

RELATIONSHIP BETWEEN PATIENT AGE AND POSTOPERATIVE COMPLICATIONS: STEMATIC LITERATURE REVIEW

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Abstract

Surgery is one of the medical procedures that can be performed to treat various diseases. However, surgery can also cause complications. The purpose of this study was to examine the relationship between patient age and postoperative complications. This study used the Systematic Literature Review research method. Research data were collected from literature published in reputable scientific journals. The literature was collected through searches in electronic literature databases, such as Google Scholar and Scopus. The data that has been collected is then analyzed in three stages, namely data reduction, data presentation and conclusion drawing. The results showed that patient age is one of the risk factors for postoperative complications. Elderly patients have a higher risk of developing postoperative complications, compared to young patients.

Keywords: Patient Age, Complications, Postoperative

INTRODUCTION

Surgery is a medical procedure performed to treat or treat an illness, injury, or other medical condition. Although surgery is often effective in treating diseases or reducing the symptoms experienced by patients, like other medical procedures, surgery also has a risk of complications. The National Cancer Institute explains that in medical science, the meaning of complications is a medical problem that occurs during having a disease or after undergoing certain procedures or treatments (Laudia Tysara, 2022)

According to WHO (2020), the number of patients undergoing surgery continues to increase every year (Mantika et al., 2023). There are an estimated 165 million surgeries performed annually worldwide, with 234 million patients in hospital in 2020. In Indonesia, surgery in 2020 reached 1.2 million patients. Based on data from the Indonesian Ministry of Health (2021), surgery occupies the 11th position out of 50 disease treatments in Indonesia, with 32% of them being elective surgery. The pattern of disease in Indonesia is estimated to consist of 32% major surgery, 25.1% mental disorders, and 7% anxiety (Ramadhan et al., 2023).

In Itani's study in Canada, it was found that the postoperative complication rate was 47% with a recurrence rate of 8% in the Lichtenstein technique, and 35% with a recurrence rate of 12% in laparoscopy (Ulfandi & Jeo, 2019). Research LUKMAN

et al., (2022) found the prevalence of the most types of cataracts, senile cataracts (99%), the rest were juvenile (0.75%) and congenital (0.25) cataracts. The youngest age of patients undergoing cataract surgery was 0.4 years (4 months) and the oldest age was 95 years, the average age of patients obtained was $61.92 \pm SD 11.72$ years, the most were female (53.75%). The prevalence of postoperative cataract complications occurs mostly using EKEK surgery techniques (48.5%). The prevalence of the most common types of postoperative cataract complications is corneal edema, using the EKEK technique as much as 35% and phacoemulsification as much as 32.5%.

Postoperative complications are a possibility that can be experienced by patients of various age ranges, although the risk tends to be higher in elderly patients. The factors that cause increased risk in this age group involve natural physiological changes that occur with aging. Organs, such as the heart, lungs, and kidneys, generally experience decreased function, so responding to postoperative stress can be more difficult. In addition, the immune system that tends to decrease in old age increases the patient's vulnerability to infection (Astari, 2018). The purpose of this study was to examine the relationship between the age of patients and postoperative complications.

RESEARCH METHODS

This study used the Systematic Literature Review research method. The Systematic Literature Review (SLR) method is a thorough process carried out systematically to identify, evaluate, and synthesize research relevant to a particular topic. This method involves certain steps to collect, review, and analyze existing literature in a methodical and structured manner (F. Rozi, 2020).

The research data was collected from literature published in reputable scientific journals. Literature is collected through searches in electronic literature databases, such as Google Scholar and Scopus. The data used in this study has several inclusion criteria, including Indonesian or English with a publication period of 2013-2023. While the inclusion criteria are in addition to Indonesian and English and published before 2013. Based on the criteria that have been determined, the flow and results of the research to be used in this study are depicted in the following PRISMA diagram.

