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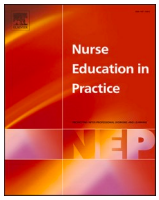

The nursing process: A supportive model for nursing students' learning during clinical education - A qualitative study

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ABSTRACT

Aim: The aim of this study was to increase understanding of nursing students' learning during clinical education in relation to the nursing process.

Background: Nursing students' learning during clinical education is of great importance in creating meaning for theory and development of core competencies. As a theoretical model, the nursing process is challenging to apply in practice for both students and registered nurses, although use of the model has benefits for patient care.

Design: This is a descriptive qualitative study with an abductive approach. *Methods:* Twelve semi-structured interviews with nursing students in education from six universities in Sweden were conducted in 2021–2022. Data were examined using qualitative content analysis.

Results: The results revealed that the nursing process supported learning when theory and practice 'spoke the same language'. This allows for the opportunity to perform in a consistent way with the theory, while obtaining awareness of an invisible process. Furthermore, the nursing process supported learning by incorporating a thought structure for the student́s professional role through developing independence to conduct a holistic assessment and increasing an understanding of the nursés area of responsibility.

Conclusion: The results revealed that when theory and practice were aligned, the nursing process became a meaningful structure to develop a sustainable, safe way of thinking for one's future professional role. It is important to use supportive pedagogical models for students and supervisors that facilitate the integration of concepts of the nursing process in practice.

1. Background

The nursing process is a widely recognized theoretical model in nursing education playing a central role in the nurse's competence. This process serves as a theoretical problem-solving model (Fertelli, 2019) in nurse's clinical decision-making, leading to individually adapted patient-safe care (Alfaro-LeFevre, 2013). The model is acknowledged by organizations such as the American Nurses Association (ANA, 2015), the European Federation of Nurses Association Competency (2015) and the Swedish Nurse Association (2017). The nursing process is independently led by registered nurses in team collaboration and partnership with patients and their families. In a Swedish context, the nursing process consists of five phases: data collection, nursing diagnostics, planning, implementation and evaluation of nursing outcomes (Florin, 2019), as also described by ANA (2015).

Several nursing theories can be related to the nursing process, as far back as Florence Nightingale (1859) description of the nursés reflective thinking and systematisation in assessment and implementation of care. Ida Jean Orlando's theory from the 1960 s may be the most fundamental (Faust, 2002). She describes the nursing process as a dynamic activity driven by critical reflection that systematises nursing, with the purpose of meeting the patient's direct needs (Orlando, 1990). Today the nursing process has become more of a model based on application that forms nurses' reasoning process (Laukvik et al., 2022) and Orlando's descriptions of the nursing process theory differ somewhat from the model used internationally today. In Sweden and several other countries, nurses' documentation in patient records is based on the nursing process and nursing diagnostics (Florin et al., 2005; Saranto et al., 2014). Nursing diagnoses can support nurses in becoming more structured in their work and communication with patients, leading to increased efficiency and quality of nursing care (Sanson et al., 2017).

Studies conducted in other countries have shown the benefits of using the nursing process. This process helps to adequately identify patients' needs and also to counteract the lack of resources and

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organisation in the work environment (Gazari et al., 2020). In a study by Osman et al. (2021), nurses' theoretical knowledge of the nursing process was found to be greater than their practical use of it. Studies indicate that the nursing process can support students, but also caution that it can be difficult to implement in practice (Inácio Soares et al., 2013). Students describe the model as being in demand, but also acknowledge that it can be an obstacle to the development of critical thinking (Heidari and Hamooleh, 2016). Educational methods can help to strengthen the acquisition of the nursing process concepts and care plans (Mousavinasab et al., 2020).

Studying the use of the nursing process in relation to student learning can provide valuable knowledge about how a theoretical model can support development of clinical competence. Greenway et al. (2019) describe a gap between theory and practice as well as between higher education institutions and clinical health care. Although nursing theories can be difficult to apply in practice (Helou et al., 2022), they provide a solid foundation for the discipline (Yancey, 2015). Students tend to prefer to apply theories using a structured approach to nursing assessment and care (Helou et al., 2022). Few studies explore how student learning and applying nursing theories in practice can support learning and development of competencies. Research should focus on the relevance of nursing theories in practice and how they contribute to safe care (Mudd et al., 2020).

