


## REVIEW

# Indicators and predictors modifiable by the nursing department during the preoperative period: A scoping review

Eloísa Fernández Fernández MSD, Professor<sup>1</sup> | Eloísa Fernández-Ordoñez PhD, Professor<sup>2</sup> | Marina García-Gamez BSN PhD, Professor<sup>2</sup>  | Cristina Guerra-Marmolejo PhD, Professor<sup>2</sup> | Rosa Iglesias-Parra PhD, Professor<sup>2</sup> | Nuria García-Agua Soler PhD, Professor<sup>3</sup> | María González-Cano-Caballero PhD, Professor<sup>4</sup>

<sup>1</sup>Agencia Sanitaria Costa del Sol, Marbella, Spain

<sup>2</sup>Department of Nursing, Faculty of Health Sciences, University of Málaga, Málaga, Spain

<sup>3</sup>Department of Pharmacology and Pediatrics, Faculty of Medicine, University of Málaga, Málaga, Spain

<sup>4</sup>Department of Nursing, School of Nursing, Physiotherapy and Podiatry, University of Seville, Seville, Spain

## Correspondence

Marina García Gámez, Professor Faculty of Health Sciences. University of Malaga (Spain), C/Arquitecto Francisco Peñalosa (Ampliación Campus Teatinos), 29071 Málaga, Spain.  
Email: magagadue@uma.es

## Funding information

University of Málaga and CBUA.

## Abstract

**Aim and objectives:** The aim of this study is to identify preoperative indicators and/or predictors of complications or inefficiencies in the surgical process that can be modified within nursing practice.

**Background:** Due to rapid sociodemographic and technological change, the global demand for surgical attention is rising exponentially, requiring new strategies for optimisation and sustainability in perioperative care.

**Design:** We conducted the scoping review using the methodology recommended by the Joanna Briggs Institute supported with The PAGER framework and guided by the PRISMA-ScR Checklist.

**Methods:** Four databases (CINAHL, MEDLINE, SCOPUS and PUBMED) were examined to extract relevant published results for elective surgery on adult patients during the period 2011–2021. This process identified 609 records. Exclusion criteria were applied, and the sample was then evaluated with the Quality Assessment Tool for Studies with Diverse Designs (QATSDD), after which 15 studies remained.

**Results:** The following preoperative indicators and/or predictors were considered: (1) Anxiety; (2) Pain; (3) Health education, knowledge and training; (4) Satisfaction; (5) Management/organisation (including costs, resources used/available, organisational issues, hospital stay (preoperative), standardisation and protocolisation.

**Conclusion:** The identification of five indicators and/or predictors of complications or inefficiencies in the surgical process, which can be modified by nursing, allows the effective application of interventions in the preoperative phase, optimising care and improving health outcomes.

**Relevance to clinical practice:** The development and implementation of specific nursing skills in the preoperative phase are essential to optimise the surgical process.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *Journal of Clinical Nursing* published by John Wiley & Sons Ltd.

## KEYWORDS

delay, indicators, nursing, preoperative period, protocols, total quality management in health care

## 1 | INTRODUCTION

Worldwide, major surgery is performed on 234 million patients annually, equivalent to about 4% of the world's population (World Health Organization [WHO], 2019). In Spain, in 2019, 3.6 million surgeries were performed (with or without hospitalisation) (Ministry of Health, Consumption, & Social Welfare of Spain, 2019) a figure that rose to 3.7 million in 2020, despite the pandemic situation (Ministry of Health, Consumption, & Social Welfare - Spanish NHS Statistical Portal, 2020). Moreover, surgical demand continues to increase, due to sociodemographic change, advances in public health policies, socioeconomic development and the exponential introduction of new technologies (Porcel-Gálvez et al., 2021).

In this context, a crucial sociodemographic change is the rapid ageing of the global population. According to the WHO, between 2020 and 2030 the proportion of the world's population aged over 60 years will rise by 34 (WHO, 2021). This rising life expectancy, among other factors, is driving the incorporation of new health technologies, such as the development and application of minimally invasive surgery, which can replace open surgery procedures for elderly patients and achieve significantly better perioperative results (Aloisi et al., 2020). Another example of technological advance in this field is the increasing use of telehealth and telemedicine services, which enable assistance without the need for face-to-face contact, thus preventing viral transmission and reducing the morbidity and mortality associated with infections such as COVID-19 (Fisk et al., 2020; Mann et al., 2020). In this respect, Spain forms part of the global trend, in which the increasing presence of elderly people is associated with greater demand for procedures, increased health spending, diverse impacts on health outcomes and accelerated technological development. All of these developments are currently being given greater momentum by the COVID-19 pandemic (Porcel-Gálvez et al., 2021).

This review is contextualised in the perioperative period, beginning with the decision to undertake surgery and extending until the patient no longer requires specialised care (Blackwood et al., 2018). The surgical actions performed during this period constitute the perioperative process or procedure, which consists of three phases: preoperative, intraoperative and postoperative. Tasks addressed in the preoperative phase include preparing for the surgical intervention, reviewing the patient's medical history, formulating a diagnosis, identifying risk factors, applying measures to limit anxiety and communicating preoperative instructions (e.g. fasting) (Bosse et al., 2015).

The preoperative indicators are measurement instruments that serve to describe and understand the health situation at the beginning of the surgical process, some of the appropriate ones, can also have a predictive effect of the postoperative results at the end

### Summary Box

- The identification of modifiable factors from nursing interventions is useful to improve and optimise preoperative care and postoperative results, acting from an early stage of the process.
- The recommendations derived from the literature review are applicable to all surgical care settings for adult patients undergoing elective surgery.
- There is a need to continue the search for indicators and/or predictors of inefficiency in the surgical process, to enable nursing departments to help optimise the intraoperative and postoperative phases.

of the process, and will be called predictors. These prognostic factors should be considered in terms of decision-making and policy adoption and implementation to prevent infection, improve therapy acceptance and coping, avoid intra- and postoperative complications and infections, optimise resources, apply best practices and high-quality materials, enhance security and humanise the services provided. Research has shown that anxiety, depression, quality of life, patient satisfaction and length of hospital stay are the most significant preoperative outcome variables and are determinants of a successful perioperative procedure (Guo, 2015).

In this context, the hospital manager's ultimate goal is to develop and implement strategies to respond appropriately to changing situations and to optimise the health services provided during the perioperative period. In this paper, we hypothesise that adequate knowledge of the prognostic factors, indicators and predictors that are modifiable within the nursing environment and are relevant to achieving a successful treatment outcome would help determine the initial situation and facilitate the evaluation, adaptation and implementation of appropriate measures in elective surgeries performed in the adult population. In this respect, nurses (especially perioperative nursing personnel) play both transversal and holistic roles, often participating in the application of strategies to enhance perioperative procedures, and may have a major impact on health outcomes (Sillero-Sillero & Zabalegui, 2019).

## 2 | AIM

In the present scoping review, the main aim is to identify preoperative indicators and predictors of complications or inefficiencies during the perioperative period that are susceptible to modification in

nursing practice, as an active, preventive component of the surgical process.

### 3 | METHODS

The methodological steps suggested by Joanna Briggs Institute followed (Peters et al., 2020), guided by the PAGER framework to improve the quality of reporting (Bradbury-Jones et al., 2021) and was reported according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses, extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018) (File S1). The protocol of the scoping review contemplated the consultation of the recommendations with the interested parties; however, this document reports exclusively on the results obtained in the review of the scoping literature (Bradbury-Jones & Aveyard, 2021).

#### 3.1 | Identification of research questions

The search terms were selected in accordance with the research question: What preoperative indicators or predictors of inefficiencies or complications can be optimised by input from nursing practice during the surgical process?

#### 3.2 | Search strategy

A preliminary search strategy was carried out by a member of the research team (EF-F) including the terms “process assessment,” “nursing,” “preoperative assessment,” “indicators” and “quality” in the electronic databases CINAHL, MEDLINE, PUBMED and SCOPUS. Continued with an exploration of key words and terms extracted from the research question objective and abstracts of retrieved papers. The term ‘preoperative assessment’ was modified to ‘preoperative period’ since it delimited the temporal space of the search and not were limited to the assessment, in the same way as ‘process assessment’.

Second, the search strategy included the Boolean operators ‘AND’ and ‘OR’, together with the MeSH thesaurus terms *Nurs\**, *indicators*, *predictors*, *preoperative period*, *total quality management in*

*healthcare*, *waiting list*, *waiting time* and *delay* (Table 1). Was carried out in February 2021, research articles published during the period from 2011 to 2021 were consulted, with no language restriction. The inclusion criteria applied were the availability of an abstract and that the studies should concern elective surgeries for adults aged over 18 years old. Studies with content that was not related to our study aims or which failed to meet the specified quality criteria were excluded (Figure 1). This search was carried out by two members of the research team (EF-F and MG-G). Duplicate articles were eliminated. The abstracts were then read, and articles with non-significant content were discarded.

The last step was analysing the reference list of the included studies to identify additional papers (Peters et al., 2015).

