
Description Of Post-Spinal Anesthesia Urinary Retention In Hernia Surgery Patients At Cilacap Regional Hospital

Andrea Dwi Puspita¹⁾, Septian Mixrova Sebayang²⁾, Surtiningsih³⁾

^{1,2)} Anesthesiology Nursing Study , Faculty of Health, Harapan Bangsa University

³⁾ Bachelor of Midwifery Study Program, Faculty of Health. Harapan Bangsa University

*Corresponding Author

Email: andreadwipuspita778@gmail.com

Abstract

A hernia is an abnormal protrusion of abdominal contents through a defect or weak area in the abdominal wall. In cases of abdominal hernia, abdominal contents protrude through a weakened musculaponeurotic layer of the abdominal wall. A hernia consists of a ring (fascia), a sac (peritoneum), and the hernia contents. This study aimed to describe the incidence of postoperative urinary retention following spinal anesthesia in hernia surgery patients at Cilacap Regional General Hospital (RSUD Cilacap). This study employed a quantitative approach with an analytical method. The study population consisted of 73 patients; using a 5% margin of error, the calculated sample size was 62 respondents. An observation sheet was used to measure the incidence of postoperative urinary retention. The results showed that, regarding respondent characteristics, the majority were over 60 years of age (40 respondents; 64.5%) and male (57 respondents; 91.9%). In terms of education, the majority had a low level of education (elementary or junior high school) (37 respondents; 59.7%). Regarding the type of hernia, the majority of cases were inguinal hernias (56 respondents; 90.3%). Concerning the incidence of urinary retention, the majority of patients did not experience urinary retention (39 respondents; 62.9%).

Keywords: *Hernia, Urinary retention, Spinal anesthesia*

INTRODUCTION

A hernia is an abnormal protrusion of abdominal contents through a defect or weak section of the damaged wall. In abdominal hernias, abdominal contents protrude through the weakened muscular-aponeurotic layer of the abdominal wall. A hernia consists of a ring (fascia), a sac (peritoneum), and hernia contents (Meliani & Dytho, 2022). A hernia is an abnormality in the form of a protrusion of the peritoneal cavity or organs in the form of preperitoneal fat caused by congenital or acquired abnormalities or defects (Aritiah et al., 2024).

Femoral, umbilical, preumbilical, epigastric, ventral, lumbar, Littre, Spieghele, obturatorial, perineal, pantaloon, and inguinal hernias are some of the types of hernias that are classified. Of all these types of hernias, inguinal hernias are the hernia with the highest number of cases, accounting for 75% of all abdominal hernias (Aritiah et al., 2024). According to the WHO (2023), more than 20 million hernia operations are performed annually worldwide. This figure indicates that hernias remain a significant global health problem. Inguinal hernias can be divided into congenital inguinal hernias and acquired or indirect inguinal hernias. Most cases of inguinal hernias found in adults are acquired inguinal hernias (Hammoud & Gerken, 2023).

The most common disease pattern among outpatients in General Hospitals throughout Indonesia is hernia, ranking 14th with a total of 210,875 patients. Among outpatients, inguinal hernia also ranks 14th with a total of 20,400 patients (Ministry of Health of the Republic of Indonesia, 2022). In Indonesia, according to data from the 2018 Basic Health Research, the prevalence of hernia was 4.2% in the adult population, with 70.9% of cases occurring in heavy workers, totaling 7,347 cases. Among hernia types, inguinal hernia remains dominant, especially in men (Riskseddas, 2018).

Epidemiologically, 75% of all abdominal hernias are inguinal hernias, of which 95% are inguinal hernias and the remainder are femoral hernias. Some researchers argue that there

is a clear relationship between age and hernias, with the prevalence of inguinal hernias increasing with age. Inguinal hernias are predominantly male (90%). Women are three times more likely to develop femoral hernias. Indirect hernias occur more frequently on the right side, as the left testicle descends from the retroperitoneum into the scrotum earlier than the right, resulting in later obliteration of the right inguinal canal than the left (Meliani & Dytho, 2022).

