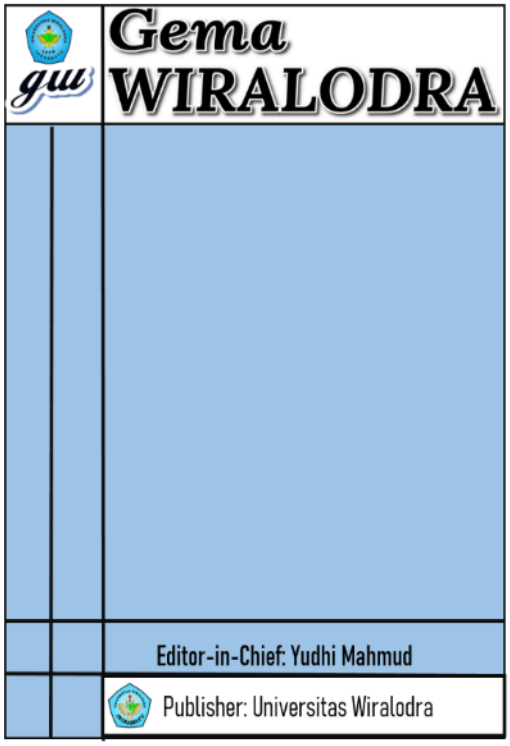
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Guided Imagery in Multimodal Pain Management: An Analysis of Anesthetic technicians's Competence in Postoperative Pain Management

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Guided Imagery in Multimodal Pain Management: An Analysis of Anesthetic technicians's Competence in Postoperative Pain Management

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ABSTRACT
Background: *Guided imagery* is a non-pharmacological technique that may be added to multimodal pain management for surgical patients. Delivering it well in perioperative settings depends on sufficient knowledge and preparedness among health professionals, anesthesia practitioners among them. Even so, little evidence is available on how competent these practitioners are in using *guided imagery*. Objective: This study sought to examine anesthesia practitioners' competence in using *guided imagery* for postoperative pain management across the knowledge, attitude, and behavior domains. Methods: A cross-sectional quantitative descriptive design was applied to 47 anesthesia practitioners. A questionnaire with three domains supplied the data: knowledge (maximum score 20), attitude (maximum score 50), and behavior (maximum score 30). Scores and category distributions in each domain were summarized descriptively. Results: Knowledge averaged 17.62±1.01 (88.1%), and every respondent (100%) fell into the good category. Attitude averaged 37.49±11.73 (75.0%); 25 respondents (53.2%) had a good attitude, 6 (12.8%) a moderate one, and 16 (34.0%) a poor one. Behavior averaged 20.38±4.80 (67.9%); 15 respondents (31.9%) showed good behavior, 22 (46.8%) moderate behavior, and 10 (21.3%) poor behavior. Conclusion: Knowledge of *guided imagery* was good among the anesthesia practitioners, but their attitudes and behaviors toward using it were more varied. The results point to a need to reinforce the use of *guided imagery* in postoperative pain management practice.

Keywords: Guided Imagery, Pain Management, Non-pharmacological Interventions, Anesthetic technicians

1. Introduction

Pain after surgery continues to be an important concern in perioperative care, since poorly controlled pain can hinder early mobilization, raise the likelihood of complications, slow recovery, lengthen hospitalization, and lower patient satisfaction with surgical and anesthesia services. Pain is a subjective and unpleasant sensory experience that differs from one person to another and can disrupt thinking, everyday activities, and general quality of life (IASP, 2020; Post-operative pain, 2016). Earlier research has found that 50–70% of patients suffer acute pain after surgery, especially within the first 24–48 hours, and that roughly 10–40% go on to develop persistent postsurgical pain that continues for weeks or months (Park et al., 2023; Timerga et al., 2024). Indonesian data show the same problem: in one study, most patients who had digestive surgery reported severe pain four hours afterward even though analgesics had been given (Wahyudi et al., 2024), and among orthopedic surgery patients the prevalence of postoperative pain was 61% at four hours, 73% at 24 hours, and 67% at 36 hours (Tarigan et al., 2025). Such results show that controlling pain after surgery is still difficult and argue for a comprehensive multimodal strategy that combines pharmacological and non-pharmacological measures (Meissner et al., 2019). Inadequate pain control can also add to morbidity, reduced physical function, longer opioid use, and greater healthcare expenditure (Arefayne et al., 2020).