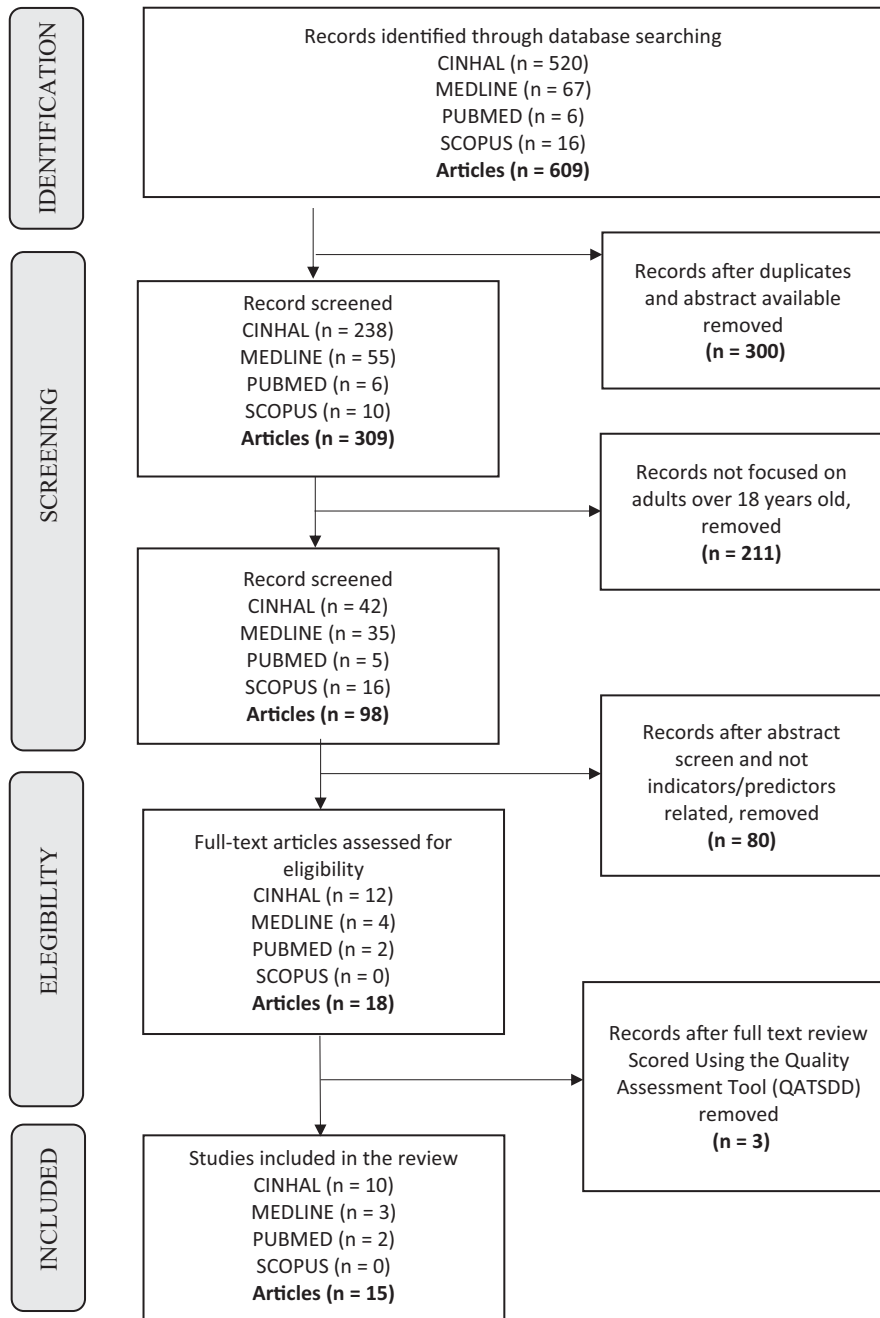
To minimise possible publication bias, two independent researchers performed a single-blind peer review. If any discrepancy was detected, a third researcher (EF-O) was consulted. The information thus compiled was summarised in a database provided to the whole research team, containing details of the searches performed and the articles extracted from each database (article title, journal title, authors, sources, year of publication, type of publication, subject area (if applicable), abstract in the original language and in Spanish and contributions by country/region).

#### 3.3 | Study selection

The review articles obtained were evaluated using the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) (McHugh et al., 2020), which has been validated for use with methodologically heterogeneous studies. First, each indicator or item was defined and examples provided of each criterion used (Fenton et al., 2015). Then, sixteen items were rated on a three-point Likert scale, although some could only be assessed in qualitative and others in quantitative studies (McHugh et al., 2020). In this area of analysis, two researchers (MG-C-C and CG-M), working independently from each other, examined and categorised the preselected articles. In cases of discrepancy, a third researcher (RI-P) was consulted, and a decision taken by consensus. Of the 18 articles originally considered, three were discarded because the corresponding QATSDD score obtained was less than 65% (Perlini et al., 2020; Taylor et al., 2020). This cut-off point was established of based on reference

TABLE 1 Search terms used

Key concepts	Keywords
Nursing	Nurs* as nurs or nurse or nursing or nurses or healthcare professional or health personnel
Procedures and protocols	Procedures and protocols
Indicators or predictors	Indicators or predictors
Preoperative period	Preoperative period
Quality management	Total quality management in healthcare or management
Waiting lists	Waiting lists or waiting time or delay



**FIGURE 1** Flow diagram for the inclusion of articles for analysis

manuscripts, avoiding fractional numbers. Finally, therefore, 15 articles were included in our literature review (Ayyadhah Alanazi, 2014; Brown et al., 2018; Crump et al., 2015; Derseh et al., 2020; Dries, 2018; Husted, 2012; Johansson Stark et al., 2014; Liederbach et al., 2015; de Lorenzo-Pinto et al., 2019; McClurkin & Smith, 2016; Papadopoulos et al., 2016; Pettersson et al., 2017; da Silva Schulz et al., 2020; Vogl et al., 2015; Wyatt et al., 2018) (Table 2).

Studies rated as having good quality described in detail the design and methodology used, gave a detailed presentation of findings and had no study limitations that were likely to affect the reliability and validity of the findings reported. The studies rated as having poor quality had limited information, making the study liable to bias and poor generalisability.

### 3.4 | Charting the data

Data analysis involves ordering, coding, categorising and summarising data from primary sources to achieve a systematic, innovative conclusion. Our review was carried out by two members of the research team (NG-AS and EF-F), who sought at all times to ensure analytical rigour and reliability. The initial analysis consisted of establishing the year of publication of each article and the contribution country-by-country (Figures 2 and 3). Next, from each selected article, the raw indicators and predictors (without a unified nomenclature) that appeared during the preoperative period were extracted. A wide range of indicators and predictors were extracted, summarised and analysed. The aspects addressed

TABLE 2 QATSDD scores for the papers reviewed (McHugh et al., 2020)

Article	Database	Score	%
Johansson Stark et al., (2014)	CINHAL	30	71
Brown et al., (2018)	CINHAL	38	90
Vogl et al., (2015)	CINHAL	39	93
da Silva Schulz et al., (2020)	CINHAL	32	76
Derseh et al. (2020)	CINHAL	28	67
Lorenzo-Pinto et al. (2019)	CINHAL	36	86
Pettersson et al., (2017)	CINHAL	33	79
Ayyadhah Alanazi, (2014)	CINHAL	28	67
Dries et al., (2018)	CINHAL	35	83
Husted, (2012)	CINHAL	38	90
Crump et al., (2015)	MEDLINE	32	76
Papadopoulos et al., (2016)	MEDLINE	31	74
Liederbach et al., (2015)	MEDLINE	41	98
Wyatt et al., (2018)	PUBMED	42	100
McClurkin & Smith, (2016)	PUBMED	32	76
Rampe Reis et al., (2020)	CINHAL	<u>23</u>	<u>55</u>
Silva et al., (2014)	CINHAL	<u>20</u>	<u>48</u>
Lee et al., (2021)	MEDLINE	<u>27</u>	<u>64</u>

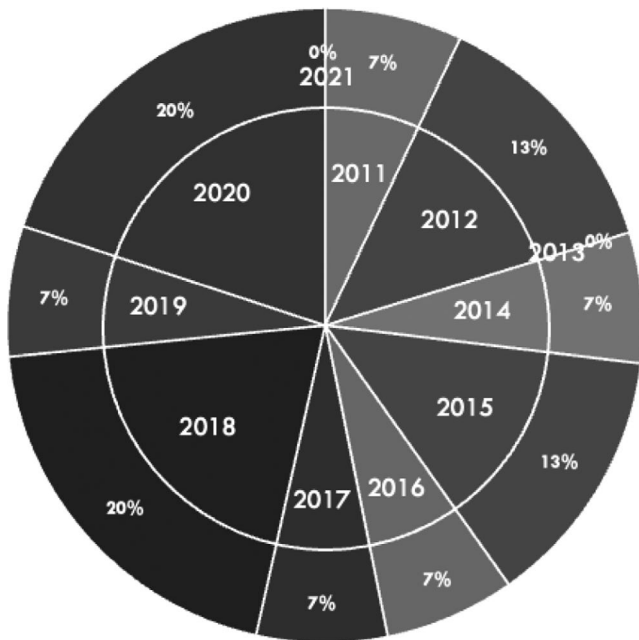


FIGURE 2 Distribution of articles by date of publication

included sociodemographic variables (sex, age, race, education, employment status, professional level, etc.), clinical factors (specific pathology, active medication, preoperative surgical risk, depressive state, pain, preoperative anxiety, etc.), organisational issues concerning the health institution (layout and availability of physical space, shift working system, employment of permanent and temporary staff, etc.), variables affecting healthcare

management (waiting time for surgery, duration of preoperative treatment, patient follow-up, etc.) and various others (patients' capacity for self-care, possible conflicts regarding treatment decisions, etc.).

Once the information has been extracted, brainstorming session was then held to discuss and resolve the items (indicators or predictors) that generated disagreement. Any discrepancies during the data extraction and analysis process were resolved by consensus among the members of the research team (Montoya et al., 2021).

Next, to develop a manageable framework for the data, the indicators and predictors were unified in standardised nursing nomenclature or aggregated by purpose, and a frequency table that quantified their mention on selected articles. This process facilitated the analysis of the qualitative data extracted, enabling their conversion into systematic, clearly distinguished categories of indicators and predictors. The information from the frequency table was then summarised in visual form, presenting the variables and groups (indicators/predictors) as a bar chart to facilitate comparisons and the last column of the results table was completed with the 5 final result indicators (Figure 4 and Table 3).

### 3.5 | Collating, summarising and reporting results

As the final outcome of this synthesis, five main variables susceptible to modification within nurses' area of competence were identified. Of the five indicators, three of them correspond to nursing diagnoses classified by NANDA International (Herdman et al., 2021) which are [00146] Anxiety, [00161] Preparation to improve knowledge and [00132] Pain acute. However, the research team decided to name the last two as Health Education and Pain for better management, analysis and synthesis and facilitate the readability of the manuscript and interpretation of the results by the reader.

Finally, the results obtained were classified according to the nursing nomenclature using the NANDA nursing diagnoses and the interventions according to the Nursing Interventions Classifications (Butcher et al., 2018) (Table 4). In addition, the research team developed the PAGER framework as a reflective tool that in turn provides a consistent approach for the analysis and presentation of the review findings (Bradbury-Jones et al., 2021) (Table 5).

## 4 | RESULTS

The advanced bibliographic search carried out, as described above, initially obtained 609 articles. After eliminating duplicate articles, those lacking an abstract and those not describing medical care for adults, 98 articles remained. In each case, the subject matter addressed was then identified by reading the abstract, a process that left 18 articles eligible for the detailed review (Figure 1).

