E-B Environment - Behaviour Proceedings Journal

AicQoL2026Jakarta

e-IPH e-International Publishing House Ltd., United Kingdom

https://www.amerabra.org/

14th AMER International Conference on Quality of Life

Sunlake Waterfront Resort & Convention, Jakarta, Indonesia, 02-03 Jan 2026

Nurse-Led Preoperative Education Impact on Anxiety and Pain in Total Hip Arthroplasty Patients: A scoping review

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Abstract

Preoperative anxiety and postoperative pain significantly affect recovery and patient satisfaction among adults undergoing elective total hip arthroplasty. Nurse-led preoperative education is a vital peri-anaesthesia intervention providing structured information, psychological support, and realistic expectations. This scoping review synthesises evidence on its relationship with anxiety and pain using PRISMA-ScR guidelines. A total of 210 records were identified across five databases; after screening, 11 studies were included. Most demonstrated reduced preoperative anxiety, while the impact on postoperative pain was inconsistent due to heterogeneity in intervention delivery. Evidence supports structured education; future research using standardised protocols needed to determine its effects on pain outcomes.

Keywords: Nurse-led education; Preoperative anxiety; Postoperative pain; Total hip arthroplasty

DOI: https://doi.org/10.21834/e-bpj.v11i35.7455

1.0 Introduction

Total hip arthroplasty (THA) is a standard elective orthopaedic procedure performed to restore mobility and relieve chronic pain. Despite advances in surgical and anaesthetic techniques, patients often experience significant preoperative anxiety and postoperative pain, both of which may influence surgical recovery, opioid use, and length of stay (Lawrence, 2023; Longo et al., 2023). Total hip arthroplasty involves surgical replacement of the diseased hip joint with a prosthetic implant to relieve pain and restore function. The procedure typically includes bone resection, implant fixation, and perioperative anaesthesia, which may be perceived as invasive and intimidating by patients. As a result, individuals awaiting THA commonly experience heightened preoperative anxiety related to surgical risks, postoperative pain, functional outcomes, and recovery expectations (O' Connor et al., 2022). This psychological distress has been associated with increased pain perception, higher analgesic requirements, and delayed recovery following surgery. Nurses play a vital role in patient preparation through pain and anxiety management by providing information, emotional support, and reassurance through structured preoperative education sessions. Nurse-led preoperative education encompasses information provided primarily by nurses through one-to-one sessions, group classes, multimedia videos, or tele-nurse counselling. These sessions aim to reduce uncertainty, promote self-efficacy, and align expectations with recovery goals. However, the reported outcomes of such interventions vary across

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settings and study designs. While many studies indicate a decrease in preoperative anxiety levels (Giardina, 2020; JOPAN Review, 2024), findings regarding pain intensity and opioid use remain inconsistent (Liu, 2025; Çalışkan, 2025).

Earlier reviews often combined data from both hip and knee arthroplasty procedures. They failed to differentiate the impact of nurse-led interventions, thereby reducing the ability to conclude that the impact was specific to THA. The global implementation of Enhanced Recovery After Surgery (ERAS) programmes has driven a paradigm shift in perioperative care by promoting patient engagement, early mobilisation, and non-pharmacological optimisation strategies during preoperative preparation. Simultaneously, the COVID-19 pandemic accelerated the adoption of telehealth-based patient education, compelling healthcare providers to deliver preoperative counselling remotely while maintaining safety and continuity of care. These developments have collectively redefined perioperative nursing practice by highlighting the importance of structured, accessible, and patient-centred education as an integral component of surgical readiness. Accordingly, this scoping review synthesises contemporary evidence (2020–2025) to explore how nurse-led preoperative education influences preoperative anxiety and postoperative pain among adults undergoing elective total hip arthroplasty (THA)**.** By examining both traditional and technology-enabled education strategies, this review aims to identify practical components of nursing interventions and provide insight into how evolving perioperative models can further enhance psychological and recovery outcomes in surgical patients.

