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SCOPING REVIEW

Prioritising patients for semi-urgent surgery: A scoping review

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Abstract

Background: Semi-urgent surgery where surgical intervention is required within 48 h of admission and the patient is medically stable is vulnerable to scheduling delays. Given the challenges in accessing health care, there is a need for a detailed understanding of the factors that impact decisions on scheduling semi-urgent surgeries.

Aim: To identify and describe the organisational, departmental and contextual factors that determine healthcare professionals' prioritising patients for semi-urgent surgeries.

Methods: We used the Joanna Briggs Institute guidance for scoping reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for scoping reviews (PRISMA-ScR) checklist. Four online databases were used: EBSCO Academic Search Complete, EBSCO Cumulative Index to Nursing and Allied Health Literature, OVID Embase and EBSCO Medline. Articles were eligible for inclusion if they published in English and focussed on the scheduling of patients for surgery were included. Data were extracted by one author and checked by another and analysed descriptively. Findings were synthesises using the Patterns, Advances, Gaps, Evidence for practice and Research recommendations framework.

Results: Twelve articles published between 1999 and 2022 were included. The Patterns, Advances, Gaps, Evidence for practice and Research recommendations framework highlighted themes of emergency surgery scheduling and its impact on operating room utilisation. Gaps in the management of operating room utilisation and the incorporation of semi-urgent surgeries into operating schedules were also identified. Finally, the lack of consensus on the definition of semi-urgent surgery and the parameters used to assign surgical acuity to patients was evident.

Conclusions: This scoping review identified patterns in the scheduling methods, and involvement of key decision makers. Yet there is limited evidence about how key decision makers reach consensus on prioritising patients for semi-urgent surgery and its impact on patient experience.

Patient or Public Contribution: No Patient or Public Contribution.

KEYWORDS
decision-making, healthcare organisations, patient care, prioritisation, scheduling, scoping review, semi-urgent surgery

1 | BACKGROUND

As healthcare systems work to balance limited resources with increasing demand, prioritising patients for semi-urgent surgery has become a critical challenge facing healthcare providers. The perioperative setting is particularly vulnerable due to the escalating demand for surgical services and associated cumulative costs of providing these services, with inpatient hospital surgical care accounting for up to 50% of total hospital expenditure (Kaye et al., 2020). Surgical schedules not only impact perioperative service delivery but also workloads across several hospital departments, including intensive care units and surgical wards that impact patient safety (Van Riet & Demeulemeester, 2015). These schedules are often vulnerable to ad hoc changes due to factors outside of the control of hospitals which have flow-on effects for service delivery (Van Riet & Demeulemeester, 2015). The funding received by health services is based on meeting certain deliverables including reduced patient waiting times for both planned and emergency surgeries. These key performance indicators ensure the delivery of safe, high-quality patient care (Dixit & Sambasivan, 2018). However, it is often challenging for health services to meet these indicators as the complexity of healthcare systems and the diversity of patient needs can make it difficult to achieve consistent and reliable performance.

Health services strive to balance operating room utilisation with the allocation of surgical time to ensure timely surgical access, decreased cancellation of planned and emergency surgeries, and shorter waiting times for patients (Department of Health and Human Services, 2012). Appropriate and timely allocation of emergency surgery relies on clinical priority based on triaging surgical requests (Babidge et al., 2020). This requires clinicians to determine the order of treatment for patients based on a pre-defined set of urgent care triggers (Babidge et al., 2020). As there is no standardised approach to how urgency categories are assigned, each healthcare organisation will have unique processes based on the population accessing these services (Göras et al., 2020). For instance, in Australia alone, there is no standardised system for assigning urgency categories, leading to variations in processes and practices nationally between states and territories. The lack of consensus in terminology is also evident worldwide. The delivery of safe surgical care therefore requires highly specialised technical skills and well-trained staff to ensure high-quality outcomes for patients (Göras et al., 2020). However, not all surgeries fit within pre-defined categories, preempting the need for substantial clinical judgement (Zonderland et al., 2010).

Scheduling surgeries is determined by surgical acuity parameters. Factors used to determine these include the patient's condition, urgency of the procedure and the availability of the surgical team required to perform the surgery (Babidge et al., 2020). Within the categorisation of planned and emergency surgery, there are multiple subcategories based on certain patient characteristics, which guide the allocation of surgical time within health services (Harris et al., 2020). Under the umbrella of emergency surgery, there are six subcategories. These include immediate surgery required within 15 min of admission for life-threatening condition and semi-urgent surgery which should be completed within 48 h of the patient being admitted to hospital (Department of Health and Human Services, 2012). The Victorian Department of Health in Australia's definitions of emergency surgeries have been adopted for this scoping review as there is no consensus worldwide. Semi-urgent surgeries are nested under the emergency surgery umbrella and are defined in this study as a patient requiring surgery within 48 h of admission, as defined by the Department of Health and Human Services, 2012, p.26: 'The patient condition is stable. No deterioration is expected but the patient is not suitable to be discharged'. However, the semi-urgent category of surgery is most vulnerable to variations in the timing of surgery and ad hoc changes in scheduling approaches.

Delays in accessing health care can have profound impacts on all facets of healthcare delivery. These include reputational harm for healthcare organisations, adverse patient outcomes, reduce quality of care delivery and increased financial burden. This highlights there is a critical need for a detailed understanding of how micro- and macro-organisational factors impact multidisciplinary teams when making decisions about scheduling semi-urgent surgery. While the process for scheduling semi-urgent patients is generally defined by the local governing health department, individual and team influences in this process are not well described or understood.

Communication within multidisciplinary teams is vital for the timely exchange of patient information and the development of a shared understanding of contextual and team factors during surgery

What does this paper contribute to the wider global community?

- Insufficient evidence hinders understanding the impact of organisational, contextual and departmental factors on scheduling semi-urgent surgical patients with available operating room time slots. As there is ambiguity and a lack of consensus in the terminology and definitions of emergency, urgent and emergent surgeries, it is difficult to determine how the scheduling process impacts on patients.
- There is a need to investigate and develop scheduling systems that incorporate patient factors alongside logistical considerations for semi-urgent surgeries.

(Gillespie, Harbeck, Hamilton, et al., 2018). Previous research details the challenges associated with communication, including the similarities and differences between the perioperative multidisciplinary team members' communications and clinical decision-making (Bucknall et al., 2019; Gillespie et al., 2013; Gillespie, Harbeck, Lavin, et al., 2018). However, to date, a comprehensive synthesis of the research is needed to develop an understanding of the issues around clinical priorities when scheduling semi-urgent surgeries, and to inform the development of interventions to guide these to ensure best patient outcomes.