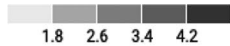


FIGURE 3 Contributions by countries

#### 4.1 | Quality assessment

The quality of the 18 preselected articles was evaluated using the QATSDD tool. This process led to three being discarded (Lee et al., 2021; Rampe Reis et al., 2020; Silva et al., 2014), leaving 15 articles to be considered in the scoping review (Table 2).

#### 4.2 | Characteristics of the articles reviewed

Among the articles reviewed, the two most frequent years of publication were 2018 (Brown et al., 2018; Dries, 2018; Wyatt et al., 2018) and 2020 (Derseh et al., 2020; da Silva Schulz et al., 2020; Vogl et al., 2015) ( $n = 3$ ), followed by 2012 (Husted, 2012; Johansson Stark et al., 2014), 2015 (Crump et al., 2015; Liederbach et al., 2015) ( $n = 2$ ), 2011 (Papadopoulos et al., 2016), 2014 (Ayyadhah Alanazi, 2014), 2016 (McClurkin & Smith, 2016), 2017 (Pettersson et al., 2017) and 2019 (de Lorenzo-Pinto et al., 2019). None of these articles were published in 2013 or 2021 (Figure 2).

The articles reviewed were conducted in 18 countries and five continents. By location, the largest number of articles originated from the United States (17%), followed by Germany (10%), Australia, Brazil, Canada, United Kingdom and Sweden (7% each) and Austria, China, Denmark, Spain, Ethiopia, Finland, France, Islamic Republic of Iran, Iceland, Japan and Norway (3% each) (Figure 3).

The results of the scoping review are summarised in Table 2, showing the characteristics of each study, its aims, the indicators or predictors considered, the authors and the year of publication.

Initially, 133 indicators and/or predictors of the preoperative phase were extracted (Table 2). However, neither the sociodemographic variables (age, sex, race, place of residence or educational level nor the medication prescribed during the preoperative period (such as analgesics, antiemetics, antiaggregants or anticoagulants) were modifiable by the nursing staff.

The following indicators and/or predictors that are modifiable by nursing personnel were then identified as being most significant, according to their frequency of appearance in the articles reviewed: (1) preoperative anxiety; (2) pain; (3) health education, the patients' expected and received knowledge, and health personnel training; (4) patients' satisfaction with the surgical process; (5) management and organisation (including the standardisation and protocolisation of processes and documents, resource management, cost control and management of the length of hospital stay, with respect to the preoperative period) (Figure 4 and Table 2).

As can be seen, the indicators and predictors related to hospital management and organisation are most commonly considered susceptible to modification by nursing personnel from an early stage of the perioperative period. These factors are closely followed in frequency of appearance by the control of preoperative anxiety. This area of concern is strongly related to perceptions of pain and, in turn, to the provision of appropriate preoperative health education. In this respect, information transmission should be clear and bidirectional, and compliance with this requirement will determine whether patients and their companions acquire the necessary knowledge and understanding. The final indicator and/or predictor of complications during the perioperative period is the presence and degree of patient satisfaction during the process.

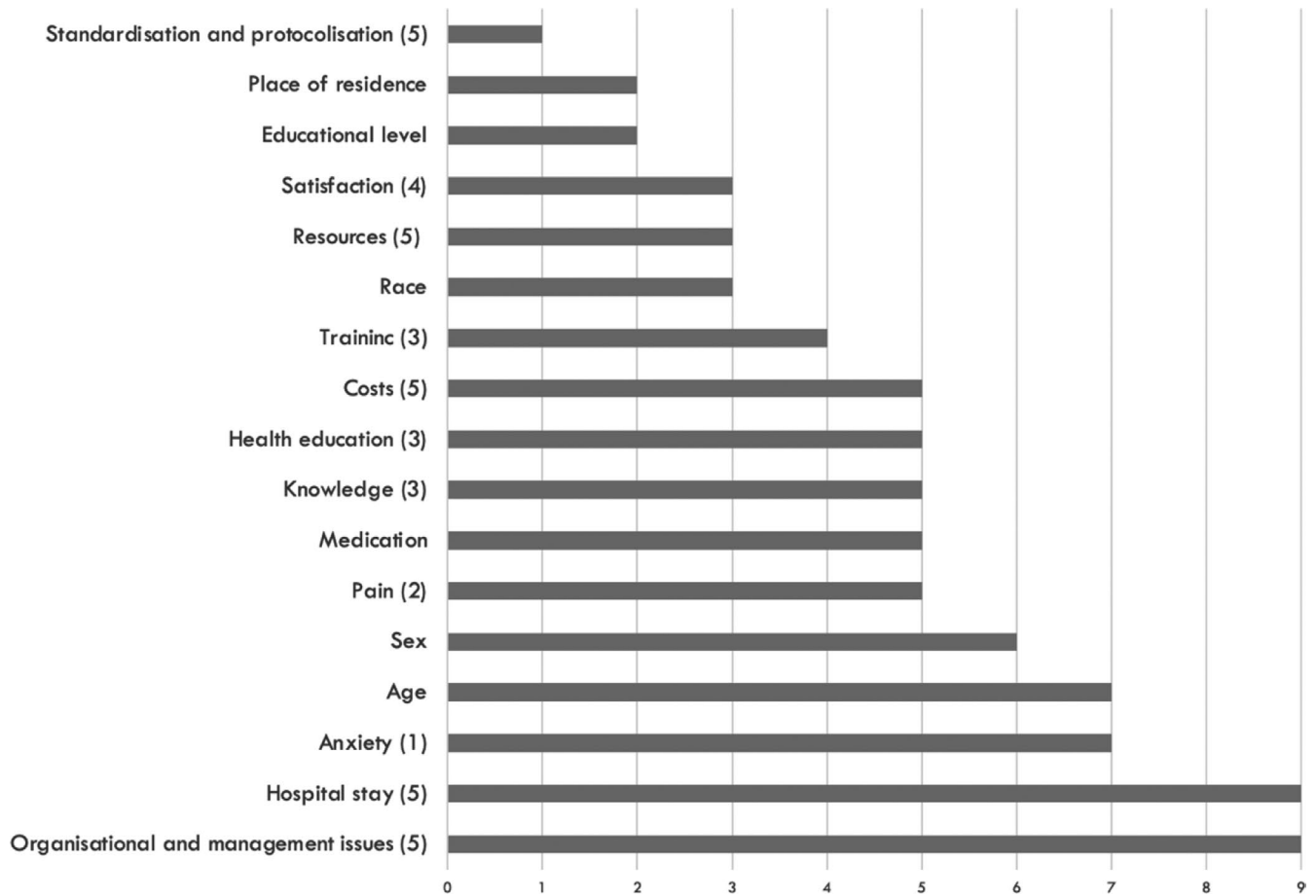


FIGURE 4 Bar chart, showing the main indicators and predictors and the number of articles in which they are mentioned. The groups that are modifiable by nursing personnel are numbered 1-5

### 4.3 | Preoperative anxiety

Anxiety is a temporary emotional state of fear, nervousness and tension caused by a highly active autonomic system (Fu et al., 2020). This modifiable indicator or predictor is mentioned in seven of the articles reviewed (Ayyadhah Alanazi, 2014; Brown et al., 2018; Crump et al., 2015; Johansson Stark et al., 2014; McClurkin & Smith, 2016; Petterson et al., 2017; da Silva Schulz et al., 2020).

Many of these articles emphasise the importance of information flow between healthcare professionals and patients in facilitating the control of preoperative anxiety. This information flow might be achieved via prior consultations in which health education and structured information are provided, thus ensuring that the knowledge received is in line with the patient's expectations (Brown et al., 2018; Johansson Stark et al., 2014; Petterson et al., 2017; da Silva Schulz et al., 2020). The factors that may influence the effectiveness of information transmission include the patient's education background, the presence or absence of depression, the training of the healthcare professionals involved and the time available for this purpose (Johansson Stark et al., 2014). Reducing preoperative anxiety may shorten the hospital stay, alleviate perioperative complications such as pain, promote wound healing, help recover personal autonomy, decrease the incidence of sleep problems and lessen the need for

anxiolytic treatment (which would otherwise decrease alertness and possibly cause side effects or require prolonged postoperative visits (Ayyadhah Alanazi, 2014; McClurkin & Smith, 2016).

Measures that have been proposed to control anxiety include health education, reducing waiting times to see a specialist and the provision of non-pharmacological measures (Ayyadhah Alanazi, 2014; McClurkin & Smith, 2016).

According to McClurkin and Smith (McClurkin & Smith, 2016), such measures may take the form of humorous distraction, prayer, massage, herbalism, megavitamins, acupuncture, visual images or the maintenance of a comfortable and relaxed environment, supervised by the nurses responsible. Another valuable approach is that of music therapy, type and time-controlled and provided only during the 15 min prior to surgery. The provision of music is an independent and often effective nursing intervention, helping create a calming environment. The musical genres can be patient-selected, but should be only instrumental and slow. These authors recommend that hospitals and ambulatory surgical centres should consider investing in appropriate libraries and systems to enable music to be incorporated as a standard part of the preoperative regimen (McClurkin & Smith, 2016). Musical intervention is safe, does not require training and can readily be provided as a therapeutic complement for preoperative patients (McClurkin & Smith, 2016).