RESULTS AND DISCUSSION

Table 1. Research Results

No	Author Name and Year	Heading	Research Results
1	(Satkunasivam et al., 2020)	Relation between surgeon age and postoperative outcomes: a population-based cohort study	Patient mortality rates, hospital readmissions, and complications decline in Ontario as surgeons age. Increasing surgeon age is associated with decreased postoperative mortality, rehospitalization, and complications in an almost

No	Author Name and Year	Heading	Research Results
			<p>linear way after accounting for factors at the patient, procedure, surgeon, and hospital levels. Further evaluation of the mechanisms underlying these findings can help improve patient safety and outcomes, as well as inform policies on maintenance of certification and retirement age for surgeons.</p>
2	(Lin et al., 2016)	Frailty and post-operative outcomes in older surgical patients: a systematic review	<p>There is strong evidence that frailty in elderly and oldest surgical patients predicts postoperative mortality, complications, and long length of stay. Flaw assessment may be a valuable tool in perioperative assessment. It is possible that tools with different weaknesses are best suited for different acuity and types of surgical patients.</p>
3	(I. F. Rozi et al., 2021)	The Relationship Between Patient Age, Fracture Type and Location of Long Bone Fracture on Post-Surgical Hospitalization at Orthopedic Hospital Prof. Dr. R. Soeharso Surakarta	<p>In theory, fractures in geriatric patients have a longer healing due to comorbid diseases. Diabetes and hypertension can cause a decrease in bone mineral density so that it has a longer healing time. Elderly patients are also susceptible to pneumonia and also deep vein thrombosis which of course can extend the length of hospitalization in fracture patients.</p>
4	(Pramono & Desfitra, 2023)	The relationship between age and postoperative chills	<p>Younger patients have less chills because they have more subcutaneous fat that protects them from cold, stable resting muscle tone, high metabolic rate, their ability to regulate and maintain normal body temperature effectively better than in old age, and thermoregulation at a young</p>

No	Author Name and Year	Heading	Research Results
5	(Widiyono & Setiyajati, 2020)	Relationship between Age and Duration of Surgery with Hypothermia in Post-Spinal Anesthesia Patients at Central Surgical Installations	age. signifikan lebih baik daripada umur tua Based on the hypothesis test with logistic regression analysis tests, it is known that age is a risk factor for hypothermia with a p coefficient of $0.025 < 0.05$ and an odds ratio value of 8.985, meaning that respondents who are getting older are 8.985 times more at risk of hypothermy.
6	(Handayani et al., 2022)	Correlation Between Age And Hypothermic Incidence Of Post Operation Patients With General Anesthesia At Pku Muhammadiyah Hospital, Bantul	Based on the results of the study, it was found that there was a relationship between age and the incidence of postoperative hypothermia with general anesthesia. The level of closeness of the relationship between age and the incidence of hypothermy can also be seen based on the incidence rate according to the age range where patients with the age range of children tend to experience severe hypothermy, amounting to 4 out of 10 patients (10%), adolescents tend to experience mild and moderate hypothermy, amounting to 5 patients each (12.5%), the adult age category tends to experience hypothermia with moderate temperature criteria, which amounts to 5 out of 10 patients (12.5%) while For the elderly category, they tend to experience severe hypothermy, amounting to 8 out of 10 patients (20%)
7	(WIDJAJANA, 2017)	The relationship of hypospadias type, age, and surgical technique to complications of	In bivariate analysis, there was no significant association between the age of surgery for hypospadias and