The management of inguinal hernias, based on the international guidelines for the management of inguinal hernias issued by the HerniaSurge group in 2018, divides treatment into two main categories: conservative and surgical. Conservative management is limited to repositioning and the use of supports or braces to maintain the position of the inguinal hernia. If repositioning is successful, the patient will be prepared for surgery. However, if repositioning is unsuccessful within 6 hours, the patient must undergo immediate surgery. Conservative therapy is not recommended for women, especially those who are not pregnant, due to the higher risk of femoral hernias. This also applies to cases of symptomatic hernias (Putri et al., 2023).

Open inguinal hernia repair is often performed under regional spinal anesthesia injected into the spine. This procedure ensures the patient is awake during the procedure, but the surgical area will be numb or numb. After appropriate anesthesia is administered, the surgeon makes a 5-6 cm linear incision parallel to the inguinal ligament (Hassler et al., 2022). Indications for Spinal Anesthesia: The most common type of anesthesia used in surgery is spinal anesthesia, which is also used for obstetrics, groin hernia repair, urogenital surgery, resections, and extreme abdominal surgery (Cahyani, 2021).

Among the various spinal complications, urinary retention is one, where central blockage results in atonic bladder outlet, resulting in increased urine volume. Efferent sympathetic blockade (T5-L1) increases sphincter tone, leading to urinary retention. Spinal anesthesia reduces glomerular filtration by 5-10%; this change is most pronounced in patients with hypovolemia. Bladder function returns most recently after spinal anesthesia (Sujadi & Indrawan, 2025).

Postoperative urinary retention is not only uncomfortable but also has the potential to lead to serious complications such as urinary tract infections, hydroureter, hydronephrosis, and even kidney failure if not properly managed. Prolonged bladder distension can increase intravesical pressure, impeding urine flow from the kidneys and ureters. Furthermore, urinary retention is a risk factor for urinary tract infections, which can progress to pyelonephritis and urosepsis (Setyaningsih et al., 2025).

Urinary incontinence is a common complication in postoperative patients, especially after surgery under spinal anesthesia or urological procedures such as prostatectomy and gynecological surgery. This condition is characterized by the patient's inability to control urine output, which can impact the patient's physical, psychological, and social aspects (Hapsari et al., 2024). Urinary incontinence that often occurs after surgery is often associated with nerve disorders that regulate bladder function, as well as the use of urinary catheters for a certain period of time, which can weaken control of the urethral sphincter (Sunarsih et al., 2024). Urethral catheter placement is a common invasive procedure performed on postoperative patients to prevent urinary retention and monitor urine output. However, prolonged use of catheters can cause loss of normal micturition reflexes, pelvic floor muscle atrophy, and an increased risk of urinary tract infections, which ultimately worsen urinary incontinence (Hapsari et al., 2024). Therefore, an effective strategy is needed to restore optimal urinary elimination function before catheter removal, one of which is bladder training. Bladder training is a bladder rehabilitation method that aims to restore patient control over urinary function after experiencing urinary elimination disorders. This method involves various techniques, such as Kegel exercises (pelvic floor muscle training), delayed

urination (urinary retention training), and scheduled bathroom trips (getting used to urinating on a schedule).

Based on a pre-survey conducted, an average of 73 patients underwent hernia repair with spinal anesthesia between January and March 2026 at Cilacap Regional Hospital. Data also revealed that urinary retention was the most common complaint in hernia repair cases with spinal anesthesia, with 9 respondents (90%). Based on the above background, the researcher is interested in examining the "Description of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional Hospital."

RESEARCH METHODS

This research uses a quantitative type with an analytical method, an analytical method is a type of research that aims to find out how and why an event occurs by using statistical analysis such as the correlation between risk factors and effects or cause and effect (Sugiyono, 2019). The research location was conducted in the Inpatient Room of RSUD Cilacap. The population in this study were all patients who underwent hernia surgery with spinal anesthesia in January–March 2026 at Cilacap Regional General Hospital, a total of 73 patients. The sampling technique used *purposive sampling* based on certain criteria set by the researcher (Sugiyono, 2019). The determination of the sample size used the Slovin formula with a 5% error rate, resulting in 62 respondents. Inclusion criteria included patients who underwent hernia surgery with spinal anesthesia, were willing to be respondents, and had a Bromage Score of less than 1. While exclusion criteria included hernia patients with other diseases such as kidney failure and hernia patients in infants and toddlers. The variable in this study was a single variable, namely the description of the incidence of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional General Hospital.