2 | METHODS

No ethics approval was required as this was a scoping review. Scoping reviews are used to map a broad range of evidence to determine what research has been conducted (Featherston et al., 2020). They provide a preliminary assessment of the size and scope of available research literature, with the aim of clarifying key concepts and definitions to identify the breadth of research evidence available on a certain topic (Arksey & O'Malley, 2005). In addition, scoping reviews enable a systematic synthesis of evidence to explore and identify gaps in the literature (Peters et al., 2020). This scoping review was guided by the methodological framework developed by Arksey and O'Malley (2005) and informed by the Joanna Briggs Institute (JBI) scoping review guidelines (Aromataris & Munn, 2020). Before undertaking this review, an a priori study protocol using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for scoping reviews (PRISMA-ScR) checklist (File S2) was developed and uploaded to the Figshare website (https://figshare.com/).

The five-stage framework developed by Arksey and O'Malley (2005) was used to (i) identify the research question, (ii) identify relevant studies, (iii) select studies, (iv) chart the data, and (v) collate, summarise and present findings. The synthesis of scoping review findings is underpinned by the Patterns, Advances, Gaps, Evidence for practice and Research recommendations framework (Bradbury-Jones et al., 2021) based on the following five domains: Patterns, Advances, Gaps, Evidence for practice and research recommendations (Bradbury-Jones et al., 2021). This framework enabled a comprehensive description and critique of the data and complemented Arksey and O'Malley's (2005) five-stage process (Bradbury-Jones et al., 2021).

2.1 | Stage 1—Scoping review question/s

This scoping review aimed to address the following review question:

What organisational, departmental, and contextual factors influence healthcare professionals' clinical priority in the scheduling of semi-urgent surgeries?For this review, semi-urgent surgeries are defined as a patient admitted in a stable condition, who requires surgery within 48 h of admission but cannot be discharged without surgery (Department of Health and Human Services, 2012). See Table 1 for definitions.

2.1.1 | Inclusion and exclusion criteria

To be eligible for inclusion, articles were peer-reviewed, publicly available, published in English and focussed on the scheduling of patients for surgery in acute healthcare settings (see Table 2). Participants included patients 16 years and older, undergoing semi-urgent surgery. Primary research included articles regardless of methodology. The grey literature was included specialist organisations such as the

TABLE 2 Inclusion and exclusion criteria.

Participants	16 years and older undergoing semi-urgent surgeries
Concept	Scheduling of semi-urgent surgeries
Context	Operating room departments

TABLE 1 Definitions of organisational, departmental and contextual factors.

Organisational	Organisational factors are defined as the elements, characteristics or aspects within an institution that influences its overall structure, functioning and decision-making processes (Michie et al., 2011). For example, this can include the operating room scheduling approach taken by an organisation
Departmental	A department is a division of an organisation that specialises or manages a specified area or specialty of an organisation (Allen, 2007). A department carries out specific duties or functions that serve the wider organisation (Butler, 2017). Departments enact a set of responsibilities, goals and activities in a defined area of an organisation (Tay et al., 2017)
Contextual	There are three contextual components of a health services (Li et al., 2018). The first component is the macro-level that considers the influence of outside factors like the political landscape of an organisation (Li et al., 2018). The meso level represents the characteristics of an organisation. These characteristics include culture, tacit rules and shared meanings or behaviours (Li et al., 2018). The micro-level includes the activities in the local setting, for example, policy and procedures, size and shape of the department. Taken together, these factors combine to determine context (Li et al., 2018)

Australian College of Perioperative Nurses (ACORN), Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (ANZCA), Royal College of Anaesthetists (RCoA), Royal Australasian College of Surgeons (RACS), American College of Surgeons (ACS), The Royal College of Physicians and Surgeons of Canada (RCI) and European Society of Surgery (ESS). It is acknowledged that these statements may or may not be evidence-based and they may not be peer reviewed. Published documents from professional organisations were included because they can serve as a valuable resource for decision makers in various disciplines as these documents often contain information relevant to policy and resources.

2.2 | Stage 2—Identify relevant studies

A search of four online databases (EBSCO Academic Search Complete, EBSCO Cumulative Index to Nursing and Allied Health Literature (CINAHL), OVID Embase and EBSCO Medline) was undertaken. The searches were undertaken in consultation with an expert health librarian. The search covered a 23-year period from 1999 to 2022 and was performed on 15 June 2022. The year 1999 was chosen as it coincided with the release of the 'To Err is human' report by the Committee in Quality Care in the United States, Institute of Medicine (Corrigan et al., 2000) which resulted in greater focus on patient safety and quality care initiates in health care. All searches were limited to human studies, and reference lists of eligible studies were screened along with forward searching in Scopus for additional articles. Searches were conducted using medical subject headings (MeSH) and related search terms, nuanced to the database. Search terms were combined using Boolean connectors 'OR' and 'AND'. The search strategy captured terms related to (i) operating room or surgery; (ii) semi-urgent or emergent; and (iii) scheduling. All included articles were managed using Covidence (www.covidence.org), a systematic review web database.

2.3 | Stage 3—Study selection

Identified article titles and abstracts were screened based on a priori inclusion and exclusion criteria. Articles were imported from Endnote™ into Covidence systematic review software after the removal of duplicate literature. Once clearly irrelevant articles were excluded by one reviewer, two reviewers assessed the remaining titles and abstracts. Those articles taken to full text were independently assessed by two reviewers, and a third reviewer was available to arbitrate. The data from all included articles were collated and synthesised using a specifically developed data extraction tool.

2.4 | Stage 4—Charting the data

Prior to data extraction, reviewers identified the specific data to be collected based on the review questions. The extraction tables were piloted on five articles and were further refined. The information being extracted included author(s), year of publication, study location, intervention type; duration of the intervention; study population; aims of the study; methodology; outcome measures and relevant results. One researcher extracted all data using the charting tables and the data extractions were verified by two other members of the review team. Where there were disagreements between the two researchers, a third researcher moderated.

2.4.1 | Quality appraisal

Although critical appraisal of primary studies is not required in the five methodological stages suggested by Arksey and O'Malley (2005), this was undertaken using the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018). Undertaking a quality appraisal enabled the review team to identify potential biases in included studies. The MMAT has clearly defined review criteria for five study designs: qualitative research, randomised controlled trials, non-randomised studies, quantitative descriptive studies and mixed methods studies (Hong et al., 2018). Each included study was assessed against two screening questions and five methodological quality questions based on study design. While the creators of the MMAT discourage assigning an overall score, response options across all study categories include 'yes', 'no' and 'can't tell' (Hong et al., 2018). The 'can't tell' response indicates that there is insufficient information reported in the study to answer either 'yes' or 'no' within a specific category. The critical appraisal was undertaken by two researchers independently. Disagreements were resolved by discussion, and where needed, a third reviewer adjudicated. Low-quality studies were not excluded to ensure a more complete understanding of the subject area.