Students need to be prepared for their professional role and ensure that they have the competencies required to provide professional and safe care (Rusch et al., 2019). Student education takes place at both higher education institutions and in clinical health care settings where both theory and practice are integrated into learning. The higher education institution has the overall responsibility for providing broad quality education based on laws and regulations, as well as preparing students with theoretical knowledge and skills training for their future professional role. Clinical education is crucial as it allows student to make sense of theory (Zhang et al., 2022), apply their learning to complex realistic situations (Lesā et al., 2022), develop core competencies (Pramila-Savukoski et al., 2020) and shape their identity in the profession (Vabo et al., 2022).

Many studies have described factors that affect learning and development during clinical education, such as supervisors' pedagogical support (Mikkonen et al., 2022; Perry et al., 2018; Vabo et al., 2022), the pedagogical atmosphere (Adamson et al., 2018; Cervera-Gasch et al., 2022; Sundler et al., 2014; Zhang et al., 2022) and a trusting and caring relationship with one's supervisor (Hilli and Sandvik, 2020; Vabo et al., 2022). Studies confirm the importance of close collaboration between higher education institutions and clinical health care, with clear pedagogical models and structures in both organisation and supervision (Lillekroken, 2019; Tuomikoski et al., 2020; Vabo et al., 2022; Yu et al., 2021).

In line with the development of clinical health care resulting in increased demands on nursing competencies in complex situations, studies show that newly graduated nurses need continual learning to increase their understanding of the complexities involved in nursing (Andersson et al., 2022). A study by Ortiz (2016) shows that newly graduated nurses lack confidence in making independent decisions about patient care, indicating the need for clear structures and learning strategies that strengthen learning and development of adequate competencies in accordance with professional nursing standards. Therefore, it is essential to gain knowledge of whether the nursing process can form a solid foundation on which nurses build their clinical competence, ensuring safe and efficient care.

2. Aim

The aim of this study was to increase understanding of nursing students' learning during clinical education in relation to the nursing process.

3. Methods

3.1. Study design

The present study uses a qualitative descriptive design with an abductive approach based on individual semi-structured interviews. The data are analysed using qualitative content analysis in accordance with Graneheim et al. (2017) and Graneheim and Lundman (2004). Qualitative content analysis allows the researchers to identify a variety of patterns and contents in data through the manifest and latent content obtained in the analysis (Graneheim et al., 2017; Lindgren et al., 2020). Thus giving both depth and meaning to the participants' descriptions.

3.2. Participants and setting

Twelve nursing students from six universities in different parts of Sweden participated in this study. A purposive sampling approach was used to select participants who could provide rich information in response to the research questions (Sandelowski, 2000). Inclusion criteria included nursing students who had completed or were completing their clinical education during the last year of their three-year nursing education, in Sweden. Participants were recruited by requesting information in the closed Swedish Facebook group, "Nursing Student". Those who showed interest in the study received an information letter by email, detailing the study's aim, implementation and data processing. They also received a response letter with information on how to receive further oral information if needed. All students who responded to the letter provided their written informed consent to participate.

Three of the students were in semester five and nine students were in semester six; they had either just completed or were currently in their clinical education period. The median age was 31. Clinical education ranged from five to seven weeks and took place in somatic care, psychiatric care, in an emergency department or elderly care. There were no dropouts in the study.

3.3. Data collection

Data collection took place between October 2021 and January 2022, through semi-structured individual interviews (cf. Kvale and Brinkman, 2014). The first author conducted all the interviews. To ensure that the questions provided answers to the study's aim, two pilot interviews were conducted and evaluated in the research group, resulting in a revision of the interview guide. Examples of questions in the interview guide were: 'Can you tell me how you plan and implement nursing care?' 'Can you tell me how you work according to the nursing process?' 'What is the significance of the nursing process for your learning?' and 'What does the nursing process mean for you?' 'In which situations do you develop your thinking based on the nursing process?' 'What barriers do you see based on the nursing process?' 'What support do you need based on the nursing process?' 'What does theory and practice mean for your learning?' 'Do you see any link between theory and practice ?'The interviewer was responsive, asking follow-up questions for clarity based on the responses. To obtain inductive data the interviewer was more following than leading in the interview (cf. Elo et al, 2014).

Participants could choose whether the interview should take place in a physical location, by phone or via video link (Zoom); they all chose Zoom. The interviews lasted between 29 and 63 min with an average of 48 min. The interviews were recorded on audio files, saved and transcribed verbatim. The transcription took place continuously as the interviews were conducted.

3.4. Data analysis

Data were analysed using qualitative content analysis in accordance with Graneheim et al. (2017) and Graneheim and Lundman (2004). The

interviews were read carefully in their entirety several times to gain context and an overall understanding. The different steps in the nursing process, such as data collection, nursing diagnostics, planning, implementation and nursing outcomes (cf. Florin, 2019) were used as a deductive grid dividing the entire text into content areas. Subsequently, meaning units based on the study's aim were extracted. No text was excluded from the interviews; the aim guided the analysis process from beginning to end.