The research instrument used was an observation sheet for urinary retention in post-spinal anesthesia patients undergoing hernia surgery. This instrument was used to record *postoperative urinary retention*, which is the inability to empty the bladder spontaneously without the aid of equipment or medical intervention for a maximum of 6 hours after the start of spinal anesthesia, by repeatedly clamping the bladder for 2 hours, a maximum of 4 times.

This study used primary and secondary data. Primary data included respondents' identities and urinary retention data obtained directly, while secondary data included age and address sourced from respondents' medical records. Data collection techniques were carried out using a *Postoperative Urinary Retention questionnaire*. Data collection began by identifying potential respondents based on inclusion and exclusion criteria, explaining the purpose and procedures of the study, and obtaining respondents' consent before surgery. Next, observations were conducted 6 hours after spinal anesthesia to determine the patient's ability to urinate spontaneously without the aid of a device, by repeatedly clamping the catheter tube for 2–3 hours four times. The data obtained were then analyzed to determine the incidence of urinary retention after spinal anesthesia in hernia surgery patients.

Data processing was carried out through the stages of *editing*, *coding*, *scoring*, data entry, *tabulation*, and *cleaning* to check completeness, provide codes, enter, group, and ensure the data is error-free. Data analysis was performed univariately using the SPSS program to describe the incidence of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional Hospital. The results of the analysis are presented in the form of frequency distribution tables and percentages.

RESULTS AND DISCUSSION

Characteristics of respondents according to age, gender, education level, and type of hernia in the incidence of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional Hospital

Table 1. Respondent characteristics according to age, gender, education level education, And type hernia on incident retention Post-spinal anesthesia urine in hernia surgery patients at Cilacap Regional Hospital n=62

Characteristics	f	%
Age		
10-17 year	0	0
18-59 year	22	35.5
> 60 year	40	64.5
Type sex		
Man	57	91.9
Woman	5	8.1
Level education		
Education low (elementary, junior high)	37	59.7
Education medium (Vocational School/High School)	23	37.1
Education tall (Diploma, Bachelor,	2	3.2

Based on Table 1 , it provides information that the characteristics of respondents based on age in the event of urinary retention at Cilacap Regional Hospital were mostly aged >60 years as many as 40 respondents (64.5%). The characteristics of respondents based on gender were mostly male as many as 57 respondents (91.9%). The characteristics of respondents based on education level were mostly low educated (elementary, junior high) as many as 37 respondents (59.7%). And the characteristics of respondents based on the type of hernia were mostly inguinal hernia cases as many as 56 respondents (90.3%).

Description of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional Hospital

Table 2 . incident retention urine post spinal anesthesia on hernia surgery patients at Cilacap Regional Hospital n=62

Characteristics	f	%
Retention urine		
Yes (> 8 more hours 4 x clamping	23	37.1
No (< 6 O'clock not enough 4 x clamping)	39	62.9
Total	62	100.0

Based on Table 2 , it provides information that the incidence of urinary retention at Cilacap Regional Hospital was 23 respondents (37.1%), and The majority did not experience urinary retention, as many as 39 respondents (62.9%).