2.5 | Stage 5—Collating, summarising and reporting the results

Descriptive analyses were used to collate and summarise the findings. Findings were synthesised quantitatively and narratively depending on the type of data presented. Inductive content analysis was chosen as it allows researchers to make replicable and valid inferences from data with the purpose of gaining knowledge and new insights in answering qualitative research questions (Erlingsson & Brysiewicz, 2017). The following inductive content analysis steps were followed: (i) organising the qualitative data including open coding, (ii) creating categories and (iii) abstraction and reporting of results (Elo & Kyngäs, 2008). The characteristics or patterns in the data were narratively described and presented in a variety of tables, figures and diagrams (Snilstveit et al., 2016). This innovative visual approach to data presentation illustrated what is known and what is not yet known about the phenomenon (Snilstveit et al., 2016).

The Patterns, Advances, Gaps, Evidence for practice and Research recommendations framework was used to guide and supplement reporting of review findings (Bradbury-Jones et al., 2021). The 'patterns' section of the framework enabled thematic analysis of key findings that identified relationships and gaps in the included articles (Bradbury-Jones et al., 2021). The second stage reporting 'advances' in the field of literature including theoretical and methodological advances over time that reflected the growth of literature on the chosen topic (Bradbury-Jones et al., 2021). To ensure rigour and transferability of findings, the 'gaps' component of the framework was used to apply a structured and critical approach to identifying inconsistencies in the literature (Bradbury-Jones et al., 2021). The 'practice component' enabled interpretation of the literature for practice and 'research recommendations' contributed to the identification of gaps to provide an overall profile of the literature (Bradbury-Jones et al., 2021).

3 | RESULTS

The literature search yielded 3505 articles. Following abstract and title screening, 50 articles were screened at full-text review. In total, 12 articles published between 1999 and 2022 were included. One article that met the inclusion criteria was identified through forward searching. Articles were taken to full-text review where there was ambiguity in study design. The most common reason for excluding articles after full-text review was that the focus was not semi-urgent emergency surgery, or they focused on the wrong patient population, or wrong patient outcomes (see Figure 1). Five additional documents were identified through the grey literature search, but all were excluded as they did not focus on the scheduling of semi-urgent surgeries. Instead, these documents discussed elective surgery categorisation and how to assign elective surgery triage scales. In relation to the grey literature, five documents were identified through professional organisations including the Australian and New Zealand College of Anaesthetists ($n=1$), Royal College of Anaesthetists ($n=1$), Australian College of Perioperative Nurses ($n=1$), Royal Australasian College of Surgeons ($n=1$) and American College of Surgeons ($n=1$).

3.1 | Study characteristics

Studies were conducted in several countries (Figure 2) with most undertaken in Europe ($n=9$) (Ax et al., 2019; Cardoen et al., 2010; Fitzgerald & Wu, 2017; Koivukangas et al., 2020; Leppäniemi & Jousela, 2014; Sandbaek et al., 2014; van Veen-Berkx et al., 2016; Wullink et al., 2007; Zonderland et al., 2010). Across the 12 research articles, study characteristics are reported in Table 3.

3.2 | Organisational factors

Only three scheduling approaches were identified in the included studies. Most articles described the different scheduling approaches related to operating room utilisation ($n=7$) (Cardoen et al., 2010; Fitzgerald et al., 2006; Fitzgerald & Wu, 2017; Sandbaek et al., 2014; van Veen-Berkx et al., 2016; Wullink et al., 2007; Zonderland et al., 2010). The remaining articles focussed primarily on how different scheduling approaches increased utilisation of operating

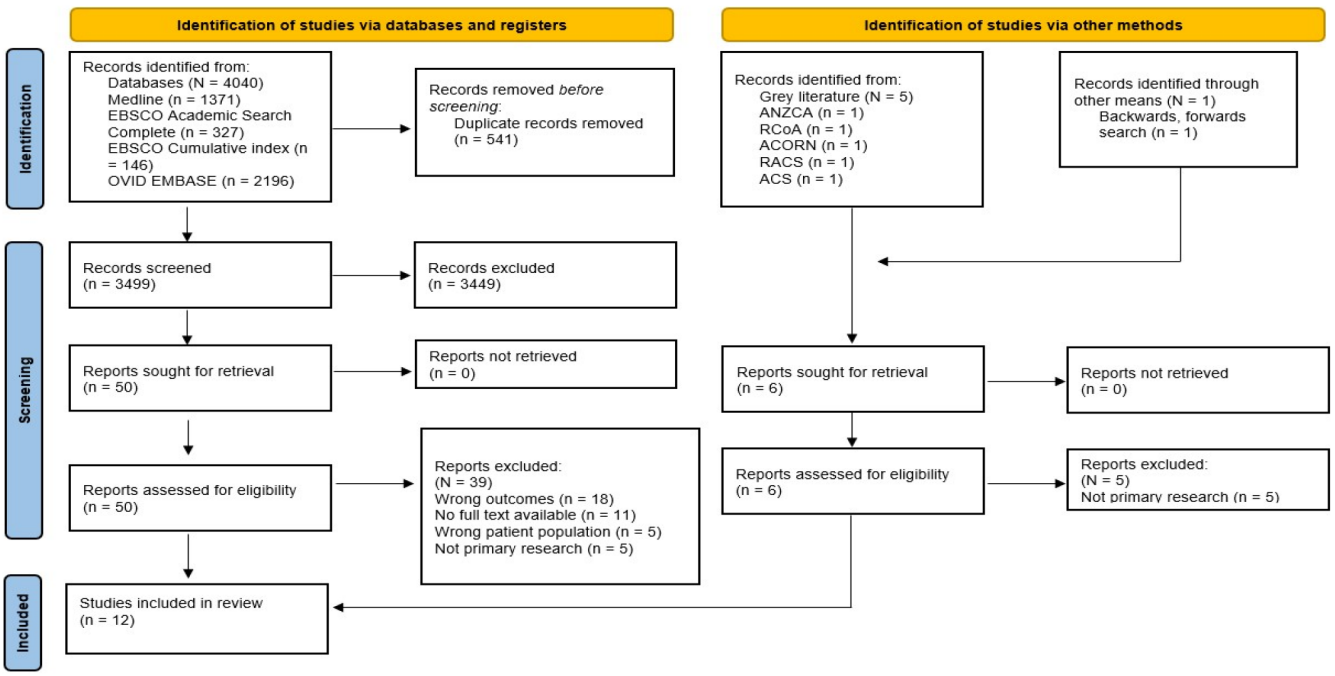

FIGURE 1 Scoping review PRISMA. [Colour figure can be viewed at wileyonlinelibrary.com]

