

Anaesthetic nurses' conditions for ensuring patient safety during anaesthesia care: A grounded theory study

Warunki zapewniania przez pielęgniarki anestezjologiczne bezpieczeństwa pacjenta podczas opieki anestezjologicznej: badanie oparte na teorii ugruntowanej

Petra Bejvančíká^{1,2,A-B,D-F,K} , Iva Brabcová^{1,A,D-E,G,L} 

¹Faculty of Health and Social Sciences, University of South Bohemia in Česke Budějovice, Czech Republic

²Faculty of Health Care Studies, University of West Bohemia in Pilsen, Czech Republic

CORRESPONDING AUTHOR:

Petra Bejvančíká

Faculty of Health and Social Sciences, University of South Bohemia in Česke Budějovice, Czech Republic
e-mail: petrabejvancika@seznam.cz

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STRESZCZENIE

WARUNKI ZAPEWNIANIA PRZEZ PIELĘGNIARKI ANESTEZJOLÓGICZNE BEZPIECZEŃSTWA PACJENTA PODCZAS OPIEKI ANESTEZJOLÓGICZNEJ: BADANIE OPARTE NA TEROII UGRUNTOWANEJ

Cel pracy. Celem badania było dośćbne zrozumienie postaw pielęgniarek anestezjologicznych wobec bezpieczeństwa pacjenta w opiece anestezjologicznej.

Materiał i metody. W badaniu tym zastosowano klasyczne podejście oparte na teorii ugruntowanej z jakościowym projektem opracowanym przez Corbina i Straussa, wykorzystując otwarte, selektywne i osiowe kodowanie do analizy danych i generowania koncepcji. Dane uzyskano poprzez półstrukturyzowane wywiady z 14 pielęgniarkami anestezjologicznymi ze szpitali w Republice Czeskiej.

Wyniki. Bezpieczeństwo pacjenta jest głównym zawodowym i etycznym priorytetem pielęgniarek anestezjologicznych. Pielęgniarki określają warunki niezbędne do zapewnienia bezpiecznej opieki anestezjologicznej: „Przygotowana pielęgniarka”, „Przygotowane miejsce pracy”, „Przygotowany/zabezpieczony pacjent”, „Współpraca w zespole anestezjologicznym” i „Kultura bezpieczeństwa w organizacji”. Na tej podstawie stworzono teorię „Warunki pielęgniarek anestezjologicznych zapewniające bezpieczeństwo pacjenta w opiece anestezjologicznej”.

Wnioski. W artykule podsumowano warunki pielęgniarek anestezjologicznych zapewniające bezpieczeństwo pacjenta w opiece anestezjologicznej. Nasze ustalenia mogą pomóc decydentom i menedżerom opieki zdrowotnej na różnych szczeblach w tworzeniu korzystnych warunków pracy i przepisów prawnych dla bezpiecznej opieki świadczonej przez pielęgniarki anestezjologiczne.

Słowa kluczowe: pielęgniarka anestezjologiczna, bezpieczeństwo pacjenta, opieka anestezjologiczna, teoria ugruntowana

ABSTRACT

ANAESTHETIC NURSES' CONDITIONS FOR ENSURING PATIENT SAFETY DURING ANAESTHESIA CARE: A GROUNDED THEORY STUDY

Aim. The purpose of the study is to develop a deeper understanding of anaesthetic nurses' attitudes towards patient safety in anaesthesia care.

Material and methods. The study employed a classical grounded theory approach with a qualitative design developed by Corbin and Strauss, utilising open, selective, and axial coding to analyse data and generate concepts. Data were obtained through semi-structured interviews with 14 anaesthetic nurses from hospitals in the Czech Republic.

Results. Patient safety represents the primary professional and ethical priority for anaesthetic nurses. These nurses establish the conditions necessary for providing safe anaesthesia care: “Prepared nurse”, “Prepared workplace”, “Prepared/safeguarded patient”, “Collaboration in anaesthesia team”, and “Safety culture in the organisation”. Based on these findings, the theory “Anaesthetic nurses' conditions for ensuring patient safety during anaesthesia care” was developed.