Subsequently, an inductive co-analysis of all meaning units took place by condensing, i.e. shortening, but keeping the core content and labeling the units with codes close to the original text. The condensation and coding were consistently compared against the entire interview text to avoid misinterpretations or rephrasing the meaning. Next, the codes were sorted, putting similar content into subcategories and making an abstraction of the content. Subcategories with similar content were then further merged and abstracted, leading to four main categories (see example of the analysis process in Table 1). The categories were judged based on being internally homogeneous but externally heterogeneous.

The analysis process was gradual, and each step was reflected in the interviews as a whole (cf. Graneheim et al., 2017; Graneheim and Lundman, 2004). All authors had access to all the data from the beginning. The first author was responsible for the analysis process, but each step was discussed by the authors until consensus and shared understanding were reached. Thereafter, the analysis process moved on to the next step. Throughout the process, the authors discussed and reflected back and forth between parts and the whole, which necessitated adjustments.

3.5. Ethical considerations

The study followed the ethical principles of the Helsinki Declaration (World Medical Association, 2022). Before involvement, participants received both oral and written information about the study's purpose, implementation and processing of data. Participants were guaranteed confidentiality throughout the research process and informed of their right to voluntary participation. Furthermore, they were given the option to withdraw at any time before the data collection was completed. All participants signed informed consents before the study began and an ethical advisory was received from the Swedish Ethical Review Authority (dnr 2021–03387), with no ethical objections to the study.

4. Results

The results consisted of two main themes: 1) Theory and practice must speak the same language and 2) Incorporate a thought structure for one's professional role. The first theme is about conditions needed for the nursing process to support learning. The second theme deals with an inner process of the student. The main themes are interpretations, that tie the categories together as a common thread through their underlying message. An overview of the results is presented in Table 2.

Table 1
Illustration of data analysis process.

Subcategories	Category	Theme
When practice and theory agree	Meet a practice consistent with the theory	Theory and practice must speak the same language
Lack of nursing focus becomes an obstacle		
To get prerequisites to apply the theoretical knowledge from education		
Learning is affected by competencies met		

Table 2
Overview of categories (n = 4) and themes (n = 2).

Categories	Themes
Meet a practice consistent with the theory	Theory and practice must speak the same language
Get support to raise awareness of an invisible process	
Develop independence to conduct a holistic assessment	Incorporate a thought structure for one's professional role
Increase the understanding of nurses' area of responsibility	

4.1. Theory and practice must speak the same language

This theme revealed that there should be an integration and consistency between what is learned in theory and how it is implemented in real-life situations. Theoretical knowledge serves as the foundation on which practical skills are built and practical experiences give meaning to the concepts learned in theory. The nursing process should guide nursing students practice, when there were opportunities to apply the nursing process into practice, the nursing process was beneficial to learning.

4.1.1. Meet a practice consistent with the theory

Nursing students experienced difficulties and confusion when their theoretical knowledge was not integrated with their practice. They perceived the nursing process as an academisation of something natural and the learning objectives were difficult to apply in all contexts. For example, in emergency departments it could be difficult to distinguish between medical and nursing interventions. Students felt that the nursing process should be clarified and made more concrete during their education.

Students described the nursing process as being overshadowed in the workplace. Nursing care could often be overlooked or not prioritised due to, e.g. medical tasks, medical rounds, examinations and patient discharges. They were not given the opportunity to act according to the nursing process and were unable to go in-depth in patient situations. Patient care was decided without any planning or interventions, which led to difficulty in evaluating and documenting:

'*You have too many patients. You just go in and take care of the problem now. You don't give it much thought, so that's probably the biggest obstacle'. (Interviewee 12)*.

Time was another obstacle to planning, but students also described the organisation's perspective of nursing care as hindering. Nursing care plans were neither documented nor clearly planned, thus affecting learning. This hindered thinking based on the nursing process and development of nursing skills. Students emphasised that documentation of nursing care plans based on nursing diagnoses and defined goals would clarify and contribute to increased learning.

The workplace's way of planning and implementing, based on routines, made it more difficult to learn the nursing process. Without the opportunity to practice what had been learned and not being able to use that knowledge, there was a fear of losing it:

'I have made a lot of goal formulations theoretically, but you should need it practically as well now, which you may not really have done and then I am afraid that it will fall away in my final learning and that it is something that I will not take with me to my future professional role'. (Interviewee 8).

