Quality Indicators in Ambulatory Care Surgery: A Scoping Review

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Ambulatory care surgery has multiple advantages over inpatient surgery, leading to great advances in recent years. Quality monitoring and assessment should be a dynamic and evolving process. Therefore, it is necessary to understand which quality indicators evaluate the process, structure, and outcomes underlying AS. This scoping review will potentially help inform the scientific community of the quality indicators used worldwide to assess ambulatory care surgery.

Ambulatory care surgery, or outpatient surgery, is transforming healthcare delivery in the 21st century. *Ambulatory care surgery* is defined by the completion of an operation/procedure in which the patients are admitted and discharged from the hospital/unit within 24 hours according to the initial medical treatment plan.

Ambulatory care surgery services can be provided by an ambulatory care surgery center as a free-standing unit or integrated with a main hospital in an independent ambulatory care surgery unit or using dedicated operating rooms in the main operating space (International Association for Ambulatory Surgery [IAAS], 2014). Day surgery has grown worldwide in recent decades and more complex procedures are being done in this surgical context (Nunes et al., 2018).

The increase in the percentage of surgeries performed in the ambulatory care setting is also reflected by the growth in ambulatory care surgery centers. In 2017, more than half of all outpatient surgeries in the United States were performed in an ambulatory care surgery center. The number was projected to increase up to 30% in the following years (van Biesen & Johnson, 2019). In the 2019 research report, van Biesen & Johnson forecasted a fast increase in more complex procedures, such as orthopedic, spine and cardio, in ambulatory care surgery centers.

Many reasons support the rising success in the ambulatory care surgery arena. One factor was the evolution of new anesthetic drugs and techniques as well as minimally invasive surgery. Moreover, ambulatory care surgery is patient centered as it allows shorter hospital stays, is highly effective at an organizational level, and has several economic advantages and is associated with decreased rates of post-operative complications and healthcare-associated infection rates. (Pinto et al., 2020; OECD, 2022).

Despite the many advantages underlying ambulatory care surgery, little is known about quality of care and how it can be assessed in this context. The proper monitoring of quality indicators may reveal potential problems not yet identified, improve the

quality of care, and sustain the progress of ambulatory care surgery.

Quality monitoring in ambulatory care surgery should be a major concern when planning health policies, being a dynamic and evolving process, which aims not only monitoring the results, but also the performance of the health system. A *health indicator* is a measurement tool which directly or indirectly reflects relevant information on different attributes and dimensions of health as well as the factors which determine them (Direção-Geral da Saúde, 2013).

Having a map of the nature of evidence on this subject is crucial to understand if those quality indicators can be influenced by nursing interventions – and subsequently design management and leadership strategies – to improve patient care. This mapping explores relevant information to encourage knowledge development, identifies possible gaps, and may inform future systematic reviews. Furthermore, this scoping review will potentially help inform the scientific community of the quality indicators used worldwide to assess ambulatory care surgery.

Methods

A preliminary search of the JBI Database of Systematic Reviews and Implementation Reports, Cochrane Database of Systematic Reviews, CINAHL, MEDLINE, and PROSPERO was conducted, yet no scoping reviews on this topic (either published or in progress) were identified. Thus, the authors decided to conduct a scoping review based on the methodological guidelines proposed by the Joanna Briggs Institute (Peters et al., 2020).

Identifying the Research Question

The objective of this review is to map the evidence on which quality indicators have been used to assess ambulatory care surgery. More specifically, this review aims to answer the following research question: What indicators have been used to evaluate quality in ambulatory care surgery?

Inclusion Criteria

The Joanna Briggs Institute methodology to identify inclusion and exclusion criteria using the population, concept, and context framework was followed while considering the components of the research question. This review did not consider any specific population since its main objective was to identify every quality indicator used in ambulatory care surgery. Regarding the concept, this scoping review considers studies which focus on the assessment of quality using quality indicators in ambulatory care surgery centers. As for the context, studies conducted in any ambulatory care surgery facility were considered.

The scoping review considered primary studies (quantitative, qualitative, and mixed-methods) as well as systematic reviews, dissertations, opinion papers, and grey literature, following the three-step method defined by the Joanna Briggs Institute methodology for scoping reviews (Peters et al., 2020). No temporal, geographic, or cultural limitations were considered, and studies published in English, Spanish, and Portuguese were included.

Searching for Relevant Studies

The search strategy used aimed to locate both published and unpublished primary studies and reviews. The first step was an initial limited search of MEDLINE (via PubMed) and CINAHL (via EBSCO) which was undertaken to identify articles on the topic. The titles, abstracts, and index terms of retrieved relevant articles were analyzed to identify specific keywords and were used to develop a full search strategy for PubMed. The second step in the search strategy was undertaken using all identified keywords and index terms across all included search engines and databases, adapting the search strategy for each one. Thirdly, the reference list of all selected sources of evidence was screened for additional sources of information.

The databases where the search was conducted were CINAHL Complete (via EBSCO platform), MEDLINE (PubMed), SCOPUS, The Cochrane Library, and SciELO. Unpublished studies were searched for in *Repositório Científico de Acesso Aberto de Portugal*.

The following medical subject headings were used for MEDLINE and The Cochrane Library: "Quality of Health Care," "Quality Indicators, Health Care," "Ambulatory Surgical Procedures." For CINAHL headings, terms included "Quality of Health Care," "Clinical Indicators," and "Ambulatory Surgery." For the other databases, the keywords used were "Quality," "Healthcare Quality," "Quality Indicators," "Healthcare Quality Indicator," "Ambulatory Surgery," "Day Surgery," and "Outpatient Surgery." Finally, to compose the search formula in the databases and research platforms, the descriptors and keywords were combined by the Boolean terms "AND" and "OR." The search strategy used in the databases is presented in Table 1. In addition, organization web sites were searched for pertinent information on the topic of the review.