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		ureoquataneous fistula in pediatric hypospadias	complications of urethrocutaneous fistula and the strength of the weak relationship (p value = 0.21 and r value = 0.28).
8	(Ulfandi & Jeo, 2019)	Comparison of the Incidence of Postoperative Complications of Herniorafi with the Lichtenstein Technique Mesh with Laparoscopic Techniques at RSCM	There are differences in the incidence of postoperative herniorafi complications with the mesh of the Lichtenstein technique and laparoscopic techniques in patients with inguinal hernia which shows that the incidence of complications appears more in the Lichtenstein technique than laparoscopy with factors of length of stay and type of surgery that significantly significant the incidence of postoperative complications. The variables age, length of surgery, and body mass index were not significantly associated with postoperative complications of the two techniques (p = >0.05).
9	(Rivai et al., 2013)	Determinants of Postoperative Cesarean Wound Infection	Risk factors for ILO events in cesarean section are the time of prophylactic antibiotics, the length of preoperative hospitalization and the length of postoperative care. Other factors, including respondents' age, nutritional status, type of surgery, preoperative hemoglobin, type of anesthesia, and length of surgery, were not found to be risk factors for ILO events in post-cesarean patients.
10	(Sidhi et al., 2021)	The relationship between the rule of ten and the incidence of post-labioplasty complications	The age of patients undergoing labioplasty surgery was dominated by the age of over 10 weeks, which was 84 patients (97.7%). Almost all cleft patients who had

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			undergone labioplasty weighed over 4.5 kg as many as 85 patients (98.8%) and hemoglobin levels above 10 g / dL were found in 83 patients (96.5%). Of the 86 cleft patients, about 80 patients (93%) met the rule of ten criteria. A total of 7 patients (8.1%) had complications.

Surgery or surgery is an invasive treatment by opening or displaying body parts, and is generally done by making incisions on the body parts to be handled and repaired and ending with closing and suturing wounds. Surgery is performed for several reasons such as diagnostic (biopsy, laparotomy, exploration), curative (excision of tumor masses, removal of inflammatory appendices), reparative (repairing multiple wounds), reconstruction and palliative (Apriansyah et al in Rizki et al, 2019). Surgery according to its type is divided into two types, namely major and minor surgery. Minor surgery is surgery on a small part of the body that has a smaller risk of complications than major surgery. Usually patients who undergo minor surgery can go home the same day. While major surgery is an operation that involves organs widely and has a high level of risk to client survival (Talindong & Minarsih, 2020).

The overall success of surgery depends largely on the pre-operative phase. This is because this phase is the initial phase which is the foundation for the next stage. In the pre-operative phase, nurses play an important role in preparing the physical and psychological condition of patients who will undergo surgery. This pre-operative phase begins when the decision for surgical intervention has been made and ends when the patient is sent to the operating room (Putri & Martin, 2020). The preparation for surgery is carried out on patients starting from the time the patient enters the treatment room until the patient is in the operating room before the surgery is performed. Patients who will undergo surgery really need to be considered in overcoming the anxiety experienced (Kurniawan et al., 2018).

Various bad possibilities can occur that will be dangerous for patients. So do not be surprised if often patients and families show excessive attitudes with the anxiety experienced. Fear of pain after surgery, fear of physical changes (becoming ugly and not functioning normally), fear of malignancy (if the diagnosis is uncertain), fear or anxiety of experiencing the same condition as others who have the same disease, fear of facing the operating room, surgical equipment and officers, fear of death during anesthesia, and fear of surgery will fail are various reasons that can cause fear or anxiety of patients in facing surgery (Sutinah, 2019). So that nurses have a role in providing information to patients and their families regarding the illness suffered and future treatment plans. The information provided must use effective and

clear information. Interpersonal communication is at the core of the job for a nurse. All nursing tasks revolve around the need for nurses to be effective informers, one of which is in providing informed consent (Murdiman et al., 2019).

The provision of information about the disease and the actions to be taken needs to be given to each patient, as the rights and obligations of patients receiving treatment in the hospital (Law-RI, No. 44 concerning Hospitals, 2009). Most patients feel that their anxiety level becomes lighter if they know information about the purpose of the examination, and the preoperative procedures to be carried out (Tamah et al., 2019)

In addition to preoperative care, postoperative patient care can also be complex due to physiological changes that may occur, including bleeding complications, irregular heart rhythms, respiratory disorders, circulation, temperature control (hypothermy), as well as other vital functions such as neurological function, skin integrity and wound condition, genito-urinary, gastrointestinal, fluid and electrolyte balance and comfort (Siswoyo & Siyoto, 2020). Postoperative complications have a significant and sustained effect on the patient's quality of life after surgery; these effects worsen as the severity of complications increases (Downey et al., 2023). Postoperative complications are a common disorder associated with poor clinical outcomes; thus, structural and procedural changes should be implemented to reduce postoperative morbidity and mortality (Satkunasivam et al., 2020)