Cross tabulation of respondent characteristics of age, gender, education level, type of hernia with the incidence of urinary retention in hernia surgery patients at Cilacap Regional General Hospital

Table 3 . Tabulation cross characteristics respondents age, Gender, education level, type of hernia with the incidence of urinary retention in hernia surgery patients at Cilacap Regional Hospital

	Incident Retention				Total	
	Urine					
	Age	Yes			No	
	f	%	f	%	f	%
18-59 year	13	20.9	9	14.5	22	35.5
>60 years	10	16.1	30	48.4	40	64.5
Gender						
Man	22	35.5	35	56.4	57	91.9
Woman	1	1.6	4	6.4	5	8.1
Education						
Education low (elementary, junior high)	13	20.1	24	38.7	37	61.6
Secondary education (Vocational School/High School)	8	12.9	15	24.1	23	37.1
Higher education (Diploma, Bachelor, Master, Doctor)	2	3.2	0	0	2	3.2
Type Hernia						
Umbilical hernia	1	1.6	4	6.4	5	8.1
Hernia inguinal	22	35.5	35	56.4	57	91.9

Based on Table 3 , it provides information that the cross tabulation between age and the incidence of urinary retention in hernia surgery patients at Cilacap Regional General Hospital is mostly >60 years old with no urinary retention of 30 respondents (48.4%), the most common gender is male with no urinary retention of 35 respondents (56.4%), the most common level of education is low education (elementary-junior high school) with no urinary retention of 24 respondents (38.7%), the most common type of hernia is inguinal hernia with no urinary retention of 35 respondents (56.4%).

Discussion

Description of respondent characteristics based on age, gender, and education level in the incidence of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional Hospital.

The results of the above study showed that the characteristics of respondents based on age in the event of urinary retention at Cilacap Regional Hospital were mostly aged >60 years, as many as 40 respondents (64.5%). Kevin (2024) stated that the highest age group of inguinal hernia sufferers at Drs. H. Amri Tambunan Regional Hospital was the 56-65 year age group, namely 13 people (30.2%) (Kevin & Ance, 2024). This is because increasing age

allows for anatomical and functional decline in body organs, such as reduced strength of the abdominal wall tissue and weak smooth muscle walls resulting in the abdominal canal. The inguinal canal is open so that the prolapsed intestine enters the inguinal annulus (Sabiston, 2021). At the age of >50 years, the possibility of a hernia is quite high, this is due to a decrease in oxytalan fibers and an increase in the amorphous substance of elastin fibers which are responsible for changes in the resistance of the transversalis fascia (Putri et al., 2023).

Age is one of the factors that determine whether someone will develop an inguinal hernia. Direct inguinal hernias are more common in older men who have weakened abdominal wall muscles. Conversely, in young adults between 20 and 40, who are in their productive years, increased intra-abdominal pressure can occur if they engage in continuous physical activity, which can increase the risk of an indirect inguinal hernia (Amrizal, 2020).

The results of the above study showed that the characteristics of respondents based on gender in cases of urinary retention at Cilacap Regional Hospital were predominantly male, with 57 respondents (91.9%). This study is in line with Kevin's (2024) study that found that males dominated inguinal hernia patients at Drs. H. Amri Tambunan Regional Hospital, with 36 people (83.7%) compared to females, with 7 people (16.3%). There is another study that in this study shows that the characteristics of patients based on gender at Gading Pluit Hospital, Jakarta, were all male, with 44 respondents (100%) (Deviyana et al., 2025).

Inguinal hernias are more common in adults than in women, possibly due to the heavy lifting often performed by men, such as lifting objects, construction work, and other jobs requiring strong strength, which are risk factors for inguinal hernias. In boys, hernias are more common due to delayed closure or obliteration of the processus vaginalis, the pathway for testicular descent, resulting in inguinal hernias (Sabiston, 2021). In men, heavy activities or work can result in increased intra-abdominal pressure, coupled with weakness of the transversalis fascia, which can contribute to inguinal hernias (Khan & Ahmed, 2021).

The results of the above study showed that the characteristics of respondents based on educational level in cases of urinary retention at Cilacap Regional Hospital were mostly low-educated (elementary, junior high school), with 37 respondents (59.7%). This study is in line with Nurhudha (2022) who found that the majority of hernia patients had an elementary school education, with 43 people (36.1%) (Nurhuda et al., 2022). Other studies have also shown that in This study found that the majority of hernia patients had elementary school education, as many as 14 respondents (50%) (Amilia et al., 2023).