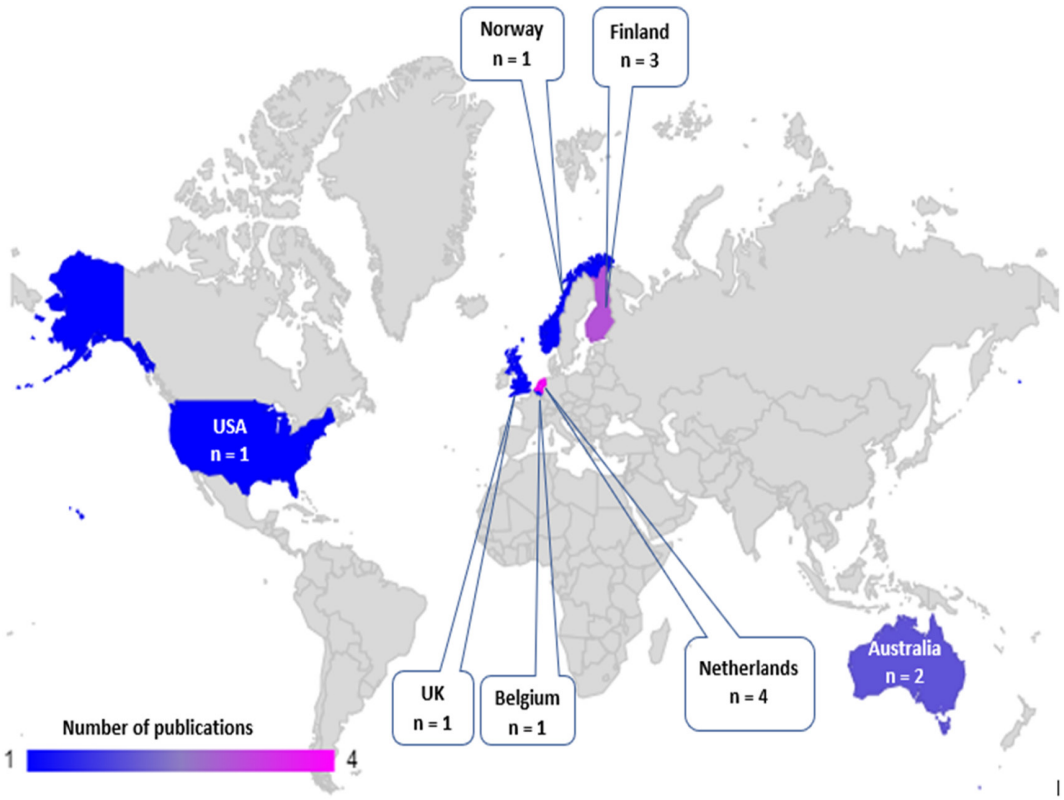

FIGURE 2 Country of origin. [Colour figure can be viewed at wileyonlinelibrary.com]

room time and decreased out-of-hours procedures by using a dedicated emergency operating room approach ($n = 5$) (Ax et al., 2019; Bhattacharyya et al., 2006; Cosgrove et al., 2008; Koivukangas et al., 2020; Leppäniemi & Jousela, 2014).

3.3 | Departmental factors

There were various types of surgeries described. Orthopaedic trauma surgery ($n = 4$) was the most investigated surgical speciality (Ax et al., 2019; Bhattacharyya et al., 2006; Leppäniemi & Jousela, 2014; Sandbaek et al., 2014), followed by neurosurgery ($n = 2$) (Leppäniemi & Jousela, 2014; Zonderland et al., 2010). Several articles ($n = 5$) did not define the surgical specialty population (Cardoen et al., 2010; Cosgrove et al., 2008; Fitzgerald et al., 2006; van Veen-Berkx et al., 2016; Wullink et al., 2007).

Five articles included a multidisciplinary team comprising a surgeon, anaesthetist and nurse in the clinical priority process of scheduling surgery (Bhattacharyya et al., 2006; Cardoen et al., 2010; Cosgrove et al., 2008; Fitzgerald et al., 2006; Fitzgerald & Wu, 2017). The radar diagram in Figure 3 depicts that in most cases, the surgeon was the key decision maker ($n = 7$) (Ax et al., 2019; Bhattacharyya et al., 2006; Cardoen et al., 2010; Cosgrove et al., 2008; Fitzgerald et al., 2006; Koivukangas et al., 2020; Sandbaek et al., 2014). Five articles did not identify the decision maker (Leppäniemi & Jousela, 2014; van Veen-Berkx et al., 2016; Wullink et al., 2007; Zonderland et al., 2010).

3.4 | Contextual factors

There was no consensus in the included articles on how to define semi-urgent surgery categories. Several study authors did not define urgency within the context of surgical categories ($n = 5$) (Cardoen et al., 2010; Cosgrove et al., 2008; Fitzgerald & Wu, 2017; Wullink et al., 2007; Zonderland et al., 2010). Of the seven articles that defined surgical categories (Ax et al., 2019; Bhattacharyya et al., 2006; Fitzgerald et al., 2006; Koivukangas et al., 2020; Leppäniemi & Jousela, 2014; Sandbaek et al., 2014; van Veen-Berkx et al., 2016), the greatest consensus was around the definition of 'emergency surgery required immediately' ($n = 4$) (Fitzgerald et al., 2006; Koivukangas et al., 2020; Leppäniemi & Jousela, 2014; van Veen-Berkx et al., 2016). Based on this definition, there was some consensus on the definition of 'urgent surgery being required within 24 hours' ($n = 4$) (Koivukangas et al., 2020; Leppäniemi & Jousela, 2014; Sandbaek et al., 2014; van Veen-Berkx et al., 2016). Most variation in definition was related to surgery categorisation relative to the timeframe requirement for 'urgent surgery' and 'semi-urgent' surgery categories, having multiple definitions (Refer to File S2).

The Patterns, Advances, Gaps, Evidence for practice and Research recommendations framework was used to summarise themes and gaps in the literature (Table 4). There is considerable overlap across themes with the focus on the type of semi-urgent surgery scheduling approach that was used and how each approach affected operating room utilisation. Gaps

TABLE 3 Study characteristics ($N = 12$).