Table 1.
Databases Search Strategy

Database: MEDLINE (via PubMed) **Results: 89** **Search date: November 2021**	
1.	(Quality [Title/Abstract])
2.	"Healthcare Quality" [Title/Abstract]
3.	"Quality indicators" [Title/Abstract]
4.	"Healthcare Quality Indicator" [Title/Abstract]
5.	"Ambulatory Surgery" [Title/Abstract]
6.	"Day Surgery" [Title/Abstract]
7.	"Outpatient Surgery" [Title/Abstract]
8.	((Quality [Title/Abstract])) OR ("Healthcare Quality" [Title/Abstract])
9.	("Quality indicators" [Title/Abstract]) OR ("Healthcare Quality Indicator" [Title/Abstract])
10.	(("Ambulatory Surgery" [Title/Abstract]) OR ("Day Surgery" [Title/Abstract])) OR ("Outpatient Surgery" [Title/Abstract])
11.	"Quality of Health Care" [MeSH Terms]
12.	"Quality Indicators, Health Care" [MeSH Terms]
13.	"Ambulatory Surgical Procedures" [MeSH Terms]
14.	((Quality [Title/Abstract]) OR ("Healthcare Quality" [Title/Abstract])) OR ("Quality of Health Care"[MeSH Terms])
15.	(("Quality indicators" [Title/Abstract]) OR ("Healthcare Quality Indicator" [Title/Abstract])) OR ("Quality Indicators, Health Care" [MeSH Terms])
16.	(("Ambulatory Surgery" [Title/Abstract]) OR ("Day Surgery" [Title/Abstract])) OR ("Outpatient Surgery" [Title/Abstract]) OR ("Ambulatory Surgical Procedures" [MeSH Terms])
17.	(((Quality [Title/Abstract]) OR ("Healthcare Quality" [Title/Abstract])) OR ("Quality of Health Care" [MeSH Terms]) AND ("Quality indicators" [Title/Abstract]) OR ("Healthcare Quality Indicator" [Title/Abstract])) OR ("Quality Indicators, Health Care" [MeSH Terms]))) AND ((("Ambulatory Surgery" [Title/Abstract]) OR ("Day Surgery"[Title/Abstract])) OR ("Outpatient Surgery" [Title/Abstract])) OR ("Ambulatory Surgical Procedures" [MeSH Terms]))))

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Selecting Studies and Charting Data

Following the search, titles and abstracts were screened by two independent reviewers against the inclusion criteria for the scoping review. Results were excluded after reading the title if they were related to specific age groups (i.e., pediatrics or geriatrics) or if they mentioned specific anesthetic or surgical procedures. The remaining records were screened by reading the abstract, excluded by the same inclusion and exclusion criteria and if they were specific to office-based surgery or if they did not mention any quality indicator in ambulatory care surgery. The methodological quality of the included studies was not assessed since it is a scoping review (Peters et al., 2020).

After validation of the relevance of the selected records, two independent reviewers extracted the data using a charting table aligned with the objective and question of this research. This tool was structured by the main

Database: CINAHL (via EBSCO) **Results: 34** **Search date: November 2021**		
S10	S7 AND S8 AND S9	34
S9	S3 OR S6	8,757
S8	S2 OR S5	14,901
S7	S1 OR S4	460,560
S6	MH "Ambulatory Surgery"	6,931
S5	MH "Clinical Indicators"	12,971
S4	MH "Quality of Health Care"	79,594
S3	TI "Ambulatory Surgery" OR AB "Ambulatory Surgery" OR TI "Day Surgery" OR AB "Day Surgery" OR TI "Outpatient Surgery" OR AB "Outpatient Surgery"	4,177
S2	TI "Quality indicators" OR AB "Quality indicators" OR TI "Healthcare Quality Indicator" OR AB "Healthcare Quality Indicator"	3,687
S1	TI Quality OR AB Quality OR TI "Healthcare Quality" OR AB "Healthcare Quality"	412,007
Database: Scopus **Results: 152** **Search date: November 2021**		
(TITLE-ABS-KEY (quality) OR TITLE-ABS-KEY ("healthcare quality") AND TITLE-ABS-KEY ("quality indicators") OR TITLE-ABS-KEY ("healthcare quality indicator") AND TITLE-ABS-KEY ("ambulatory surgery") OR TITLE-ABS-KEY ("day surgery") OR TITLE-ABS-KEY ("outpatient surgery")) AND (EXCLUDE (LANGUAGE, "french") OR EXCLUDE LANGUAGE, "german") OR EXCLUDE (LANGUAGE, "danish")) AND (EXCLUDE (LANGUAGE, "dutch") OR EXCLUDE (LANGUAGE, "italian") OR EXCLUDE (LANGUAGE, "swedish"))		
Database: SciELO **Results: 63** **Search date: November 2021**		
(ti:(Quality)) OR (ab:(Quality)) OR (ti:("Healthcare Quality")) OR (ab:("Healthcare Quality")) AND (ti:("Quality indicators")) OR (ab:("Quality indicators")) OR (ti:("Healthcare Quality Indicator")) OR (ab:("Healthcare Quality Indicator")) AND (ti:("Ambulatory Surgery)) OR (ab:("Ambulatory Surgery)) OR (ti:("Day Surgery")) OR (ab:("Day Surgery")) OR (ti:("Outpatient Surgery")) OR (ab:("Outpatient Surgery"))		

researcher and included bibliographic data (title, authorship, year of publication, journal, country), methodology data (type of study, research objective(s), population and sample, data collection method), results extracted (quality indicators in ambulatory care surgery assessed, concepts of significance to the review question), and references which should be analyzed for further sources of information.

Reporting the Results and Charting Data

The results of this scoping review are presented as a map of the data extracted from the included sources in a diagrammatic, tabular, and descriptive form, aligned with the objective and scope of this scoping review (Peters et al., 2020).