Knowledge is the result of knowing, and this occurs after an individual senses a particular object. Sensing occurs through the five human senses: sight, smell, hearing, taste, and touch. However, most human knowledge is acquired through the eyes and ears, which then shape individual actions encompassing cognitive, affective, and psychomotor abilities. The level of knowledge can be influenced by the source of information. A person exposed to a source of information is theoretically more knowledgeable than someone who is not (Deviyana et al., 2025).

Sources of information that can influence a person's knowledge include print media such as books, newspapers, magazines, social media, and television. In this modern era, where rapid globalization facilitates the delivery and dissemination of information, social media has become a rapidly developing instrument for this purpose. Similarly, other sources of information, such as print media and advertising, are becoming increasingly diverse, making them attractive for increasing knowledge (Deviyana et al., 2025). Education is a demand in the life of growing children, the meaning of which is that education guides all the natural powers that exist in children, so that they as humans and as members of society can achieve the highest safety and happiness (Annisa, 2022).

The results of the above study showed that the type of hernia in the case of urinary retention at Cilacap Regional Hospital was mostly inguinal hernia cases, with 56 respondents (90.3%). This study is in line with Farida's (2023) study which found that the incidence of inguinal hernia (medial and lateral) was 10 times higher than femoral hernia and both had a percentage of around 75-80% of all types of hernia, incisional hernia 10%, ventral hernia 10%, umbilical hernia 3%, and other hernias around 3% (Farida Mustafavi & Muhammad Sayuti, 2023).

Another study found that 39 cases of hernia were treated in the Central Men's Surgery Room of Dr. M. Djamil Padang General Hospital from July 1, 2023, to November 1, 2023, with the majority of cases being inguinal hernias, with 17 patients (Zalius & Bahar, 2025). The most common hernia case is an inguinal hernia. Inguinal hernias are of two types: the first is an indirect inguinal hernia/lateral hernia. The second is an inguinal hernia. Direct/medial hernia. An indirect inguinal hernia is when the hernia contents enter the inguinal canal through the locus minoris resistance. When the back of the inguinal canal weakens, the hernia contents can enter through the weak gap. This is called a direct inguinal hernia (Jamal & Demaria, 2015). This is thought to be due to the anatomical structure of the lateral area of the inguinal region, which has a locus minoris resistance, namely the processus vaginalis which does not close perfectly during the congenital process so that when weakness occurs in the anterior abdominal wall it will be very susceptible to experiencing a lateral inguinal hernia (Kevin & Ance, 2024).

Inguinal hernia is a multifactorial condition and can affect anyone, regardless of age or gender. However, inguinal hernias are more common in men and older individuals, with one-third of men diagnosed with an inguinal hernia. In addition to gender and age, several other factors that can increase the likelihood of an inguinal hernia include genetics and a history of chronic obstructive pulmonary disease (COPD), Danlos syndrome, and Marfan syndrome. Genetic factors can increase the likelihood of an inguinal hernia four times higher than in individuals without a family history of inguinal hernia (Putri et al., 2023).

Description of the incidence of urinary retention after spinal anesthesia in hernia surgery patients at Cilacap Regional Hospital.

Urinary retention is the inability to empty the bladder until its capacity is exceeded. Urinary retention can be classified into two types: acute urinary retention, which is the sudden inability to urinate despite the urge to urinate. Chronic urinary retention, which is the inability to completely empty the bladder during urination, is usually not accompanied by suprapubic pain (Zahrana & Sholihin, 2022). This inability to urinate occurs suddenly and is accompanied by severe pain when the bladder is full within 6 to 8 hours after surgery (Huang & Leslie, 2026).

Postoperative urinary retention was measured in patients after spinal anesthesia for hernia surgery. The frequency of retention was categorized as the inability to empty the bladder spontaneously without the aid of instruments or medical intervention for a maximum of 6 hours after the start of spinal anesthesia, with repeated clamping for 2 hours and a maximum of 4 times (Khasanah, 2021).

