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Nurse anesthetist students' experiences of peer learning in clinical education – A qualitative study

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ABSTRACT

Background: As part of an interprofessional operating team, nurse anesthetists need to be skilled in collaboration, problem solving, attentiveness, independent decision-making and knowledge of anesthesiology nursing. Factors that are vital for nurse anesthetist students' future profession. The educational model peer learning, characterized by collaboration and learning through social interaction between individuals, may support nurse anesthetist students' development in such skills.

Aim: The aim of the study was to explore nurse anesthetist students' perceptions of their experiences of peer learning as an educational model during their clinical education in a Swedish context.

Methods: The approach was a qualitative descriptive design. Seven nurse anesthetist students from four different universities were interviewed individually using a semi-structured interview guide. The data were analyzed with content analysis.

Results: Three generic categories revealed a description of the phenomenon: Increased independence, Holistic view and Expansive learning process. A main category brought together the content of the generic categories and shows the overall finding of the study: Peer learning promotes nurse anesthetist students' personal and professional development.

Conclusion: Peer learning as an educational model during nurse anesthetist students' clinical education might facilitate preparation for their coming profession.

Introduction

Teamwork is important to optimize the operating team's capacities (Armour Forse et al., 2011; Sonoda et al., 2018) where discussion and knowledge sharing among colleagues are essential in promoting interprofessional learning and developing perioperative clinical competence (Blomberg et al., 2019). As part of an interprofessional operating team, nurse anesthetists need to be skilled in collaboration, problem solving, attentiveness, independent decision making and knowledge of anesthesiology nursing, as described by the National Association for Anesthesia and Intensive Care in Sweden (Riksföreningen för anestesi och intensivvård, 2020). To better prepare nurse anesthetist students for their future profession, it may be vital to improve these skills even during their clinical education. Although neither collaboration nor professional independence is prominent in the traditional precepting model, there are educational models that may support such processes: one such model is *peer learning*. Peer learning has been defined by Topping (2005) as "the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions". Previous research shows that peer learning is suitable for clinical education characterized by collaboration, reflection and communication and that it is based on learning through social interaction between two students at the same educational level, that is, peers (Boud, 2016; Carlson, 2013; Markowski et al., 2021; Secomb, 2008; Stone et al., 2013). As peer learning as an educational model for nurse anesthetist students might facilitate their development, the current study will thus explore and present its suitability in this context.

Background

In Sweden, a nurse anesthetist is required to have a specialist nursing license (The Swedish Code of Statues, 1998:531), which is taken as a one-year post-graduate specialist nursing program (60 ECTS, European Credit Transfer System). Students qualifying to the program need a

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bachelor nursing degree (180 ECTS) and at least one year of professional experience as a registered nurse. Both programs include theoretical and clinical education, meaning that the students have an opportunity to transfer their theoretical knowledge into practice during the clinical education (Mamhidir et al., 2014), and is supported by a preceptor to understand the theory behind the practice (Nyhagen & Strøm, 2016). These preceptors teach individual students how to perform tasks and provide them with clinical knowledge similar to their own (Mamhidir et al., 2014). Preceptorship in this manner can be compared to the master-apprenticeship model, where the student learns by watching and listening. However, this has been perceived as passive learning by students, rather than enabling them to seek knowledge themselves (Andrews et al., 2006). A review by Laal (2011) shows that learners should not be passive receivers of knowledge. Instead, they need to be active and upgrade their skills throughout their lives to develop lifelong learning. A definition of lifelong learning is "the context within which learning takes place, occurs at all times in each place, through one's life" (p.473, Laal, 2011).