Results

The database and registers search retrieved 338 and 10 records, respectively. The titles were screened for duplicates and assessed based on the inclusion and exclusion criteria and 264 records were removed. The abstracts of the selected records were screened based on the inclusion and exclusion criteria and 38 were excluded. The full text of the remaining 52 records was assessed and 23 were excluded. There were 10 records identified from organizations' websites and citation searching, and six were excluded because they were not specific to quality indicators in ambulatory care surgery. A total of 32 sources were included in this scoping review. The selection process of the records retrieved from the search is presented in Figure 1, using a PRISMA Extension for Scoping Reviews flow diagram, detailing the complete process (Peters et al., 2020).

Description of Studies

The records included in the review had a publication range between 1994 and 2021, and included 17 quantitative studies, seven commentaries, three literature reviews, and two master's dissertations from the database search; as well as two documents retrieved from

searching organizations' websites and one book chapter from citation search. The studies included in the review were conducted in the United States (11), Portugal (six), Spain (four), Australia (two), Germany (two), China, Canada, France, Iceland, and United Kingdom.

Overview of Study Characteristics

In Table 2 is a list of the records selected for the scoping review from database search. In Table 3 are the records retrieved from organizations' websites and citation search. There were 32 records in total for this scoping review.

Using the data extraction tool, 42 quality indicators in ambulatory care surgery were identified. The identified quality indicators are related to clinical care, operational features of the ambulatory care surgery center, and economic aspects. To facilitate the results presentation and interpretation, the quality indicators were compiled and classified according to the three components approach for evaluating the quality of care by Donabedian (2005):

- Structure.
- Process.
- Outcome.

The reason for choosing this model relied on the fact that quality metrics ought to incorporate all aspects of care to give a complete overview of the provider's ability to deliver high-quality health care. For instance, if the nurse fails to administer preoperative antibiotics the quality of care provided is compromised, even if the patient does not suffer any negative outcomes (Vaswani et al., 2016).

There were six quality indicators found for structure:

1. Safety in the ambulatory care surgery center: patient safety, occurrence, and reporting of safety events, such as adverse events, near-misses, or never events, as well as occupational safety.
2. Compliance with regulations: Influenza vaccination compliance among healthcare personnel; prophylactic intravenous antibiotic timing; safe surgery checklist use; appropriate surgical site hair removal.
3. Preoperative delays and incidents.
4. Medication errors.
5. Department-specific indicators.
6. System efficiency, including ambulatorization index, scheduling efficiency, costs, and personnel skill mix.

As for process, the following quality indicators were identified:

- Same day cancellation.
- Documentation.
- Discharge information (given pre- and post-operatively), education on discharge, ambulatory care surgery center hospital telephone number provided, and clinical information provided to patients and relatives.
- Delayed discharge.
- Postoperative evaluation 24 hours after discharge (i.e., postoperative follow-up).
- Waiting times in the ambulatory care surgery center.
- Duration of operation.

Finally, the quality indicators allocated to the outcomes component were:

- Staff satisfaction.
- Patient satisfaction.
- Pain assessment/ postoperative pain evaluation (quality of recovery).
- Postoperative nausea and vomiting (patient selection for administration of postoperative nausea and vomiting prophylaxis and selection of postoperative nausea and vomiting prophylaxis).
- Mortality and morbidity.
- Postoperative complications, such as bleeding, urinary retention, hematoma, rash, wound dehiscence, ischemia, postoperative hypertension, thromboembolic events (deep venous thrombosis, pulmonary embolism), hypoxemia, toxic anterior segment syndrome, unplanned anterior vitrectomy.
- Surgical site infection.
- Unplanned re-operation (in 24 hours or up to 30 days).
- Unplanned re-hospitalization or hospital transfer, or same day admission with a length of stay greater than 24 hours (one to 30 days), or unplanned overnight admission or at least one postoperative visit to both primary care and surgical specialty clinics within 30 days.
- Postoperative emergency department visit within 30 days.

Table 2.
Records Selected from the Database Search

Authorship & Year	Methodological Design	Study Objectives	Quality Indicators in Ambulatory Care Surgery Assessed
(Yan et al., 2021)	Retrospective study	Examine the complications and quality indicators of patients who underwent gynecological ambulatory care surgery	Postoperative complications; mortality; unplanned re-operation; delayed discharge; unplanned re-hospitalization; patient satisfaction
(Alves et al., 2020)	Retrospective study	Demonstrate the introduction of the National Health Assessment System evaluation at the ambulatory care surgery center improved the overall quality of ambulatory surgery and the quality of the clinical records	Patient selection for administration of postoperative nausea and vomiting prophylaxis; selection of postoperative nausea and vomiting prophylaxis; postoperative pain evaluation; pain medications after discharge; education after discharge; contact telephone number provided; postoperative evaluation 24-hours after discharge
(Theissen et al., 2019)	Review	Mapping of processes and theoretical risks in ambulatory care surgery	Process indicators: surgical consent, evaluation of risk for post operative nausea and vomiting, evaluation of risk of thromboembolism, anticipation of post-operative pain management, evaluation of eligibility for admission, evaluation of discharge criteria, patient contact on post-op day 1-3 Outcome indicators: rate of conversion from outpatient to inpatient hospitalization, all-cause re-hospitalization rate between day 1 and day 3 Patient satisfaction
(Mull et al., 2018)	Retrospective study	Develop and validate a surveillance model to identify outpatient surgical adverse events based on previously developed electronic triggers	Postoperative emergency department visit within 30 days; same day admission with a length of stay greater than 24 hours; postoperative admission within 1-30 days; at least one postoperative visit to both primary care and surgical specialty clinics within 30 days
(Nunes et al., 2018)	Review	Review global quality indicators used in ambulatory care surgery and compare them with those used in Portugal	Perioperative quality indicators: clinical information provided to patients and relatives; Incidence of patient burn; Incidence of patient fall; Incidence of wrong site, wrong side, wrong patient, wrong procedure or wrong implant surgery; Influenza vaccination compliance among healthcare personnel; medication errors; prophylactic IV antibiotic timing Postoperative quality indicators: general condition of the patient at 24-hours after the intervention, monitored via a telephone call the following day; postoperative pain (quality of recovery); patient's ability to resume normal activities following surgery and anesthesia; patient satisfaction; postoperative nausea and vomiting; surgical site infection; unanticipated complications; unplanned delay in discharge exceeding 6 hours; unplanned overnight admission; unplanned return to the operating room