The results of the above study showed that urinary retention occurred in 23 respondents (37.1%) at Cilacap Regional Hospital, and the majority did not experience urinary retention (39 respondents (62.9%). This finding aligns with other studies, which found that the majority of respondents did not experience urinary retention (12 respondents (86%)), and urinary retention occurred in 2 respondents (14%) (Marina, 2020). Furthermore, research also showed that none of the 30 respondents (100%) who underwent surgery under spinal anesthesia experienced urinary retention (Leonardo, 2021).

Another study explains that in cases of post-operative complications, urinary retention is one of the most common complications that occurs in post-TURP patients, with an

incidence of 24.49%. With a classification of incidence rates based on age groups, in the age group > 71 years, urinary retention occurred in 8 people (0.06%). In the age group 61-70 years, urinary retention occurred in 3 people (0.02%). In the age group 51-60 years, urinary retention occurred in 1 person (0.01%). Incidence rates based on comorbidities, patients with hypertension who experienced urinary retention numbered 6 people (0.05%), patients with diabetes who experienced urinary retention numbered 5 people (0.04%), patients with accompanying heart failure who experienced urinary retention numbered 4 people (0.03%), patients with accompanying dyslipidemia who experienced urinary retention numbered 1 person (0.01%), and in patients with accompanying COPD who experienced urinary retention numbered 1 person (0.01%) (Hakiim et al., 2025).

Several factors contribute to *urinary retention*, including age, gender, and duration of surgery. This study emphasizes the importance of early identification of at-risk patients and the implementation of preventive nursing interventions such as early ambulation and warm compresses to reduce the incidence of urinary retention after spinal anesthesia (Setyaningsih et al., 2025).

Based on the literature and concepts of spinal anesthesia, increasing the dose of local anesthetic administered, which means creating a block with a higher level and longer duration, makes it more likely to cause urinary retention and bladder catheter placement. Likewise, the duration and type of surgery where in major operations with heavy bleeding, bladder catheterization will be required for hemodynamic parameters and in long operations also the risk of bladder distension will increase. Therefore, the type of surgery that requires a lower block and a shorter duration of surgery (under 2 hours) is chosen so that the bladder recovers from the effects of spinal anesthesia more quickly (Leonardo, 2021).

There are treatments to reduce the incidence of *urinary retention*, one of which is the use of *suprapubic hot pack therapy* as a complementary therapy, specifically for managing the recovery of the bladder reflex in postoperative patients with spinal anesthesia (Suwoyo, 2024). Early mobilization can also be applied to postoperative patients, being an important aspect in accelerating the patient's recovery process and preventing postoperative complications. One of these is accelerating bladder function and can reduce the incidence of *urinary retention* in postoperative patients (Kostic et al., 2024).

The high proportion of patients who do not experience urinary retention is due to a combination of optimal surgical and anesthetic management, namely the selection of a short-duration operation (<2 hours), a controlled dose of spinal anesthesia, and rapid recovery of bladder nerve function postoperatively.

Cross tabulation of respondent characteristics of age, gender, education level, type of hernia with the incidence of urinary retention in hernia surgery patients at Cilacap Regional General Hospital

Cross tabulation between age and the incidence of urinary retention in hernia surgery patients at Cilacap Regional General Hospital, the most common age is >60 years with no urinary retention of 30 respondents (48.4%), the most common gender is male with no urinary retention of 35 respondents (56.4%), the most common level of education is low education (elementary-junior high school) with no urinary retention of 24 respondents (38.7%), the most common type of hernia is inguinal hernia with no urinary retention of 35 respondents (56.4%).

This research is in line with other research that found that the age of 55-70 years experienced acute urinary retention with a total of 28 people with a percentage of 63.6% and non-acute urinary retention with a total of 27 people with a percentage of 61.3% (Rizki & Rizaldi, 2024).

CONCLUSION

Based on the results and discussion of the research conducted at Cilacap Regional General Hospital, the following conclusions can be drawn. Respondent characteristics based on age in the incidence of urinary retention at Cilacap Regional General Hospital were mostly aged >60 years as many as 40 respondents (64.5%). Respondent characteristics based on gender were mostly male as many as 57 respondents (91.9%). And the characteristics of respondents based on education level were mostly low educated (elementary, junior high) as many as 37 respondents (59.7%), the type of hernia in the majority was inguinal hernia cases as many as 56 respondents (90.3%). The incidence of urinary retention at Cilacap Regional General Hospital was 23 respondents (37.1%), and the majority did not experience urinary retention as many as 39 respondents (62.9%). Cross tabulation between age, gender, education, type of hernia with the incidence of urinary retention in hernia surgery patients at Cilacap Regional General Hospital.