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Good multimodal pain management depends on combining drug therapy with non-pharmacological measures that can enhance patient comfort and aid postoperative recovery. *Guided imagery* is one such measure; it is a relaxation method that leads patients to picture peaceful and reassuring scenes (Hart, 2008). Research to date indicates that *guided imagery* can lower postoperative pain intensity and anxiety and may reduce the need for analgesics (Astrid & Setiawan, 2019; Topan et al., 2025; Vagnoli et al., 2019). Beyond traditional delivery, newer formats including audio, video, and virtual reality have shown promise as ways of delivering *guided imagery* (Hansen, 2015; Hondro et al., 2025; Yasin et al., 2025). Nonetheless, how useful these approaches are in the clinic hinges not only on their benefits but also on whether health workers understand the intervention, view it favorably, and can integrate it properly into perioperative care. Easing postoperative pain is a shared, multidisciplinary duty that includes anesthetic technicians, who take part in perioperative patient care (Matkap et al., 2011).

Although evidence on the benefits of *guided imagery* keeps growing, most earlier work has examined its effects on patients, and far less has looked at what healthcare providers know, feel, and do when applying it to postoperative pain (Beatriz & Barbosa, 2017). Evidence on the competence of anesthetic technicians in particular is scarce. They were chosen as respondents because they are involved in perioperative care and because their role is closely tied to delivering anesthesia-related care and postoperative pain management strategies (Matkap et al., 2011). What they know about the principles, indications, contraindications, and procedures of *guided imagery*, along with their attitudes toward using it clinically and their reported practices, reveals how far this intervention is acknowledged and possibly used in clinical care.

In addition, few studies have addressed instruments for measuring anesthetic technicians' knowledge of *guided imagery*, especially validated tools suited to the Indonesian setting (Rahmawati & Kurniawati, 2022). This gap calls for a systematic assessment of knowledge, attitudes, and practices that can set a baseline for anesthetic technician competence and reveal which areas need further educational support. Even though *guided imagery* holds promise within multimodal pain management, evidence of its clinical effectiveness does not by itself show that providers are ready to apply it. Evaluating the three domains is therefore valuable for grasping present conditions and guiding future professional development.

Against this background, the study set out to describe anesthetic technicians' competence in using *guided imagery* for postoperative pain management by assessing their knowledge, attitudes, and practices. More precisely, it looked at how well respondents understand the concepts and principles of *guided imagery*, how they feel about applying it, and what they report doing when using it as a non-pharmacological intervention within multimodal pain management. The results are intended to give a baseline picture of competence across these three domains and to support the design of targeted educational strategies and evidence-based clinical guidance, such as standard operating procedures (SOPs), so that *guided imagery* can be properly integrated into perioperative nursing care.

2. Methods

a. Research Design

A quantitative descriptive survey design with a structured questionnaire was applied. Data were gathered between July and September 2026 in Makassar City, Indonesia. The descriptive design served to measure and portray respondents' competence in three domains, namely knowledge, attitudes, and practices concerning *guided imagery* in postoperative pain management.

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b. Population and Sample

The population consisted of anesthetic technicians working in anesthesia services in Makassar City, Indonesia, and the target population numbered 60 anesthetic technicians. Purposive sampling was used for recruitment, guided by inclusion and exclusion criteria set in line with the study aims. Forty-seven respondents who satisfied the eligibility criteria and took part were entered into the final analysis, which equals 78.3% of the 60 individuals in the target population. The sample size was thus determined by the number of eligible participants obtained through purposive sampling, not by a statistical sample size formula (Palinkas et al., 2016). Eligible respondents were anesthetic technicians who were actively delivering anesthesia services and agreed to participate. Respondents who left the questionnaire incomplete were removed from the analysis.

c. Research Instrument

Data were obtained with a Knowledge, Attitude, and Practice (KAP) questionnaire that was built from a literature review on *guided imagery*, multimodal pain management, and the part anesthetic technicians play in postoperative pain management. It had three domains: knowledge, attitudes, and practices.

The knowledge domain measured how well respondents grasp the concept of *guided imagery*, including its aims, benefits, indications, contraindications, and implementation steps, as well as its use within multimodal pain management. The attitude domain captured respondents' acceptance and views about using *guided imagery* for postoperative pain management. The practice domain gauged how respondents reported applying *guided imagery*, or being inclined to apply it, as a non-pharmacological way of managing pain.