In Malaysia, Enhanced Recovery after Surgery (ERAS) programmes are increasingly adopted in tertiary hospitals to improve surgical outcomes, reduce length of stay, and enhance patient experience. Although ERAS implementation in orthopaedics is still evolving, core components such as patient education, multimodal pain management, and early mobilisation align closely with peri-anaesthesia nursing roles. Nurse-led preoperative education is therefore highly relevant within the Malaysian ERAS context, as it supports patient engagement, psychological preparedness, and adherence to recovery pathways (Wong et al., 2024).

2.0 Methodology

This review followed the Arksey and O'Malley (2005) methodological framework as cited in Majid et al. (2025). It was refined by Levac et al. (2010) and was reported in accordance with the PRISMA-ScR guidelines (Tricco et al., 2018). The framework consists of five sequential stages which guided the conduct of this review.

Stage 1: Identifying the Research Question

The research question guiding this review was: What is the impact of nurse-led preoperative education on preoperative anxiety and postoperative pain among adults undergoing elective total hip arthroplasty (THA)? The question was structured using the Population Concept Context (PCC) framework, in which the population comprised adults aged ≥ 18 years undergoing elective THA; the concept focused on nurse-led preoperative education; and the context referred to hospital or ambulatory surgical settings.

Stage 2: Identifying Relevant Studies

A comprehensive search strategy was developed and applied to five electronic databases: PubMed, CINAHL, Embase, Scopus, and the Cochrane Library, supplemented by ProQuest Dissertations and the WHO ICTRP registry. Boolean operators and controlled vocabulary were used as follows: ("total hip arthroplasty" OR "hip replacement") AND ("nurse-led" OR "nursing education") AND ("preoperative anxiety" OR "pain"). Filters were applied to limit publications to English and Malay languages from 2020 to 2025. All searches were documented in an Excel spreadsheet, noting the database name, date, search string, and total records retrieved to ensure transparency and reproducibility.

Stage 3: Selection of Studies

Two reviewers independently screened titles and abstracts against predefined inclusion and exclusion criteria, followed by full-text review of potentially eligible papers. Discrepancies were resolved by consensus with a third reviewer. Studies were included if they involved adult THA patients, nurse-led preoperative education interventions, and reported outcomes on anxiety and/or postoperative pain using quantitative, qualitative, or mixed-methods designs published between 2020 and 2025. Excluded studies were those involving emergency surgery, non-nurse-led education, non-English/Malay texts, or incomplete data. The overall selection process is illustrated in Figure 1 (PRISMA-ScR Flow Diagram).

Stage 4: Charting the Data

A standardized data-charting form was used to extract relevant information, including author, year, country, study design, sample size, description of the intervention, measurement tools for anxiety and pain, and main findings. Two reviewers independently extracted and verified the data to maintain accuracy and consistency.

Stage 5: Collating, Summarizing, and Reporting Results

Extracted data were synthesized using descriptive mapping and narrative summary to capture the scope and nature of existing evidence. No formal quality appraisal tool was applied in accordance with PRISMA-ScR guidance; however, potential sources of bias, such as sample size, blinding, and reporting transparency, were described narratively.