REFERENCES

- Amilia, Y., Ningsih, R., & Istibsaroh, F. (2023). The Effect of Health Education Using Videos in Reducing Anxiety Levels in Pre-Hernia Surgery Patients. *Cereal For*, 8 (1), 51.
- Amrizal. (2020). Inguinal Hernia. Literature Review. *Journal of Medicine and Health*, 6 (1), 1–12. <https://doi.org/10.32502/sm.v6i1.1374>
- Annisa, D. (2022). Journal of Education and Counseling. *Journal of Education and Counseling*, 4 (1980), 1349–1358.
- Aritiah, MAR, Fariztia, AI, Azmi, NA, Andi, Haq, MAF, Ragad, P., Rizaldi, MH, Sania, M., Salsabilah, & Sari, LS (2024). Inguinal Hernia: Literature Review. *Journal of Tropical Biology*, 2 (1), 258–263.
- Cahyani, NPDA (2021). The Relationship between American Society of Anesthesia (ASA) Physical Status I-III and Time to Achieve Bromage Score 2 in Post-Spinal Anesthesia Patients. *Journal of Anesthesia*, 6.
- Deviyana, E., Dwiramajaya Hartoyo, B., & Diana. (2025). The Influence of Patient Knowledge About Hernias and Anxiety Before Laparoscopic Hernia Surgery (Case Study at Gading Pluit Hospital, Jakarta). *Journal of Community Service and Educational Research*, 3 (4), 6049–6055. <https://doi.org/10.31004/ierkin.v3i4.2533>
- Farida Mustafavi, & Muhammad Sayuti. (2023). Selection and Use of Mesh in Hernias. *Calory Journal: Medical Laboratory Journal*, 1 (4), 77–84. <https://doi.org/10.57213/caloryjournal.v1i4.92>
- Hakiim, MDT, Nurdianto, H., Purwaningsari, D., & Sudiarta, KE (2025). Incidence of Postoperative Complications of TURP (Transurethral Resection of the Prostate) in BPH Patients at Dr. Ramelan Naval Hospital, Surabaya. *Surabaya Biomedical Journal*, 4 (3), 187–203. <https://doi.org/10.30649/v4i3.135>
- Hammoud, M., & Gerken, J. (2023). Inguinal Hernia (Archived). *Operative Endoscopy and Endoscopic Surgery in Infants and Children*, 315–318. <https://doi.org/10.1201/b13490-56>
- Hapsari, PS, Rosyid, FN, & Indriastuti, E. (2024). Bladder Training Before Catheter Removal in Postoperative Patients with Urinary Incontinence: A Literature Review. *Journal of Professional Nursing (KEPO)*, 5 (2), 393–401. <https://doi.org/10.36590/kepo.v5i2.1131>
- Hassler, K.R., Saxena, P., & Baltazar-Ford, K.S. (2022). Open Inguinal Hernia Repair. *Journal of Medicine*, 1–20. <https://www.ncbi.nlm.nih.gov/books/NBK459309/>