To facilitate student activity, developing educational models may create a basis for students' lifelong learning and support their capacity to develop independent knowledge, critical thinking, reflection and problem-solving (Boud, 2016). A study by Nyhagen and Strøm (2016) indicates that post-graduate nursing students consider these factors important during clinical education. Moreover, Blum and Gordon (2009) relate how nursing students appreciate being encouraged to ask questions and trusted to work independently. Consequently, educational models need to shift from the preceptor-directed teaching to focusing on students' active learning to support their development (Andrews et al., 2006). The educational model peer learning is an example where students collaborate and learn from one another (Topping, 1996, 2005). The model corresponds to Vygotsky's social learning theory (1978), which is based on the notion that learning occurs through interaction, collaboration and communication with others. The theory is a form of social constructivism, based on the idea that human development and learning are constructed through social interactions (Vygotsky, 1978), and can be relevant to nursing students and their development by using the students' formal knowledge and creating collaborative learning (Stenberg et al., 2022).

Peer learning has been studied and described as suitable for nursing students (Christiansen & Bell, 2010; Jassim et al., 2022; Mamhidir et al., 2014; Ravanipour et al., 2015; Stenberg & Carlson, 2015; Stone et al., 2013). In peer learning, two students are supervised by the same preceptor, which is in contrast to the master-apprenticeship model. The preceptor takes a step back and allows the students to collaborate and learn from each other, which stimulates the interaction between them encouraging and challenging students to be active and take responsibility for their own learning (Carlson, 2013; Kjällquist-Petrisi & Hommel, 2021; Mamhidir et al., 2014). Vygotsky's (1978) concept of learning development concerns a learner who, although ready to move to the next level of knowledge, lacks maturational ability, and thus needs the support of more capable and experienced people. The transition area – the Zone of Proximal Development (ZPD) – refers to the difference between what a learner can do without help and what can be done with encouragement from others. Moreover, the learning development will occur in social interaction with others. Carlson et al. (2019) assert that the learning process develops when students support each other instead of learning on their own and that learning is dependent on interactions and collaboration between students sharing a common ground.

Nursing students' perspectives of peer learning show that experiences of friendship decrease stress and anxiety (Goldsmith et al., 2006; Roberts, 2009) due to shared discussion and not feeling abandoned in task assignments (Christiansen & Bell, 2010; Ravanipour et al., 2015; Stenberg & Carlson, 2015; Stone et al., 2013). In addition, peer learning may support confidence building, independence development, and personal and professional acquirements (Ravanipour et al., 2015; Stenberg & Carlson, 2015; Stone et al., 2013). These areas are consistent with competences required for nurse anesthetists (Riksföreningen för anestesi och intensivvård, 2020), and by using peer learning during nurse anesthetist students' clinical education might support their professional development. Negative aspects of peer learning are students feeling they have to compete for the preceptors' attention and time and with regards to the clinical tasks they need to conduct (Ravanipour et al., 2015; Stenberg & Carlson, 2015). Another aspect is students' experiences of stress due to peer incompatibility in terms of knowledge level, of which they are compared continuously (Ravanipour et al., 2015, Stenberg & Carlson, 2015). Furthermore, students at a lower knowledge level can experience stress because of competition with their peers, and vice versa (Stenberg & Carlson, 2015).

Although nurse anesthetists work independently, they are highly dependent on teamwork within the interprofessional operating team. Therefore, nurse anesthetist students need to improve their interprofessional skills to better prepare them for their future profession. Such development may be facilitated through support within the peer learning model during the clinical education. To the best of our knowledge, no previous study has reported on nurse anesthetist students' experiences of peer learning in clinical education. Therefore, the model is worth investigating in this context.

Aim

The aim of the study was to explore nurse anesthetist students' perceptions of their experiences of peer learning as an educational model during their clinical education in a Swedish context.

Method

The approach for the study was a qualitative descriptive design using interviews to explore individuals' experiences of a phenomenon (Risjord, 2014). An inductive content analysis inspired by Elo and Kyngäs (2008) was applied in the study.