Conclusions. This article summarises anaesthetic nurses' conditions for ensuring patient safety during anaesthesia care. Our findings can assist policymakers and healthcare managers at various levels in creating favourable working and legislative conditions for safe care provided by anaesthetic nurses.

Key words:

patient safety, grounded theory, anaesthetic nurse, anaesthesia care

INTRODUCTION

The operating room (OR) environment is characterised by complexity, advanced technology, high pace, and elevated risk [1]. The intraoperative care process is managed within the anaesthesia team and influenced by surgical team activities [2]. Anaesthesia practice consists of distinct phases with varying goals, tasks, and intensity levels, requiring constant and active presence of the anaesthesia team [2].

Nurse anaesthetists provide or participate in anaesthesia services in 75% of all anaesthesia cases worldwide [3]. However, their education, roles, and responsibilities vary considerably. This diversity stems from differences in legislation, professional training, and work guidelines [4]. Nurse anaesthetists play an essential role in reducing harm and improving patient safety [5]. Safe anaesthesia practice requires advanced knowledge and skills to meet patient needs [5]. These nurses care for anaesthetised patients by combining technical expertise with a compassionate approach [6]. The surgical patient represents a person in a vulnerable situation [1], and nursing practice must be intentional, thoughtful, and goal-directed in response to patients' specific needs.

Anaesthesia care in the Czech Republic is provided by an anaesthesia team comprising an anaesthesiologist and a nurse (termed an anaesthetic nurse, though without specific legislative background). The physician anaesthesiologist has primary responsibility for anaesthesia care. In clinical anaesthesiology practice, the anaesthetic nurse serves as an integral component of a multidisciplinary team dedicated to patient safety.

AIM

This study aimed to develop a deeper understanding of anaesthetic nurses' attitudes regarding patient safety in anaesthesia care within the Czech Republic context.

MATERIALS AND METHODS

Grounded theory employs a methodological approach in which concepts or theories emerge from data that are collected, analysed, and compared throughout the research process. The initial phase involves open coding, where codes are combined into more general and elaborate concepts, leading to selective coding. All analytical notes and questions emerging during analysis (memos) are recorded systematically. The subsequent phase involves searching for theoretical connections between concepts. Even when analysing these connections (axial coding), researchers must proceed from the obtained data. The final phase encompasses selecting a central concept and defining the theory. In fact, the theory is generated after achieving theoretical saturation and explaining the connections among categories.

The research received approval from the Ethics Committee, and all participants provided informed consent in accordance with the Declaration of Helsinki. The study involved fourteen anaesthetic nurses from different

hospital types. All participants were female, with an average length of anaesthesiology practice of 14 years (range 3–25 years). Data were collected through semi-structured interviews ranging between 35 and 92 minutes. Each interview began with the question: „How do you, as an anaesthetic nurse, influence patient safety in anaesthesia care?”

Data analysis commenced during fieldwork and continued parallel to data collection. New findings were discussed and interpretations as well as memos were agreed upon. Increasingly abstract codes were assigned, and incoming data were compared with existing data, concepts, and emerging categories. Theoretical saturation was achieved during the conversation with the tenth participant; the subsequent four conversations yielded no new concepts.

RESULTS

More than 100 codes and memos were identified for each category, enabling the conceptual development of the theory. Memos were utilised to analytically elaborate the categories and their interrelationships. For example, analysis of a situation where insufficient communication between a nurse and anaesthesiologist resulted in inadequate information about a planned operation helped us understand how collaboration within the anaesthesia team affects nurse's preparations (preventing the nurse from creating an appropriate plan), thus contributing to the definition of the central category.

Nurse preparedness, workplace preparedness, safeguarded (prepared) patient, cooperation in the anaesthesia team, and safety culture in the organisation represent dimensions that are causally related to safe anaesthesia care. The relationships between these dimensions are mutually interdependent. Disruption of even one dimension may result in failure to meet the conditions required for safe anaesthesia care. If the nurse is not adequately prepared across all dimensions, the care provided cannot be safe. This applies whether the workplace is unprepared, the patient is inadequately prepared, or the team collaboration is dysfunctional. Conversely, if the workplace or patient is not adequately prepared, or if the team collaboration or organizational culture is deficient, nurses cannot achieve the state of preparedness necessary for providing safe anaesthesia care.