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Table 2. (continued)
Records Selected from the Database Search

Authorship & Year	Methodological Design	Study Objectives	Quality Indicators in Ambulatory Care Surgery Assessed
(Nunes et al., 2018) *(continued)*			Indicators defined by the Portuguese Healthcare Regulation Authority: education on discharge; pain medications on discharge; patient selection for administration of postoperative nausea and vomiting prophylaxis; postoperative evaluation 24-hours after discharge; postoperative pain evaluation; selection of prophylaxis for postoperative nausea and vomiting; telephone number given
(Martínez & Segura, 2018)	Retrospective study	Determine which key indicators of the Spanish National Health Service influence patient satisfaction with the Spanish NHS and physicians	Patient satisfaction
(André et al., 2017)	Descriptive, cross-sectional study	To determine the ideal and perceived quality of the users of outpatient surgery of a central hospital	Patient satisfaction
(Allison, 2016)	Commentary	N/A	Incidence of patient burns; incidence of patient falls; incidence of wrong site, wrong side, wrong patient, wrong procedure, and wrong implant surgery; incidence of hospital transfer/admission; prophylactic IV antibiotic timing; safe surgery checklist use; ambulatory care surgery facility volume data on selected ambulatory care surgery center surgical procedures; Influenza vaccination coverage among healthcare personnel; endoscopy/poly surveillance: appropriate follow-up intervals for normal colonoscopy in average risk patients; colonoscopy intervals for patients with a history of adenomatous polyps
(Menendez & Ring, 2016)	Retrospective study	To determine the rates, reasons, and factors associated with emergency department visits within 30 days of elective outpatient hand surgery	Emergency department visits within 30 days of inpatient surgery
(Sveinsdottir et al., 2016)	Retrospective study	To investigate patients' quality of recovery in ambulatory care surgery, measured by QoR-40	Patient satisfaction; postoperative evaluation (quality of recovery)
(Menendez et al., 2016)	Retrospective study	To develop and validate an electronic health record-based trigger algorithm to identify adverse events after outpatient orthopedic surgery	Surgical site infection; unplanned re-operation; postoperative emergency department visits within 30 days; thromboembolic events; postoperative complications

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Table 2. (continued)
Records Selected from the Database Search

Authorship & Year	Methodological Design	Study Objectives	Quality Indicators in Ambulatory Care Surgery Assessed
(Vaswani et al., 2016)	Commentary	N/A	Patient satisfaction; prophylactic IV antibiotic timing
(Brown & Aronow, 2016)	Commentary	N/A	Staff skill mix; incidence of patient burn; incidence of patient fall (with or without injury); hospital transfer/admission; incidence of wrong site, wrong side, wrong patient, wrong procedure, or wrong implant surgery
(Rodenas et al., 2014)	Prospective, observational, & descriptive study	To describe the evolution of quality indicators in an ambulatory care surgery center in 3 years	Delayed discharge; unplanned re-hospitalization; unplanned re-operation; same day cancelation; patient satisfaction
(Martín-Ferrero et al., 2014)	Retrospective study	To determine clinical and quality indicators in orthopedic ambulatory care surgery	Unplanned overnight admission; same day admission with a length of stay greater than 24 hours during the first month after surgery; same day cancelation
(DeJohn, 2014)	Commentary	N/A	Incidence of patient burn; incidence of patient fall; incidence of wrong site, wrong side, wrong patient, wrong procedure, wrong implant; hospital transfer/admission; prophylactic intravenous antibiotic timing; safe surgery checklist use; ambulatory care surgery facility volume data on selected ambulatory care surgery center surgical procedures; influenza vaccination coverage among healthcare personnel; endoscopy/polyp surveillance: appropriate follow-up interval for normal colonoscopy in average risk patients; endoscopy/polyp surveillance: colonoscopy interval for patients with a history of adenomatous polyps – avoidance of inappropriate use; cataracts – improvement in patient's visual function within 90 days following cataract surgery
(França, 2013)	Master's dissertation	To collect and evaluate clinical indicators in ambulatory care surgery from different countries	Surgical site infection; mortality/morbidity rates; unplanned re-operation; delayed discharge; unplanned re-hospitalization; patient satisfaction; postoperative pain evaluation; postoperative emergency department visit within 30 days; incidence of patient burn; incidence of patient fall; incidence of wrong site, wrong side, wrong patient, wrong procedure, or wrong implant surgery; safety events occurrence rate; department specific indicators; ambulatorization index
(Correia, 2010)	Master's dissertation	To assess quality and patient satisfaction in an ambulatory care surgery center	Patient satisfaction
(Brökelmann & Bäcker, 2010)	Retrospective study	To update the results of a quality assurance program with respect to selected clinical indicators	Postoperative complications; surgical site infections; unplanned re-hospitalization; patient satisfaction; pain medications on discharge; contact telephone number provided; postoperative evaluation 24-hours after discharge (postoperative follow-up); preoperative delays and incidents; patient's ability to resume normal activities following surgery; thromboembolic events; system efficiency

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Table 2. (continued)
Records Selected from the Database Search