Context

Anesthesia is a medical specialty which include perioperative care. A nurse anesthetist requires knowledge, skills and professional approach within nursing and medical care for patients that go through anesthesia and surgical treatment. In Sweden, nurse anesthetists usually work independently as nurse practitioner with patients ASA-classified I-II (American Society of Anesthesiologists, 2020), after prescription issued by the anesthesiologist. That includes assessing, establishing and maintaining a free airway as well as monitoring and evaluate ventilation, circulation, depth of anesthesia, temperature, fluid balance (Riksföreningen för anestesi och intensivvård, 2020). The role of a nurse anesthetist can alter between being primary responsible for the patient during the perioperative phase or, alternatively, act as assisting nurse anesthetist. A principal task for the primary nurse anesthetist is to manage the patient's airway and have an overall view of the anesthesiology nursing, while the assisting role is to assist with the anesthesiology nursing and perform delegated tasks. The nurse anesthetist is present throughout the entire perioperative phase and collaborates with the operating team (anesthesiologists, surgical nurses, surgeons and assistant nurses). The nurse anesthetist students who participated in this study studied at different universities in Sweden. Thus, their clinical placements were located at several hospitals where peer learning was implemented as an educational model. During the clinical placements in the peer learning model the students took turns working in pairs and alternating between practicing the role as primary nurse anesthetist and assisting nurse anesthetist with the preceptor continuously present and accountable for the patient safety.

Participants and recruitment

A purposive sampling of the participants was conducted to cover the research area (Polit & Beck, 2016). Inclusion criterion to participate in the study was nurse anesthetist students in Sweden that have been precepted with peer learning during their clinical education in the academic year 2020 to 2021. To reach more participants, no limit was set on the number of days the students had experienced peer learning. In total, 13 universities in Sweden have a post-graduate specialist nursing program in anesthesia, of which 12 were contacted in the recruiting process. One university was excluded to avoid bias, since the first author is working as a nurse anesthetist and as a clinical educator in the same county. Program coordinators at the 12 included universities received written information about the study by e-mail, including a request to forward the information to students. Two program coordinators responded they did not have the education within the study's time frame, while one chose not to proceed because peer learning was not implemented. The remaining nine universities agreed to inform their students about the study and relayed a request for participation. Six posted information about the study on the student website. For the other three universities, the first author had to apply via the student administration system to receive the students' e-mail addresses for personal contact. The information letter contained the authors' contact details and a request to communicate with the first author to participate. Ten students who studied at five different universities responded positively to being interviewed. Thereafter, a written informed consent form was sent to them. Some students responded upon being recruited by classmates, the so-called snowball sample (Naderifar et al., 2017). Three of the ten students failed to respond to the request for the date of interview. Ultimately, seven students from four different universities participated during their final semester of the program. The participants were between 26 and 37 years old and had worked as registered nurses between 5 and 14 years (mean 7 years). Three participants had another post-graduate nursing qualification in prehospital emergency care or intensive care. Furthermore, three participants had experiences of peer learning from their undergraduate nursing program. Experiences of peer learning as nurse anesthetist students varied between 4 and 12 days.

Data collection

Individual semi structured interviews were conducted by the first author via online video meetings and were audio-recorded with a Dictaphone. An interview guide was used with open and probing questions (Table 1). The guide was tested in a pilot interview with a recently graduated nurse anesthetist to ascertain if the questions matched the aim of the study (Polit & Beck, 2016). A minor change to the interview guide was made. The pilot interview was not included in the study. Other interviews were held at the end of the participants' education in May and June 2021, and lasted from 19 to 42 min (mean 27 min). These were transcribed verbatim by the first author shortly after. All interviews were coded to maintain the participants' confidentiality, and the data were only available to the authors (Polit & Beck, 2016).

Table 1
Examples of questions in the interview guide.

Open questions	Probing questions
• Can you describe how peer learning was used where you were a nurse anesthetist student? • What are your experiences of peer learning? • Can you tell me about a peer learning situation you have experienced? • What thoughts do you have about the interaction and collaboration with your peer? • How can peer learning contribute to your future profession as nurse anesthetist? • What is your view concerning peer learning as a preceptorship model for nurse anesthetist students?	• What did you mean when you said…? • Can you elaborate what you said about…? • Can you explain…? • Can you tell me more about…? • We have not talked about…how do you experience this? • Do you want to add something about your experiences of peer learning?