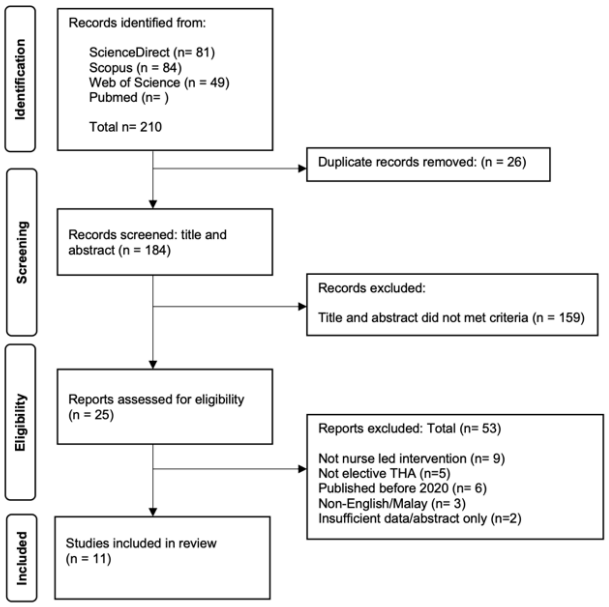

Figure 1: (PRISMA-ScR Flow Diagram).

3.0 Results

A total of 210 records were identified; 11 studies were included after screening (Table 1). Six were randomized controlled trials, three were observational studies, and two were integrative/systematic reviews.

Table 1: Summary of included studies on nurse-led preoperative education, anxiety, and pain outcomes among total hip arthroplasty patients (2020–2025)

No	Author (Year)	Country	Design	Sample	Type of Nurse-Led Education	Outcomes Measured	Summary of Findings
1	Giardina (2020)	USA	Observational	120	Group "Joint Academy" class	APAIS; VAS	Participation in a nurse-led class significantly reduced preoperative anxiety and enhanced patient preparedness before surgery.
2	Çengel & Andsoy (2022)	Türkiye	Quasi-experimental	82	Operating room nurse visit	HADS-A	A single preoperative visit by the operating room nurse effectively decreased anxiety levels in surgical patients.
3	O'Connor et al. (2022)	UK	Systematic review	–	Counselling and educational booklet	STAI; VAS	Identified that patients with higher preoperative anxiety tended to report more postoperative pain, emphasizing the need for preoperative education.

4	Longo et al. (2023)	Italy	Systematic review	–	Group and video-based education	HADS-A; NRS; Opioid use	Structured group and multimedia education lowered anxiety scores and opioid requirements after THA, improving recovery.
5	Lawrence (2023)	USA	Commentary	–	Nurse-led prehabilitation sessions	APAIS	Highlighted the critical role of nurse-led education in enhancing ERAS compliance and patient psychological readiness.
6	JOPAN Review (2024)	USA	Integrative review	–	Nurse counselling and tele-nurse follow-up	STAI; VAS	Consistently demonstrated anxiety reduction after nurse-led education, though postoperative pain outcomes varied across studies.
7	Amprachim (2024)	UK	Narrative review	–	Structured preoperative modules	APAIS	Found improved patient confidence and readiness when nurses provided structured, standardized education materials.
8	Liu (2025, in press)	China	Randomized controlled trial (ERAS bundle)	104	Structured nurse-led education integrated into ERAS	APAIS; NRS	Reported significantly reduced anxiety, postoperative pain, and length of hospital stay among intervention groups.
9	Çalışkan (2025)	Türkiye	Cross-sectional	150	Nurse-led lecture	HADS-A; VAS	Demonstrated a positive correlation between anxiety and pain, reinforcing the importance of preoperative anxiety management.

10	Singapore Nurse Visit (2025)	Singapore	Quality-improvement study	80	One-to-one counselling session	STAI; Patient satisfaction	Found reduced anxiety and increased satisfaction following nurse-led preoperative counselling.
11	Meta-analysis (2025)	Multi-country	Meta-analysis	–	Nurse-inclusive educational interventions	Multiple scales	Confirmed the association between effective preoperative education, anxiety reduction, and decreased pain perception across pooled studies.