Every domain contained 10 items. Knowledge items were scored dichotomously, with 1 point for a correct answer and 0 for an incorrect one, whereas attitude and practice items used Likert-type scoring. Each domain's total score was turned into a percentage of its maximum possible score and sorted into three categories: good (76–100%), moderate (56–75%), and poor (≤55%). The categories made it easier to interpret respondents' knowledge, attitudes, and practices in applying *guided imagery* to postoperative pain management.

Prior to use, the instrument went through content validity assessment by expert judgment from specialists in anesthesiology and pain management. It was then piloted for validity and reliability on respondents whose characteristics resembled those of the study sample.

Validity testing showed that the items fulfilled the preset validity criteria. Reliability testing produced Cronbach's alpha values of 0.630 for the knowledge domain and 0.730 for both the attitude and practice domains, which signify acceptable internal consistency. The instrument was accordingly judged appropriate for this study.

d. Data Collection Procedure

Data collection began after ethical approval and a research permit had been secured from the **"Pelayanan Terpadu Sistem Satu Pintu (PTSP)"**. Prospective participants were told about the study objectives, possible benefits, procedures, data confidentiality, and their right to take part voluntarily. Those who agreed gave **informed consent** prior to filling in the questionnaire, which was distributed through **online and offline methods** and completed by participants on their own. All collected data were coded and entered into a database for statistical analysis, and participant confidentiality was safeguarded during data collection and analysis.

e. Data Analysis

Univariate analysis was used to describe respondent characteristics and the spread of scores in each competency domain (knowledge, attitudes, and practices). Respondent

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characteristics were reported as frequencies and percentages, while competency scores were summarized through frequency distributions, percentages, and suitable measures of central tendency and dispersion given the nature of the data.

Competency levels were then classified from each domain's score. The obtained score was expressed as a percentage of the maximum possible score and interpreted against the categories defined beforehand for the study. These results were used to outline the competency profile of anesthetic technicians in applying *guided imagery* within postoperative pain management.

SPSS version 30 was used for all statistical analyses, and the significance level was set according to what each analysis required.

f. Ethical Considerations

Ethical approval was granted by the **Health Research Ethics Committee (KEPK)** of Institut Nani Hasanuddin under approval number **240/INSTITUT-NH/KEPK/VII/2026**. Respondents received information on the study and joined voluntarily after giving **informed consent**. Their confidentiality and anonymity were protected throughout the research, and the data were employed only for research purposes.

3. Results

Characteristics of Respondents

Table 1
Characteristics of Respondents

Characteristics	n	%
Age		
Rerata ± SD	35,21 ± 7,54	
Median	35	
Min-Max	22-54	
Sex		
Male	34	72.3
Female	13	27.7
Education		
Diploma III	8	17.0
Diploma IV/ STKA	29	61.7
Professional Degree	5	10.6
Magister (S2)	5	10.6
Work Experience		
< 1 Year	7	14.9
1-5 Year	17	36.2
6-10 Year	11	23.4
>10 Year	12	25.5

SD = standart deviation; n = total

Table 1 shows that **47 respondents** took part, with a mean age of **35.21 ± 7.54 years** and an age range of **22 to 54 years**. Most were male (**72.3%**) and held a **Diploma IV/ STKA** qualification (**61.7%**). In terms of employment duration, the biggest group had **1–5 years of work experience (36.2%)**.

Tabel 2
Distribution of score total by competence domain

Competence Domain	Maximum Score	Mean ± SD	Median	Min-Max	Percentile
Knowledge	20	17,62 ± 1,01	17	16-20	88,1%

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Attitude	50	37,49 ± 11,73	39	20-50	75%
Behavior	30	20,38 ± 4,80	20	10-30	67,9%

SD = standart deviation

Table 2 shows that scores differed across the three domains. Knowledge averaged 17.62 ± 1.01 out of a maximum of 20 (88.1%), reflecting fairly strong mastery. Attitude averaged 37.49 ± 11.73 out of 50 (75.0%), and practice averaged 20.38 ± 4.80 out of 30 (67.9%). Practice therefore recorded the lowest mean percentage of the three domains. This suggests a possible gap between knowing about *guided imagery* and putting it into practice among anesthetic technicians.

Table 3
Distribution of Knowledge, Attitude and Behavior toward Guided Imagery by category

Variable	Category	n	%
Knowledge	Good	47	100
Attitude	Good	25	53.2
	Moderate	6	12.8
	Poor	16	34.0
Behavior	Good	15	31.9
	Moderate	22	46.8
	Poor	10	21.3

Knowledge, attitude and behavior were categorized as good (76-100%), moderate (56-75%), and poor (≤55%) of the maximum score.