TABLE 3 Preoperative indicators and predictors of complications during the perioperative period, according to each article considered

References	Design	N	Duration	Sex	Mean age (years)
Johansson Stark et al., 2014	Descriptive study	320	3 years (2009–2011)	55% women, 45% men	64
Brown et al. (2018)	Descriptive study	67	20 months (Apr 2015 to Jan 2017)	100% women	58
Vogl et al. (2015)	Cohort study	26,525	6 months	63.85% women, 36.15% men	68.5
Schulz et al. (2020)	Randomised controlled study, bicentric	43	6 months (Mar-Aug 2016)	58.1% women, 49.1% men	69.3
Derseh et al. (2020)	Institution-based cross-sectional study	254	4 years (Jan 2014 to Dec 2017)	11% women, 89% men	34
Lorenzo-Pinto et al. (2019)	Analytic, observational study	5415	4 months (July-Oct 2017)	73.7% men	76



Objectives	Results: Indicators and predictors	Indicators and predictors (by groups) modifiable by nursing
To describe the differences between received and expected knowledge in patients undergoing elective hip replacement in three Nordic countries, and to consider how these differences are related to patients' characteristics, preoperative symptoms and emotions.	Health education Anxiety Pain Hospital stay Relationship of received/expected knowledge Predictors: education, professional status, depressive state	Anxiety (1) Pain (2) Knowledge (3) Health education (3) Hospital stay (5)
To identify differences in the perception of a breast care nurse (BCN) consultation between women who experienced preoperative, face-to-face counselling and education with a BCN, and those who had a telephone consultation or were unable to attend a preoperative BCN consultation.	Anxiety and intraoperative psychological distress due to the absence of a preoperative breast care nursing consultation. Preoperative consultation time. Type of query (null, face-to-face or telephone). Age. Employment status. Place of residence. Type of surgery. Preoperative knowledge/understanding. Preoperative psychological support. Preoperative practical support.	Anxiety (1) Knowledge (3) Training (3) Organisational and management issues (5)
To compare pre- and postoperative health-related quality of life and length of hospital stay after total hip replacement in matched German and English patient cohorts, testing for differences in admission thresholds, clinical effectiveness and resource utilisation.	Referral and treatment delay and interval between indication for surgery and intervention. Length of hospital stay. Perception of preoperative quality of life. Resource utilisation.	Organisational and management issues (5) Hospital stay (5) Resources (5)
To evaluate the effectiveness of telephone consultation in reducing the duration of surgical recovery in patients undergoing laparoscopic cholecystectomy and hernia repair.	Professional-patient communication. Hospital stay. Anxiety. Patient satisfaction. Nursing diagnoses. Sociodemographic variables. Pain. Fatigue. Post-operative expectations. Antiemetic medication.	Anxiety (1) Pain (2) Health education (3) Training (3) Satisfaction (4) Hospital stay (5)
To assess results following surgery for intestinal obstruction in an Ethiopian hospital.	Age. Late presentation of the disease. Follow-up of patients. Surgical management In-hospital death. Sociodemographic factors (age, sex, residence). Duration of the disease. Cause of pathology (intestinal obstruction).	Organisational and management issues (5)
To calculate the rate of cancellation of elective surgical procedures due to inadequate management of chronic medications, and to analyse the underlying causes.	Interval between preoperative evaluation and surgery. Inappropriate use of chronic medications such as antiplatelets or anticoagulants. Intercurrent disease. Inadequate preparation (fasting). Ignorance of the date and time of surgery. Difficulty of the anaesthetist in giving understandable instructions. Sociodemographic variables (age, sex, etc.). Available resources.	Knowledge (3) Training (3) Organisational and management issues (5) Resources (5)

TABLE 3 (Continued)

References	Design	N	Duration	Sex	Mean age (years)
Petterson et al. (2017)	Analytic, observational study	7	8 months (Dec 2010 to July 2011)	3 women, 4 men	66
Alanazi et al. (2014)	Systematic review	14 interventional trials. 1752 participants	3 months (May-July 2013)	No data	No data
Dries et al. (2018)	Descriptive cross-sectional study	1979	18 months (Jan 2010 to June 2013)	Male 440, (22.2%) female 1539 (77.8%)	No data
Husted (2012)	Review	9 papers	No data	No data	No data
Crump et al. (2015)	Descriptive study	700	4 years	No data	No data
Papadopoulus et al. (2011)	Cohort study	207	6 years and 6 months (Jan 2008 to Jan 2013)	54% men, 46% women	82.8

Objectives	Results: Indicators and predictors	Indicators and predictors (by groups) modifiable by nursing
To describe topics, structures and documentation in preoperative nursing consultations with patients undergoing surgery for colorectal cancer.	(Evaluation of 7 topics; 41 subtopics) Health status Pre-surgery preparation Discovery of tumour symptoms. Anxiety. Self-care. Lack of time. Non-standardised questionnaire. Knowledge. Nursing training. Administrative problems and solutions. Health education.	Anxiety (1) Knowledge (3) Training (3) Health education (3) Hospital stay (5) Organisational and management issues Standardisation and protocolisation (5) Resources (5)
To investigate the effectiveness of various preoperative educational interventions in reducing preoperative anxiety	Anxiety. Pain. Pharmacological interventions. Costs.	Anxiety (1) Pain (2) Health education (3) Hospital stay (5) Costs (5)
To determine whether rapid surgical interventions for elderly patients with fragility fractures are related to reduce length of hospital stay, total inpatient charges, in-hospital mortality and post-admission development of delirium and pressure ulcers.	Preoperative anxiety. Morbidity. Mortality. Costs. Development of pressure ulcers. Delirium on admission. Fracture site (hip fractures for study of rapid interventions, that is <24 h). Demographic variables (race, sex).	Hospital stay (5) Costs (5)
To reduce morbidity, mortality and functional convalescence by the early achievement of functional milestones (such as discharge criteria), thus reducing length of hospital stay and increasing patient satisfaction.	Hospital stay Pain (analgesia, specific techniques). Safety. Patient satisfaction. Costs/savings. Organisational configuration (permanent/temporary staff, continuity, information, motivation, availability). Morbidity/mortality. Patient education. Age. Sex.	Pain (2) Health education (3) Satisfaction (4) Hospital stay (5) Costs (5) Organisational and management issues (5)
To determine the impact of 'wait one' (W1) for elective surgeries on patients' health and whether this time can be reduced	Waiting time for surgeon consultation (before indication of surgery). Health status. Pain. Depression. Medical and/or psychological syndromes. Anxiety. Knowledge and understanding. Treatment decision conflicts.	Anxiety (1) Pain (2) Knowledge (3) Organisational and management issues (5)
To report experiences with fast-tracking patients undergoing transapical transcatheter aortic valve implantation and to determine perioperative predictors for fast-track protocol failure.	Hospital stay. Mortality. Age (>80 years). Sex. Health status (COPD, chronic pulmonary hypertension, AH, DM, CKD, smoking, peripheral disease, cerebrovascular disease, etc.). Other medical history.	Hospital stay (5)

References	Design	N	Duration	Sex	Mean age (years)
Liederbach et al. (2015)	Descriptive observational study	819,175	9 years (2003 to 2011)	100% women	≤45 = 13.7%, 46–55 = 25%, 56–64 24.1%, ≥65 37.2%
Wyatt et al. (2018)	Cohort study	254	7 months (Mar-Sep 2016)	100% women	44
McClurkin and Smith (2016)	Experimental study; randomised control trial	133	No data	No data	54

#### 4.4 | Pain

Pain during the preoperative period is a predictor of subsequent complications, according to five of the studies reviewed (Ayyadhah Alanazi, 2014; Crump et al., 2015; Husted, 2012; Johansson Stark et al., 2014; da Silva Schulz et al., 2020).

As noted above, pain is directly related to preoperative anxiety and depression, and therefore, the measures used to control preoperative anxiety impact on the perception and treatment of pain and vice versa (Ayyadhah Alanazi, 2014). Accordingly, detecting pain at an early stage and addressing it on the basis of appropriate preoperative health education (in which there is an acceptable relationship between the information expected and received) are questions of great importance (Ayyadhah Alanazi, 2014; Johansson Stark et al., 2014).

Among other consequences, the pain experienced by the patient determines the length of time needed to reinitiate the normal activities of life and to enjoy health and well-being. Its excessive presence delays surgical recovery and may extend post-surgical hospital stay (Husted, 2012; da Silva Schulz et al., 2020). In this respect, Husted mentions the ideal notion of 'the surgical operation without pain or risk', first formulated in 1994 (Husted, 2012; Kehlet, 1994). Needless to say, this goal has yet to be achieved. Steps that are being taken in this direction include the use of various combinations of anaesthetics and other pain-reducing drugs, together with technological advances, mobilisation regimens, re-evaluated principles of care, optimised logistics, education and motivation, improved surgical techniques and fast-track perioperative circuits. These endeavours produce synergies and when applied successfully can replace potentially harmful traditions with more beneficial, evidence-based clinical features, thus ensuring that patients will receive the best possible treatment at all times (Husted, 2012).

#### 4.5 | Health education, knowledge and training

In eight of the fifteen articles reviewed, health education and information provision for patients and their families, together with training for the professionals responsible, are cited as preoperative indicators or predictors as a means of alleviating the complications of the surgical process (Ayyadhah Alanazi, 2014; Brown et al., 2018; Crump et al., 2015; Husted, 2012; Johansson Stark et al., 2014; de Lorenzo-Pinto et al., 2019; Pettersson et al., 2017; da Silva Schulz et al., 2020).

Various articles highlight the importance of nurses providing preoperative health education in the form of structured consultations, whether face-to-face (Pettersson et al., 2017), by telephone (da Silva Schulz et al., 2020), or through visual means such as multimedia, with verbal or non-verbal support (Ayyadhah Alanazi, 2014). In this respect, Brown et al. (Brown et al., 2018), in a study of patients requiring breast cancer surgery, demonstrated the effectiveness of preoperative nursing consultations, in person or by telephone. Benefits were also obtained when this consultation was performed during or even after treatment. Similarly, Pettersson et al. (Pettersson et al., 2017), in their study of general, digestive and ostomy surgery considered it essential to protocolise the duration and content of nursing consultations. In short, comprehensive nursing support in any preoperative context reduces anxiety and facilitates education and counselling for patients and their families, addressing both emotional and physical needs (Sillero-Sillero & Zabalegui, 2019). Further developing this idea, Johansson Stark et al., (2014) suggested that patient education should be personalised to promote person-centred care and shared decision-making, and that nurses should play a leading role in this activity. The ultimate goal of consultation, communication and education is to empower patients, enhance their satisfaction and promote self-care, thus optimising

Objectives	Results: Indicators and predictors	Indicators and predictors (by groups) modifiable by nursing
To generate normative data to help establish standards for the timely delivery of breast surgical care using the National Cancer Database.	<ol style="list-style-type: none"> <li>Socioeconomic factors (age, Black or Hispanic race, health insurance, education, metropolitan residence, comorbidities, stage of the disease).</li> <li>Academic/research facilities (volume and location).</li> </ol>	Organisational and management issues (5)
To improve assessment for pregnancy before scheduled outpatient gynaecologic surgical procedures.	Costs. Efficiency (delays in starting the procedure).	Costs (5) Organisational and management issues (5)
To analyse the effectiveness of music therapy applied for 15–30 min to reduce anxiety and enhance satisfaction.	Preoperative anxiety. Use of analgesics. Sleep problems. Costs. Anxiolytic treatment. Non-pharmacological treatment for anxiety (distraction, prayer, massage, herbalism, acupuncture, images or music). Satisfaction. Alteration of vital signs (respiratory rate, pulse).	Anxiety (1) Satisfaction (4) Hospital stay (5) Costs (5)

post-surgical recovery, controlling pain, improving the patient's knowledge and understanding of the processes involved and reducing anxiety. As regards organisational issues, by monitoring preoperative knowledge and potential decision conflicts, planners can identify factors that may shorten waiting times, reduce the need for hospital stay and prevent unnecessary cancellations due to 'inadequate preparation of the patient', for reasons such as incorrect medication or non-compliance with preoperative instructions (Crump et al., 2015; Husted, 2012; de Lorenzo-Pinto et al., 2019).