Note. *APAIS = Amsterdam Preoperative Anxiety and Information Scale; HADS-A = Hospital Anxiety and Depression Scale–Anxiety subscale; NRS = Numeric Rating Scale; STAI = State-Trait Anxiety Inventory; VAS = Visual Analogue Scale; THA = Total Hip Arthroplasty; ERAS = Enhanced Recovery after Surgery. A dash (–) indicates that sample size was not reported. "In press" refers to articles accepted for publication but not yet assigned to an issue.*

4.0 Summary of Findings

Across the eleven studies published between 2020 and 2025, nurse-led preoperative education consistently demonstrated effectiveness in reducing preoperative anxiety among adults undergoing elective total hip arthroplasty (THA). Various educational approaches, such as group classes, individualized counselling, multimedia teaching, and tele-nurse sessions, proved beneficial in enhancing patient knowledge, emotional preparedness, and confidence before surgery.

Findings on postoperative pain outcomes were more variable. Several studies reported lower pain intensity scores and decreased opioid use, whereas others identified only a modest or indirect relationship between anxiety and pain perception. Nonetheless, the collective evidence supports the view that reducing preoperative anxiety through nurse-led education indirectly contributes to improved pain control, shorter recovery times, and greater patient satisfaction *(Giardina, 2020; O'Connor, 2022; Longo, 2023; Çalışkan, 2025; Liu, 2025)*. Interventions that featured interactive communication, patient feedback, and family involvement were consistently more effective. Linking these approaches to Enhanced Recovery After Surgery (ERAS) principles may further strengthen peri-anaesthesia nursing practice, as ERAS recognises patient education as a key component of optimal surgical recovery.

5.0 Discussion

This scoping review synthesized evidence published between 2020 and 2025 on the relationship between nurse-led preoperative education and its influence on preoperative anxiety and postoperative pain among adults undergoing elective total hip arthroplasty (THA). Using Arksey and O'Malley's framework, this review systematically mapped current knowledge, identified intervention characteristics, and highlighted existing research gaps. The analysis revealed that nurse-led preoperative education consistently reduced preoperative anxiety and may contribute indirectly to lower postoperative pain intensity and improved recovery outcomes.

5.1 Impact on Preoperative Anxiety

Across nearly all included studies, nurse-led education was associated with significant reductions in patient anxiety before surgery. This outcome underscores the critical psychological role nurses play in preoperative preparation. According to Giardina (2020) and Çengel and Andsoy (2022), direct interaction with nurses prior to surgery enhances patient understanding, fosters trust, and reduces anxiety towards the upcoming procedure. These findings reflect the principles of cognitive-behavioural theory, which suggests that anxiety decreases when individuals receive adequate information and develop realistic expectations about impending events; however, this theoretical influence was not directly assessed in those studies. The emphasis on interpersonal communication indicates that the relational aspect of nursing plays a crucial role in modulating patient emotions and shaping psychological readiness.

Further evidence suggests that the method of educational delivery significantly affects outcomes. Structured, interactive formats such as group-based learning, multimedia-supported modules, and tele-nurse consultations are more effective than passive or one-way verbal explanations (JOPAN, 2024; Liu, 2025). These interventions encouraged patient engagement, enabled real-time clarification of concerns, and promoted active participation in decision-making, all consistent with adult learning principles and patient-centred care models. Such interactive strategies also strengthened self-efficacy and emotional preparedness, leading to better surgical adaptation and recovery experience.

Cultural and contextual adaptation was another influential factor in the effectiveness of nurse-led education. Research conducted within Asian populations (Çengel & Andsoy, 2022; Liu, 2025) demonstrated that education delivered in culturally sensitive language, with familiar communication styles and awareness of patient beliefs, resulted in greater anxiety reduction and higher levels of acceptance. This has important implications for peri-anaesthesia nursing practice in Malaysia, where patients often come from

multilingual and multicultural backgrounds. Tailoring educational interventions to reflect sociocultural norms, language preferences, and family involvement is therefore essential to ensure high-quality, inclusive patient preparation. These findings emphasise the evolving role of perioperative nurses as not only technical practitioners but also psychological advocates and facilitators of therapeutic communication, reinforcing their position as key contributors to enhanced patient outcomes in surgical pathways.

