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Anesthesia Program Students' Perceptions of the Operating Room: A Metaphor Analysis

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Research Article

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Abstract

Background

Clinical learning environments play a critical role in shaping students' professional perceptions, emotional responses, and learning experiences. The operating room is a high-risk, complex, and multidisciplinary setting that involves patient safety, life-sustaining interventions, and active participation in teamwork. Understanding anesthesia program students' perceptions of this environment before and after clinical practice is essential for the improvement of clinical education. This study aims to examine changes in anesthesia program students' perceptions of the operating room before and after their first clinical practice through metaphor analysis.

Methods

This study is a qualitative descriptive phenomenological study conducted using metaphor analysis. The study was carried out with 54 first-year anesthesia program students who had no prior clinical experience and were enrolled at a state university during the 2023–2024 academic year. Data were collected in two phases: before clinical practice and after a 14-week operating room clinical training period. Participants were asked to complete the statement, 'The operating room is like … because …". A total of 108 metaphors were obtained and analyzed using content analysis. The metaphors were categorized based on shared meanings, and perceptions before and after clinical practice were compared.

Results

The analysis identified four main categories: professional environment, life-preserving setting, educational environment, and critical environment. Before clinical practice, students' metaphors were predominantly emotional and abstract, reflecting perceptions of mystery, fear, hope, and idealized healing (e.g., "closed box," "light of hope," "mystery"). After clinical practice, the metaphors became more concrete, realistic, and profession-oriented, emphasizing themes of systematic work, responsibility, teamwork, and continuous learning (e.g., "clock," "puzzle," "school," "being alert"). Metaphors associated with fear and uncertainty decreased, while those reflecting professional awareness and structured learning increased.

Conclusions

Clinical practice was found to transform anesthesia program students' perceptions of the operating room from emotional and fear-based approaches to a more professional, realistic, and learning-oriented perspective. These findings highlight the importance of structured, supportive, and role model–based

clinical education in fostering professional identity development and emotional adaptation. Enhancing the quality of clinical learning environments may contribute to the effectiveness and sustainability of anesthesia education.

Introduction

There is a strong relationship between the theoretical foundations of anesthesia technician education and experiential learning. This relationship enables students to effectively develop their professional skills through clinical practice and achieve successful learning outcomes [1]. Clinical practice allows the application of theoretical knowledge acquired in the classroom to real-world settings and plays a complementary role in the learning process [2]. Moreover, clinical practice contributes to the development of critical thinking, decision-making, self-confidence, and communication skills [3].

The operating room is one of the most complex, high-risk, and multidisciplinary working environments in healthcare. Practices carried out in this setting require advanced technical knowledge, team coordination, time management, and a high level of responsibility. Since anesthesia services play a central role in maintaining patients' vital functions, anesthesia technicians take an active role throughout the surgical process. The operating room provides an essential learning environment for anesthesia program students to safely perform anesthesia practices during the perioperative period, ensure patient safety, adhere to infection control principles, prepare and monitor anesthesia equipment, and develop multidisciplinary teamwork skills [4]. Therefore, anesthesia program students' perceptions of the operating room have a significant impact on their professional competence and professional identity development [5–7].

For students in the health sciences, the operating room is not only a setting where technical skills are acquired but also a clinical learning environment in which stress, uncertainty, responsibility, and learning are intensely experienced. Before clinical practice, students primarily form their perceptions of this environment based on theoretical knowledge, observational experiences, and personal expectations. With the clinical practice process, these perceptions are reshaped through direct experience, intra-team interaction, and responsibility for practice [8].

The literature includes studies examining nursing and other health science students' perceptions of clinical environments. These studies indicate that clinical experience has a significant impact on students' stress levels, learning approaches, and professional perceptions [7, 9]. In particular, the operating room environment is described by students as both an educational and challenging learning setting. It has been reported that this environment may trigger emotions such as fear, anxiety, and uncertainty among students [10, 11].