4.1.2. Get support to raise awareness of an invisible process

The nursing process was expressed as invisible and not reflected on by the student or supervisor, which was perceived as an obstacle to learning. Some supervisors explained it, while others just performed it and it was apparent during the assessment talks that there was a lack of integration in practice. It was evident that the supervisors either lacked knowledge of the nursing process or nursing diagnoses and interventions were performed routinely, making the nursing process a kind of rote

memory for the supervisors that students did not receive:

'It is quite complex if you say so, complex and difficult, difficult to talk about, so it is difficult to verbalise the entire nursing process. I think my colleagues, supervisors and clinical teachers also think so because it is not highlighted perhaps in the way it would be needed'. (Interviewee 10).

Students emphasised learning the nursing process by reflecting and breaking down its different parts with their supervisors. By breaking it down, the process became a more natural part of their work. They wanted their supervisors to pay attention when they began the nursing process, as over time it would become clearer and contribute to a broader understanding. When they documented the nursing process it became clearer and they saw the reason for using it.

Supervisors' pedagogical skills had an impact on their learning outcomes. The supervisors had an important role in supporting learning and development of the nursing process by being encouraging and asking questions. The students felt a sense of safety from a supervisor who provided continuous feedback, giving them confidence and helping them learn from their mistakes. Students expressed that an important prerequisite was that the supervisor gave them time and space to be independent. They also received support from the teacher during the assessment talks:

'*I think only one or two supervisors have said, "Now we should think about the nursing process". The vast majority do not. It is, of course, not included in their repertoire, but then you have to learn simply from how they work'. (Interviewee 1)*.

4.2. Incorporate a thought structure for one's professional role

This theme revealed that the nursing process was supportive for learning, as it abled the incorporation of a safe thought structure. By adhering to the nursing process and relying on this thought structure, nurse students can optimize their learning experience in patient encounters and develop their independence in their professional role to provide safe care.

4.2.1. Develop independence to conduct a holistic assessment

The nursing process reinforced a holistic view of nursing, which contributed to deeper learning in practice and facilitated an understanding of the entire chain in the nursing process. They were able to shift the focus from "doing" to assessment and evaluation, which helped in addressing more complex nursing needs. Quickly assessing, prioritising and planning were described as important skills. However, they indicated that to maintain the overall picture and develop skills, a reduced area of responsibility would be more beneficial for learning.

The nursing process contributed to the development of independence. Their work shifts often began by gathering information through oral reports and documentation to get an overview of the patient. It was important to use different data collection methods to determine their own assessment of the patient's needs. The nursing process facilitated data collection by focusing on relevant information. Students expressed the importance of clinical competence when using the nursing process to explore patients' needs. Responsibility for one's patients and being able to think independently based on the nursing process steps strengthened their problem-solving skills and provided confidence. To be independent in both thought and action provided a sense of safety and a broader knowledge base, which increased confidence in responding to patients' needs:

'*I kind of have to be given the opportunity to be able to collect the data I need, to be able to formulate a problem, a diagnosis and then decide how am I going to do this. I then need to be able to evaluate it. [I need] to know, but do I think right here, or do I need to do something else, because otherwise I'm missing out on that learning process'. (Interviewee 9)*.

Developing care plans, planning goals and interventions with the patient and care team was important for learning and team collaboration facilitated patient assessment, contributing to increased learning. The students expressed that interacting with the patient increased their competence,by asking targeted questions and this contributed to developing a close patient relationship.

Patient continuity aided evaluation and learning through continuous training of the nursing process, which contributed to clarity in using and understanding information in practice. The nursing process was then consolidated and made automatically present in every meeting with a patient, providing a solid, safe and logical structure that facilitated learning and implementation of work regardless of context. Students expressed that it prevented information from being overlooked:

'I think it creates a good foundation for me, as I dońt have any prior health care experience. It stands as a tool that we can use regardless new developments or situations. I believe it is always beneficial'. (Interviewee 5).

4.2.2. Increase the understanding of nurse's area of responsibility

The nursing process helped students understand their unique area of responsibility and the significance of their competencies as crucial for providing safe care. They viewed the meaning of the nursing process as central and the data collection as laying the foundation for planning interventions. Gaining a deeper knowledge of the parts of the nursing process increased students' clinical competence:

'I develop accuracy in my future work and understand that every time I collect data, it has a significant impact on patient care'. (Interviewee 7).

Thinking from the perspective of the nursing process provided support to critically focus on the nurse's area of responsibility. They saw their responsibility and attitude for learning to be an important competence in their professional role. By using the nursing process, students linked theory into practice, which contributed to deeper learning:

'As a *nurse you have prescriptions and interventions from all possible directions and it may be more important to have this nursing process so you do not forget about your own area'. (Interviewee 6)*.