Pettersson et al., (2017) stressed the value of formal training for nurses in communication theory and in how to create a dialogue, in order to avoid situations in which the nurse's attention is focused exclusively on technical aspects. If there is no active listening, if a two-way relationship is not fostered, the patient is likely to be treated merely as a passive recipient of attention. Husted, (2012) made a similar point, arguing that nursing staff should be trained in relational coordination, to adopt a uniform approach based on informing and motivating the patient.

#### 4.6 | Satisfaction

Three of the fifteen articles reviewed mention patient satisfaction as a determinant prognostic factor in the perioperative period. In the preliminary phase, this aspect is closely related to the patient's preparation, the information received and the postoperative outlook (Husted, 2012; McClurkin & Smith, 2016; da Silva Schulz et al., 2020).

According to Husted, (2012), it is essential to reduce preoperative dissatisfaction in order to increase the patient's general satisfaction with the health care received. To this end, information should be provided and the patient motivated to play an active role, whilst modulating expectations regarding the likely outcome of the process.

Age is positively associated with patient satisfaction, particularly among the very young and the very old. However, the opposite relation holds for anxiety. Accordingly, the application of formulas to mitigate anxiety and intensify the bond between patients and health professionals will help increase satisfaction (McClurkin & Smith, 2016; da Silva Schulz et al., 2020).

#### 4.7 | Management and organisation

Broadly speaking, the aspects of management most commonly cited in the articles reviewed as significant indicators and predictors in the preoperative period involve organisational questions affecting the institution as a whole, the creation of protocols and standards and the deployment of strategic resources in accordance with budget constraints. Within the preoperative period, five main areas are identified as susceptible to influence and improvement by nursing personnel: organisational and management issues (cited in nine articles), the length of (preoperative) hospital stay (in seven), the resources employed (in three), the costs incurred (in five) and the creation of protocols and standards (in one).

The following organisational and management issues have been considered relevant indicators/predictors: response times, such as the time elapsed between initial consultation and surgery, referral or treatment (Brown et al., 2018; Crump et al., 2015; de Lorenzo-Pinto et al., 2019; Vogl et al., 2015); the effectiveness of follow-up (Derseh et al., 2020); the occurrence and resolution of administrative problems (Pettersson et al., 2017); variables affecting organisational efficiency during the initial phase of the perioperative period (Wyatt et al., 2018); micromanagement questions (Husted, 2012; Pettersson et al., 2017); and the profile of the health institution itself, which will influence the patient's access and response to treatment (Liederbach et al., 2015).

Preoperative consultations not only facilitate health education, but also constitute a valuable management and organisational strategy within the perioperative process. In this sense, Pettersson et al., (2017) detailed the method to be followed and the structures required, highlighting the need for standardised procedures, adequate resources, sufficient time and specialised, comprehensive training for the professionals involved. In addition, de Lorenzo-Pinto et al., (2019) emphasised the importance of advance preparation and the need to reconcile recommendations and treatment. These authors suggested that the pharmacy service should take responsibility for medication control, based on the anaesthesia register, institutional protocols and clinical guidelines. To this, Brown et al., (2018) added that the hospital should foster the availability of preoperative consultations by offering flexible working hours and alternative types of attention, that is in person or by telephone.

Also in this area of management and organisation, three articles identified the question of available resources as a preoperative predictor of health outcomes (de Lorenzo-Pinto et al., 2019;

Pettersson et al., 2017; Vogl et al., 2015), and another five mentioned the impact of costs and the need to achieve financial savings in order to anticipate or prevent complications (Ayyadhah Alanazi, 2014; Dries, 2018; Husted, 2012; McClurkin & Smith, 2016; Wyatt et al., 2018).

Other potential indicators/predictors fall under the heading of standardisation and include aspects such as unification and structuring by creating standard elements and instruments for use in health care and by establishing protocols for each of the processes involved. Unifying the questionnaires used in healthcare practice would help identify possible complications in the preoperative phase by avoiding data heterogeneity (Pettersson et al., 2017; Wyatt et al., 2018). Moreover, it would facilitate the compilation and analysis of strategies and protocols, and enable planners to modify those not meeting criteria of efficiency and effectiveness (Ayyadhah Alanazi, 2014; Dries, 2018; Vogl et al., 2015). In a related study, Husted (Husted, 2012) emphasised the need to implement protocols to analyse and optimise organisational activities. This author discussed the case of fast-track surgical protocols (specifically, regarding knee

Indicator Predictor	NANDA	NIC
Anxiety	[00146] Anxiety	[5820] Anxiety reduction [5880] Calming technique [6040] Relaxation therapy
Pain	[00132] Acute pain	[0224] Exercise therapy: Joint mobility [0840] Positioning [2210] Analgesic administration
Health Education	[00161] Readiness for enhanced knowledge	[5510] Health education [5610] Teaching: Preoperative [5305] Health coaching [5250] Decision-making support [4420] Patient contacting [5470] Truth telling [5270] Emotional support [5460] Touch [4340] Assertiveness training [6520] Health screening [8180] Telephone consultation [8190] Telephone follow-up
Satisfaction	[00246] Risk of delayed surgical recovery	[2930] Surgical preparation
Management/ Organisation	[00100] Delayed surgical recovery	[7615] Collaboration enhancement [7630] Cost containment [7830] Staff supervision [7760] Product evaluation [8550] Fiscal resource management
	[00292] Ineffective health maintenance behaviour	[7970] Health policy monitoring [2920] Surgical precaution [2930] Surgical preparation [7926] Documentation: meetings [7920] Documentation [7400] Health system guidance
	[00126] Deficient knowledge	[2880] Preoperative coordination [7320] Case management [2880] Preoperative coordination

**TABLE 4** Review outcomes, in terms of standard nursing practice taxonomy

TABLE 5 PAGER framework (Bradbury-Jones et al., 2021)

Patterns	Advances	Gaps	Evidence for practice	Research recommendations
Anxiety	There is evidence of an associative relationship between preoperative anxiety and perioperative complications or undesirable health outcomes	There is a need for ongoing empirical work exploring a homogeneous and multidisciplinary strategy to address anxiety throughout the entire perioperative process, but especially from the earliest stage, the preoperative	It is important for nurses to take a leadership role in dealing with anxiety given their strategic position and skills, training specifically for this  It is important to consider the use of alternative therapies for anxiety control	To continue working on developing and validating the implementation of alternative therapies for the control of preoperative anxiety by nursing.  Unification of strategies
Pain	There is evidence of an associative relationship between poorly studied and controlled pain and perioperative complications or undesirable health outcomes	There is a need for an empirical work that specifically evaluates the previous pain with the final health outcomes during the surgical process	It is important for nurses to understand the importance of pain management throughout the surgical process. It should also be considered by other professionals involved.  It is important to develop procedures for early detection, control and follow-up pain starting from the preoperative period	To carry out more research to explore to what extent (qualitatively and quantitatively) pain treatment, in each of the perioperative phases, improves health outcomes and prevents complications
Health education	There is evidence of an associative relationship between an appropriate preoperative health education and perioperative complications or undesirable health outcomes	-	It is important for nurses to be instructed to implement pre-surgical consultations (face-to-face, telephone or telematic) that are adapted to the needs and consider a structured methodology centred on the person	To continue working on developing and validating the implementation of pre-surgical consultations led by nurses

(Continues)

TABLE 5 (Continued)

Patterns	Advances	Gaps	Evidence for practice	Research recommendations
Satisfaction	There is evidence base on patient satisfaction and health outcomes of the perioperative process	There is a need for work that explores satisfaction specifically in the initial phase and exactly with which variables it is directly related	It is important that nurses consider (detection, measurement, and treatment) the satisfaction of the patient who is going to undergo surgery	Conduct preoperative research and analysis of patient satisfaction
Management/ Organisation	There is a growing evidence base that links decision-making and organisational, training, and procedural problems in health institutions with the health outcomes of surgical procedures	There is evidence of the need to improve many aspects related to organisation and management; however, there is a need for work that provides tactical solutions that can be extrapolated or generalised to many health institutions	It is important for nurses to promote their own training and specialisation to respond to new unmet needs (Advanced Practice Nursing in the perioperative period). It is important for nurses to promote the standardisation of the procedures and protocols of their own work and all whilst advocating for the sustainability of the health system by promoting the efficient use of available resources	To carry out more research exploring the differences between the training, roles, and competencies of advanced perioperative practice nurses in different countries around the world and their outcomes



and hip arthroplasties) and recommended that a logistical approach be applied to patient admission. Other desirable features were that staff should be educated to take a uniform approach; that more preoperative information should be provided (including the expected length of hospital stay and the functional discharge criteria applied); that short-stay departments should be structured in a standard format; that employment patterns should be stable, with a high degree of continuity; and finally, that good use should be made of the time available.

The strategies described by Husted are related to another indicator, hospital stay, which is cited in nine articles (Ayyadhah Alanazi, 2014; Dries, 2018; Husted, 2012; Johansson Stark et al., 2014; McClurkin & Smith, 2016; Papadopoulos et al., 2016; Pettersson et al., 2017; da Silva Schulz et al., 2020; Vogl et al., 2015). This term is usually understood to mean an overnight stay plus the time corresponding to the provision of a main meal (lunch or dinner). This prognostic factor has been widely studied because it is relevant to preventing infection and other complications (da Silva Schulz et al., 2020). It is also related to preoperative anxiety, pain, preparation, risk factors and the patient's knowledge and expectations of the surgical process (Ayyadhah Alanazi, 2014; Husted, 2012; Johansson Stark et al., 2014; McClurkin & Smith, 2016; Pettersson et al., 2017). Two papers analyse fast-track surgical procedures and conclude that abbreviating the perioperative period and facilitating prompt discharge significantly enhance clinical results (Dries, 2018; Papadopoulos et al., 2016). These findings corroborate Vogl et al., (2015), who suggested that a shorter hospital stay was not associated with worse health outcomes after 6 months.