In recent years, metaphor analysis has been widely used in qualitative research as an effective method for revealing individuals' perceptions of abstract concepts together with their emotional and cognitive dimensions. Metaphors reflect how students make sense of their experiences, expectations, and perceptions, thereby providing in-depth insights into clinical learning processes. Comparing metaphors

generated before and after clinical practice is considered an important approach for making changes in students' perceptions visible [12, 13].

However, a review of the literature reveals that perceptions of the operating room environment have been examined primarily among nursing students, and there is a lack of studies that comparatively investigate anesthesia program students' perceptions of this unique clinical setting, particularly before and after clinical practice. Yet, anesthesia program students are directly involved in practices related to patient safety, maintenance of vital functions, and critical interventions in the operating room. Therefore, this qualitative study, designed with a descriptive phenomenological approach using metaphor analysis, aims to evaluate anesthesia program students' perceptions of the operating room before and after their first clinical practice through metaphors.

Methods and materials

Study Desing

This qualitative study, designed with a descriptive phenomenological approach using metaphor analysis, aims to evaluate anesthesia program students' perceptions and views of the operating room environment before and after clinical practice through metaphors.

Prior to the study, the researcher provided theoretical instruction for 14 weeks, including scenario-based activities and simulation practices. Before the start of clinical practice, a 45-minute discussion session titled 'Expectations from anesthesia students in the operating room' was conducted with the anesthesia program students. The students then participated in operating room clinical practice for a total of 14 weeks, 8 hours per week. During this period, students' clinical practices were supervised by mentor anesthesia technicians and a clinical instructor (the researcher).

Study Setting and Population

The study population consisted of 55 first-year students enrolled in the Anesthesia Program at the Vocational School of Health Services, Erzincan Binali Yıldırım University, during the 2023–2024 academic year. First-year students were selected because they had no prior clinical practice experience in healthcare settings. No sampling method was applied; instead, 54 students who voluntarily agreed to participate constituted the study sample. One student was excluded from the study because they had previously participated in clinical practice.

Study Procedure

The research data were collected face-to-face by the researcher in two phases between February and June 2024. In the first phase, before the start of clinical practice, students were given a form consisting of two questions on demographic characteristics, three questions related to their profession, and one

question designed to elicit metaphor generation. Subsequently, the researcher provided a 20-minute training session on the concept of metaphors to facilitate metaphor production and activate students' metaphorical perceptions. To determine the metaphorical meanings, participants were asked to complete the statement, "The operating room is like … because …". The rationale for requesting the justification was to ensure that the intended meaning and purpose of each metaphor were clearly understood. After the first phase, the forms were collected and archived. In the second phase of the study, following the 14-week clinical practice period, students were given a new form and asked to generate metaphors related to the operating room environment, allowing for comparison of the data. A new form was used to prevent students from being influenced by the metaphors and justifications they had produced in the first phase. In the presentation of findings, direct quotations were coded using identifiers such as K1, K2, …, K54 to represent individual participants.

Results

The mean age of the participants was 19.53 ± 1.327 years, and 83.3% were female. Of the participants, 88.9% reported that they had chosen their profession willingly, 88.9% stated that they liked their profession, and 85.2% indicated that they experienced stress prior to clinical practice (Table 1).

Table 1
Demographic characteristics and professional perceptions of anesthesia program students (n = 54)

Variables		**Min-Max**	**Mean ± SD**
Age		18–23	19.53 ± 1.327
		Frequency	**Percentage**
Gender	Female	45	83.3
	Male	9	16.7
Choosing the profession willingly	Yes	48	88.9
	No	6	11.1
Liking the profession	Yes	50	92.6
	No	4	7.4
Clinical practice–related stress	Experiencing	46	85.2
	Not experiencing	8	14.8
Min: Minimum, Max: Maksimum			