These interrelations can be analogously applied from the patient's perspective: if any required condition is not met, anaesthesia care safety will be compromised. Furthermore, an established organisational safety culture emerges as a significant factor in enabling nurses to ensure safe anaesthesia care. It has been confirmed that when effective management support is lacking or patient involvement in care is disrupted, the overall safety of anaesthesia care decreases—not only for the patient but also for all parties involved in the care process.

Patients find themselves in difficult, stressful situations, feeling vulnerable, and nurses should guide them through these situations and provide comfort. Patients under general anaesthesia are perceived as individuals with rapidly changing states of self-sufficiency. Nurses repeatedly assess patient's needs and provide appropriate interventions to meet them or assume the role of patient advocate. An anaesthetised patient must never be left unattended by responsible personnel, even

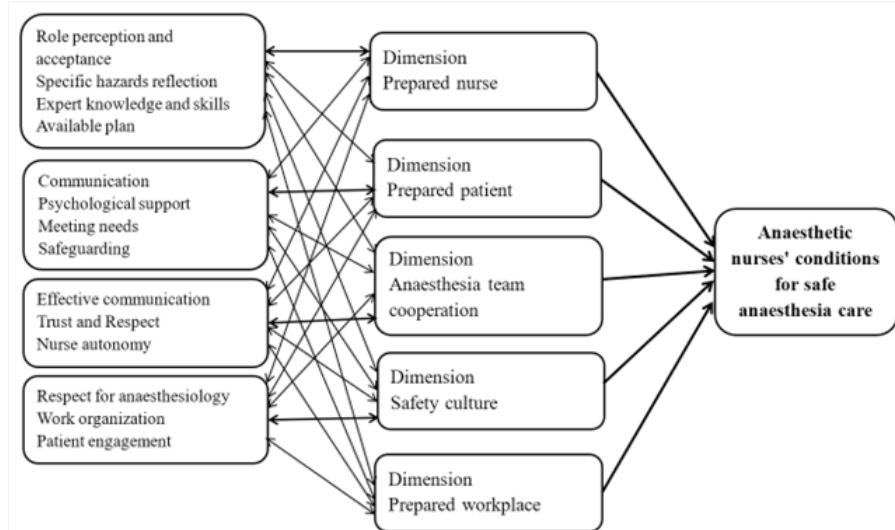


Fig 1. Schema of dimensions

1. The prepared nurse perceives and accepts her role in providing safety. Nurses perceive safety as important not only for patients but also for healthcare providers themselves. Patient safety represents one of their primary tasks and missions. Nurses recognise the need to care for patients before, during, and after anaesthesia care while acknowledging its specific risks. The medications used induce unconsciousness and loss of defensive reflexes, making patients vitally dependent on equipment. Additionally, there is often a lack of care continuity, and nurses have limited influence on the quality of patient preparation before anaesthesia care. Nurses must possess theoretical knowledge and practical skills not only in nursing but also in anaesthesiology. They must be technically proficient, adaptable, and resilient under pressure. Anaesthetic nurses must immediately evaluate and interpret their findings, make decisions, and act accordingly. For patient safety, it is crucial to have a plan regarding what will happen, how, and when. This applies not only to equipment and workplace preparation but also to planning work rhythm and ensuring sufficient time reserves for necessary interventions. Nurses emphasise the need for contingency planning—preparation for situations that may arise and typically require immediate attention. They strive to anticipate and prepare for these situations, whether involving aids, medications, equipment, or assistance from colleagues.
2. Preparation of the anaesthesia workplace and orientation within it are of paramount importance for patient safety. Individual steps and activities must not be omitted, and lists, checklists, or technician assistance can provide valuable support. Equipment testing, the availability of instructions, and substitute devices and aids are essential because, in case of complications, patient life or health may depend on their immediate availability.
3. Prepared/safeguarded patient. Communication with patients serves nurses not only as an information source but also as a means of human contact. It helps to satisfy patients' needs for confidence and safety.

though monitoring devices are in place (safeguarded patient).