Data analysis

The data were analyzed by using an inductive content analysis according to Elo and Kyngäs (2008). At the start of the analysis phase, the authors decided to analyze both the manifest and the latent content. The transcribed text was read repeatedly to obtain a sense of the content, and open coding was done in parallel through documentation of headings describing aspects of the content. The open coding was handwritten in text and margins. As many headings as possible were required to achieve a rich description of the content and were collected onto coding sheets to obtain an overview and organize the data. Sub-categories and generic categories were identified and created from the headings to provide meaning of the phenomenon. The creating of categories was a comparative phase, bringing together data belonging to a specific group in relation to the content. Progression of a main category occurred successively during the abstraction process, which grouped the categories because of its threads of meaning. The authors agreed when the abstraction process was deemed to be completed, which resulted in nine sub-categories, three generic categories and one main category (Table 2).

Ethical considerations

As this study did not explore sensitive issues (e.g., political, sexual or religious), no formal ethical application was needed according to Swedish law (SFS 2003:460). However, the study was reviewed by the local Ethical Board at the Faculty of Health and Society at Malmö University (dnr HS2021:44). Program coordinators at the included universities approved the nurse anesthetist students receiving written information about the study. Students were also informed that they could withdraw from participation at any time, in accordance with the 1964 Helsinki declaration of the World Medical Association (2013) and the Swedish Research Council (2017). Furthermore, they were assured of confidentiality and the likelihood of the study being published. Students who agreed to participate provided written consent. None of the authors were involved in the participants' grading or assessing, nor had any relationships with them. The first and last authors have substantial clinical experience from anesthetic nursing and the second and last author extensive experience of qualitative studies.

Methodological considerations

According to Lincoln and Guba (1985), the trustworthiness of a research study is important in evaluating its worth in terms of credibility, dependability, confirmability and transferability. Both previous research and this study's analysis process were described, and quotes were used to strengthen the result, thus leading to increased credibility.

Table 2
Categories developed through the data analysis

Main category	Peer learning promotes nurse anesthetist students' personal and professional development		
Generic categories	Increased independence	Holistic view	Expansive learning process
Sub-categories	Feel comfortable	Different roles	Reflect on their personal learning
	Freedom and responsibility	Wider perspective	Meet with different experiences
	Gain self-confidence	Interprofessional collaboration	Learn the social interaction between peers

Moreover, credibility was attained through the authors' having the capacity to analyze the latent content and simplify the data-generating categories that reflect the aim of the study (Elo & Kyngäs, 2008). During the analysis process, the authors held continuous discussions and transparently described the research process to achieve dependability. To attain confirmability, the authors remained as objective as possible in relation to the data (Lincoln & Guba, 1985) and aware of the pre-understanding that might have influenced the study, such as the first author's profession as a nurse anesthetist and a clinical educator. Transferability was facilitated through the description of the context, participants, data collection and data analysis to allow the reader to understand the results and whether this can be applied in other contexts (Elo & Kyngäs, 2008; Lincoln & Guba, 1985).

Findings

The data analysis revealed a main category and three generic categories. The main category shows the overall finding of the study: Peer learning promotes nurse anesthetist students' personal and professional development. The main category illuminates and brings together the content of the generic categories from the participants' experiences of the phenomenon: *Increased independence*, *a holistic view* and *expansive learning process* are meaningful aspects to develop for nurse anesthetist students for both their future profession and their personal progress. The generic categories are described below and supported by quotations in the text, and the sub-categories are in cursive script in the text. In the quotations "S" is the abbreviation used for "nurse anesthetist student".