Table 3 shows that **all respondents (100%) had good knowledge** of *guided imagery*. For attitude, **25 respondents (53.2%)** were categorized as good, **6 respondents (12.8%)** as moderate, and **16 respondents (34.0%)** as poor. For practice, **15 respondents (31.9%)** were classified as good, **22 respondents (46.8%)** as moderate, and **10 respondents (21.3%)** as poor. Thus, while knowledge of *guided imagery* was good in every respondent, attitudes and practices were spread more widely, and the share with good practice was smaller than the shares with good knowledge and good attitude.

4. Discussion

The three competency domains were achieved to different degrees by the anesthetic technicians applying *guided imagery* to postoperative pain management. Every respondent (100%) had good knowledge, but just 53.2% showed good attitudes and 31.9% good practices. Such a pattern implies that sufficient knowledge does not automatically bring about ideal attitudes and implementation practices.

These results suggest that clinical competence is more than mastery of knowledge; it also includes attitudes and the capacity to apply that knowledge in clinical work. A systematic review on assessing clinical competency in nursing found that competency instruments usually cover several dimensions, such as knowledge, attitudes, behaviors, cognitive skills, and psychomotor skills, although measurement approaches differ widely between studies (Horn & Lewallen, 2023).

That every respondent had good knowledge is an encouraging result for *guided imagery* implementation. Sufficient knowledge lets anesthetic technicians understand the aims, principles, benefits, indications, and features of the intervention before using it with patients. This matters because *guided imagery* is a non-pharmacological, complementary approach to pain management. Darmadi & Hafid (2020) noted that several studies reported

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benefits of *guided imagery* in lowering postoperative pain; most of the studies they reviewed found less pain after the intervention, together with better patient comfort and lower anxiety. Sumarni et al. (2025) likewise found a significant drop in pain scores after *guided imagery* among patients recovering from fractures ($p < 0.001$). This agrees with Zengin Aydın & Doğan (2023), whose randomized controlled trial of 60 patients having lower-extremity surgery showed significantly lower postoperative pain scores in the *guided imagery* group than in the control group ($p < 0.001$). A further study in geriatric orthopedic patients also found that *guided imagery* clearly decreased pain and improved comfort (Ozdemir et al., 2023). The high knowledge level of the present respondents is therefore clinically meaningful, because the intervention under study is backed by evidence of potential benefit for postoperative pain management.

Even though everyone had good knowledge, only 53.2% had good attitudes. This difference implies that knowing about *guided imagery* does not necessarily mean accepting it or being ready to use it. Providers' attitudes toward an intervention can be shaped by how they see its benefits and ease of use, their clinical experience, their confidence that it works, and the nature of their practice setting. The result is in line with Adombire et al. (2024), who found that nurses in low- and middle-income countries mostly held positive attitudes toward evidence-based practice across the reviewed studies, yet their knowledge, skills, and clinical implementation often stayed at moderate or low levels. About 84% of the reviewed studies described evidence-based practice implementation as moderate, low, poor, or suboptimal. Such findings imply that a positive attitude alone may not guarantee consistent use of evidence-based interventions in clinical practice.

Good practice was even less common in this study, at only 31.9%, with 46.8% classed as moderate and 21.3% as poor, which points to a wider gap between knowledge and its application. Nasiri et al. (2019) reported a similar pattern in a study of nurses' knowledge, attitudes, and practices in infection prevention and control: most of the reviewed studies found adequate knowledge and positive attitudes, yet nurses' practices in many of them stayed moderate or low. Several researchers stress combining theoretical and practical education with ongoing training to improve clinical practice (Guerrero et al., 2024; Meghani et al., 2020). These studies dealt with other clinical interventions, but they help explain the present results, since good knowledge and favorable attitudes do not always yield optimal practice. Adombire et al. (2024) likewise found that nurses in low- and middle-income countries often had moderate, low, or inadequate knowledge and skills in evidence-based practice, and that most reviewed studies rated implementation in healthcare facilities as moderate to suboptimal. The authors argued that better knowledge needs to be paired with sufficient resources and supportive organizational settings for implementation to be consistent. This view may account for the present findings: anesthetic technicians may understand *guided imagery* well, yet its use in perioperative care may depend on factors beyond personal knowledge, such as clinical experience, training opportunities, availability of standardized procedures, workload, organizational support, and how well non-pharmacological interventions are built into routine perioperative care.