5.2 Relationship between Preoperative Anxiety and Postoperative Pain

While anxiety reduction was consistent across studies, findings on postoperative pain outcomes were less uniform. Several studies (Longo, 2023; Liu, 2025; Giardina, 2020) found that nurse-led preoperative education was associated with lower postoperative pain scores and reduced opioid use, supporting the hypothesis that psychological readiness positively influences pain perception. This aligns with the biopsychosocial model of pain, which acknowledges the interplay between mental state, coping ability, and physiological response.

Conversely, studies by O'Connor et al. (2022) and Çalışkan (2025) reported only a weak or indirect association between anxiety and pain. These inconsistencies could be attributed to differences in intervention timing, content standardization, or postoperative analgesic protocols. Not all studies controlled for variables such as anaesthetic technique, use of multimodal analgesia, or comorbid psychological factors (e.g., depression, catastrophizing), which can confound the anxiety–pain relationship. Therefore, although nurse-led education clearly improves emotional preparedness, its direct causal effect on pain remains inconclusive.

Nevertheless, the observed reduction in opioid consumption among several cohorts is clinically relevant. It suggests that patients who receive structured preoperative education demonstrate better postoperative coping, engage more effectively in early mobilization, and exhibit fewer pain-related complications. For perioperative nurses, this finding reinforces the value of patient education as a non-pharmacological adjunct to pain management.

5.3 Education Strategies and Implementation Challenges

The included studies reflected a wide range of educational approaches from traditional face-to-face counselling to innovative tele-nurse and video-based sessions. Interventions that emphasized interactive communication, teach-back techniques, and family involvement yielded stronger outcomes, highlighting the importance of two-way engagement rather than one-directional instruction. However, several barriers were identified. Common challenges included time constraints, staff shortages, inconsistent training, and a lack of standardized educational materials. Amprachim (2024) and the JOPAN Review (2024) noted that the absence of uniform educational guidelines often leads to variation in message quality and delivery method. Furthermore, digital literacy and language barriers may limit the accessibility of tele-nurse programs among older or rural patients.

To overcome these challenges, hospitals implementing ERAS pathways should consider developing standardized nurse-led preoperative education modules that can be easily adapted across departments. These modules should include clear objectives, visual aids, translated materials, and culturally relevant examples to enhance understanding among diverse patient populations. Integration into pre-admission workflows, as recommended by Lawrence (2023), ensures that such education becomes an expected and measurable component of the surgical preparation process.

5.4 Implications for Malaysian Peri-anaesthesia Nursing Practice

In the Malaysian context, this review emphasizes the need to formalize nurse-led education within peri-anaesthesia nursing standards in many Malaysian healthcare settings. Preoperative education is still commonly delivered through informal, brief verbal explanations due to constraints on workload, staffing, and time. Implementing a standardised approach, such as structured nurse-led sessions lasting approximately 15–30 minutes, may improve patient confidence, enhance psychological preparedness, and promote safer and more informed surgical care. The findings support the integration of nurse-led education into Enhanced Recovery After Surgery (ERAS) protocols, in line with the Ministry of Health Malaysia's emphasis on patient-centred care and quality improvement. By embedding educational interventions into existing workflows, perioperative nurses can effectively address both psychological and physiological aspects of patient recovery, leading to reduced anxiety, improved satisfaction, and potential decreases in postoperative complications.

6.0 Identified Gaps and Future Research Directions

Although current evidence continues to grow, important gaps in the literature persist. Firstly, there is a lack of standardised measurement tools and consistent reporting formats for both anxiety and pain outcomes. Different studies used APAIS, HADS-A, STAI, and VAS, resulting in considerable heterogeneity that makes comparison and synthesis difficult. Secondly, most studies did not assess intervention fidelity, leaving uncertainty about whether education was delivered as intended or consistently across sessions. Without fidelity checks, the actual effectiveness of nurse-led education remains unclear, particularly when interventions vary in duration, depth, and delivery method.

