

## How Do Operating Room Nurse Students Experience the Learning Environment in the Operating Room?<sup>1</sup>

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### Abstract

**Background:** There is little research-based knowledge about how operating room nursing students experience the learning environment in an operating room. Results from international studies indicate that structural challenges such as time pressure, high demands for efficiency, and a minimum of time delegated to guidance are all characteristic of the learning environment. More insight into how operating room nursing students experience an operating room is an important element for improving the quality of practice studies in a high-tech and time-efficient environment.

**Aim:** The purpose of the study is to describe operating room nursing students' experiences of their learning environment in operating rooms.

**Method:** The study has a qualitative and descriptive research design, utilizing systematic text condensation as an analytical method. Data was gathered through conducting focus-group interviews with operating room nursing students in their final semester of the nursing education study program.

**Results:** Three main categories were brought up repeatedly by these students: 1) The significance of having supervisors, 2) The unclear responsibility with respect to formal and informal guidance in a multidisciplinary learning environment, and 3) The situation of learning in a complex and unpredictable learning environment.

**Conclusion:** The results provide further insight into operating room nursing students' experiences of their learning environment in authentic practice studies.

The results can be utilized in further improving the learning environment for operating room nursing students.

**Keywords:** *learning environment; operating room nurse; practice studies; qualitative research design*

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## Background

Starting on January 1, 2023, all educational institutions offering postgraduate education in operating room nursing are required to adhere to new national guidelines (1). These guidelines emphasize that the quality of practice studies, in conjunction with the education provided by the institution, is crucial for overall study program quality (1). Institutions must therefore ensure that selected practice study sites offer relevant learning situations, evidence-based services, and competent supervisors (1). The Norwegian Nurses Association's operating room nursing group (2) notes that nurses who work in operating rooms have a pedagogical responsibility for their students, and that any supervision of these students should be conducted in accordance with pedagogical principles. Tveiten defines supervision as a formal, relational, and pedagogical empowerment process aimed at strengthening the focus person's competence through dialogue based on knowledge and humanistic values (3).

Benner describes the goal of clinical supervision as helping the student understand, reflect upon, and articulate their practice, as well as discern the priorities and demands inherent in each situation. This requires dedicating time to building a trusting relationship between supervisor and student. Established trust forms the basis for successful demonstrations, explanations, imitations, exercises, reflection, and guided reflection (4).

Kårstein and Caspersen assert that quality and relevance in practice studies are characterized by having clear plans comprised of explicit goals that are understood by all parties involved. Supervisors must possess relevant mentoring skills and a comprehension of the curricular structure and organization (5).

A small number of international studies have explored operating room nursing students' experiences of the learning environment in operating rooms; their results indicate that the perceived quality of guidance depends on the priorities set by the practice study site (6). A leadership culture that facilitates prioritizing staff time and fulfilling supervisory responsibilities is described as crucial for students' perception of a good learning environment (6). However, insufficient time allocated for supervision is identified as a characteristic of the learning environment in operating rooms (7,8); in fact, in most learning situations, focus is placed on mastering advanced procedures, leaving little time for student preparation. As a consequence of the demand that they rapidly acquire practical skills, operating room nursing students may find it challenging to synthesize practical and theoretical knowledge (6). Flott and Linden (9) have identified four factors that influence students' experiences of the learning environment in practice studies: 1) physical surroundings, 2) psychosocial factors, 3) organizational culture, and 4) choice of learning and teaching methods.

This study describes operating room nursing students' experiences of the learning environment in practice studies in a Norwegian context.

## Purpose

The purpose of the study is to describe operating room nursing students' experiences of the learning environment in operating rooms.

## Methods

### Design

The study employed a qualitative research design (10) with textual analysis of operating room nursing students' descriptions of their experiences of the learning environment in practical studies in operating rooms. The data analysis was conducted using systematic text condensation as described by Malterud (10); additionally, Consolidated Criteria for Reporting Qualitative Research (COREQ) was utilized as a checklist for critically assessing the study and its reported research findings (11).