## 5 | DISCUSSION

The results obtained from this review demonstrate the existence of preoperative indicators and/or predictors of complications or inefficiencies in the surgical process, some of which can be modified during nursing practice. If these indications are correctly identified, effective protocols, procedures and strategies can be devised and implemented to anticipate and prevent the occurrence of adverse effects during the perioperative period.

According to several recent studies, preoperative anxiety is the most common problem during the preoperative period (Mulugeta et al., 2018). This anxiety may delay hospital admission and provoke significant difficulties in the hospital environment, especially regarding anaesthesia and the performance of surgery. Moreover, this delay could result in greater postoperative pain, the increased consumption of analgesics, a prolonged hospital stay and higher costs. The nursing department can play a fundamental role in mitigating preoperative anxiety and helping control its harmful effects (Fu et al., 2020), by considering non-pharmacological methods, among other measures (McClurkin & Smith, 2016). Kanza Gul & Solt Kirca, (2020) reported that the use of non-pharmacological methods such as acupuncture to control anxiety (in pregnant

women scheduled to undergo a caesarean section) can obtain significant benefits. Similarly, Jaruzel et al., (2019) concluded that aromatherapy can be beneficial to women undergoing breast surgery.

A direct relationship between anxiety, pain and preoperative depression was established by Ayyadhah Alanazi, (2014), corroborating previous work by Strøm et al., (2018), who concluded that the inadequate management of anxiety and the existence of preoperative depression are important predictors of negative clinical outcomes, including greater pain, physical deterioration and a lower health-related quality of life, among patients undergoing spinal surgery. The authors also noted that pain, lack of information, disability, the return to work and mental health status were all interacting factors that influenced anxiety and depression before and after surgery.

Crump et al., (2015) supported the view that the presence of pain should be considered an indicator and identifier of the patient's willingness to undergo surgery, and of the final decision taken in this respect. Accordingly, this indicator can be used to optimise referrals for elective surgery, either through better patient education on surgical interventions or through shared, better decision-making.

With respect to pain, nursing attention consists of early detection, treatment reconciliation, referral and control/monitoring. All of these tasks are influenced by the overarching role of preoperative education (Giardina et al., 2020) and by the information received by the patient (Navarro-Gastón & Munuera-Martínez, 2020).

As concerns the latter factors, it is generally considered that patients wish to have more information; indeed, studies have shown that preoperative knowledge and anxiety are inversely related (Wongkietkachorn et al., 2018). However, our review findings suggest this generalisation should be avoided; the patient's situation should be evaluated beforehand, to personalise information provision and adapt health education to individual needs, without assuming that all patients wish to be exhaustively informed about techniques, surgical risks and processes. This understanding is supported by Wongkietkachorn et al. (Wongkietkachorn et al., 2018), in whose study almost half of the participants preferred to receive more concise information about their disease process.

Preoperative education has been widely studied as an important factor influencing patient expectations about surgery and is believed to reduce anxiety and aid recovery (Giardina et al., 2020). To be effective, however, this education should be applied systematically from a patient-centred standpoint, to enhance the relationship between expected, received and assimilated knowledge. Moreover, the approach taken should be comprehensive, permitting the recognition of idiosyncratic beliefs and fears, to facilitate the planning and provision of adapted education, based on the patient's needs (Jarmoszewicz et al., 2020; Viftrup et al., 2021). In this sense, sociodemographic variables are commonly mentioned in the articles reviewed as significant indicators or predictors in the preoperative period. Although these factors are not modifiable by nursing

interventions, they should be taken into consideration to offer personalised health education for patients and their families and thus overcome barriers and correct misapprehensions that might interfere with the transmission of information. The language employed in providing patient education should be adapted to take account of the individual's age, possible sensory limitations and prior education, avoiding the undue use of technicalities. Liederbach et al., (2015) analysed the relationship between certain sociodemographic factors, different types of healthcare facilities and closely related predictors of delay in receiving breast cancer surgery. These authors concluded that in many cases these factors determined accessibility and waiting times, and therefore that the health care provided, including patient education, should reflect the specific context.

A growing body of research is highlighting the essential importance of communication skills in the provision of nursing services (Fu et al., 2020). Thus, Kim & Sim, (2020) observed that communication skills and a good understanding of the patient's condition are directly relevant to perceptions of nursing competence. Accordingly, nursing departments should emphasise these concerns and develop programmes to raise awareness and strengthen nurses' professional skills, and thus enhance the perceived quality of medical services.

Pettersson et al., (2017) emphasised the importance of specific training for nurses in communication skills, even before their entry into the profession. These authors argued that communication skills should be fostered within university education because they are universally applicable and of fundamental importance throughout professional life, including but not limited to clinical training. Once again, it becomes evident that the scope and complexity of nurses' skills require very deliberate educational preparation to ensure the safety and quality of patient care (Considine et al., 2021).

With respect to patient satisfaction in the initial stages of the surgical process, our review of the studies conducted in this area reveals certain limitations. Further research is needed to consider each of the perioperative phases, and the overall process, in order to determine whether the treatment provided is optimal.

Regarding indicators or predictors related to hospital management and organisation, preoperative consultations, based on methods standardised in content and in form, are increasingly provided. The channels used for this type of consultation are still evolving, as demonstrated by the current surge in the use of mobile telecommunications and the priority goal of health planners to improve accessibility. Therefore, the possible use of telemedicine should be viewed as a factor of strategic importance in pre-anaesthetic nursing consultations. For example, the field of anaesthesiology has benefited greatly from this technology since 2004, both in rural settings and in metropolitan areas, with high rates of user satisfaction, fewer appointment cancellations, greater financial savings and no reduction in the quality of health services or outcomes (Sigal et al., 2020). Nevertheless, nursing professionals and health institutions are urged to share their knowledge, successes and shortcomings in order to improve existing instruments, to enable the design

of comprehensive protocols, to facilitate the analysis of patient selection, to determine the satisfaction of patients and healthcare providers, to assess equipment reliability and performance and to guarantee the security of confidential health information (Bridges et al., 2020). Ming Teh et al., (2016) reported the effectiveness of attention to these questions in a study of formal training and specialised functions.

In view of these considerations, we recommend the development and implementation of specialist training in Advanced Nursing Practice for the perioperative period, to monitor the surgical process from the preoperative stage to the immediate postoperative period and the patient's subsequent referral to primary care (Turunen et al., 2017).

For healthcare managers, an essential consideration is that nurses constitute the largest group of professionals within the healthcare system. Among the 172 countries for which data were available in 2020, nurses accounted for 59% of healthcare professionals, with a total of 19.3 million in the profession (WHO, 2020b). This dimension of the profession has major repercussions, for example producing responsibilities in terms of the costs generated, not only for salaries (which account for an important part of the health system budget), but also with respect to the rational use of material resources.

According to basic health economics, it is of fundamental importance to make good use of limited resources to address our infinite needs. Therefore, nurses and healthcare managers and decision-makers must clearly understand the need to optimise spending, which impacts directly on the health services offered and the outcomes achieved. Accordingly, it is essential to provide appropriate training to raise awareness and foster a basic knowledge of health economics among healthcare professionals, including nurses (Kamdar et al., 2020).

Many of the articles reviewed call for the standardisation of healthcare questionnaires and protocols, and so nursing departments should seek to unify criteria, creating work patterns and methods grounded on current scientific views and widely accepted guidelines for clinical practice to improve treatment effectiveness and efficiency.

Among the variables categorised within the field of organisation and management are the response times for health services and the need to optimise the perioperative process, from the initial stages until the patient's complete recovery.

With respect to the issues identified in our review, and considering the quantitative dimension of the nursing profession within the health system, the characteristics of nursing work and the responsibilities and importance of nurses within the health system and society as a whole, we consider it essential to create, develop and implement strategic lines of action to identify and make use of indicators and predictors of treatment complications in order to optimise the policies adopted in this field.

The WHO, in the report 'State of the world's nursing 2020: Investing in education, jobs and leadership' (WHO, 2020a) underlines the importance of nurses being part of integrated teams to

make decisive contributions to universal health coverage and other national and global health goals. The report states, moreover, that national governments, via national and international associations, should catalyse and promote efforts to strengthen the leadership capacities, good governance and management of the nursing staff, to optimise returns on investment in nursing and to draft and implement the necessary regulations regarding training, decent work, deployment, practice, productivity, regulation and the retention of workers. To achieve these goals, there must be substantial investment in the health sector and, specifically, in the nursing workforce (WHO, 2020a).

In summary, there is a need for greater professionalisation of nursing management, facilitating self-governance and leadership, to influence health policies and address global needs through investment in education, professional development, appropriate regulation, improved employment conditions, the dissemination of effective and innovative nursing practices and an analysis of the economic and labour impact of this employment sector.

## 6 | LIMITATIONS

Finally, within the analysis of the present literature review, two limitations are detected. The first is that quality assessment is a complex task that requires specific tools according to the context addressed. These tools, moreover, must be validated and current. The review we present was performed using the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) to assess the methodological and reporting quality of the articles considered. However, this tool was later revised by Harrison et al., (2021) (OMS, s.f.), as the Quality Assessment for Diverse Studies (QuADS), which has proven to be reliable and suitable for application to multi-method research into health services.

In second place, the review is limited to the preoperative period, a focus that limits the generation of strategies spanning the entire surgical process. A similar study that also included the intraoperative and postoperative phases would give a broader vision of the indicators and predictors of inefficiency, and also enable us to differentiate it by medical-surgical specialities, specific surgical procedures, age or sex.

## 7 | CONCLUSIONS

Hospital nursing departments play a vital role in health institutions worldwide, and among their responsibilities is that of designing and implementing improvements in perioperative practice. To do so, it is essential to identify, at an early stage, the preoperative prognostic factors that may be modifiable by nurses. Our scoping review identifies the following groups of indicators and predictors of perioperative complications for which the interventions that can be modified and optimised by the application of nursing competencies are extracted: (1) Preoperative anxiety, treatable by alternative

therapies for its alleviation/control. (2) Pain, through detection, monitoring, impact on adherence to treatment, and control. (3) Preoperative health education, via nursing consultation (face-to-face or by phone), protocolising duration and content, focusing on the patient, adapting attention to individual needs, promoting bidirectional communication and shared decision-making, and ensuring that nurses are adequately equipped in communication techniques and skills from the early stages of clinical training and practice. (4) Satisfaction, promoting and developing research studies to evaluate patient satisfaction with preoperative preparation, education and postoperative outcomes. (5) Issues related to surgical management, such as organisation of the institution, resource availability and use, cost savings and the standardisation of protocols and the tools used in healthcare practice.