Table 2
Categorical distribution of metaphors related to the operating room

Category	Pre-clinical practice		Post-clinical practice	
	Metaphors	Frequency	Metaphors	Frequency
Professional Environment	Factory (3), Heart of the hospital (3), Clock (2), Laboratory (1), Kitchen (1), Refrigerator (1), Organized room (1), Quiet room (1), Another world (1), Home (1), Systematic work (1)	16 (30%)	Clock (3), Kitchen (2), Puzzle box (2), System (1), Home (1), Library (1), Quiet study room (1), Baby's room (1), Planet (1), Busy street (1)	15 (28%)
Life-Protecting Area	Light of hope (5), New life (4), Place of healing (3), Mother (3), Tree of life (2), Sun of life (1), Rainbow (1), Therapy (1),	20 (37%)	Mother (2), Breath (2), Medicine (1), Painkiller (1), Orphanage (1), Safe space (1), Heart (1), Turning point (1), Garden (1)	12 (22%)
Educational Environment	Mystery (6), Reading a book (2), School (1), Exciting place (1),	10 (19%)	School (2), Reading a book (1), Learning new things every day (1), Engaging (1)	5 (9%)
Critical Environment	Closed box (5), An oral exam for a course I did not study for (5), Between life and death (4), Cold (3), Battlefield (3), Oven (2), Dark forest (3),	25 (46%)	Life (4), Being constantly alert (3), Exam moment (2) Domino pieces (1), Chess (1), Stress ball (1), Risky place (1), Cold (1), War (1), Haunted house (1), Point of no return (1)	17 (31%)

In this study, anaesthesia programme students' perceptions of the operating theatre concept were examined through metaphors in two periods: before and after clinical placement. A total of 54 students produced one metaphor in each period, yielding a total of 108 metaphors. The metaphors obtained were evaluated under four main categories: (1) Professional environment, (2) Life-preserving space, (3) Educational space, (4) Critical environment (Table 2).

Before clinical internship, 30% of the students (n = 16) described the operating room as a professional environment. The most frequently reported metaphors in this category were “factory” (n = 3) and “the heart of the hospital” (n = 3). Students explained their reasons as follows (Table 2):

K8: “The operating theatre is like a factory. Because it operates non-stop, 24 hours a day, 7 days a week”.

K2: “The operating theatre is the heart of the hospital. Because it is where seconds save lives and the most critical interventions are performed”.

Following the clinical period, the professional environment category decreased to 28% (n = 15), while the metaphors became more concrete and detailed, such as “clock” (n = 3), “kitchen” (n = 2), and “puzzle box”

(n = 2) (Table 2).

K47: “The operating theatre is like clockwork. Because even the smallest part working correctly affects the entire process”.

K53: “The operating theatre is like a jigsaw puzzle box. Because when all the pieces come together, the operation is complete”.

K45: “The operating theatre is like a kitchen. Because everything has its place, and when things are not in their place, things go wrong”.

Before the clinical internship, 37% of the students (n = 20) described the operating room as a life-preserving setting. The most frequently reported metaphors in this category were “light of hope” (n = 5) and “new life” (n = 4). Students perceived the operating room as an emotional and idealized source of healing (Table 2).

K7: “The operating theatre is like a ray of hope. Because every procedure performed on the patient offers a glimmer of hope for the good days ahead”.

K32: “The operating theatre is like starting a new life. Because it is the patient's relief from the pain and suffering they experience”.

After the clinical internship, the life-preserving setting category decreased to 22% (n = 12). The emotional intensity of the metaphors diminished, and more realistic expressions were used. The most frequently reported metaphors in this category were “mother” (n = 2) and “breath” (n = 2) (Table 2).

K27: “The operating theatre is like a mother. Because it welcomes every patient with open arms, regardless of age. Every detail is carefully considered; cleanliness, order and safety are always paramount”.

K14: “The operating theatre is like breathing. Just as breathing is necessary for life to continue, the harmony and intervention of the operating theatre team is necessary for the patient to cling to life”.

Before the clinical internship, 19% of the students (n = 10) described the operating room as an educational environment. The most frequently reported metaphor in this category was “mystery” (n = 6) (Table 2).

K50: “The operating theatre is like a mystery. Because although we have learnt a great deal about its technology, equipment and procedures, we have yet to experience it in practice”.