Author(s)	Aims	Setting and sample	Design and data collection	Intervention	Key findings
Ax et al., 2019	To analyse the flow of patients in a traffic light coded system to decrease the hospitalisation burden and enabling scheduled emergency surgeries.	Central Finland Hospital 1830 green light operations per year 5838 emergency operations per year Surgeries included in study • Orthopaedic • Orthopaedic trauma • Trauma • Hand surgery	A traffic light system is used to schedule surgeries into three categories: Green (>48 h), Yellow (8–48 h) and Red (<8 h). A retrospective cohort study evaluated orthopaedics, orthopaedic trauma and hand surgery specialties using electronic medical records from 2010 to 2015 Data collected included wait time, age, length of hospital stays, mortality and ASA classification	N/A	1830 Green Light Procedures (GLP) and 5838 Inpatient Emergency Operations (IEO) were audited. GLP patients were significantly younger (mean age 48) than IEO patients (mean age 61) and healthier according to the ASA classification ($p < .0001$) 65% of GLP patients were operated within a week, while 68% of IEOs were performed within 24 h and 92% within 3 days ($p < .001$).
Bhattacharyya et al., 2006	The aims of this study were to: 1. establish if a dedicated orthopaedic trauma OR is logistically feasible 2. determine whether the dedicated orthopaedic trauma OR improves patient flow in the OR suite.	Orthopaedic trauma OR in a US hospital Patients undergoing closed femoral nailing and dynamic hip screw fractures This sample was selected to create a comparable dataset	A retrospective review compared a 1-year control period before the introduction of a dedicated trauma operating room in 1999 to a 1-year period after introduction in 2002 The study involved intertrochanteric hip fracture patients, and data collected included tip-apex distance, time to surgery, length of stay and surgical complications (defined as an unplanned return to the OR)	The introduction of a dedicated trauma OR	The introduction of a dedicated trauma operating room improved operating suite flow, reducing hip fractures treated in the evening by 72%, semi-urgent cases by 6% and OR over-utilisation by 6% Closed femoral nailing operations out of hours required longer operating time (261 vs. 219 min, $p < .04$) and had a greater incidence of surgical complications ($p < .04$ and $p < .036$)
Cardoen et al., 2010	To present an overview of operating theatre planning and scheduling within hospitals in Flanders Belgium	Belgium hospitals in the Flemish region both public and private 95 hospitals invited to participate 52 hospitals participated totalling a 58% response rate	The survey asked a number of questions related to: 1. Institution demographics 2. Questions related to institutional issues related to the planning process for elective and emergency cases	N/A	Most hospitals in the region used different prioritisation rules to schedule surgeries, such as scheduling outpatient or children's surgeries first, grouping surgeries of the same type together, prioritising patients with latex allergies or operating on contaminated patients last However, the survey found that the actual operating schedule often deviated significantly from the planned schedule
Cosgrove et al., 2008	To explore causes of operating delays in urgent cases scheduled in the OR	Patients presenting for semi-urgent surgery Surgery categories were defined as: Code 1—operate within hours Code 2—operate within hours Code 3—operate within days Code 4—planned procedures	Prospective audits during October 2004–March 2006 and October 2005–February 2005 we undertaken. The results of 2004 audit were disseminated in between the audit cycles	No intervention. Rather a classification and audit of delayed interventions for emergency and urgent surgeries using existing guidelines	There was no significant difference in the number of patients presenting for urgent surgery in the two audit periods In the first audit period, 121 cases (32%) experienced delays, with not having an appropriate surgeon available being the most common reason (49%) The second audit period showed a significant decrease in delays to 63 cases (14%), with only 6 cases (10%) delayed due to lack of an appropriate surgeon The waiting time for urgent surgery significantly decreased from 6.5 to 5.0 h, with the decrease being significant in the second audit ($p < .01$) but not in the first ($p = .08$)

(Continues)

TABLE 3 (Continued)

Author(s)	Aims	Setting and sample	Design and data collection	Intervention	Key findings
Fitzgerald et al., 2006	The aim of this study was: 1. To measure clinical urgency of a set of clinical conditions; 2. To test the variance among responses of nurses/ managers, anaesthetists determining urgency; and 3. To measure disparity between professions when determining ideal times for the commencement of surgery and the latest time that surgery should commence	Convenience sampling from a list of NSW metro and regional public hospitals. From the convenience sample, four regional and four metro hospitals were selected. 71 ORs included in sample	A cross-sectional survey consisting mostly of closed-ended questions was sent to 71 NSW public hospitals The survey, called the Emergency Surgery Survey, focused on factors influencing the urgency of clinical conditions, unplanned surgery, ideal times for commencing unplanned surgery, and the maximum acceptable timeframe and surgeon for perceived scheduling delays of unplanned surgery	N/A	A total of 198 decision makers responded: surgeons (42.8%), anaesthetists (24.7%) and nurses (32.5%) Findings suggests relative agreement among surgeons, anaesthetists and nurses when scheduling urgent and non-urgent surgeries. The cases that prove to have the most disparity in decision-making when being scheduled are the cases deemed as semi-urgent Semi-urgent cases caused the most discussion and potential disagreement between surgeons, anaesthetists and nurses There was significant disparity between individual surgeons, anaesthetists and nurses when asked about an ideal commencement of surgery time and acceptable length of wait for potential cases When making decisions, anaesthetists are the intermediaries b/surgeons and nurses
Fitzgerald & Wu, 2017	To analyse staff perceptions related to the logistical or operational reasons that influence scheduling unplanned surgery.	Multi centre involving eight Australian and seven hospitals in the Netherlands. Recruitment operating room staff including surgeons, anaesthetists, nurses and managers. Participants were grouped into four categories: • Surgeons • Anaesthetists • Nurses • Managers	Anonymous questionnaire in English and Dutch was developed in a previous study that consisted of open-ended questions and a Likert scale. The questionnaire contained 15 logistical and 19 logistic priority setting factors. The study was conducted 2003–2004, each hospital site had a study co-ordinator	N/A	Differences in perceptions of logistical and logistical priority delays were found among professional groups. Managers experienced higher delays due to patient factors There was no significant difference between managers and non-managers for perceptions. Doctors and non-doctors and all four professional groups perceived logistical delay factors and logistical priority settings similarly
Koivukangas et al., 2020	To describe how well-planned urgency class is being implemented	The planned and actual waiting times for all emergency surgeries were studied during the 6-month period in the Oulu University Hospital	A retrospective audit investigated the planned urgency class and actual waiting time of patients during a 6-month period between June and December 2016 using the hospital's database. Surgical urgency was classified as (E) extremely urgent immediate operation required Class (I) urgency within 3 h Class (II) within 8 h Class (III) within 24 h	N/A	Results showed that urgent procedures were more likely to be undertaken within the planned time, while less urgent procedures had longer waiting times As the urgency decreased, the proportion of patients operated on within the target time decreased. Class III had the longest waiting times, with as high as 22% of patients waiting over 24 h

TABLE 3 (Continued)