### Sample

The study sample consists of 11 operating room nursing students who conducted practical studies in operating rooms at various Norwegian metropolitan hospitals during 2019 and 2020. The sample included female participants between the ages of 27 and 45. While the practice studies were carried out in operating rooms with a varied number of units, each site had a minimum of 10 operating rooms. A purposive sample was recruited through written communication from the educational institution to all 46 operating room nursing students; those who volunteered to participate received both written and oral information about the study.

### Data collection

Focus group interviews were chosen as the data collection method to elicit in-depth descriptions of participants' experiences of the learning environment in the operating room (12). The focus group interviews were conducted as discussions with 5 and 6 participants in each group, respectively.

A semi-structured interview guide was used, with the main question being how participants experienced the learning environment in operating rooms during their practical studies. According to Drageset and Ellingsen (13), an open approach to research interview topics contributes to generating new knowledge. To ensure that the data represented a shared understanding between participants and interviewers, follow-up questions were posed to maintain validity (13). Follow-up questions were formulated at the interviewers' request for: 1) further description, 2) clarification, 3) examples, and 4) linking experiences to specific events.

The interviews were conducted in meeting rooms located at the educational institution, and audio recordings were made. The duration of both focus group interviews was approximately 60 minutes. Both interviews were conducted by the first author, who at the time was an operating room nurse and master's student. The interaction and dynamic process in the focus groups produced extensive data for analysis.

### Analysis

Analysis of verbatim transcribed data from the focus group interviews was conducted using systematic text condensation (10). This analysis followed four steps: 1) forming an

overall impression, 2) identifying units of meaning, 3) abstraction and condensation of the content of each meaningful unit, and 4) summarizing code groups into three descriptive categories which constitute the study's results. The data analysis was performed in close collaboration between the authors, involving questioning the material and making continuous comparisons at all stages of the analytical process. Rationales for the development of meaningful units, code groups, and categories were continuously documented in a log, contributing to the process' coherence, progression, and transparency, which in turn produced the study's results.

**Table 1** Example of analysis of category 1

Meaning units (selected)	Main code group	Subgroups	Condensate	Synthesis
-Those who are uncertain and stressed, yes, those who don't grasp the subject, well they quickly lose focus themselves, and it often results in poor learning situations. - While those who are confident in their role as operating room nurses and know what's happening, may have guided before, and attended such guidance courses. -Yes, they are quite good at planning. And they see me and take care of me. And I've had a lot of that kind of before and after guidance. -I feel that with those who know the subject, I get more leeway and they are a bit more relaxed about what I'm allowed to do. While those who are more uncertain get stressed. - It took quite a long time before I was allowed to be fully involved. To try... - Yes, to go alongside someone who is confident and secure in what they are teaching. It creates very good learning situations for me, I have noticed. -If you become uncertain, there's always someone there right away who is so confident in their role and in guiding. But as you become a bit more skilled, they sit in the chair next to you and observe. Then, you get to be more and more independent yourself.	Formal supervisors' importance	Supervisor competence	"Secure guides so my learning needs and adapted guidance then. They guided both before and after, and they made me feel secure. It provided me with good learning opportunities. Those who were stressed did not let me participate."	"Secure guides provided me with good learning opportunities."
-They are much easier to gain trust from when they know me and let me do things because they know where I am in the process and what I can and cannot do. -There's a significant difference from the days I, for example, work with others who don't know what I can do. -It's precisely the trust you gain to do things and manage them on your own, rather than if, it's a very practical profession, and if you can't do those things independently, you also won't learn as much. Connecting things, keeping track during the operation, is there something else needed now, where are my things instead of them taking a random guess before you grab it, but knowing that he needed it, and then they are quick to yes, but getting those two extra seconds as a student, which you might need to think, - yes, now is the next step, or now is what's needed, that's when you get the time.	Formal supervisors' importance	Continuity	"Consistent guides gave me confidence so I got to try to perform things myself. This is a practical profession where one must get hands-on experience to learn. This gave me more sense of mastery."	"Consistent guides provided continuity and trust, and I felt that I mastered."

