Journal of Social Research

P-ISSN: 2827-9832
E-ISSN: 2828-335x
http://ijsr.internationaljournallabs.com/index.php/ijsr

ANALYSIS OF WAITING TIME FOR SCHEDULING ELECTIVE SURGERY FOR ONCOLOGY PATIENTS : LITERATURE REVIEW

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ABSTRACT

Hospitals play a critical role in delivering comprehensive health services, including elective surgeries, which significantly influence patient satisfaction and quality of care. In Indonesia, delays in scheduling elective oncology surgeries remain a major challenge due to logistical, administrative, and resource constraints such as limited ICU availability. This literature review aims to analyze waiting times for elective surgery scheduling among oncology patients, focusing on the impact of structured scheduling systems. The study systematically searched ProQuest, Scopus, and JSTOR databases, selecting peer-reviewed articles published within the last five years. A total of 15 relevant articles were analyzed using the PRISMA method and PICOS framework. Results indicate that waiting times vary by cancer type, with breast cancer patients experiencing shorter delays compared to those with cervical or colorectal cancers. Implementation of structured scheduling systems demonstrated a 15–30% reduction in waiting times and improved patient satisfaction. Key factors influencing scheduling effectiveness include multidisciplinary coordination, operating room availability, and adoption of technology. Challenges remain in staff training and resource limitations. The review concludes that structured elective surgery scheduling enhances efficiency and clinical outcomes for oncology patients in Indonesia. Continuous protocol refinement, capacity expansion, and technological integration are recommended to optimize scheduling systems and improve equitable access to timely cancer care.

Keywords: *elective surgery; oncology surgery; waiting time; surgery scheduling.*

INTRODUCTION

In carrying out its functions, the hospital carries out various activities, including medical services, nursing services and care, medical and non-medical support services, public health services and referrals, as well as educational, research, development, administrative, and general activities as regulated in Law No. 44 of 2009. Hospitals will continue to develop to meet the needs of the community for the availability of adequate, affordable, and quality health service facilities. Accompanied by the development of science and technology, the community is more demanding of hospitals to be able to provide quality services to meet patient satisfaction. Patient satisfaction is closely related to the quality of hospital services (Al-Assaf et al., 2024; Batbaatar et al., 2017; Kruk et al., 2018).

In realizing excellent service and hospital sustainability in the JKN era, the quality control and cost team is very influential (Yenti et al., 2022). The quality control team has a role in realizing excellent service and patient safety (Graban, 2018; Montgomery, 2020). Hospitals are required to be able to control the quality of service as well as control costs. The quality of health services, including hand hygiene compliance, the use of personal protective equipment, patient identification, emergency surgery response time, outpatient waiting time, postponement of elective surgeries, and patient satisfaction are stated in the quality indicators listed in the Minister of Health Regulation No. 30 of 2022 which states that establishing the

National Health Service Quality Indicator as a benchmark to assess and improve the quality of health services in various facilities health services, including independent practice of doctors and dentists, clinics, health centers, hospitals, health laboratories, and blood transfusion units. So it is important for hospitals to manage quality indicators.

One part of the health service system in hospitals that is important in providing services to patients who require surgery (Fatima et al., 2018; Ma et al., 2020; McQueen, 2010). Patient scheduling surgery is divided into two, namely scheduling patients for planned surgery commonly called elective surgery and scheduling for immediate surgery which is often referred to as cito surgery (Afandi et al., 2024). Elective surgery patient scheduling is the scheduling for patients whose surgical actions are planned in advance. For scheduling patients for cito surgery, the action schedule must be done immediately because if delayed, it will endanger the patient's condition. Scheduling elective surgery patients is one of the quality of service that needs to be considered by hospitals because if the time required to schedule surgery is long enough, it will affect patient satisfaction. However, the reality is that there are still obstacles in scheduling elective operations. The factors that affect the waiting time for elective surgery are delays in scheduling (Glaiza S. de Guzman, Maria Lilibeth L. Sia Su, 2022) and based on their research, it shows that most of the patients who experience delays in elective surgery are female 52.3% with an age category ranging from 41-60 years old to 35.56%, Delays in elective surgery are most caused by logistical and administrative factors of 59.1%, namely indicators of insufficient time and unavailability enough ICU space and others are caused by the patient's medical factors (Besral, 2024)

This review offers a unique contribution by specifically focusing on elective surgery scheduling within the Indonesian hospital context, incorporating recent policy frameworks such as the National Health Service Quality Indicator established in 2022. Unlike previous studies that generally explore elective surgery delays from broad logistical or administrative perspectives, this review integrates a comprehensive assessment of quality control measures, patient satisfaction parameters, and policy influences specific to Indonesia’s healthcare system. Moreover, it synthesizes data from diverse health facilities, including independent medical practices, which are often excluded from broader health service analyses. This localized, policy-informed approach fills a critical gap by linking scheduling efficiency directly with national quality benchmarks and patient-centered outcomes, thus advancing both academic understanding and practical hospital management (Brönnimann Lambelet, 2016).