Author(s)	Aims	Setting and sample	Design and data collection	Intervention	Key findings
Leppäniemi & Jousela, 2014	To test the feasibility of classifying emergency surgeries across multiple specialties by urgency and the dedicated use of an emergency OR combined with a computer based OR management system was undertaken To measure changes made to the urgency classification had on overall flow of emergency surgeries.	Meilahti hospital within the Helsinki University Hospital complex 8000 operations performed every year with about 50% of these operations being classified as emergency surgeries	A traffic light system was designed to aide scheduling of emergency operations. The system categorised emergency surgery according to urgency based in a clinical assessment A red code is emergency surgery that needs to be performed as soon as possible and no later than 8 h from booking Orange indicates surgery that is required within 8–24 h and yellow is surgery required with 24–48 h Data were collected using raw utilisation time of the operating theatre. Raw utilisation was defined as the time the patient is in the operating room of the allocated time for the procedure.	A traffic light system for scheduling emergency surgery.	After the adoption of the colour coding system in 2004 (2 = 6194, 1 df, p 0001), the percentage of night-time emergency operations dropped from 27.34% (2563 of 9347) to 23.50% (7731 of 32,959) Prior to and following this adjustment, the % patients who underwent surgeries with a red code rose from 45.2% (5831 of 12,907 operations) to 62.7% (13,020 of 20,778 operations; 2 = 986.99, 1 d.f., p 0001) The primary emergency operation theatre's office-hours raw utilisation time was 85% in 2012
Sandbaek et al., 2014	To evaluate the effectiveness of a new: • resource allocation strategy, • policy for patient urgency classification and • system for OR booking that had been implemented.	St Olav's Hospital is a public tertiary referral hospital that services elective and non-elective surgery. 12 ORs A total of 23,515 elective (planned) and non-elective (unplanned) orthopaedic and general surgeries	Before-and-after design using routinely collected OR data Data collected for elective and non-elective orthopaedic and general surgery case Data including urgency level, dates and times of OR booking for non-elective surgeries, operation start and finish times	Organisational structural changes were a part of the staged interventions. This included dedicating three staffed ORs to non-elective surgery during the daytime and changing the patient classification and OR booking system. The new system had pre-assigned urgency levels/colour codes: U1 (red) OR required within 6 h, U2 (yellow) OR required within 24 h and U3 (green) within 72 h. No changes were made to after hours allocations.	A total of 23,515 elective (planned) and non-elective (unplanned) orthopaedic and general surgeries were conducted during calendar year 2007 (period 1) and July 2008 to July 2009 (period 2) The implemented interventions improved OR efficiency and throughput of cases in the OR Interventions also reduced operating overtime and waiting times without the uses of additional use of resources. An increased amount of operating time (7.1%, $p < .05$) was conducted without any increase in out of hours case time Overall results also showed that the interventions led to more effective utilisation of daytime operating time and a more selective use of evening operating time for time critical patients only

(Continues)

TABLE 3 (Continued)

Author(s)	Aims	Setting and sample	Design and data collection	Intervention	Key findings
van Veen-Berkx et al., 2016	To determine policy outcomes related to OR utilisation of reserving capacity for emergency surgery in the elective OR	3 University Medical Centres (UMCs) in the Netherlands	Interrupted controlled time-series design/ ANOVA Data were collected for the period of 8 consecutive years from 1 January 2000 to 31 December for scheduling emergency surgery 2007. Timeframes for indication of urgency were category: 1. OR required immediately, 2. OR required within 2, 3. OR required within 6 h and 4. OR required within 24 h	Three key performance indicators including utilisation, the number of operating theatres in use and cumulative overtime from operating rooms running late was measured daily and prospectively within the operating room department Two measurement periods pre-implementation and two measurement periods post-implementation.	Performance was measured based on 467,522 surgical cases. After closing the dedicated emergency OR, utilisation slightly increased ($p < .01$); overtime also increased ($p < .01$) A dedicated OR for emergency cases is preferred over the mixed scheduling approach of reserving time on each list for potential emergency cases Additional data suggested a dedicated OR leads to less case cancellations
Wullink et al., 2007	To determine the best way to reserve operating room time for emergency surgery	Erasmus MC the largest teaching hospital in the Netherlands with 1300 inpatient beds Data on 180,000 surgical procedures were prospectively collected.	Two approaches of reserving OR capacity were compared: 1. concentrating all reserved OR capacity in dedicated emergency ORs, 2. evenly reserving capacity in all elective ORs To determine this a discrete event simulation model, the real situation was modelled The main outcome measures used were as follows: 1. waiting time, 2. staff overtime and 3. OR utilisation was evaluated for the two approaches	An event simulation model was developed to evaluate the effectiveness of different scheduling methods. There were two simulation models run considering the different scheduling options available Option one utilised a dedicated emergency operating room. Option 2 allowed for emergency surgeries to be allocated to all elective operating lists	Policy of reserving capacity for emergency surgery in all elective ORs led to an improvement in waiting times for emergency surgery from 74 (±4.4) minutes to 8 (±0.5) min Working overtime was reduced by 20%, and overall OR utilisation can increase by around 3%. Emergency patients are operated upon more efficiently on elective ORs instead of a dedicated Emergency OR

TABLE 3 (Continued)

Author(s)	Aims	Setting and sample	Design and data collection	Intervention	Key findings
Zonderland et al., 2010	To analyse the cancellation rate of elective surgical patients to allow scheduling of semi-urgent surgeries	Finnish neurosurgery department Patients scheduled for OR in a 2-week block Undertaken in a 10-week period	Queuing theory to evaluate the OR capacity needed to accommodate every incoming semi-urgent surgery introduce another queuing model that enables a trade-off between the cancellation rate of elective surgeries and unused OR time based on Markov decision theory, develop a decision support tool that assists the scheduling process of elective and semi-urgent surgeries	Queuing theory was used to analyse the rate of cancellation of elective surgical patients to accommodate the scheduling of semi-urgent surgeries The cancelled surgeries were rescheduled for the coming 2-week period, and a Markov decision model strategy was developed for scheduling semi-urgent surgery time slots	A decision-making tool was developed using the Markov decision theory with the purpose of scheduling elective and semi-elective patients for surgery The model outlines a one-week guideline for scheduling semi-urgent surgeries

included the different methods of managing operating room utilisation and the incorporation of scheduling semi-urgent surgeries into operating schedules. The limited surgical specialties and uncertainty surrounding the definition of emergency surgery, and parameters used to assign surgical priority, create difficulties in determining the primary decision maker responsible for scheduling the order of surgical cases. Additionally, the lack of consensus regarding the definition of emergency surgery and criteria for assigning surgical priority can impact the scheduling of surgical cases and patient care.

The need to explore how individual, organisational and departmental factors influenced scheduling of patients requiring semi-urgent surgeries was evident in the themes identified in the data. Overall, there was limited evidence about how individual patient factors influence clinicians' clinical priority around the order of scheduling semi-urgent surgical patients.

3.5 | Quality assessment

A quality assessment of each study was carried out using the mixed methods appraisal tool (MMAT) (refer to File S3). The methodological quality varied among the included studies. Most studies included single site (Ax et al., 2019; Bhattacharyya et al., 2006; Koivukangas et al., 2020; Leppäniemi & Jousela, 2014; Sandbaek et al., 2014; van Veen-Berkx et al., 2016; Wullink et al., 2007; Zonderland et al., 2010), single department or specialty (Ax et al., 2019; Bhattacharyya et al., 2006; Zonderland et al., 2010), which limits the ability to generalise results. Five studies were descriptive (Cardoen et al., 2010; Cosgrove et al., 2008; Fitzgerald et al., 2006; Fitzgerald & Wu, 2017; Koivukangas et al., 2020). Most studies used observational methods that may have introduced performance biases such as the Hawthorne effect (Ax et al., 2019; Bhattacharyya et al., 2006; Cosgrove et al., 2008; Koivukangas et al., 2020). A common limitation of the quantitative studies was the limited explanation of the conceptual definitions used for the variables and how these were measured (i.e., operationalised). The classification of the types of surgeries observed in each study were homogeneous, and most included studies used convenience sampling (Cardoen et al., 2010; Cosgrove et al., 2008; Fitzgerald et al., 2006; Fitzgerald & Wu, 2017; Koivukangas et al., 2020; Leppäniemi & Jousela, 2014).