## Research ethical considerations

The privacy consequences of the study were assessed and approved on July 10, 2020, by the Norwegian Centre for Research Data (NSD) (Reference number 590079). In an interview study, the researcher's ethical judgment plays a significant role at all stages of the process (14). A central obligatory research ethic is to maintain confidentiality and clarify one's own role in research (13). It is impossible for an outsider to understand another individual's experiences; in this case, it may be difficult for the interview to understand which questions might be sensitive or challenging for informants. Showing sensitivity and humility with respect to another person's boundaries is, therefore, an obligatory research ethic (13).

The participants in this study were students who had successfully completed their practice studies in operating rooms. The participants engaged in the interview study based on informed and voluntary consent; it was assumed that their decision to participate was made based on interest and a commitment to sharing experiences with other students. The participants were not subjected to psychological pressure, distortion, or recognition. The focus group interviews were conducted with clear intent of which all participants had been notified in advance. The interviews were conducted in a conversational format in accordance with the interview guide and in a setting designed to ensure participants' need for calm and a perception of being in a safe psychosocial and physical environment.

The participants demonstrated trust in the researchers by participating in the focus group interviews, dedicating their free time to participating in them. No financial reward nor other incentives were used to recruit them, and no compensation was given to them after the interviews were over. It is ethically sound to not conduct more focus group interviews than necessary to adequately address a research question (13).

## Results

The analysis of participants' descriptions of their experiences in the learning environment in operating rooms resulted in the creation of three main categories: 1) The significance of the supervisor, 2) Unclear responsibility in formal and informal guidance in a multidisciplinary learning environment, and 3) A complex and unpredictable learning environment. Each main category is further divided into two subcategories (see Table 2).

**Table 2** Main categories and subgroups

Main groups	Sub-groups
Formal supervisors' importance	Supervisor competence Continuity
Informal supervisors' importance	Guide without disrupting operations Use of power tactics
Complex and unpredictable learning environment	Unprepared for complexity Lack of influence on daily work

The results are presented in line with the study's purpose and in relation to the following three categories.

### **The significance of the supervisor**

Continuity in supervision was emphasized as crucial for the ability to acquire new knowledge in a cumulative learning process. A majority of the participants experienced frequent changes made to both their immediate supervisors and supervisors in general. They described the quality of supervision and achievement of learning outcomes as weak when supervisors constantly being switched out." Good" supervisors were those who were up to date about the curriculum's learning outcomes for relevant practical studies and clear about how they could meet student's learning needs. These supervisors often held pre-, and post- supervisory sessions with students; they also taught students during the practice sessions themselves. On the other hand, "insecure" supervisors were perceived as being controlling and having a high level of personal stress.

One participant described this situation as follows:

"I found that supervisors who were stressed and unsure of their role didn't let me do practice tasks to the same extent as confident supervisors did. The ones who had experience or formal training in supervision were good at planning teaching situations and gave me the opportunity to try things out myself. They also provided guidance before and after our practice sessions."

### **Unclear responsibility in formal and informal guidance in a multidisciplinary learning environment**

Participants experienced that all supervision in operating room nursing had to be adapted to and aligned with the tasks of other professional groups in the multidisciplinary team. The informal supervision provided by professionals other than operating room nurses was described by participants as resembling power tactics. One participant used the term 'micro-supervision' to describe situations where operating room nursing students were supervised in what was described as "a separate sphere," with their backs to the operating field to avoid disturbing other professional groups.

"And if we try to provide guidance and ask a question ... we have to stand with our backs to the operating field, or something like that, and whisper. And engage in a kind of micro-supervision, in a small area off to the side. So, we create our own area over there, where we can work very quietly...we mustn't disturb anyone else ..."