Medical complications are associated with a twofold increase in pain that limits function 1-3 months after surgery. Understanding the mechanisms linking complications to pathological persistence of pain could help develop future approaches to preventing pain that persists after surgery (Moleong, 1989). Pain is an unpleasant feeling, cannot be handed over to others and it is caused by special mechanical, chemical, electrical stimuli, found at the ends of the nerves. Pain is one of the things that affect the comfort of the body. Being free from pain is a basic need that humans must overcome (Sidharti & Kurniawaty, 2023). Postoperative nausea and vomiting or PONV (Post Operative Nausea and Vomiting) is still a common problem in nursing services. The incidence of PONV (Post Operative Nausea and Vomiting) occurs in 25-30% of postoperative patients under general anesthesia and can reach 70% in postoperative patients with high risk (Rahmayana et al., 2014).

One of the factors that cause the presence or absence and speed or duration of postoperative effects is the age of the patient. According to Lin et al., (2016) there is strong evidence that weakness in elderly surgical patients and the oldest surgical patients predicts postoperative mortality, complications, and long length of hospitalization. Flaw assessment may be a valuable tool in perioperative assessment. It is possible that tools with different weaknesses are best suited for different acuity and types of surgical patients.

Elderly patients are also susceptible to pneumonia and deep vein thrombosis which of course can extend the length of hospitalization in patients (I. F. Rozi et al., 2021). Younger patients have less chills because young people have more subcutaneous fat that protects them from cold conditions, resting muscle tone is stable, metabolic rate is still high, their ability to regulate and maintain normal body temperature effectively is better than in old age, and thermoregulation measures at a

young age are significantly better than in old age (Pramono & Desfitra, 2023). Postoperative hypothermia is a core temperature lower than normal body temperature of 36°C after the patient is operated on. Under normal circumstances, the human body is able to regulate temperature in hot and cold environments through a temperature-protective reflex regulated by the hypothalamus. During general anesthesia, the reflex ceases to function, making the patient very susceptible to hypothermia. About 33-56.7% of patients undergoing spinal anesthesia experience wheezing events (Tubalawony & Siahaya, 2023).

According to Handayani et al., (2022) stated that the level of closeness of the relationship between age and the incidence of hypothermy can also be seen based on the incidence rate according to the age range where patients with the age range of children tend to experience severe hypothermy, amounting to 4 out of 10 patients (10%), adolescents tend to experience mild and moderate hypothermy, which amounts to 5 patients each (12.5%), The adult age category tends to experience hypothermy with moderate temperature criteria, amounting to 5 out of 10 patients (12.5%), while for the elderly category tends to experience severe hypothermy, which amounts to 8 out of 10 patients (20%). However, the statement of Ulfandi & Wifanto (2019), on the contrary, is that the age variable does not have a significant relationship with postoperative complications. Supported by Rivai et al (2013) who stated that other factors such as respondents' age, nutritional status, type of surgery, preoperative hemo-globin, type of anesthesia, and duration of surgery, were not found as risk factors for ILO events in postoperative patients.

CONCLUSION

Elderly patients have a higher susceptibility to postoperative complications compared to younger patients. These age-related differences underscore the importance of considering age as an important factor in assessing and managing the potential risks associated with surgical procedures. As patients age, there is an inherent increase in the likelihood of facing complications during the postoperative period. The findings emphasize the need for tailored and attentive care for elderly patients undergoing surgery, focusing on proactive measures to mitigate the increased risk and ensure a smoother recovery process.

Widiyono et al (2020) age is a risk factor for hypothermy with a coefficient $p < 0.025 < 0.05$ and an odds ratio value of 8.985 meaning that respondents who are getting older are 8,985 times more at risk of hypothermy.

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