- Huang, BY, & Leslie, S.W. (2026). *Postoperative Urinary Retention* . StatPearls. <https://www.ncbi.nlm.nih.gov/books/NBK549844/>
- Jamal, M. K., & Demaria, E. (2015). *Inguinal Hernias: Surgical Attending Rounds* . https://www.researchgate.net/publication/304954220_Inguinal_hernias
- Kevin, RP, & Ance, R. (2024). Characteristics of Inguinal Hernia Patients at Drs. H. Amri Tambunan Regional General Hospital in 2021–2022. *Pandu Husada Journal*, 5 (2), 65–71.
- Khan, Z. U., & Ahmed, N. (2021). Anatomy, embryology and pathophysiology of Inguinal Hernia and current trends in Inguinal Hernia treatment. *Pakistan Journal of Surgery* . https://psa.pastic.gov.pk/SearchArticleView.aspx?articledetailId=154893&S_id=37816
- Khasanah, AM (2021). *Application of Blader Training to Patients with Permanent Catheters in Need of Elimination* . Nursing Poltekkes Kemenkes Jogja.
- Kostic, B., Gum, J., Djurasovic, M., Carreon, L., & Glassman, S. (2024). Barriers to Early Mobilization after Spine Surgery. *Norton Healthcare Medical Journal*, 1 (2), 1–5. <https://doi.org/10.59541/001c.123054>
- Leonardo, A. (2021). *Overview of Urinary Retention Incidence in Postoperative Patients Under Spinal Anesthesia at Dr. Rivai Abdullah General Hospital, Palembang* . Bali Health Research and Development Center Repository.
- Marina, V. (2020). Application of Early Mobilization to Urinary Retention in Post-Caesarean Section Patients. *Nursing* , 8–10.
- Meliani, RI, & Dytho, MS (2022). Hernia. *Continuing Medical Education* , 406–417.
- Ministry of Health of the Republic of Indonesia. (2022). *Indonesian Health Profile 2021*. Data Center of the Ministry of Health.
- Nurhuda, M., Fitriyasti, B., Siana, Y., Prawita, N., Kedokteran, F., & Baiturrahmah, U. (2022). Risk Factors of Inguinal Hernia Patients at Dr. M. Nusantara Hasana General Hospital. *Journal*, 2 (7), 268–275.
- Putri, NA, Feby, N., Agistany, F., Bayu, R., & Akhyar, F. (2023). Journal of Tropical Biology Iguinal Hernia: Diagnosis and Management. *Journal of Tropical Biology* , 96–103.
- Riskesdas. (2018). Results of Basic Health Research 2018. *Ministry of Health of the Republic of Indonesia*, 53 (9), 1689–1699.
- Rizki, MDF, & Rizaldi, A. (2024). Acute Urinary Retention in Benign Prostatic Hyperplasia (BPH) Patients Is Not Related to Age and Prostate Volume. *Pandu Husada Journal*, 5 (2), 26–33.
- Sabiston. (2021). *Textbook of Surgery Part 1* (Volume 2). EGC.
- Setyaningsih, A., Arisdiani, T., Asyrofi, A., Studi, P., Keperawatan, S., Tinggi, S., Kesehatan, I., & Tengah, J. (2025). Predictors of Postoperative Urinary Retention with Spinal Anesthesia. *Journal of Nursing and Health Sciences (JIJK)*, 2 , 21–30. <https://doi.org/10.5281/zenodo.18753300>
- Sugiyono. (2019). *Statistics for Research* . Alfabeta.
- Sujadi, D., & Indrawan, K. (2025). Spinal Anesthesia Complications in Surgical Patients: Literature Review. *Unram Medical Journal*, 15 , 516–520.
- Sunarsih, S., Lintang, M., Amatiria, G., & Sulastri, S. (2024). The Effectiveness of Bladder Training on the Ability to Control Incontinence in Post-Laparotomy Patients. *Indonesian Journal of Nursing Science (JIKPI)*, 5 (1), 280–287. <https://doi.org/10.57084/jikpi.v5i1.1535>
- Suwoyo, N. (2024). The Effect of Suprapubic Hot Pack Therapy on the Recovery of the Urinary Bladder Reflex After Spinal Anesthesia at Dr. H. Abdul Moeloek Regional Hospital. *Nursing Journal*, 2 , 306–312.

- Zahrana, AR, & Sholihin, RM (2022). Urine Retention. *Handbook of Urological Diseases in Children* , 2721–2882, 101–104. https://doi.org/10.1142/9789814287418_0006
- Zalius, MF, & Bahar, I. (2025). Application of Deep Breathing and Finger Holding Therapy for Lateral Inguinal Hernia Pain. *Jurnal Kebidanan dan Keperawatan Medika*, 1 (1), 1–5.