Several participants described experiences while in the operating room of being ignored and treated with a condescending attitude by other professional groups. This created

a sense of uncertainty and anxiety in them, which in turn led to their becoming more passive and making less effort to learn. Multiple participants described challenging and difficult experiences in the learning environment where professional groups other than operating room nurses had become impatient with them; as a result, participants felt they had not been given sufficient time and opportunity to perform tasks.

One participant explained it as follows:

“Yes, I often feel this way when the surgeons get impatient; they set the tone for the whole room, and if we try to make a comment or ask a question, we have to whisper. Everything has to go so fast, and you become even more afraid of making mistakes.”

Participants also described having had positive learning experiences where other professional groups, especially surgeons, provided them with guidance operation itself, which was described as conducive to learning and valuable for operating room nursing students. One of them remarked:

“Some surgeons want complete silence so they can concentrate on what they’re doing. But then you have those who chatter away and are happy teach me new things. That’s when I learn a lot!”

### **A complex and unpredictable learning environment**

Lack of influence over their own practice, a limited number of opportunities to plan their own learning activities, and a lack of understanding about the priorities made by other professionals were factors describing participants’ experience of the learning environment as challenging, despite their background as registered nurses before starting the study program in operating room nursing. One of the participants commented:

“Everything was so new to me; I hadn’t been in an operating room before and didn’t understand when things were supposed to be done. It was certainly very frustrating in the beginning, but it got better as time went on.”

Time pressure, excessive noise, and a unique communication style contributed to participants’ perception of the learning environment as unpredictable.

“We don’t get the time we need to learn. It’s like we’re supposed to know things before we’ve even started. It’s almost like they expect me to be know something new before I can learn it, but when do I get the time to learn?”

Several participants felt that the noise level in the operating room hindered their learning. The team’s communication style in the operating room was perceived by the students as being direct and at times bordering on tactless and rude. They described

the atmosphere in the operating room as being militant and harsh. This was experienced as intimidating, stressful, and not conducive to learning. One of the participants explained:

“Whenever I got reprimanded, I got stressed out and insecure. The environment is a bit militant, and when I became insecure, I didn’t dare to ask anything. They’d tell me very bluntly what they were dissatisfied with about me, and this made me feel useless.”

## Discussion

The study’s results indicate that operating room nursing students consider their supervisor to be significant for their own learning. The supervisor’s guidance-related competence and continuity were highlighted as crucial factors for ensuring an effective learning process. However, the participants noted that there was an unclear responsibility in the learning environment between formal and informal supervisors. The complexity and unpredictability of a busy learning environment was described as challenging, which in turn challenged the students’ independence and ability to take responsibility for their own learning process.

The study underscores the important role that supervisors play for operating room nursing students, especially their role in practice studies. Drawing on Benner’s (4) concept of experiential learning as ‘signature pedagogy’ in nursing education, effective supervision is portrayed as a formal, relational, and pedagogical process requiring time and space for a trust-based dialogue. However, the participants in this study perceived a lack of trust, security, and continuity in supervision due to frequent and unplanned changes of supervisors. Kårstein and Caspersen (5) argue that ensuring the quality of guidance in practical studies requires supervisors to possess relevant guidance-related competence.

The integration of practical knowledge in theoretical education is crucial for a comprehensive understanding of nursing. The fragmentation between theoretical and practical knowledge is a common issue in many professional study programs, contributing to students’ difficulties in connecting theory with practice. Therefore, combining academic positions with clinical practice may positively impact collaboration between education and the field, promoting effective student guidance.

In this study, while informal supervision from professionals outside the field of operating room nursing was viewed as both valuable and complementary, it was also regarded as confusing and unplanned. This aligns with Mausethagen and Smeby’s (16) findings which highlight the benefits of interprofessional learning communities for strengthening knowledge integration. However, the informal guidance received from non-operating room nursing professionals lacked coordination, planning, and relevance to learning outcomes. The role of surgeons was emphasized in shaping the overall collaborative climate in the operating room. The participants reported surgeons’ varying approaches to



student guidance, reflecting the hierarchical structure that exists in operating departments. Instances of anxiety, uncertainty, and confusion related to power dynamics in informal guidance were prevalent, aligning with literature on disrespectful behavior and power abuse in surgical settings. As such, improvements may be suggested, for instance revising preparatory courses to enhance students' resilience when facing the challenges of a complex learning environment. Having clear communication about expectations and required nursing knowledge is essential before practice placements are made; this communication should emphasize collaboration between educational institutions and practice settings (17).