4. The essence of effective teamwork lies in cooperation. It is necessary to divide tasks associated with competencies, autonomy, and responsibility. Mutual assistance and oversight, consultation, trust, and respect are equally important. Effective communication between team members is essential. Anaesthetic nurses' autonomy represents a condition for the proper performance of safe nursing care; otherwise, care continuity and safety may be compromised.
5. Safety culture in the organisation. Anaesthesiology requires respect because it is often underestimated not only by patients but also by surgical teams. Management support for employees consists of creating favourable conditions for professional performance by supporting education, clearly defining competencies and work procedures, and implementing comprehensive risk management. Emphasis should be placed on interdisciplinary cooperation and eliminating burdens caused by excessive performance pressure and insufficient time for preparation and execution of necessary care. Patients should be actively engaged because they can pose risks to themselves if they remain passive, disinterested, unwilling to seek information, make decisions, or accept responsibility.

DISCUSSION

The analysis of the interviews and the subsequent theory of anaesthetic nurses' conditions confirm that anaesthetic nurses perceive patient safety as a priority and play an important role in ensuring it. As highlighted by Murray et al. [7], healthcare staff attitudes towards patient safety play a key role in shaping overall patient safety. Anaesthetic nurses should always intend to protect and represent patients in their vulnerable situations [8]. In our study, nurses' attitudes were defined as „anaesthetic nurse perceives and accepts her role in anaesthesia care safety.” The narrative of holding another person's life in one's hands emerged. This assumption of existential and

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moral responsibility for another's life is often referred to as part of nursing's ethical foundation [5]. Through their presence, nurses are responsible for patients' emotional and physical safety [8].

According to our nurses, a „prepared nurse” possesses theoretical knowledge, practical skills, and employs critical thinking. This aligns with the view of Lekens et al. [1], who state that clinical judgment is essential for ensuring quality care and requires a range of skills and attributes, critical thinking, and ethical decision-making translated into clinical practice. Nurses proactively approach patient care by planning care (nurses have a plan), designing contingency plans (nurses have plan B), and adapt care to patient needs (meeting patient needs). This approach highlights the necessity of a well-organized nursing process as key to safe patient care [1].

Creating a sense of safety appears to be twofold, as actual safety, defined by risk management, does not always correspond with patients' feelings of safety [9]. Patients should rely on abilities of anaesthetic nurses, who provide them with not only safe but also individualised care. According to Lekens et al. [1], anaesthetic nurses are uniquely positioned within the perioperative team to support care continuity and address any care gaps [1]. Genuine interest and participation in perioperative dialogue is a prerequisite for the relationship between patient and nurse [8]. Communication and psychological support of patients were perceived by nurses in our study as essential for „patient preparations.” Anaesthetic nurses help patients cope with their situations. When patients are unwilling or unable to defend themselves, anaesthetic nurses protect and represent them [8]. This aligns with our study results. Anaesthetic nurses present these activities as their fundamental professional and moral obligations in the subcategories „Meeting patient needs (including patient advocacy)” and „Patient surveillance.”

Specific attitudes and mutual interactions of health-care teams contribute to safety culture formation [10]. Collaboration, mutual assistance, trust, and respect are qualities that our nurses expect from teamwork. These are associated with competence, autonomy, responsibility, and effective communication within the team. The importance of planning for both expected and unexpected situations and sharing plans between anaesthetic nurses and anaesthesiologists is emphasised by Olin et al. [2]. Lekens et al. describe teamwork and the ability to manage services at the system level as the foundation of anaesthesia nursing [5]. Proper teamwork and shared values across disciplines are essential in providing holistic patient care. All team members, including patients, must work together and share their perspectives to provide optimal care [5]. Nurses in our study also advocate for „patient engagement.”