Applying *guided imagery* takes more than recalling theory. Anesthetic technicians must communicate well with patients, give suitable instructions, tailor the intervention to each patient's condition, choose the right moment to start, and assess how patients respond. Clinical competence is also shaped by clinical experience, education and training, professional development, communication skills, and the practice environment (Feriyanto et al., 2025; Hastuti et al., 2023). Almarwani & Alzahrani (2023) similarly reported that clinical nursing competence develops through education and training, clinical experience,

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professional development, clinical judgment, decision-making, and communication skills. For this reason, the comparatively small share of respondents with good practice should not be read only as a result of inadequate knowledge. It may instead point to a gap between "knowing" and "doing," where sufficient knowledge has not yet been converted into consistent clinical practice.

These findings also bear on how the competence of anesthetic technicians might be raised. Teaching about *guided imagery* should go beyond theory and include practice-based learning that helps carry knowledge into clinical application. Hill et al. (2024) support this: in a study of 5,208 healthcare professionals, educational interventions grounded in evidence-based healthcare influenced knowledge, skills, attitudes, and professional behaviors, and active and blended learning emerged as factors that could boost their effectiveness. Yuan (2024) points the same way, having examined an educational intervention to improve nurses' knowledge, attitudes, and practices in pain management; it improved nurses' knowledge, attitudes, and ability to deliver both pharmacological and non-pharmacological pain interventions. This is highly pertinent here because *guided imagery* is a non-pharmacological pain management intervention. The relatively small proportion of respondents with good practice could therefore serve as a basis for skills-oriented training that stresses hands-on use of *guided imagery* instead of only expanding theoretical knowledge.

Evidence of the effectiveness of *guided imagery*, for example in reducing postoperative pain among total joint arthroplasty patients (Ahmidati et al., 2024), further highlights why competence in implementing it matters. This evidence relates directly to the present study, as it shows that *guided imagery* has a research basis for use in pain management. Given this proven effectiveness, strengthening providers' competence in applying it is key to moving the benefits seen in experimental research into everyday clinical practice. Fontaine et al. (2024) noted that implementation strategies such as educational meetings, educational materials, clinical guidelines, reminders, *audit and feedback*, tailored interventions, and *educational outreach* can improve clinical practice, though their effect varies with context and the strategies used. Accordingly, implementing *guided imagery* in clinical settings may be reinforced by combining structured training, practical guidelines, standard operating procedures, clinical supervision, and continuous evaluation of its implementation.

In sum, the main gap found in this study is not in knowledge, which was good in all respondents, but in turning that knowledge into suitable attitudes and, above all, into clinical practice. The findings support the view that clinical competence is multidimensional and that better knowledge alone does not ensure optimal clinical implementation. Competency development should hence take an integrated approach that covers knowledge acquisition, attitude formation, practical skill development, and supportive clinical environments.

Implications for Practice

In practical terms, the findings offer a basis for strengthening anesthetic technicians' competencies in multimodal pain management. Developing competence in *guided imagery* could center on structured training covering conceptual understanding, patient selection, communication and delivery of instructions, demonstration, simulation, hands-on practice, assessment of patient responses, and documentation of the intervention. Learning approaches that include practical experience may be an appropriate way to build and reinforce clinical skills.

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Study Limitations

Several limitations should be considered when interpreting these results. First, competence was measured with a questionnaire, so the practice domain reflects self-reported practice and not direct observation of clinical work. Second, the cross-sectional design captured competence at a single point in time, which prevents examining change over time or establishing causal relationships. Third, competence was operationalized through knowledge, attitudes, and practices, while the literature shows that no single standardized approach exists for assessing clinical competence, which may also include cognitive and psychomotor skills.

Future studies should therefore consider direct observation of practice, simulation-based assessment, or performance-based evaluation to gain a fuller assessment of anesthetic technicians' competence in implementing *guided imagery* for postoperative pain management.

5. Conclusion

In summary, anesthetic technicians in this study had a high level of knowledge about *guided imagery*, while attitudes, and practices in particular, left more room for improvement. This pattern shows that mastering knowledge does not automatically guarantee effective use of the intervention in clinical practice.

Competency development for *guided imagery* should consequently move past simple knowledge transfer toward an integrated approach that brings together knowledge, attitude development, practical skills, simulation, clinical guidelines, and implementation support. As the available evidence indicates that *guided imagery* can help lower postoperative pain, strengthening anesthetic technicians' competence in applying it may help build comprehensive multimodal pain management in perioperative care.

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