After the clinical internship, the metaphor “school” (n = 2), emphasizing learning, increased within the educational environment category (Table 2).

K34: “The operating theatre is like a school. Because we witness new methods, new knowledge and new lives; we learn something new every day and our experience grows.”

Before the clinical internship, 46% of the students (n = 25) described the operating room as a critical environment. The most frequently reported metaphors in this category were “closed box” (n = 5) and “an oral exam for an unstudied course” (n = 5) (Table 2).

K37: “The operating theatre is like a closed box. Because it holds all kinds of risks and excitement”.

K45: “The operating theatre is like an oral exam you've never studied for. Because you never know what kind of problem you'll encounter or when”.

After the clinical internship, the proportion of the critical environment category decreased to 31% (n = 17). Metaphors reflecting fear decreased and were replaced by those emphasizing a sense of responsibility. The most frequently reported metaphors in this category were “life” (n = 4) and “being alert at all times” (n = 3) (Table 2).

K19: “The operating theatre is like life itself. Because you never know what will happen”.

K43: “The operating theatre is always on high alert. Because even in a patient who is progressing normally, complications can arise at any moment”.

Discussion

This study found that anaesthesia programme students' perceptions of the operating theatre changed significantly before and after clinical practice. It has been determined that during the pre-clinical training period, students mostly associate the operating room with intense emotions such as hope, healing, and mystery within an emotionally charged context, whereas after clinical training, their perceptions become more balanced, realistic, and professional. This finding demonstrates that clinical education is not limited to imparting technical skills, but is also a powerful learning process that transforms students' professional perceptions, emotional responses, and cognitive frameworks [4, 7, 8, 11].

Before clinical practice, students’ descriptions of the operating room using the metaphors “factory” and “the heart of the hospital” indicate that this environment was perceived as a continuously operating, high-paced unit central to hospital functioning. During this period, as students had not yet assumed an active practitioner role, it can be inferred that they perceived the operating room primarily from an external observer perspective, evaluating its functioning in broad terms and from a holistic viewpoint. In contrast, the metaphors “clock,” “kitchen,” and “puzzle box” that emerged after clinical practice indicate a shift to a more micro-level perception, reflecting students’ recognition of the importance of individual roles, timing, and team coordination within the operating room. This finding is consistent with previous studies reporting that, as students gain experience, the operating room is increasingly perceived as a professional environment requiring systematic work and coordination [11, 14]. The clinical experience process enables students to transition from passive observers to active participants, thereby

transforming their perception of the operating room from a complex environment into a highly organized work setting. In a study conducted in Ethiopia, team coordination and time management were highlighted as key factors influencing professional perceptions of the operating room learning environment, with these elements reported to play a critical role in supporting students' professional identity development and perceptual transformation in clinical settings [4]. Another study reported that, in the operating room, a lack of interprofessional communication and coordination negatively affected students' perceptions of the professional environment as clinical education stressors; however, this perception improved positively with increased experience [7]. In a study conducted with nursing students, the sense of being part of the team during operating room experiences was found to strengthen professional perceptions, leading students to reinterpret the complex environment as an organized structure [15]

In this study, the prominence of the metaphors "light of hope" and "new life" during the pre-clinical practice period indicates that students perceived the operating room primarily as an idealized space of healing and salvation. This perception can be associated with the caregiving ideal and professional motivation commonly observed among students who are newly entering the healthcare field. However, after clinical practice, the replacement of these metaphors with more functional, protective, and sustaining metaphors such as "mother" and "breath" indicates that students no longer viewed the operating room as a miraculous rescuer, but rather as a critical care environment that ensures the continuity of life.

The literature reports that clinical experience tempers students' idealistic approaches while fostering professional realism, a process that enhances students' sense of responsibility [16, 17]. The findings of this study also support that clinical practice transforms the meaning students attribute to the operating room from emotional intensity toward functional awareness. One study emphasized that the life-preserving dimension of students' perceptions of the operating room was associated with team cohesion and technical interventions, and that this perception evolved into a more realistic structure through clinical experience [4]. Another study reported that meeting students' psychological needs in the operating room strengthened their perception of it as a life-preserving setting, with a supportive environment transforming emotional metaphors such as hope and healing into sustainable awareness [7].