Excessive demands for work efficiency and time pressure were perceived as safety threats by anaesthetic nurses. This can lead to rationed nursing care, which poses a potential threat to holistic care [5]. Missed nursing care may be related to nurse internal factors and/or work environment and leadership quality [1]. Baumgarten et al. [11] found that physician legal responsibility for patient care can lead to uncertainty about roles and responsibili-

ties. This unclear division creates feelings of insecurity and is perceived as a potential threat to patient safety. According to Yeganeh et al. [12], limited nurse autonomy and reduced influence on decision-making processes can lead to feelings of frustration and injustice. These factors contribute to conflict emergence and weakening of teamwork, which interviewed nurses perceived as a threat to care safety.

CONCLUSIONS

Study results demonstrate that patient safety is a priority for anaesthetic nurses. Conditions related to the anaesthesia team, anaesthesia workplace, patients, and safety culture in the organisation are essential for providing safe anaesthesia care. The study findings can assist policymakers and healthcare managers at various levels in creating favourable working and legislative conditions for safe care provided by anaesthetic nurses.

ORCID

Petra Bejvančíká  <https://orcid.org/0000-0002-7141-0387>
Iva Brabcová  <https://orcid.org/0000-0002-8707-8091>

REFERENCES

1. Lekens ALB, Drageset S, Hansen BS. Knowing how, arguing why: nurse anaesthetists' experiences of nursing when caring for the surgical patient. *BMC Nurs.* 2025;24(1):144. <https://doi.org/10.1186/s12912-025-02752-3>.
2. Olin K, Klinga C, Ekstedt M, et al. Exploring everyday work as a dynamic non-event and adaptations to manage safety in intraoperative anaesthesia care: an interview study. *BMC Health Serv Res.* 2023;23(1):651. <https://doi.org/10.1186/s12913-023-09674-3>.
3. Meeusen V, van Zundert A, Hoekman J, et al. Composition of the anaesthesia team: a European survey. *Eur J Anaesthesiol.* 2010;27(9):773-9. <https://doi.org/10.1097/EJA.0b013e32833d925b>.
4. Lemos CDS, Peniche ADCG. Nursing care in the anesthetic procedure: an integrative review. *Rev Esc Enferm USP.* 2016;50(1):158-66. <https://doi.org/10.1590/S0080-623420160000100020>.
5. Lekens ALB, Drageset S, Hansen BS. How nursing care is expressed among nurse anaesthetists in the perioperative context: A meta-ethnographic synthesis. *J Clin Nurs.* 2023;32(17-18):5763-5778. <https://doi.org/10.1111/jocn.16700>.
6. Petersen HS, Rothmann MJ, Jensen HI. Certified Registered Nurse Anesthetists' Experiences of Nursing in Anesthesia Care: An Interview Study. *J Perianesth Nurs.* 2024;39(6):1049-1055. <https://doi.org/10.1016/j.joran.2024.01.024>.
7. Murray M, Sundin D, Cope V. New graduate nurses' understanding and attitudes about patient safety upon transition to practice. *J Clin Nurs.* 2019 Jul;28(13-14):2543-2552. <https://doi.org/10.1111/jocn.14839>.
8. Abelsson A, Falk P, Sundberg B, et al. Empowerment in the perioperative dialog. *Nurs Open.* 2020;8(1):96-103. <https://doi.org/10.1002/nop2.607>.
9. Henriksen KF, Hansen BS, Wøien H, et al. The core qualities and competencies of the intensive and critical care nurse, a meta-ethnography. *J Adv Nurs.* 2021;77(12):4693-4710. <https://doi.org/10.1111/jan.15044>.
10. Pimentel MPT, Choi S, Fiumara K, et al. Safety Culture in the Operating Room: Variability Among Perioperative Healthcare Workers. *J Patient Saf.* 2021;17(6):416. <https://doi.org/10.1097/PTS.0000000000000385>.
11. Baumgarten M, Brødsgaard A, Nørholm V, et al. Interprofessional Collaboration Between Nurses and Physicians in the Perioperative Period. *J Perianesth Nurs.* 2023;38(5):724-731. <https://doi.org/10.1016/j.joran.2022.12.002>.
12. Yeganeh S, Torabizadeh C, Bahmani T, et al. Examining the views of operating room nurses and physicians on the relationship between professional values and professional communication. *BMC Nurs.* 2022;21(1):17. <https://doi.org/10.1186/s12912-021-00778-x>.

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