risk of urinary tract infections (UTIs) may increase with urinary catheter use, and this risk appears to be even higher with continuous catheterization (Suyanto & Amal, 2020).

5. Based on the results from Table 5, the factors affecting delayed ART are categorized into two groups: anesthesia-related factors and non-anesthesia-related factors. Among the anesthesia-related factors contributing to prolonged anesthesia services, the most common is patient positioning for anesthesia induction, as reported by 49 respondents (38.3%). Burlingame (2017) explained that every surgical procedure requires optimal patient positioning because any position during surgery has the potential for patient position-related injuries (Burlingame, 2017). In this study, several challenges arose during patient positioning for anesthesia induction, including patients' fear of needles, difficulty in locating the lumbar bone for spinal anesthesia injection, anatomical anomalies of the spine, and positions causing patient discomfort. An anesthesia team requires varying amounts of time depending on the difficulty of each patient's anesthesia.

In the distribution of non-anesthesia-related factors before induction, the waiting time for the surgeon to arrive was the most common factor, with 82 respondents (64.1%). There are many factors influencing actions before anesthesia. These factors can originate from patients, doctors, healthcare staff, or medical equipment. This is in line with

Prabowo's (2018) research, which found that the main cause of extended non-anesthesia time was waiting for the surgeon to arrive, accounting for 42.5% of cases (Prabowo *et al.*, 2018). During the study, it was found that surgeons had busy schedules, attending to patients in the outpatient clinic, visiting patients in the wards, or performing surgical procedures in other operating rooms. As a result, patients had to wait for the surgeon to arrive. Some doctors also had practice hours at other institutions, requiring time to commute from other practice locations to RSI Banjarnegara.

In the table of non-anesthesia-related factors after induction but before incision, the most common factor was patient positioning, reported by 51 respondents (39.8%). This is in line with Prabowo's (2018) view that patient positioning is one of the factors causing prolonged ART (Prabowo *et al.*, 2018). Several factors can influence actions before anesthesia, originating from patients, doctors, healthcare staff, or medical equipment. ART can serve as a standard for anesthesia services in hospitals. ART has been found to be a useful auditing tool in the field of anesthesia, with implications for improving operating room efficiency (Zafar *et al.*, 2006). ART can be used as a measurement tool for establishing realistic performance goals (Cruz *et al.*, 2015).

CONCLUSION

An overview of ART in the anesthesia service at the Central Surgery Unit of RSI Banjarnegara reveals that 114 respondents (89.1%) fall within the "good" category of ART measurements. When examining ART according to the type of anesthesia administered, it is evident that the "good" category is most prevalent in the case of spinal anesthesia, with 69 respondents (53.9%) falling into this category. Evaluating ART based on ASA status, it becomes apparent that the "good" category is most frequent among ASA I-II patients, totaling 95 respondents (74.2%). The most commonly performed invasive procedure is the insertion of a urinary catheter, with 69 respondents (53.9%). Factors causing delayed ART are anesthesia-related, primarily the time needed for patient

positioning for anesthesia induction, reported by 49 respondents (38.3%). Non-anesthesia-related factors include waiting for the surgeon to arrive, with 82 respondents (64.1%), and patient positioning, with 51 respondents (39.8%).

RECOMMENDATION

Due to the limitations of this study, it is recommended that future researchers further develop the research by conducting observations of the entire anesthesia service, from pre-anesthesia to the post-anesthesia care unit (PACU). Additionally, future studies could enhance their results by providing a detailed breakdown of the average time required to reach the "ready for surgery" point.

RSI Banjarnegara is advised to seek input from the anesthesia team to improve anesthesia services and reduce the factors that contribute to delayed ART.

REFERENCES

- Burlingame, B. L. (2017). Guideline Implementation: Positioning the Patient. *AORN Journal*, 106(3), 227–237. <https://doi.org/10.1016/j.aorn.2017.07.010>
- Chen, Y., Gabriel, R. A., Kodali, B. S., & Urman, R. D. (2016). Effect of Anesthesia Staffing Ratio on First-Case Surgical Start Time. *Journal of Medical Systems*, 40(5), 1–6. <https://doi.org/10.1007/s10916-016-0471-z>
- Cruz, P. L. O., Prudente, E. S., & Lapitan, M. C. M. (2015). Benchmarking anesthesia-controlled times at a tertiary general hospital in the philippines. *Acta Medica Philippina*, 49(4), 62–68. <https://doi.org/10.47895/amp.v49i4.907>
- Doyle, D. J., Hendrix, J. M., & Garmon, E. H. (2022). *American Society of Anesthesiologists Classification*.
- Gupta, B., Agrawal, P., D'souza, N., & Dev Soni, K. (2011). Start time delays in operating room: Different perspectives. *Saudi Journal of Anaesthesia*, 5(3), 286–288. <https://doi.org/10.4103/1658->