A further gap relates to limited cultural contextualisation. Only a small number of studies incorporated culturally tailored materials or addressed language diversity, despite evidence indicating that cultural congruence enhances patient understanding and anxiety reduction. Additionally, there is a notable lack of THA research in Malaysia, despite the growing demand for joint replacement procedures in the country. Local studies are needed to reflect Malaysian patient demographics, cultural values, and healthcare system constraints.

Future research should therefore focus on developing and validating standardised nurse-led preoperative education frameworks specifically for THA patients. Mixed-method designs can capture both patient experiences and measurable clinical outcomes, while

experimental studies should examine the impact of digital, tele-nurse, and hybrid education models in Malaysian hospitals. Economic evaluations assessing the cost-effectiveness of structured education, as well as research on nurse training, workload feasibility, and resource allocation, are also crucial to support sustainable implementation within limited-resource environments.

7.0 Limitations

This scoping review was limited to articles published between 2020 and 2025, which may have excluded relevant studies published before this period or those not indexed in major databases. Variations in methodological designs, interventions, and outcome measures across the included studies prevented direct comparisons and limited the ability to conduct quantitative or meta-analytical synthesis. In accordance with the Arksey and O'Malley framework and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR), no formal methodological quality appraisal or risk-of-bias assessment was undertaken, as these are beyond the scope of the scoping review objectives. Consequently, the accuracy of the findings depends on the quality and completeness of reporting in the included studies. Therefore, results should be interpreted as descriptive and exploratory rather than conclusive or causal. Future systematic reviews with formal quality appraisal and statistical synthesis are recommended to establish the strength of evidence and validate the effectiveness of nurse-led preoperative education on anxiety and pain outcomes.

8.0 Conclusion and Recommendations

Between 2020 and 2025, nurse-led preoperative education consistently demonstrated positive effects in reducing preoperative anxiety and enhancing psychological readiness for surgery among patients undergoing elective total hip arthroplasty. Several studies also indicated improvements in pain management and reduced opioid use, although findings remain mixed due to variability in intervention format, educational timing, and outcome measurements. These results reinforce the importance of nurses as key facilitators in peri-anaesthesia preparation, particularly within (ERAS) frameworks.

To strengthen clinical implementation, structured, interactive, and culturally sensitive education modules should be integrated into standard preoperative pathways. Future research should evaluate intervention fidelity, adopt standardised measurement tools, and investigate long-term outcomes. Additionally, the feasibility of digital or tele-nurse platforms should be explored to support broader accessibility across diverse Malaysian healthcare settings.

Based on this review, healthcare institutions are encouraged to integrate structured nurse-led education as a routine preoperative intervention within (ERAS) protocols. Standardised educational modules that include interactive communication, patient feedback, cultural adaptation, and family involvement should be developed and implemented. Future research should focus on validating standard tools for assessing preoperative anxiety and postoperative pain, improving intervention fidelity monitoring, and evaluating clinical outcomes beyond the immediate postoperative phase. In addition, feasibility studies on digital and tele-nursing education delivery models, particularly within Malaysian hospital settings, are recommended to increase accessibility and sustainability of nurse-led perioperative education.

Acknowledgements

The authors express their appreciation to the Faculty of Health Sciences, Universiti Teknologi MARA (UiTM) and Hospital Al-Sultan Abdullah for their support and resources in conducting this study.

Paper Contribution to the Related Field of Study

This scoping review advances peri-anaesthesia and orthopaedic nursing by mapping evidence on the impact of nurse-led preoperative education on anxiety and pain among patients undergoing elective total hip arthroplasty. It highlights the effectiveness of structured and interactive education in reducing anxiety, while identifying research gaps related to intervention consistency and pain outcome variability. The review emphasizes the need for culturally adapted, standardised education models and supports integrating of such interventions into ERAS-based perioperative pathways. Findings reinforce the emerging role of nurses as therapeutic educators and inform future research development in Malaysian surgical practice.

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