Increased independence

The students experienced that peer learning developed their independence because it allowed them to feel comfortable, relaxed and safe when working with someone in the same learning situation. Having a supportive peer led to less stress and anxiety, thus contributed to their independence:

> *I appreciated being together with my peer. … To be with someone who was in the same situation as me made me feel comfortable, which encouraged me to perform better. … And I believe the feeling of safety and comfort developed my independence.*
>
> (S1)

Furthermore, the continuous presence of the preceptor also made the students *feel comfortable*. As long as patient safety was not an issue, the students were expected to work independently while the preceptor observed. The *freedom and responsibility* seemed to be important for the students. The preceptor encouraged the students to take joint responsibility for the patient; this show of trust led to the students readily embracing the challenge. Having the opportunity to work independently with the freedom to perform their tasks also made the students braver:

> *We were responsible for the patient as if we were nurse anesthetists, but together … and in addition, being two students, led us to get a freedom in decision making, which increased our courage.*
>
> (S3)

Peer learning was considered as an effective model for nurse anesthetist students to gain independence in decision making and willingness to take charge because it facilitates building both courage and confidence. To *gain self-confidence*, the students preferred working together rather than with the preceptor, and was also the case with regards to reflecting on and explaining their thoughts:

> *It's more challenging to reflect and explain my thoughts together with a peer compared to a preceptor because the discussion with a preceptor is more about right and wrong.*
>
> (S4)

Another aspect that led to gaining self-confidence was when the students observed and compared each other rather than the preceptor. Moreover, students believed they could perform tasks on par with each other as they were in the same learning situation.

Holistic view

During the clinical education, the students followed the working procedures for nurse anesthetists, meaning that they alternated between being "the responsible" and "the assistant" for every other patient. A primary task with the former role is to manage the patient's airways. However, in peer learning students got the opportunity to develop a holistic view by participating in many more aspects of anesthesiology nursing:

> *During the clinical education, the traditional major focus is the airways. … But when students work together and split the tasks between them, it will not only be about the airways. … It opens up for other things that need to be done and can be missed if the airways are the only focus.*
>
> (S3)

The students saw taking *different roles* and sharing tasks as leading to an increased and more comprehensive view of the nurse anesthetist's work performance. However, some students felt that they got less opportunity to practice clinical tasks, such as airway management, as they only were accountable for every second patient. Another aspect of taking on different roles was that the students experienced getting additional time to think and reflect:

> *I think it's positive to work with a peer because when I have the assistant role, I will get more time to reflect on issues that are coming up. … I feel more relaxed and can observe other things in the room when I don't have the role as primarily responsible for the patient.*
>
> (S5)

Being two students generated more interaction with the operating team because one student could move around in the operating room to observe and talk to the assistant nurse, while the other had control over the patient. Therefore, the students thought that being with a peer provided a holistic view of the operating process and gave them a *wider perspective*. They also described that collaboration and communication with the operation team were easier due to the mutual support, as compared to being alone. They experienced that they were challenged in a positive way to communicate with others in the operating team. Being two students made it easier to attain *interprofessional collaboration*:

> *My peer and I had the dialogue and discussion with the operating team instead of the preceptor doing that. … We were forced to collaborate with the team, and I think that was a very positive aspect in peer learning.*
>
> (S6)

An example of a question posed to the surgical nurse or the surgeon was if the surgery was more painful for the patient at specific moments. Information of this kind was considered important in getting an overall perspective of the operating process.

Expansive learning process

The category illuminates how the students *reflect on their personal learning* and their experiences of learning from one another. The students' perception of their own learning process in peer learning was expressed in various ways. They thought it was stimulating and developing when there was reasoning and discussion between the peers. Furthermore, they were inspired by observing and listening to their peer, which was perceived as increased learning:

> *When I handled the medications, I observed my peer and could also listen to what was said about the airway. … I listened, I watched, I used my senses. … I think that was stimulating my personal learning process.*

(S1)

The students reasoned that they already were nurses when they attended the post-graduate specialist nursing program. Their different experiences, backgrounds and perspectives as nurses were seen as positive factors in peer learning because they complemented each other with previous knowledge. To *meet with different experiences* was seen as a strength in peer learning:

> *Sometimes we said to each other … how do you know about this … when did you learn that … who told you this … I haven't heard that. … Hence there were some tasks I had knowledge about where my peer had none … and vice versa.*

(S7)

Some students reasoned that the learning situation would probably be difficult if the peers were at different knowledge and competence levels. A more competent student could hold the other back or be too dominant, while a student at a lower level could be less active in discussions and tasks. Being on an equal knowledge level was considered important for the students' personal learning development:

> *I would feel discouraged if our knowledge levels would have been far apart. … The peers need to be on an equal level … otherwise it will be untenable.*

(S2)

An additional aspect of learning was to be aware of and *learn the social interaction between the peers*. The students highlighted the dynamics in peer learning based on the discussions, relationship, interaction and collaboration among peers. They realized that these factors were important in the profession of a nurse anesthetist and contributed to an expansive learning in social interaction:

> *My experience was that I was very motivated to perform well together with my peer, which led to me being more distinct and attentive. … So it's good to get the collaboration and interaction in peer learning.*

(S6)

Discussion

The findings show that preceptorship with peer learning led to nurse anesthetist students' perceptions of gaining increased independence, a holistic view and an expansive learning process, which collectively promoted their personal and professional development. Therefore, peer learning seems to be a relevant educational model in supporting nurse anesthetist students' development for their future profession and for their personal development. This is consistent with studies on undergraduate nursing students (Ravanipour et al., 2015; Stenberg & Carlson, 2015; Stone et al., 2013). Being two students working together appeared to be a meaningful aspect from the participants' experiences in the current study. Therefore, "being two" is used as a basis for the following discussion.

The first aspect of being two can be illustrated in through how the participants felt comfortable and safe with a peer who was in the same learning situation. Previous studies have described being two students as contributing to a safe learning environment (Christiansen & Bell, 2010; Ravanipour et al., 2015; Stenberg & Carlson, 2015; Stone et al., 2013; Vuckovic et al., 2019). Creating a good learning environment is also highlighted by Vygotsky (1978), who underlines this is fundamental in promoting the learning process. Being in the same situation is chronicled in a study by Roberts (2009), where nursing students expressed the relationship with their peer as "*being in the same boat*". In addition, friendship between nursing students facilitated learning in clinical education and generated a safe climate for the students to ask any questions (Roberts, 2009). In the current study, the participants felt both relaxed in discussions and appreciated working independently with their peers in a safe environment with the preceptor present, but in the background. This is consistent with descriptions of the peer learning preceptor who takes a step back and delegates responsibility to the students (Kjällquist-Petrisi & Hommel, 2021; Mamhidir et al., 2014). When the participants in the current study were challenged by the preceptor to take joint ownership of patient responsibility, the students became braver and performed with a high degree of confidence. The establishment of becoming braver while being two students is also revealed in a study by Nygren and Carlson (2017). Moreover, Nyhagen and Strøm (2016) outlined the importance of students being trusted and given responsibility by the preceptor, which resulted in them working independently. In current study, aspects of feeling safe and gaining confidence are associated with the cultivation of independence of as a result of the students being two. Development of independence corresponds to Vygotsky's (1978) notion that this will occur in dialogue with others, such as peers.

The second aspect of being two can be viewed from the participants' learning process through social interactions between them, which is consistent with Vygotsky's (1978) social learning theory, based on the notion that learning occurs through interaction, collaboration and communication. Peer learning is characterized by similar aspects (Carlson, 2013; Stone et al., 2013; Topping, 1996, 2005). The analysis in the current study illustrates the participants' emphasis on the dynamic interaction they had with their peer, which they saw as stimulating their personal learning and development. Personal and social development related to peer learning is described by Topping (2005). Moreover, Roberts (2008) showed that collaboration between peers helps them put theoretical knowledge into practice. Experiences from participants in this study are in line with Roberts' (2008) findings, that is, students' reasoning regarding how they supported each other both in theory and in practice. Mutual inspiration between peers was regarded as heightening learning. Thus, it may create a basis for lifelong learning, which is in line with Vygotsky's (1978) social learning theory, where learners need to be active and develop their knowledge throughout their lives. In addition, the participants experienced that peer learning supported their ability for shared reflection and critical thinking, which is consistent with a study by Vuckovic et al. (2019). Boud (2016) asserts that students' capacity for independent knowledge, critical thinking, reflection and problem-solving contributes to lifelong learning. Participants in the current study also experienced these aspects, as well as social interaction. Being two and supporting each other was seen as beneficial for the development of all the fore-mentioned these skills.