## 8 | RELEVANCE TO CLINICAL PRACTICE

Research outcomes should be applied to enhance nursing competencies as a primary tool to optimise the surgical process. Three formulas stand out in this respect. Specialised training and developments like the perioperative Advanced Nursing Practice format; preoperative nursing consultations to maximise accessibility with the use of regulated formats including telephone calls, face-to-face consultations and telemedicine; and finally, nursing management should be further professionalised with self-governance and leadership capacity and incorporated as an integral part of the drive to achieve global solutions within health systems, worldwide.

The identification of modifiable factors from nursing interventions is useful to improve and optimise preoperative care and postoperative results, acting from an early stage of the surgical process. The results are aimed at a more humanised healthcare provision focused on the patient and their caregivers, promoting health education from specialised consultations, led by trained nurses, capable of self-managing resources and time with standardised tools and based on scientific evidence to provide healthcare perioperative with the highest quality.

### ACKNOWLEDGMENT

We thank Francisco Rivas Ruiz for his assistance, advice and valuable input on critical reading of the manuscript.

### CONFLICTS OF INTEREST

The authors declare they have no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

### DATA AVAILABILITY STATEMENT

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

### ORCID

Marina García-Gamez  <https://orcid.org/0000-0001-9953-9812>

## REFERENCES

- Aloisi, A., Tseng, J., Kuhn, T., Feinberg, J., Chi, D. S., Brown, C. L., Mueller, J. J., Gardner, G. J., Zivanovic, O., Jewell, E. L., Long Roche, K., Broach, V., Abu-Rustum, N. R., & Leitao, M. M. (2020). Robotic surgery in the frail elderly: analysis of perioperative outcomes. *Annals of Surgical Oncology*, 27(10), 3772–3780. <https://doi.org/10.1245/s10434-020-08475-w>
- Ayyadhah Alanazi, A. (2014). Reducing anxiety in preoperative patients: A systematic review. *British Journal of Nursing*, 23(7), 387–393. <https://doi.org/10.12968/bjon.2014.23.7.387>
- Blackwood, D. H., Vindrola-Padros, C., Mythen, M. G., & Walker, D. (2018). Advance-care-planning and end-of-life discussions in the perioperative period: A review of healthcare professionals' knowledge, attitudes, and training. *British Journal of Anaesthesia*, 121(5), 1138–1147. <https://doi.org/10.1016/j.bja.2018.05.075>
- Bosse, G., Abels, W., Mtatifikolo, F., Ngoli, B., Neuner, B., Wernecke, K.-D., & Spies, C. (2015). Perioperative care and the importance of continuous quality improvement—a controlled intervention study in three Tanzanian hospitals. *PLoS One*, 10(9), e0136156. <https://doi.org/10.1371/journal.pone.0136156>
- Bradbury-Jones, C., & Aveyard, H. (2021). The incomplete scope of scoping reviews: A framework for improving the quality of reporting. *Journal of Clinical Nursing*, 30(21–22), e67–e68. <https://doi.org/10.1111/jocn.15998>
- Bradbury-Jones, C., Aveyard, H., Herber, O. R., Isham, L., Taylor, J., & O'Malley, L. (2021). Scoping reviews: The PAGER framework for improving the quality of reporting. *International Journal of Social Research Methodology*, 1–14. <https://doi.org/10.1080/13645579.2021.1899596>
- Bridges, K. H., McSwain, J. R., & Wilson, P. R. (2020). To infinity and beyond: the past, present, and future of tele-anesthesia. *Anesthesia and Analgesia*, 130(2), 276–284. <https://doi.org/10.1213/ANE.0000000000004346>
- Brown, J., Refeld, G., & Cooper, A. (2018). Timing and mode of breast care nurse consultation from the patient's perspective. *Oncology Nursing Forum*, 45(3), 389–398. <https://doi.org/10.1188/18.ONF.389-398>
- Butcher, H. K., Bulechek, G. M., Dochterman, J. M. C., & Wagner, C. M. (2018). *Nursing Interventions Classification (NIC)*. Elsevier Health Sciences. [https://books.google.es/books?id=h\\_ptAEACA AJ&dq=nursing+interventions+classifications&hl=es&sa=X&redir\\_esc=y](https://books.google.es/books?id=h_ptAEACA AJ&dq=nursing+interventions+classifications&hl=es&sa=X&redir_esc=y)
- Considine, J., Berry, D., Allen, J., Hewitt, N., Oldland, E., Sprogis, S. K., & Currey, J. (2021). Team-based learning in nursing education: A scoping review. *Journal of Clinical Nursing*, 30(7–8), 903–917. <https://doi.org/10.1111/jocn.15599>
- Crump, T., Wing, K., Bansback, N., & Sutherland, J. M. (2015). Surgical assessment: Measuring unobserved health. *BMC Surgery*, 15, 4. <https://doi.org/10.1186/1471-2482-15-4>
- da Silva Schulz, R., Santana, R. F., Dos Santos, C. T. B., Faleiro, T. B., do Amaral Passarellas, D. M., Hercules, A. B. S., & do Carmo, T. G. (2020). Telephonic nursing intervention for laparoscopic cholecystectomy and hernia repair: A randomized controlled study. *BMC Nursing*, 19, 38. <https://doi.org/10.1186/s12912-020-00432-y>
- de Lorenzo-Pinto, A., Ortega-Navarro, C., Ribed, A., Giménez-Manzorro, Á., Ibáñez-García, S., de Miguel-Guijarro, Á., Ginel-Feito, M. D., Herranz, A., & Sanjurjo-Sáez, M. (2019). Cancellations of elective surgical procedures due to inadequate management of chronic medications. *Journal of Clinical Pharmacy and Therapeutics*, 44(4), 561–564. <https://doi.org/10.1111/jcpt.12816>
- Derseh, T., Dingeta, T., Yusouf, M., & Minuye, B. (2020). Clinical outcome and predictors of intestinal obstruction surgery in Ethiopia: a cross-sectional study. *BioMed Research International*, 2020, 7826519. <https://doi.org/10.1155/2020/7826519>
- Dries, S. (2018). Rapid surgical intervention for geriatric patients with fractures: economic and clinical outcomes. *Nursing Economic*, 36(2), 88–96.
- Fenton, L., Lauckner, H., & Gilbert, R. (2015). The QATSDD critical appraisal tool: Comments and critiques. *Journal of Evaluation in Clinical Practice*, 21(6), 1125–1128. <https://doi.org/10.1111/jep.12487>
- Fisk, M., Livingstone, A., & Pit, S. W. (2020). Telehealth in the context of COVID-19: Changing perspectives in Australia, the United Kingdom, and the United States. *Journal of Medical Internet Research*, 22(6), e19264. <https://doi.org/10.2196/19264>
- Fu, S., Wang, Q., Fan, C., & Jiang, Y. (2020). The efficacy of nursing intervention to reduce preoperative anxiety in patients with total knee arthroplasty: A protocol of prospective randomized trial. *Medicine*, 99(38), e22213. <https://doi.org/10.1097/MD.00000000000022213>
- Giardina, J. L., Embrey, K., Morris, K., & Taggart, H. M. (2020). The impact of preoperative education on patients undergoing elective total hip and knee arthroplasty: the relationship between patient education and psychosocial factors. *Orthopedic Nursing*, 39(4), 218–224. <https://doi.org/10.1097/NOR.0000000000000674>
- Guo, P. (2015). Preoperative education interventions to reduce anxiety and improve recovery among cardiac surgery patients: A review of randomised controlled trials. *Journal of Clinical Nursing*, 24(1–2), 34–46. <https://doi.org/10.1111/jocn.12618>
- Harrison, R., Jones, B., Gardener, P., & Lawton, R. (2021). Quality assessment with diverse studies (QuADS): An appraisal tool for methodological and reporting quality in systematic reviews of mixed- or multi-method studies. *BMC Health Services Research*, 21, 144. <https://doi.org/10.1186/s12913-021-06122-y>
- Herdman, T. H., Kitsuru, S., & Lopes, C. T. (2021). *NANDA International Nursing Diagnoses. Definitions and Classification 2021-2023*. Thieme. <https://books.google.es/books?id=ilcbEAAAQBAJ>
- Husted, H. (2012). Fast-track hip and knee arthroplasty: Clinical and organizational aspects. *Acta Orthopaedica. Supplement*, 83(346), 1–39. <https://doi.org/10.3109/17453674.2012.700593>
- Jarmoszewicz, K., Nowicka-Sauer, K., Zemła, A., & Beta, S. (2020). Factors associated with high preoperative anxiety: results from cluster analysis. *World Journal of Surgery*, 44(7), 2162–2169. <https://doi.org/10.1007/s00268-020-05453-x>
- Jaruzel, C. B., Gregoski, M., Mueller, M., Faircloth, A., & Kelechi, T. (2019). Aromatherapy for preoperative anxiety: a pilot study. *Journal of Perianesthesia Nursing*, 34(2), 259–264. <https://doi.org/10.1016/j.jopan.2018.05.007>
- Johansson Stark, A., Ingadottir, B., Salanterä, S., Sigurdardottir, A., Valkeapää, K., Bachrach-Lindström, M., & Unosson, M. (2014). Fulfilment of knowledge expectations and emotional state among people undergoing hip replacement: A multi-national survey. *International Journal of Nursing Studies*, 51(11), 1491–1499. <https://doi.org/10.1016/j.ijnurstu.2014.03.006>
- Kamdar, N. V., Huverserian, A., Jalilian, L., Thi, W., Duval, V., Beck, L., Brooker, L., Grogan, T., Lin, A., & Cannesson, M. (2020). Development, implementation, and evaluation of a telemedicine preoperative evaluation initiative at a major academic medical center. *Anesthesia and Analgesia*, 131(6), 1647–1656. <https://doi.org/10.1213/ANE.0000000000005208>
- Kanza Gul, D., & Solt Kirca, A. (2020). Effects of acupressure on preoperative acute anxiety in cesarean section under spinal anesthesia: a double-blind randomized controlled study. *Holistic Nursing Practice*, 34(6), 356–364. <https://doi.org/10.1097/HNP.0000000000000413>
- Kehlet, H. (1994). Painless and risk-free surgery—A vision of the future? *Ugeskrift for Laeger*, 156(23), 3468–3469.
- Kim, A. Y., & Sim, I. O. (2020). Communication skills, problem-solving ability, understanding of patients' conditions, and nurse's perception of professionalism among clinical nurses: a structural equation model analysis. *International Journal of Environmental Research and Public Health*, 17(13), 4896. <https://doi.org/10.3390/ijerph17134896>