Authorship & Year	Methodological Design	Study Objectives	Quality Indicators in Ambulatory Care Surgery Assessed
(Lemos et al., 2009)	Observational, prospective study	To evaluate patient satisfaction at discharge and 30 days after day surgery, and to identify predictive factors of patient satisfaction	Patient satisfaction
(Brökelmann & Mayr, 2007)	Retrospective study	To find clinical indicators for benchmarking out of a nationwide quality assurance program	Unplanned re-hospitalization rate; patient satisfaction; patient's ability to resume normal activities following surgery (days)
(Shnaider & Chung, 2006)	Review	To summarize and examine the updated published results on the outcome measures used to assess the quality of ambulatory care surgery and anesthesia	Patient satisfaction; postoperative complications rates; mortality/morbidity rates; unplanned re-operation; delayed discharge; same day cancelation; preoperative delays and incidents; patient's ability to resume normal activities following surgery (days)/ postoperative patient function; safety events occurrence rate
(Jiménez et al., 2004)	Retrospective study	To describe quality assessment in a multidisciplinary day surgery unit using clinical indicators	Hospital admissions; hospital re- admissions; ratio between suspended procedures/canceled procedures; major complications; minor complications; wound infection; patient comfort 24 hours after the procedure; patient satisfaction; substitution indexes
(Yellen, 2003)	Descriptive study	To explore the influence of selected nurse-sensitive variables on patient satisfaction and compare the reliability and validity of existing instruments that measure patient satisfaction	Patient satisfaction
(Williams et al., 2003)	Retrospective study	To assess patient satisfaction with day surgery using survey methodology in a large public metropolitan hospital in Australia.	Patient satisfaction
(Frezza et al., 2000)	Commentar	N/A	Patient satisfaction; staff skill mix; scheduling efficiency

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Table 2. (continued)
Records Selected from the Database Search

Authorship & Year	Methodological Design	Study Objectives	Quality Indicators in Ambulatory Care Surgery Assessed
(Twersky, 1994)	Commentary	N/A	Surgical site infection; delayed discharge; unplanned re-hospitalization; patient satisfaction; postoperative pain evaluation; postoperative follow-up; same day cancelation; preoperative delays and incidents; documentation
(Roberts, 1994)	Commentary	N/A	Unplanned re-operation; delayed discharge; same day cancelation; unplanned overnight admission
(Hitchcock & Ogg, 1994)	Prospective study	To describe the implementation of a quality assurance program in a day surgery facility	Postoperative complications; patient satisfaction; selection of postoperative nausea and vomiting prophylaxis; postoperative pain evaluation; same day cancelation; staff satisfaction; safety; staff skill mix

- Incidence of patient burn.
- Incidence of patient fall (with or without injury).
- Incidence of wrong site, wrong side, wrong patient, wrong procedure, or wrong implant surgery.
- Patient's ability to resume normal activities following surgery (days) and/or postoperative patient function.
- Normothermia.

The quality indicators identified in this scoping review are summarized in Table 4.

Discussion

The purpose of this scoping review is to map the evidence on which quality indicators have been used to assess ambulatory care surgery. No temporal limits were used in the search and, while the concept of ambulatory care surgery is not recent, the first attempts to outline quality measures were only made in 1994. In the past 10 years a greater volume of studies focusing on measuring quality in the ambulatory care surgery context were published.

Since 2006, efforts have been made to measure and report ambulatory care surgery center quality data in a meaningful way. The ASC Quality Collaboration attempts to develop standardized ambulatory care surgery center quality measures (ASC Quality Collaboration, 2022).

Compliance with regulations was mentioned several times in the analyzed literature. Conformity with these recommendations and standards of recommended practice is crucial since the rationale behind them is well established and in alignment with many organizations worldwide (ASC Quality Collaboration, 2022).

System efficiency is strongly related to the economic features of the ambulatory care surgery center. Some authors highlight the importance of staffing and dependence on nursing care as critical in ambulatory care surgery (Brown & Aronow, 2016).

Safety was considered a broad indicator which includes patient safety, occurrence and reporting of safety events, and occupational safety. Ambulatory care surgery is growing and is still poorly studied with respect to safety (Mull et al., 2018). Measuring and monitoring quality indicators and outcomes is crucial for patient safety (Vaswani et al., 2016). Some authors defend electronic health records can be used to monitor safety events since they allow automated identification of triggers which indicate the possibility of occurrence of a safety event (Menendez, et al., 2016).

Discharge information should be clear and customized to all levels of health literacy and may also help limit emergency department visits and have a great influence in other indicators, such as patient satisfaction (Menendez & Ring, 2016; Williams et al., 2003).

Table 3.
Records Selected from Organizations' Websites and Citation Search

Authorship & Year	Source Type	Quality Indicators in Ambulatory Care Surgery Assessed
(ASC Quality Collaboration, 2022)	Organization website	All-cause hospital transfer/admission; all-cause emergency department visit within 1 day of discharge; all-cause unplanned hospital admission within 1 day of discharge; appropriate surgical site hair removal; normothermia; patient burn; patient fall in the ambulatory care surgery center; prophylactic IV antibiotic timing; toxic anterior segment syndrome; unplanned anterior vitrectomy; wrong site, wrong side, wrong patient, wrong procedure, wrong implant
(International Association for Ambulatory Surgery, 2014)	Organization website	Cancelation of booked procedures; unplanned return to the operation room on the same day; unplanned overnight admission; unplanned return of the patient to an ambulatory care surgery unit or hospital; unplanned readmission of the patient to an ambulatory care surgery unit or hospital; mortality rate; infection
(Lemos & Regalado, 2006)	Citation search (book chapter)	Mortality and major morbidity rates; minor morbidity rate; functional health status and quality of life; patient satisfaction; economic outcomes; cancelation of booked procedures; cancelation after arrival at the ambulatory care surgery center; unplanned return to the operating room on the same day of surgery; unplanned overnight admission; unplanned return of the patient to a hospital; unplanned readmission of the patient to an ambulatory care surgery center or hospital; patient satisfaction; delayed patient discharge

Patient satisfaction is a major quality indicator for ambulatory care surgery as it was mentioned in 21 of the reviewed sources. This indicator represents the patients' perspective of quality and seems to be related to their clinical outcome (Lemos et al., 2009; Shnaider & Chung, 2006). Yet, it is not well established when to evaluate patient satisfaction (at the time of discharge or 30 days after surgery) and how to perform such evaluation (Nunes et al., 2018). Some studies suggest nursing care is a key determinant of overall patient satisfaction, being the highest correlation with communication with the nurse and education provided at discharge (Williams et al., 2003; Yellen, 2003).