4 | DISCUSSION

To the best of our knowledge, this is the first review of its kind exploring priority related to scheduling semi-urgent surgeries. The findings include studies conducted both in the Australian context and internationally. However, it is evident from this review that there is a lack of global consensus regarding the definition of semi-urgent surgeries. While optimisation of operating room schedules follows similar approaches worldwide, the specific criteria for categorising a surgery as semi-urgent remain undefined. Consequently, the characteristics and outcomes associated with this patient group remain

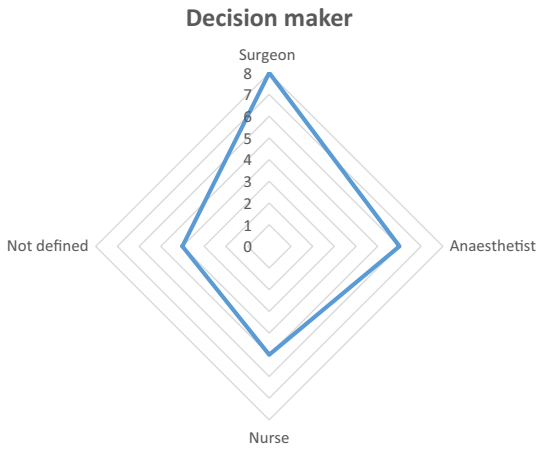

FIGURE 3 Radar diagram demonstrating the key decision maker. [Colour figure can be viewed at wileyonlinelibrary.com]

unclear. This study highlights the complex interplay between organisational, departmental and contextual factors that influence the decisions related to clinical priority when scheduling semi-urgent surgeries. Specifically, our findings identify important organisational factors that enable integration of operating room utilisation and scheduling of semi-urgent surgeries into daily surgical activities. They also highlight gaps at the departmental level, and the need for a more nuanced understanding of surgical priority and the role of decision makers involved in scheduling semi-urgent surgeries. Finally, contextual factors suggest definitions of emergency surgery and the criteria used to assess surgical acuity for patients, lack consensus, detail and further challenge clinical prioritising. While individual factors were identified in the literature, their role was not extensively examined. The studies also lacked a clear description of the criteria utilised by surgeons for scheduling procedures, with minimal focus on patient acuity and the implications of delayed procedures.

The scheduling of semi-urgent surgeries presents an indeterminate demand on the resources of perioperative departments (Ahmed et al., 2022; Li et al., 2016; Zonderland et al., 2010). Various approaches are used by healthcare organisations to schedule semi-urgent surgeries, with ad hoc scheduling being the most used strategy (Van Riet & Demeulemeester, 2015). For example, an audit conducted by Heng and Wright (2013) following implementation of a dedicated operating room into the daily schedule revealed that a hybrid model of scheduling emergency surgeries decreased elective surgery cancellations and out-of-hours operating. However, this approach may not be feasible for small centres with limited emergency operating demand, capacity and personnel resulting from departmental factors such as available workforce, staff skill mix and physical size of the operating suite (Heng & Wright, 2013; Latorre-Núñez et al., 2016). Healthcare organisations need to employ effective strategies and communication practices to optimise scheduling and ensure that patients receive timely and appropriate care.

Our scoping review identified that most communications between surgeons and nurses regarding decision-making related to patient selection for surgery, with anaesthetists typically serving as mediator. Disagreements were attributed to lack of familiarity among team members due to the ad hoc nature of surgical teams, poor timing of the communication, erroneous patient information and unresolved problems increasing the risk of errors during decision-making interactions (Kurmann et al., 2012; Tørring et al., 2019). Tørring et al. (2019) undertook an ethnographic study using semi-structured interviews with 39 surgical teams. Findings highlighted the effectiveness of surgical team collaboration that was dependent on the knowledge and abilities of team members to understand their roles, as well as open communication processes that supported effective collaboration. This underscores the importance of clinical priority and the recognition of factors that potentially affect clinical prioritisation when scheduling semi-urgent surgeries.

The use of different definitions to describe semi-urgent surgery categories complicates decisions related to clinical priority, that can potentially lead to inappropriate triage practices and delayed surgical treatment. Surgeons may manipulate the triage process to the most convenient operating time, potentially impacting on patient safety and may result in adverse outcomes (Fitzgerald et al., 2006; Fitzgerald & Wu, 2017). Lack of consensus among the treating surgical and anaesthetic teams further exacerbates the problem. Evidence-based guidance is necessary to effectively triage patients and prioritise semi-urgent surgical patients, as without it, there is a greater risk of unfavourable outcomes to patients, the surgical teams and department (Johnson et al., 2018; Magnusson et al., 2020). In their qualitative study examining triage determinants in assessing patients' suitability for intensive care admission, Escher et al. (2019) found that the lack of intimate knowledge of patients led to the application of inappropriate triage scores or decreased consensus among the treating medical team. In their observational studies, Lin et al. (2022) and Blanch et al. (2016) found that there was little guidance or evidence for how to prioritise patients who have the same triage ranking. This scoping review supports the need for clear guidelines that should be implemented into hosptial policy and emphasises the importance of understanding factors influencing clinical prioritisation in scheduling semi-urgent surgeries (Ax et al., 2019; Bhattacharyya et al., 2006; Fitzgerald et al., 2006; Fitzgerald & Wu, 2017; Leppäniemi & Jousela, 2014). The lack of consensus and guidance in clinical prioritisation for semi-urgent surgeries poses a significant risk to patients, surgical teams and departments. The need for evidence-based guidelines and a better understanding of clinical priority is crucial to improve patient outcomes and prevent adverse events.

Operating room utilisation is a complex issue affected by various individual factors, such as performing out-of-hours surgery and cancelling elective cases, leading to increased demand for resources and longer wait times for emergency surgical patients (Fixler & Wright, 2013). Triage decisions can also be influenced by individual interactions within the multidisciplinary team, which can affect resource allocation and bargaining between surgical specialties (Jebali & Diabat, 2017). In a qualitative study at a large Swiss tertiary hospital, Escher et al. (2019) found that to mitigate these issues, multidisciplinary team members needed to collaborate and be aware of each other's roles, and negotiate with patient safety and resource implications embedded in their decision-making when prioritising patients. Blanch et al. (2016) who conducted a small qualitative study using semi-structured interviews with critical care specialists that found

TABLE 4 Synthesis of the review findings using the PAGER framework.