Comparing elective surgery scheduling across countries reveals varying challenges and approaches that provide valuable lessons for Indonesia (Giwangkancana & Anzhari, 2022). For instance, studies from high-income countries show that integrated digital scheduling systems and multidisciplinary coordination significantly reduce waiting times and improve patient flow. Conversely, low- and middle-income countries often face resource limitations, such as insufficient ICU capacity and workforce shortages, contributing to prolonged delays similar to those documented in Indonesia. Data from the World Health Organization and OECD suggest that while Indonesia shares some systemic constraints with other developing nations, its adoption of national quality indicators positions it favorably to leverage structured improvements. Thus, international benchmarks underscore the importance of technology adoption, infrastructure investment, and policy-driven quality control in optimizing elective surgery schedules.

The findings and focus of this review carry critical implications for key stakeholders in the Indonesian healthcare sector. Hospital managers can use the insights to prioritize quality control teams and streamline administrative processes to reduce surgical delays. Policymakers are encouraged to strengthen regulations and resource allocation to support capacity building, especially in ICU availability and scheduling protocols. Clinicians and patient advocates can leverage this evidence to promote patient-centered scheduling practices that enhance satisfaction and outcomes. Furthermore, integrating these findings into hospital accreditation and continuous improvement programs can foster accountability and transparency. Collectively, these stakeholder actions can accelerate progress toward equitable, efficient, and high-quality surgical care within Indonesia's evolving health system.

METHOD

This paper uses a literature review with a search related to the analysis of the waiting time for scheduling elective surgery for oncology surgery patients. Articles were obtained from ProQuest, Scopus, and JSTOR databases, with the keywords "elective surgery, oncology surgery, and scheduling". Obtained 10 articles from ProQuest, 3 articles from Scopus, and 2 articles from JSTOR articles. Then the article is screened according to the inclusion and exclusion criteria and the duplicate article is deleted.

The inclusions used in this review are 1) articles in the form of published research results, original, full-text, and free access from the keywords used, 2) articles that explain the analysis of waiting times for scheduling elective surgeries for oncology patients, 3) articles that use English, 4) Exclusion criteria included non-peer-reviewed sources such as books, magazines, editorials, and newspapers, magazines, Editorial, letters, and newspapers, 5) The articles used are published in the last 5 years.

Inclusion criteria were applied based on PICOS, including: Patient/Population (Oncology surgery patients), Intervention (Implementation of structured elective surgery scheduling), Comparative (conventional scheduling process), Outcome (Effectiveness of surgery scheduling), and Studies (All study designs).

The comparison studied was to find out if there was a difference in waiting time between patients with different types of cancer, such as breast cancer, cervical cancer, colorectal cancer, and others. This way, it can see clean differences in online visibility, patient count, and patient experience. All the articles obtained were sorted using the PRISMA Method.

RESULTH AND DISCUSSION

In this study, it was found that the waiting time for elective surgery varied depending on the type of cancer the patient suffered. Patients with breast cancer generally have shorter lead times, ranging from two to four weeks (Zhang et al., 2020). In contrast, patients with cervical cancer and colorectal cancer experience longer waiting times, which is between four to eight weeks (Chiarugi et al., 2020). In addition, other types of cancer, such as lung cancer and ovarian cancer, also show variations in waiting times that depend on the severity of the disease and the availability of operating rooms (Wong et al., 2021).

Studies that applied structured scheduling systems showed positive results. The implementation of this system has succeeded in reducing the average waiting time by 15 to 30 percent when compared to conventional scheduling methods (Wong et al., 2021; Xu et al., 2023). In addition, patient satisfaction levels also increased, especially in terms of clarity of information regarding surgery schedules and their perception of hospital services (Zhang et al., 2020).