Participants described developing situational awareness and understanding of the rationale for prioritizations as challenging, particularly in the initial phase of a new and unfamiliar learning environment. Operating departments were portrayed as being complex and demanding workplaces. Hence, this study acknowledges the positive impact of a learning environment that focuses on individual student strengths in challenging situations. Benner's (4) argument that professional education should aim for optimal practical competence is reiterated, emphasizing the need for timely feedback and opportunities for students to articulate and reflect on their experiences.

The study also suggests the need for a review of preparatory courses in operating room nursing to ensure students possess a fundamental understanding of the demands of expertise in this field. Enhancing continuity in guidance, raising formal supervisor competence levels, clarifying roles and responsibilities in multidisciplinary learning environments, and fostering collaboration between educational institutions and operating departments are essential for developing a conducive learning environment that is aligned with framework and curriculum goals (18,19). Addressing challenges related to the unpredictable nature of the operating room, recognizing and utilizing students' prior experiences, and implementing effective preparatory courses are crucial steps toward ensuring relevance and quality in the guidance of postgraduate perioperative nursing students. Collaboration between academic institutions and practice settings, especially in professions like nursing that allocate a significant portion of study time to practical experience, is crucial at both the undergraduate and postgraduate levels (18-21).

### **Strengths and limitations**

There is limited research-based knowledge, nationally and internationally, about the learning environment in operating rooms. The current study's relevance is ensured by describing students' own perspectives. The researchers have a preunderstanding of the topic as an experienced operating room nurse (first author) as well as a teacher and mentor in nursing education at the undergraduate, graduate, and postgraduate levels (second author). Both have actively worked against showing bias for certain elements in the study by systematically reflecting on their role in the research process and questioning their own thought processes and conclusions throughout the study's

duration. The analytical log described in the method section is actively and reflectively used in the analysis of findings. Despite the authors' attempts to exclude bias, it cannot be ruled out that this factor may have had some influence on the study's reliability.

In focus group interviews, it is well known that influence can be enriching and provide valuable data; but it can also be inhibiting as participants may withhold information. Upon reflection, the interviewers experienced that participants helped one another, perceiving the group interviews as a meaningful conversation about their experiences of the learning environment in their practice studies.

## Conclusion

The findings of this study underscore the importance of supervisory competence, continuity in supervision, and clarification of responsibilities in formal and informal supervisory settings within a multidisciplinary learning environment. These elements should be prioritized in the ongoing development of quality and relevance in operating room nursing practice studies. Establishing a culture that more effectively incorporates trust-based and systematic supervision is essential for educating operating room nurses within a specialized healthcare sector that is continuously contending with demands for higher levels of efficiency and productivity.

## Implications for practice

The participants in this study perceived a lack of connection between theoretical knowledge acquired in the classroom and its application in practice. They expressed a sense of fragmented education and insufficient preparedness for practical experiences. Hence, postgraduate education in operating room nursing necessitates a three-way collaboration involving 1) the student, 2) the operating department, and 3) the educational institution. It should present itself as a comprehensive program that cohesively encompasses all theoretical and practical components. This collaboration should focus on the content and organization of supervision provided to operating room nursing students, ensuring their preparedness for practice studies in a time-efficient, technologically advanced, and interdisciplinary learning environment.

## Implications for further research

There is a need for further research on the learning environment in operating rooms in order to create the best possible knowledge base for professional and pedagogical development. Further research that includes more participants could enhance the knowledge base, for example, through a quantitative survey of a large number of operating room nursing students at multiple institutions regarding their experiences of the learning environment and learning quality in practical studies in operating rooms.

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