Pattern	Advances	Gaps	Evidence of practice	Research recommendations
Prioritising scheduling for emergency and semi-urgent case varies across specialities	There is evidence that specific operating list scheduling approaches can reduce out-of-hours operating and elective case cancellations	There is a need for empirical work exploring the wider surgical specialty populations and how they impact the scheduling of semi-urgent surgeries	Approaches to operating room utilisation may benefit from clear decision guides to aid in scheduling and optimising operating room time	To progress this work, it is important to explore the impact of all surgical specialities requiring access to semi-urgent surgery operating time have on the scheduling and operating room utilisation
Surgeons are the chief decision makers in prioritising semi-urgent surgical patients	There is some evidence suggesting that in certain situations, the key decision-making role is the in-charge anaesthetist and in charge perioperative nurse prioritising to clinical urgency and the order of operating room lists	There is limited evidence of how organisational, contextual and departmental factors influence the decision of scheduling semi-urgent surgical patients using vacant operating room time slots. The exact parameters, cues or negotiations that occur to make this decision are unclear	There is a need to identify the organisational, contextual and departmental factors that influence decision-making when scheduling patients for surgery. Strategies to improve or streamline clinical priority in prioritising patients process allowing equitable access to operating time for all patients requiring a procedure that includes a wide range of speciality surgeries	Undertake qualitative research exploring the multidisciplinary team's clinical priority process while assigning surgical urgency to patients
The absence of a universal standardised definition of semi-urgent surgery impacts scheduling and consistency	There is some evidence of emergency, urgent and emergent surgeries having consistent definitions in the literature	There is limited evidence of a universal definition describing the semi-urgent surgery, restricting the ability for research to be transferrable	A standardised description will allow for a universal or adaptable tool to defining surgical categorisation and operating room utilisation	Developing an agreed definition for the category of semi-urgent surgery may help to increase standardisation of prioritisation across local contexts
Implementing a dedicated emergency surgery operating list may improve operating room utilisation and reduce the rate of elective surgery cancellations	There is some evidence to support the use of dedicated emergency theatre operating time reducing the number of out-of-hours operating and increasing planned utilisation of operating time	Included studies that report an increase in utilisation are all single site studies and the findings may not be generalisable	A larger multisite study will allow for generalisable findings to inform further research	Further work is required to explore the contextual, developmental and organisational factors that impact on the implementation and utilisation of dedicated emergency operating room time
Delaying or cancelling semi-urgent surgeries without considering the patient's acuity can have a negative impact on their health outcomes	There is some evidence that surgeons are starting to consider specific criteria when allocating surgical urgency categories	There is limited evidence of patient acuity when prioritising patients requiring semi-urgent surgery	There is a need to identify how patients who have been signed the same surgical urgency category are prioritised for scheduling	Further work is required to explore the contextual, developmental and organisational factors that impact on decision-making related to selecting semi-urgent patients requiring surgery and development of criteria to schedule semi-urgent patients
When scheduling semi-urgent surgeries, patient preferences and input are often overlooked in favour of ad hoc logistical decisions, leading to potential gaps in patient-centred care	There is some evidence that multidisciplinary teams acknowledge partnering with consumers needs to be implemented when scheduling semi-urgent surgeries	There is limited evidence of the clinical and social consequences for patients when elective surgery is cancelled to facilitate emergency and semi-urgent surgeries	There is a need to explore how patients are impacted both physically and psychologically when surgeries are cancelled or delayed	Further work is required to explore the patient impacts when implementing operating room scheduling methods

distrust was evident when decision makers were not known to each other, making negotiations more challenging. It is essential to consider these individual factors to improve operational efficiency and reduce wait times for surgical patients.

Delaying or cancelling elective surgical procedures in order to prioritise emergency cases is often necessary but can have adverse outcomes for patients (Fu et al., 2020). Delayed treatment leads to increased healthcare costs, contributes to disease progression and decreases patients quality of life (Reyes et al., 2019). Longer wait times for surgery can lead to significant health-related anxiety among patients, as they fear their condition may worsen (Herrod et al., 2019; Lankoandé et al., 2017). This anxiety can be exacerbated when surgeries are cancelled due to a lack of available resources. This was demonstrated by Herrod et al. (2019) who found that patients who had their surgery cancelled experienced negative economic outcomes such as additional workdays lost and increased childcare costs. However, there is a gap in available evidence on how individual patient factors affect decisions about cancelling elective or semi-urgent surgeries to allow emergency access. This issue is particularly relevant for patients who require semi-urgent surgeries, as they are often subject to multiple cancellations due to a lack of available operating room resources (Gandjour, 2022). Therefore, careful consideration must be given when prioritising surgeries to ensure that the well-being of all patients is taken into account.

The results of our scoping review indicate that patients' voices and their preferences regarding their surgery have not been fully considered. The primary focus in included studies focused on the logistics of facilitating access to scheduled OR time for emergency surgeries, with little regard for how these decisions affected patients and their health outcomes. Person-centred care, which involves partnering with consumers, has been recognised world-wide as a fundamental aspect of quality and safe patient care (Australian Commission on Safety and Quality in Health Care [ACSQHC], 2021, Standard 2; American Hospital Association, 2023). In an Australian emergency department survey, Toloo et al. (2016) found that patients' perception of urgency and actual medical urgency differed, highlighting the importance of understanding patients' viewpoints and involving them in clinical priority processes. Open communication and patient integration into triage processes are necessary for successful person-centred care (Toloo et al., 2016).

5 | LIMITATIONS

There are limitations on the extent to which the conclusions about organisational, departmental and contextual factors that affect the scheduling of semi-urgent surgeries may be applied due to the limited data available. Limitations also include the lack of generalisability of the results as most studies were single sites and may have been subject to self-report bias, impacting the ability to draw broad conclusions.

While rigorous, we acknowledge the limitations of the review methods. For instance, only English articles were included, which may lead to language bias. The authors acknowledge there may be a limitation in the search strategy; however, this was undertaken in consultation with an expert health librarian. Furthermore, although a rigorous and systematic search strategy was used some articles may have been missed for inclusion in this scoping review. The MMAT used for quality appraisal is subjective by nature which may have led to bias in the appraisal of included literature. To mitigate this risk, a systematic approach was taken to pretesting and appraisal with two independent assessments undertaken. Reviewers met regularly to discuss their appraisals.

6 | CONCLUSIONS

In conclusion, further research needs to be conducted to determine the individual, departmental and contextual factors that influence how patients are scheduled for semi-urgent surgery. Although this scoping review identified patterns among the scheduling method used, and key decision makers involved, there was little to no evidence available to explore the factors the impact how these key decisions makers interact with each other to reach a consensus. Finally, the impact these decisions have on patient experience and outcome is yet to be determined.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Data available on request from the authors: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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