354X.84103

- Kemenkes, R. (2011). Peraturan Menteri Kesehatan Republik Indonesia Nomor 519/2011 Pedoman Penyelenggaraan Pelayanan Anestesiologi dan Terapi Intensif di Rumah Sakit. In *Peraturan Menteri Kesehatan Republik Indonesia* (Vol. 519, Issue III, pp. 1–47).
- Kodali, B. S., Kim, K. D., Flanagan, H., Ehrenfeld, J. M., & Urman, R. D. (2014). *Variability of Subspecialty-Specific Anesthesia-Controlled Times at Two Academic Institutions*. <https://doi.org/10.1007/s10916-014-0011-7>
- Lai, H. C., Chan, S. M., Lu, C. H., Wong, C. S., Cherng, C. H., & Wu, Z. F. (2017). Planning for operating room efficiency and faster anesthesia wake-up time in open major upper abdominal surgery. *Medicine (United States)*, *96*(7), 1–5. <https://doi.org/10.1097/MD.00000000000006148>
- Lupei, M. I., Chipman, J. G., Beilman, G. J., Oancea, S. C., & Konia, M. R. (2014). The association between ASA status and other risk stratification models on postoperative intensive care unit outcomes. *Anesthesia and Analgesia*, *118*(5), 989–994. <https://doi.org/10.1213/ANE.00000000000000187>
- Mangku, G., & Senaphati, T. G. A. (2017). Buku ajar ilmu anestesi dan reanimasi. In *PT Indeks* (pp. 1–381).
- Mobalen, O., Tansar, T., & Maryen, Y. (2019). Perbedaan Pemasangan Kateter Dengan Menggunakan Jelly Yang Dimasukkan Uretra Dan Jellyyang Dioleskan Di Kateter Terhadap Tingkat Nyeri Pasien Di Rsud Sele Be Solu Kota Sorong. *Nursing Arts*, *13*(2), 109–116. <https://doi.org/10.36741/jna.v13i2.90>
- Nurchayani, S. (2020). *Hubungan Status Fisik (Asa) Dengan Lama Anestesi Pada Pasien Dengan General Anestesi Di Instalasi Bedah Sentral Rsud Wates*. Poltekkes Kemenkes Yogyakarta.
- Prabowo, Y. A., Basoeki, A. P., Sylvaranto, T., & Edwar, P. M. (2018). Analisis Anesthesia Ready Time Dalam Pelayanan Anestesi untuk Pembedahan Darurat di Kamar Operasi IGD RSUD Dr. Soetomo Surabaya Tahun 2018. *JAI (Jurnal Anestesiologi Indonesia)*, *10*(3), 134. <https://doi.org/10.14710/jai.v10i3.20278>
- Pramono, A. (2017). *Buku kuliah anestesi*. EGC.
- Rothstein, D. H., & Raval, M. V. (2018). Operating room efficiency. *Seminars in Pediatric Surgery*, *27*(2), 79–85. <https://doi.org/10.1053/j.sempedsurg.2018.02.004>
- Santoso, H. E., Suandika, M., & Dewi, P. (2023). *Perbandingan Skala Nyeri Penggunaan Spinal Needle Ukuran 25G Dengan 26G Pada Spinal Anestesi Di RSUD Bula Kabupaten Seram Bagian Timur*. *3*(8), 7281–7286.
- Sukma, M., Masrul, M., & Semiarty, R. (2020). Analisis Penyebab Keterlambatan Mulai Operasi Pertama Pasien Elektif Di Instalasi Bedah Sentral Rsam. *Human Care Journal*, *4*(3), 178. <https://doi.org/10.32883/hcj.v4i3.578>
- Suyanto, S., & Amal, A. I. (2020). Nyeri, ketidaknyaman dan perasaan malu sebagai dampak dari pemasangan kateter menetap. *Gaster*, *18*(2), 192. <https://doi.org/10.30787/gaster.v18i2.536>
- Zafar, S. U., Khan, F. A., & Khan, M. (2006). Standardization of anaesthesia ready time and reasons of delay in induction of anaesthesia. *Journal of the Pakistan Medical Association*, *56*(3), 112–115.