Some of the identified outcome quality indicators were consensual in many of the included sources, such as pain assessment, postoperative nausea and vomiting, post-operative complications, surgical site infection, unplanned re-operation, unplanned re-hospitalization within one day of discharge/hospital transfer/unplanned overnight admission, and postoperative emergency department visit within 30 days of the surgery.

Although some authors mentioned mortality rates and major morbidity rates as a quality indicator for ambulatory care surgery, others do not consider them useful for monitoring ambulatory care surgery daily practice as they may not reflect the quality of care (Lemos & Regalado, 2006; Shnaider & Chung, 2006; IAAS, 2014). Furthermore, rates of infection requiring antibiotics were also mentioned as a controverse quality indicator in ambulatory care surgery context for the same reasons (Lemos & Regalado, 2006; IAAS, 2014).

Limitations

In this scoping review, only sources in Portuguese, Spanish, and English were included. Studies published in other languages may have been of interest to be included in this review. Since the methodological quality of the studies was not assessed, we do not present any recommendations for practice.

Recommendations for Research

This scoping review highlights significant gaps in the available knowledge on quality indicators in ambulatory care surgery. The quality indicator

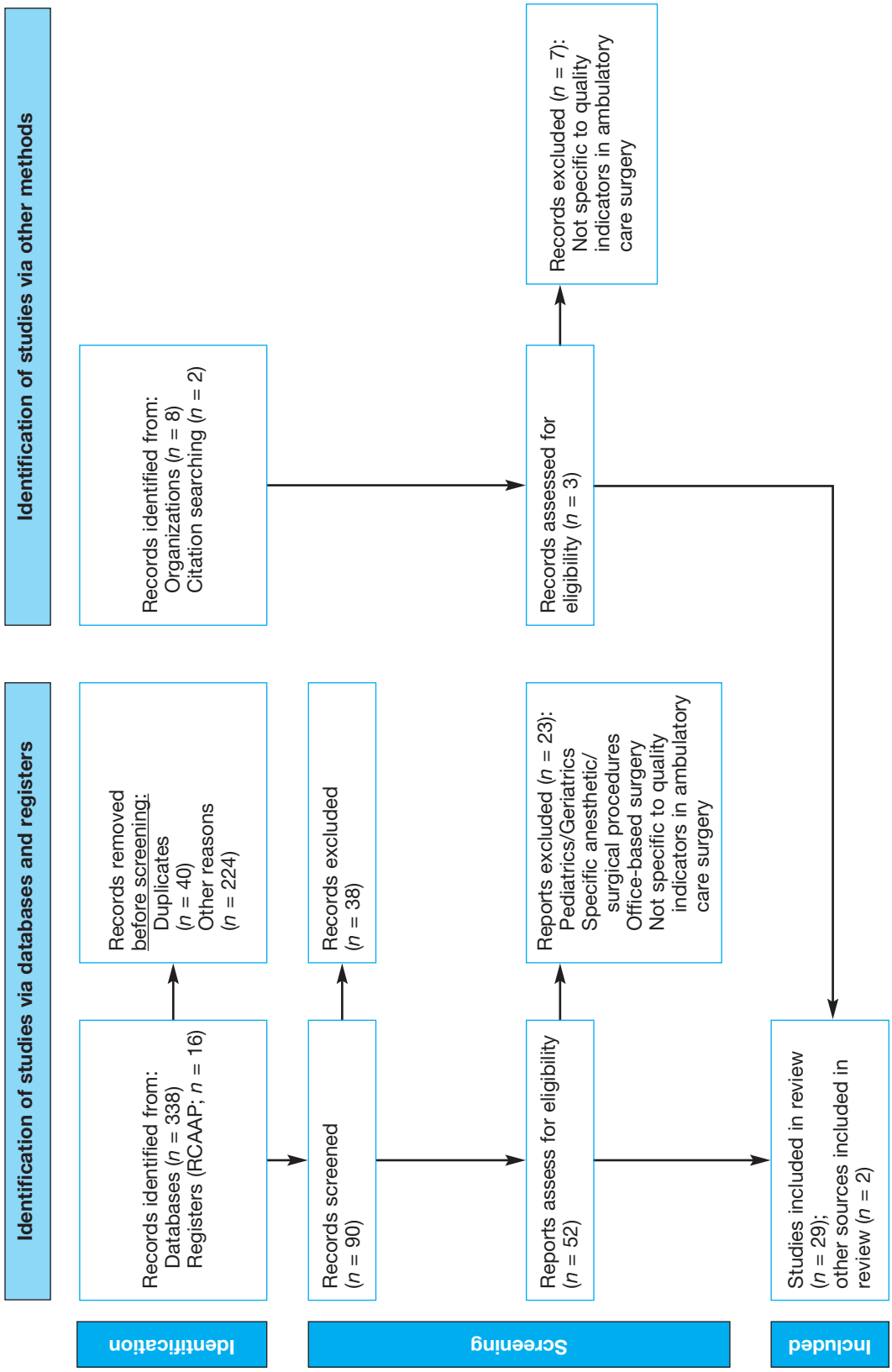
Table 4.
Quality Indicators in Ambulatory Care Surgery