The predominance of the metaphor "mystery" during the pre-clinical practice period indicates that students perceived the operating room as a setting they understood theoretically but had not yet experienced in practice. This suggests that learning was largely shaped by expectations, curiosity, and uncertainty. In contrast, the prominence of the metaphor "school" after clinical practice indicates that the operating room was embraced by students as an educational environment where active learning occurs and knowledge and skills are acquired through practice. This suggests that learning was largely based on expectations, curiosity, and uncertainty. In contrast, the emergence of the metaphor "school" after clinical practice demonstrates that students came to view the operating room as an educational environment in which active learning takes place and knowledge and skills are acquired through hands-

on practice. This finding is consistent with studies that describe the operating room as a clinical learning environment in which experiential learning is intensely experienced [8, 11]. The clinical practice process supports students' professional identity development and transforms learning from abstract knowledge into concrete experience. It has been reported that the operating room learning environment is initially perceived as a structure characterized by uncertainty and mystery; however, the active presence of role-model instructors in the clinical setting accelerates the transformation of this perception into a more structured, school-like learning environment. This indicates that such a process enhances students' learning motivation [4]. One study emphasized that instructors' communication performance and supportive roles positively influenced learning, and that the reduction of practical skill deficiencies led to a decrease in perceptions of mystery [7]. A systematic review showed that students' curiosity-driven learning is transformed into tangible learning outcomes through clinical practice [18].

The prominence of the metaphors "closed box" and "an oral exam for an unstudied course" during the pre-clinical practice period indicates that students associated the operating room with uncertainty, fear of making mistakes, and high stress. This perception is consistent with the anxiety and stress responses commonly reported among students with no prior clinical experience. In the post-clinical practice period, the prominence of the metaphors "life" and "being alert at all times" indicates that students' risk perceptions shifted from fear-based responses to a sense of professional vigilance and responsibility. The findings of this study demonstrate that clinical education plays a critical role in professionally preparing students for high-risk environments.

The literature reports that clinical experience reduces students' perceived stress levels over time while simultaneously strengthening professional competence and professional behaviors. Studies conducted with nursing students have shown that perceived stress decreases during the clinical internship process, whereas clinical competence increases [19]. Furthermore, a significant relationship has been established between perceived stress and professional behavior [20]. It has also been shown that perceptions of the clinical learning environment are associated with stress levels, suggesting that positive clinical environments may mitigate the negative effects of stress [21]. Another study emphasized that operating room stressors increase fear and uncertainty; however, with supportive education and effective communication, these perceptions can be transformed into a sense of responsibility [7].

Conclusion

This study demonstrates that the clinical practice process profoundly transforms anesthesia program students' mental images of the operating room. While hope- and fear-based perceptions were dominant before clinical practice, these were replaced after clinical practice by perceptions focused on professionalism, responsibility, and learning. This transformation indicates that clinical education is indispensable not only for the development of technical competence but also for emotional maturation and professional identity formation. The findings highlight the importance of maintaining clinical practices in anesthesia education programs in a structured, supportive, and guidance-oriented manner.

Declarations

Supplementary Information

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Author contributions

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Data availability

The data sets used and/or analyzed during the current study can be obtained from the corresponding author upon reasonable request.

Ethics approval and consent to participat

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Erzincan Binali Yıldırım University Human Research Ethics Committee for Health and Sports Sciences (29.12.2023, E-88012460-050.04-328867), and institutional permission was obtained from the institution where the research was conducted (24.01.2024, E-35848429-101.04-330633). Students were informed about the purpose of the study and confidentiality. Verbal and written informed consent was obtained from all participants, and they were informed that they could withdraw from the study at any time.

Clinical trial number: not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no conflict of interest.

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