The third aspect of being two relates to Vygotsky's (1978) concept of ZPD, in terms of the participants' descriptions of their different backgrounds and experiences as nurses. Being two working together was viewed as a strength because it caused the participants to complement and support each other in the learning process. The findings add to the concept in ZPD regarding how a learner can move through next level of knowledge with the support of a more experienced and knowledgeable individual. Nyhagen and Strøm (2016) explain how nursing students preferred to find a way to manage a specific situation themselves rather than being told what to do by a preceptor. In the current study, the participants both discussed and reflected with each other and expressed how they gained in-depth knowledge through learning from reciprocal previous experiences. The in-depth knowledge aligns with a study by Kjällquist-Petrisi and Hommel (2021) that demonstrates how post-graduate students gained a deeper understanding in a specific area when they shared knowledge and experiences. Because of the various backgrounds of the participants in current study, they might be seen as "the more experienced one" in different areas, hence concurring with Vygotsky's concept of ZPD (1978). In short, being two and being peers with various nursing experiences made it possible for the participants to support each other in the learning process.

The fourth aspect concerned how being two facilitated the participants' interaction with the operating team and how they experienced a holistic view of the operating process. A wider perspective was achieved when participants switched roles between being the primary responsible

and the assistant, thereby participating in various aspects of anesthesiology nursing. In addition, being two allowed the participants more flexibility in the operating room and enhanced collaboration with the operating team, which is in line with a study by Blomberg et al. (2019) showing the importance of interaction in the operating team. Interprofessional relations require communication and collaboration, both of which are competences nurse anesthetists need to develop (Riksföreningen för anestesi och intensivvård, 2020). According to research, peer learning may support students' progress in this area (Ravanipour et al., 2015; Stenberg & Carlson, 2015; Stone et al., 2013). Therefore, the learning process in the current study may be viewed through the interaction between the participants, as discussed in the second aspect, and in the participants' interaction with the interprofessional operating team. The participants experienced the interactions as helpful and as providing a holistic view of the operating process, which facilitated their development.

Limitations

To the best of our knowledge, all nurse anesthetist students at the included universities were given the opportunity to participate in the study. However, we acknowledge the small number of seven participants and therefore, the findings should be read with caution and saturation might not be assured. Furthermore, the findings might not mirror a general picture as those who participated mainly had positive experiences of peer learning.

Future research

A nurse anesthetist is part of the interprofessional operating team that makes competences such as collaboration and communication an essential part of the work. Therefore, future research needs to address how peer learning might support nurse anesthetist students' development in these areas. Another aspect to investigate is if nurse anesthetist students precepted with peer learning are more prepared for teamwork in the interprofessional operating team compare to students precepted in traditional ways.

Implications for nurse anesthesia education

This study shows that nurse anesthetist students' personal and professional development were facilitated when precepted with peer learning. Therefore, peer learning might be useful as an educational model in nurse anesthesia education during the clinical education. Clinical educator and program director at the faculty need to conduct a dialogue in how to prepare nurse anesthetist students for peer learning.

Conclusions

The findings of this study imply that when precepted with peer learning, nurse anesthetist students perceived gained increased independence, a holistic view and an expansive learning process, which together promoted their personal and professional development. Therefore, peer learning as an educational model during nurse anesthetist students' clinical education might facilitate preparation for their coming profession.

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Conflicts of interest

No conflict of interest is to be declared.

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