	Number of References
Structure	
Safety: patient safety; safety events; occupational safety	6
Compliance with regulations	13
Preoperative delays and incidents	3
Medication errors	2
Department specific indicators	3
System efficiency	8
Process	
Same day cancelation	9
Documentation	3
Discharge information	9
Delayed discharge	7
Postoperative evaluation 24-hours after discharge (postoperative follow-up)	5
Waiting times	5
Duration of operation	1
Outcome	
Staff satisfaction	1
Patient satisfaction	21
Pain assessment; postoperative pain evaluation (quality of recovery)	11
Post operative nausea and vomiting	7
Mortality/morbidity rates	4
Postoperative complications	16
Surgical site infection	8
Unplanned re-operation	9
unplanned re-hospitalization/hospital transfer/unplanned overnight admission	18
Postoperative emergency department visit within 30 days	3
Incidence of patient burn	6
Incidence of patient fall	7
Incidence of wrong site, wrong side, wrong patient, wrong procedure, or wrong implant surgery	6
Postoperative patient function	4
Normothermia	2

most often mentioned in the literature was patient satisfaction; however, there is no consensus on the timing when it should be evaluated or how it should be evaluated. All indicators related to safety (patients and staff) require urgent further study as little is known about these topics. Further research is needed to provide answers to these gaps.

This review provides an overview of the quality indicators used in ambulatory care surgery; nonetheless, it is not documented which of these quality indicators are influenced by nursing care. It is imperative to understand how nursing practice can influence quality in

Figure 1.
PRISMA Extension for Scoping Reviews Flow Diagram for Study Selection



ambulatory care surgery in order to optimize management strategies and improve patient care.

Conclusions

The scoping review aimed to map the evidence on which quality indicators have been used to assess ambulatory care surgery. A total of 32 sources were included in the review and 42 quality indicators were identified. Those quality indicators were grouped according to Donabedian's structure-process-outcome framework.

To make suitable clinical, management, and financial decisions and improvements in ambulatory care surgery, it is necessary to understand what metrics exist to assess quality and what challenges need to be addressed. Measuring and assessing quality indicators in ambulatory care surgery show a commitment to quality improvement in ambulatory care surgery centers and are of paramount importance for patient safety.

Nurses' value in ambulatory care surgery remains undocumented from a quality and patient safety measurement perspective. To improve the quality of care in this context, nurses deserve to know how it can be influenced by their practice and can provide effective, efficient, high-quality, patient-centered care. $

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References

Allison, J. (2016). Ideas and approaches for quality-assessment and performance-improvement projects in ambulatory surgery centers. *AORN Journal, 103*(5), 483-488. https://doi.org/10.1016/j.aorn.2016.02.014

Alves, E.C., Correia, T., Brandão, P., Teixeira, L., & Povo, A. (2020). SINAS: Effective impact in the quality improvement of ambulatory surgery at an ambulatory centre. *Acta Médica Portuguesa, 33*(9), 546-551. https://doi.org/10.20344/amp.12580

André, S.M.F., Tomás, Â., Cunha, M., & Duarte, J. (2017). Qualidade dos cuidados relativos à cirurgia de ambulatório: Perspectiva dos utentes. *Millenium, 2*(2), 73-81. https://doi.org/10.29352/mill0202e.06

ASC Quality Collaboration. (2022). *ASC quality measures: Implementation guide: Version 10.0.* https://higherlogicdownload.s3.amazonaws.com/ASCACONNECT/1b34f1a1-0180-4005-9507-902fdf8f242e/UploadedImages/Implementation_Guide/ASC-QC-Implementation-Guide-10_0-February-2022.pdf

Brökelmann, J., & Bäcker, K. (2010). Clinical indicators for ambulatory surgery. *Ambulatory Surgery, 16*(2), 34-37. https://www.iaas-med.com/files/Journal/FINAL16.2/brockelman.pdf

Brökelmann, J., & Mayr, R. (2007). Quality assurance and benchmarking in ambulatory surgery. *Ambulatory Surgery, 13*(3), 61-63. https://www.iaas-med.com/files/Journal/13.3/13.3BROKELMAN.pdf

Brown, D.S., & Aronow, H.U. (2016). Ambulatory care nurse-sensitive indicators series: Reaching for the tipping point in measuring nurse-sensitive quality in the ambulatory surgical and procedure environments. *Nursing Economic$, 34*(3), 147-151.

Correia, R. (2010). Inquérito de avaliação de qualidade e satisfação do utente do serviço de cirurgia de ambulatório do hospital de Santo António.

DeJohn, P. (2014). ASCs face learning curve as quality reporting goes online. *OR Manager, 30*(6), 29-31.

Donabedian, A. (2005). Evaluating the quality of medical care. *The Milbank Quarterly, 83*(4), 691–729. https://doi.org/10.1111/j.1468-0009.2005.00397.x

Direção-Geral da Saúde. (2013). *Plano nacional de saúde 2012–2016: Indicadores e metas em saúde.* http://pns.dgs.pt/files/2012/02/99_7_Indicadores_e_Metas_em_Saude_2013-01-18.pdf

França, L.G.L. (2013). Indicadores clínicos de qualidade em cirurgia de ambulatório.

Frezza, E.E., Girnys, R.P., Silich, R.J., & Coppa, G.F. (2000). Commentary: Quality of care and cost containment are the hospital-based ambulatory surgery challenges for the future. *American Journal of Medical Quality, 15*(3), 114-118. https://doi.org/10.1177/106286060001500305

Hitchcock, M., & Ogg, T.W. (1994). A quality assurance initiative in day case surgery: General considerations. *Ambulatory Surgery, 2*(4), 181-192. https://doi.org/10.1016/0966-6532(94)90016-7

International Association for Ambulatory Surgery (IAAS). (2014). *Ambulatory surgery handbook* (2nd ed.). https://www.iaas-med.com/files/2013/Day_Surgery_Manual.pdf

Jiménez, A., Elia, M., Garcia, J.A., Artigas, C., Lamata, F., & Martínez, M. (2004). Indicadores de calidad asistencial en cirugía mayor ambulatoria. *Cirugía Española, 76*(5), 325-330. https://doi.org/10.1016/S0009-739X(04)72385-4

Lemos, P., & Regalado, A.M. (2006). Patient outcomes and clinical indicators for ambulatory surgery. In P. Lemos, P. Jarrett, & B. Philip (Eds.), *Day surgery: Development and practice* (pp. 257-280). International Association for Ambulatory Surgery.