- Lee, S. H., Jang, J. S., Chung, J. W., Kwon, J. T., & Park, Y. S. (2021). Clinical pathway for emergency brain surgery during COVID-19 pandemic and its impact on clinical outcomes. *Journal of Korean Medical Science*, 36(2), e16. <https://doi.org/10.3346/jkms.2021.36.e16>
- Liederbach, E., Sisco, M., Wang, C., Pesce, C., Sharpe, S., Winchester, D. J., & Yao, K. (2015). Wait times for breast surgical operations, 2003–2011: A report from the National Cancer Data Base. *Annals of Surgical Oncology*, 22(3), 899–907. <https://doi.org/10.1245/s10434-014-4086-7>
- Lima, E. D. F. A., Reis, M. M. R., Crozeta, K., Casagrande, R. I., Leite, F. M. C., & Primo, C. C. (2020). Evaluation of hospital permanence time in heart surgery in a university hospital. *Revista De Pesquisa: Cuidado E Fundamental*, 12(1), 667–675. <https://doi.org/10.9789/2175-5361.rpcf.v12.9158>
- Mann, D. M., Chen, J., Chunara, R., Testa, P. A., & Nov, O. (2020). COVID-19 transforms health care through telemedicine: Evidence from the field. *Journal of the American Medical Informatics Association: JAMIA*, 27(7), 1132–1135. <https://doi.org/10.1093/jamia/ocaa072>
- McClurkin, S. L., & Smith, C. D. (2016). The duration of self-selected music needed to reduce preoperative anxiety. *Journal of Perianesthesia Nursing*, 31(3), 196–208. <https://doi.org/10.1016/j.jopan.2014.05.017>
- McHugh, S. K., Lawton, R., O'Hara, J. K., & Sheard, L. (2020). Does team reflexivity impact teamwork and communication in interprofessional hospital-based healthcare teams? A systematic review and narrative synthesis. *BMJ Quality & Safety*, 29(8), 672–683. <https://doi.org/10.1136/bmjqs-2019-009921>
- Ming Teh, A. H., Turner, B. S., Tan, S. B., & Tham, C. S. (2016). Effectiveness of an advanced practice nurse-led preoperative telephone assessment. *Journal of Nursing Care Quality*, 31(2), 191–196. <https://doi.org/10.1097/NCQ.0000000000000152>
- Ministry of Health, Consumption and Social Welfare of Spain. (2019). *Data\_Spanish National Health Service\_2019.pdf*. [https://www.msbs.gob.es/estadEstudios/portada/docs/DATOS\\_SNS\\_A4\\_12\\_2019.pdf](https://www.msbs.gob.es/estadEstudios/portada/docs/DATOS_SNS_A4_12_2019.pdf)
- Ministry of Health, Consumption and Social Welfare—Spanish NHS Statistical Portal. (2020). <https://www.msbs.gob.es/estadEstudios/sanidadDatos/tablas/tabla26.htm>
- Montoya, N. P., Glaz, L. C. O. B., Pereira, L. A., & Loturco, I. (2021). Prevalence of burnout syndrome for public schoolteachers in the Brazilian context: a systematic review. *International Journal of Environmental Research and Public Health*, 18(4), 1606. <https://doi.org/10.3390/ijerph18041606>
- Mulugeta, H., Ayana, M., Sintayehu, M., Dessie, G., & Zewdu, T. (2018). Preoperative anxiety and associated factors among adult surgical patients in Debre Markos and Felege Hiwot referral hospitals, Northwest Ethiopia. *BMC Anesthesiology*, 18(1), 155. <https://doi.org/10.1186/s12871-018-0619-0>
- Navarro-Gastón, D., & Munuera-Martínez, P. V. (2020). Prevalence of preoperative anxiety and its relationship with postoperative pain in foot nail surgery: a cross-sectional study. *International Journal of Environmental Research and Public Health*, 17(12), 4481. <https://doi.org/10.3390/ijerph17124481>
- Papadopoulos, N., El-Sayed Ahmad, A., Thudt, M., Fichtlscherer, S., Meybohm, P., Reyher, C., Moritz, A., & Zierer, A. (2016). Successful fast track protocol implementation for patients undergoing transapical transcatheter aortic valve implantation. *Journal of Cardiothoracic Surgery*, 11(1), 55. <https://doi.org/10.1186/s13019-016-0449-4>
- Perlini, C., Donisi, V., & Del Piccolo, L. (2020). From research to clinical practice: A systematic review of the implementation of psychological interventions for chronic headache in adults. *BMC Health Services Research*, 20(1), 459. <https://doi.org/10.1186/s12913-020-05172-y>
- Peters, M. D. J., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, 13(3), 141–146. <https://doi.org/10.1097/XEB.0000000000000050>
- Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Synthesis*, 18(10), 2119–2126. <https://doi.org/10.11124/JBIES-20-00167>
- Pettersson, M. E., Öhlén, J., Friberg, F., Hydén, L.-C., & Carlsson, E. (2017). Topics and structure in preoperative nursing consultations with patients undergoing colorectal cancer surgery. *Scandinavian Journal of Caring Sciences*, 31(4), 674–686. <https://doi.org/10.1111/scs.12378>
- Porcel-Gálvez, A. M., Badanta, B., Barrientos-Trigo, S., & Lima-Serrano, M. (2021). Personas mayores, dependencia y vulnerabilidad en la pandemia por coronavirus: Emergencia de una integración social y sanitaria. *Enfermería Clínica*, 31, S18–S23. <https://doi.org/10.1016/j.enfcli.2020.05.004>
- Sigal, I., Dayal, P., Hoch, J. S., Mouzoon, J. L., Morrow, E., & Marcin, J. P. (2020). Travel, time, and cost savings associated with a university medical center's video medical interpreting program. *Telemedicine Journal and E-Health*, 26(10), 1234–1239. <https://doi.org/10.1089/tmj.2019.0220>
- Sillero-Sillero, A., & Zabalegui, A. (2019). Safety and satisfaction of patients with nurse's care in the perioperative. *Revista Latino-Americana De Enfermagem*, 27, e3142. <https://doi.org/10.1590/1518-8345.2646.3142>
- Silva, A. M. N., Souza, E. F. D., de Barbosa, T. L. A., Esilva, C. S. O. & Gomes, L. M. X. (2014). Fatores que contribuem para o tempo de internação prolongada no ambiente hospitalar. *Revista De Pesquisa: Cuidado E Fundamental*, 6(4), 1590–1600. <https://doi.org/10.9789/2175-5361.2014.v6i4.1590-1600>
- Strøm, J., Bjerrum, M. B., Nielsen, C. V., Thisted, C. N., Nielsen, T. L., Laursen, M., & Jørgensen, L. B. (2018). Anxiety and depression in spine surgery—a systematic integrative review. *The Spine Journal*, 18(7), 1272–1285. <https://doi.org/10.1016/j.spinee.2018.03.017>
- Taylor, F. R., Cooper, W., & Kaniecki, R. G. (2020). Abstracts and citations. *Headache: the Journal of Head and Face Pain*, 60(10), 2636–2647. <https://doi.org/10.1111/head.13953>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garrity, C., ... Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine*, 169(7), 467–473. <https://doi.org/10.7326/M18-0850>
- Turunen, E., Miettinen, M., Setälä, L., & Vehviläinen-Julkunen, K. (2017). An integrative review of a preoperative nursing care structure. *Journal of Clinical Nursing*, 26(7–8), 915–930. <https://doi.org/10.1111/jocn.13448>
- Viftrup, A., Dreyer, P., Nikolajsen, L., & Holm, A. (2021). Surgery cancellation: A scoping review of patients' experiences. *Journal of Clinical Nursing*, 30(3–4), 357–371. <https://doi.org/10.1111/jocn.15582>
- Vogl, M., Leidl, R., Plötz, W., & Gutacker, N. (2015). Comparison of pre- and post-operative health-related quality of life and length of stay after primary total hip replacement in matched English and German patient cohorts. *Quality of Life Research*, 24(2), 513–520. <https://doi.org/10.1007/s11136-014-0782-9>
- Wongkietkachorn, A., Wongkietkachorn, N., & Rhunsiri, P. (2018). Preoperative needs-based education to reduce anxiety, increase satisfaction, and decrease time spent in day surgery: a randomized controlled trial. *World Journal of Surgery*, 42(3), 666–674. <https://doi.org/10.1007/s00268-017-4207-0>
- World Health Organization (2019). *10 safety facts in surgical care*. [https://www.who.int/features/factfiles/safe\\_surgery/facts/es/](https://www.who.int/features/factfiles/safe_surgery/facts/es/)
- World Health Organization (2020a). *State of the world's nursing 2020: Investing in education, jobs and leadership*. <https://www.who.int/es/publications/i/item/9789240003279>
- World Health Organization (2020b). *World Health Statistics 2020: Monitoring health for the SDGs, sustainable development goals*. <https://apps.who.int/iris/bitstream/handle/10665/338072/9789240011953-spa.pdf?sequence=1&isAllowed=y>

World Health Organization (2021). *Ageing and health*. [https://www.who.int/features/factfiles/ageing/ageing\\_facts/es/](https://www.who.int/features/factfiles/ageing/ageing_facts/es/)

Wyatt, M. A., Ainsworth, A. J., DeJong, S. R., Cope, A. G., & Long, M. E. (2018). Implementation of the 'pregnancy reasonably excluded guide' for pregnancy assessment: a quality initiative in outpatient gynecologic surgery. *Obstetrics and Gynecology*, 132(5), 1222–1228. <https://doi.org/10.1097/AOG.0000000000002917>

#### SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

**How to cite this article:** Fernández Fernández, E., Fernández-Ordoñez, E., García-Gamez, M., Guerra-Marmolejo, C., Iglesias-Parra, R., García-Agua Soler, N., & González-Cano-Caballero, M. (2022). Indicators and predictors modifiable by the nursing department during the preoperative period: A scoping review. *Journal of Clinical Nursing*, 00, 1–22. <https://doi.org/10.1111/jocn.16287>