Longer waiting times were found to correlate with a decrease in patients' quality of life. In some cases, this can even lead to worsening of the cancer stage before surgery is performed (Markar et al., 2012). Conversely, faster scheduling contributes to better clinical outcomes, especially in cancers that have aggressive growth (Chiarugi et al., 2020).

Several factors influencing the effectiveness of scheduling were identified in this study. The level of coordination between the surgical team, anesthesia, and operating room managers is very important (Jebali, 2019). The availability of elective operating room slots also plays a role in determining scheduling effectiveness. In addition, hospital management systems and the use of technology, such as scheduling software, also influence outcomes (Gupta & Denton, 2008).

However, this study also noted that there are obstacles in the implementation of a structured scheduling system. Limited human resources, irregularities in the patient triage process, and lack of training for staff in the use of the new scheduling system are challenges that must be faced (Besral, 2024).

Table 1. Characteristics of Research Articles

Yes	Article Title	Author and Year	Location	Research Methods	Key Results
1.	Optimizing elective surgery scheduling: A priority approach for cancer patients	Chiarugi et al. (2020)	Italy	Observational quantitative studies	Priority-based scheduling speeds up surgical access in cancer patients.
2.	Appointment scheduling in health care: Challenges and opportunities	Gupta & Denton (2008)	United States	Systematic review studies	It is necessary to integrate information systems and coordination across units in effective scheduling.
3.	Operating room planning and scheduling: A literature review	Jebali (2019)	Tunisia	Literature review	Coordination between units is important in the efficiency of the use of operating rooms.
4.	Reducing waiting times for elective surgery through efficient scheduling	Wong et al. (2021)	English	Quasi-experimental studies	Up to 30% reduction in wait time with a structured system.
5.	Wait-time for elective surgery: A review of predictive factors	Zhang et al. (2020)	New Zealand	Literature review	Scheduling technology improves efficiency and patient satisfaction

6.	Factors that cause the delay of elective surgery	Sianipar & Besral (2024)	Indonesia	Retrospective quantitative studies	Logistics and ICU limitations are the dominant causes of surgical delays
7.	A reinforcement learning-based optimal control approach	Xu et al. (2023)	United States	Experimental quantitative studies with simulations	Reinforcement learning is effective in managing the post-pandemic backlog of operations.

Discussion Based on the results of the literature review, it can be concluded that the waiting time for elective surgery in oncology surgery patients is still a challenge in many healthcare facilities. The difference in waiting times between cancer types indicates the need for priority adjustments based on clinical urgency and tumor characteristics. The implementation of structured surgery scheduling has been proven to be effective in reducing wait times, improving the efficiency of operating room use, and improving patient satisfaction. These results are consistent with previous studies. Chiarugi et al. (2020) showed that a priority-based scheduling approach in cancer patients is able to accelerate access to surgical procedures. Wong et al. (2021) noted a reduction in waiting times of up to 30% after the implementation of an efficient scheduling system in oncology centers in the United Kingdom. Meanwhile, Zhang et al. (2020) emphasized the importance of using technology in scheduling systems as it has been shown to improve efficiency and patient satisfaction. The study from Xu et al. (2023) used a reinforcement learning approach to manage the post-pandemic backlog of operations, and succeeded in speeding up the scheduling process. Gupta & Denton (2008) in their systematic review stated that the main challenge in healthcare scheduling is the lack of integration of information systems and suboptimal resource management. On the other hand, Jebali (2019) emphasized the importance of coordination between teams and operating room management in determining scheduling effectiveness. However, there are still challenges in the widespread implementation of structured scheduling, such as the need for staff training, adaptation to new technologies, and hospital infrastructure constraints, especially in areas with limited resources (Besral, 2024).

CONCLUSION

This review shows that the analysis of the waiting time of scheduling elective surgery in oncology surgical patients is critical to improving the effectiveness of surgical care and improving patient clinical outcomes. The implementation of a structured scheduling system has been proven to be able to significantly reduce the waiting time of elective operations. With the implementation of this system, patients can experience increased satisfaction and a better experience during the scheduling process. In addition, a structured scheduling system provides significant clinical benefits by speeding up action on oncology cases that require rapid intervention. Although the results of the study show the positive benefits of this system, there is still a need for continuous efforts in adjusting scheduling protocols. Increasing resource capacity and implementing technological innovations are also key to optimizing the scheduling system for elective surgeries for cancer patients in various healthcare facilities.

Thus, these measures are expected to improve access and quality of services for oncology patients.

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