Lemos, P., Pinto, A., Morais, G., Pereira, J., Loureiro, R., Teixeira, S., & Nunes, C.S. (2009). Patient satisfaction following day surgery. *Journal of Clinical Anesthesia, 21*(3), 200-205. https://doi.org/10.1016/j.jclinane.2008.08.016

Martín-Ferrero, M.Á., Faour-Martín, O., Simon-Perez, C., Pérez-Herrero, M., & de Pedro-Moro, J.A. (2014). Ambulatory surgery in orthopedics: Experience of over 10,000 patients. *Journal of Orthopaedic Science, 19*(2), 332-338. https://doi.org/10.1007/s00776-013-0501-3

Martínez, M.C.V., & Segura, E.A. (2018). Satisfacción del paciente en el sistema nacional de salud Español. *Anales Del Sistema Sanitario de Navarra, 41*(3),

309-320. https://doi.org/10.23938/assn.0315

Menendez, M.E., Janssen, S.J., & Ring, D. (2016). Electronic health record-based triggers to detect adverse events after outpatient orthopaedic surgery. *BMJ Quality & Safety, 25*(1), 25-30. https://doi.org/10.1136/bmjqs-2015-004332

Menendez, M.E., & Ring, D. (2016). Emergency department visits after hand surgery are common and usually related to pain or wound issues. *Clinical Orthopaedics and Related Research, 474*(2), 551-556. https://doi.org/10.1007/s11999-015-4489-1

Mull, H.J., Itani, K.M.F., Pizer, S.D., Charns, M.P., Rivard, P.E., McIntosh, N., … Rosen, A.K. (2018). Development of an adverse event surveillance model for outpatient surgery in the veterans health administration. *Health Services Research, 53*(6), 4507-4528. https://doi.org/10.1111/1475-6773.13037

Nunes, J.S., Gomes, R., Povo, A., & Alves, E.C. (2018). Quality indicators in ambulatory surgery: A literature review comparing Portuguese and international systems. *Acta Médica Portuguesa, 31*(7-8), 425-430. https://doi.org/10.20344/amp.10416

OECD. (2022). *Health at a glance 2021: OECD indicators.* OECD Publishing. https://doi.org/10.1787/ae3016b9-en

Peters, M.D.J., Godfrey, C., McInerney, P., Munn, Z., Tricco, A.C., & Khalil, H. (2020). Scoping reviews. In E. Aromataris & Z. Munn (Eds.), *JBI Manual for Evidence Synthesis.* Joanna Briggs Institute. https://doi.org/10.46658/JBIMES-20-12

Pinto, J.R.L., Matias, A.C.R., & Sarnadas, L.L. (2020). Avaliação da cultura de segurança do doente em cirurgia ambulatória pelos enfermeiros: Protocolo de scoping review. *Revista de Enfertmagem Referência, 5*(4), 1-6. https://doi.org/10.12707/RV20059

Roberts, L. (1994). Clinical indicators for quality assurance in ambulatory surgery. *Ambulatory Surgery, 2*(1), 5-6. https://doi.org/10.1016/0966-6532(94)90040-X

Rodenas, F.M., Grifell, J.C., Quintana, P.D., Corchón, J.G., Casares, F.B., Garanto, X.G., … Dorrego, X.V. (2014). Indicadores de calidad asistencial en cirugía mayor ambulatoria (2010-2012). *Revista de Calidad Asistencial, 29*(3), 172-179. https://doi.org/10.1016/j.cali.2014.01.006

Shnaider, I., & Chung, F. (2006). Outcomes in day surgery. *Current Opinion in Anaesthesiology, 19*(6), 622-629. https://doi.org/10.1097/ACO.0b013e328010107e

Sveinsdottir, H., Borgthorsdottir, T., Asgeirsdottir, M.T., Albertsdottir, K., & Asmundsdottir, L.B. (2016). Recovery after same-day surgery in patients receiving general anesthesia: A cohort study using the quality of recovery-40 questionnaire. *Journal of Perianesthesia Nursing, 31*(6), 475-484. https://doi.org/10.1016/j.jopan.2015.07.003

Theissen, A., Slim, K., Deleuze, A., & Beaussier, M. (2019). Risk management in outpatient surgery. *Journal of Visceral Surgery, 156*(Suppl. 1), S41-S49. https://doi.org/10.1016/j.jviscsurg.2019.04.005

Twersky, R.S. (1994). Quality improvement in ambulatory surgery – the US perspective. *Ambulatory Surgery, 2*(4), 216-222. https://doi.org/10.1016/0966-6532(94)90020-5

van Biesen, T., & Johnson, T. (2019). *Ambulatory surgery center growth accelerates: Is medtech ready?* https://www.bain.com/insights/ambulatory-surgery-center-growth-accelerates-is-medtech-ready#

Vaswani, R., Hutzler, L., & Bosco, J. (2016). Measuring quality in ambulatory orthopedic surgery. *American Journal of Medical Quality, 31*(2), 187-189. https://doi.org/10.1177/1062860615601217

Williams, A., Ching, M., & Loader, J. (2003). Assessing patient satisfaction with day surgery at a metropolitan public hospital. *Australian Journal of Advanced Nursing, 21*(1), 35-41.

Yan, L., Rong, F., Gao, M., Chen, G., Su, Y., Xing, L., & Xu, M. (2021). Complications and feasibility analysis of ambulatory surgery for gynecological diseases in China. *Medicine, 100*(1), e23995. https://doi.org/10.1097/MD.0000000000023995

Yellen, E. (2003). The influence of nurse-sensitive variables on patient satisfaction. *AORN Journal, 78*(5), 783-788. https://doi.org/10.1016/S0001-2092(06)60638-8