5. Discussion

The aim of this study was to increase understanding of nursing students' learning during clinical education in relation to the nursing process. The overall themes showed that when theory and practice 'spoke the same language', the nursing process became meaningful in developing a sustainable and safe way of thinking for one's future professional role.

The results of the present study indicate that the nursing process is an invisible process not verbalised in clinical practice. Benner (2001) explains that experienced nurses have knowledge, skills and experience that develop over time, and they may be unaware of these competencies. Benner describes these nurses as experts and they build up their conclusions, not element by element, but rather by grasping the whole. This may explain why students in this study indicated that it was hard for supervisors to express the nursing process. Another explanation could be that supervisors are inexperienced and have limited knowledge. The question is whether the nursing process is a tacit knowledge of experienced nurses and carried out intuitively, which cannot be accounted for theoretically (Polanyi, 1958) or is it simply intuition? According to Melin-Johansson et al. (2017), intuition plays a key role more or less in every part of decision-making in the nursing process. It is about more than a "gut feeling"; it is a process based on knowledge and practical experience. Concretising and verbalising this decision-making process for students is important for learning and clinical reasoning (Levett-Jones et al., 2010).

In this study students expressed the importance of competent and professional supervision for adequate learning of the nursing process. According to Benner (2001) a prerequisite for developing clinical competencies is having support and structure to put words to knowledge and experiences in situations. This support is needed from experienced nurses who can explicitly clarify and verbalise in care situations (Andersson et al., 2022). Sandvik et al. (2015) noted that understanding develops through independent thinking and autonomous nursing, which

is supported by external factors such as supervision and the learning environment. Based on the results of this study, there is a need to raise awareness among supervisors of the importance of verbalising the nursing process yo support student learning. Pramila-Savukoski et al. (2020) argued that supervisors need pedagogical competencies to identify individual learning needs and support learning processes to successfully support student learning in clinical education. Study results also showed that continuous feedback from supervisors and opportunities for reflection were considered essential for student learning and development of the nursing process. Adamson et al. (2018) point out that the responsibility of feedback in clinical education lies with both students and supervisors; using tools that stimulate this process can make it easier. The nursing process can serve as an active tool for a starting point when giving feedback and facilitating reflection, since active and reflective learning in clinical education may help students achieve professional socialisation (Marañón and Pera, 2015). It will challenge students to see the entirety in relation to the parts and the parts in relation to the entirety, which can lead to a new embodied understanding (Ekebergh, 2011). Giving students the opportunity for continuous reflection that clarifies the theoretical context in practice with their own lived experience can thereby facilitate understanding of the nursing process.

Results show that the opportunity to meet a practice consistent with the theoretical knowledge was challenging for the students. They felt that they had not gained sufficient prior knowledge of the model before clinical education and that the learning environment during clinical education was not designed to implement the model. Tan et al. (2021) believe there is a consensus that nursing practices should be based on nursing theories, despite the fact that there is still a biomedical framework that forms the teaching and practice of physical assessments. Tan indicates a need to shift focus from medical assessments to identifying nursing problems for planning and providing nursing care. Students in this study considered that care plans promoted learning by making the concepts more explicit based on a context; however, they expressed this was a shortcoming in workplaces and requested that existing work models should meet their learning needs. This can be interpreted as a gap between theory and practice based on student statements that nursing was not in focus and learning was task oriented. In a review from Greenway et al. (2019), the theory-practice gap attributes can be relational problems between university and clinical practice, with practice failing to reflect theory and theory perceived as irrelevant to practice.

Study results indicate that when theory and practice did not speak the same language, students did not see any benefit in learning the nursing process and were fearful of losing knowledge. Educators have a crucial role in providing students with a solid foundation in the theories of the discipline, but what constitutes nursing is sometimes vague. According to Yancey (2015) if educated nurses lack a solid foundation, new knowledge development in nursing will suffer. Helou et al. (2022) even argue that students would not consider patient situations holistically or do thorough assessments of patients' needs and the focus would be on delegated tasks unrelated to nursing knowledge. Helou et al. (2022) claim that educators need to rethink how they teach nursing theories and guide practice during clinical education. This may mean that if students are given opportunities to integrate theoretical concepts and nursing practice during clinical education, the gap might decrease and student learning would become more meaningful. Mudd et al. (2020) state that without clear articulation, integration of nursing remains implicit and there is a risk for the nursing profession to not develop and progress. The results in the present study showed that the nursing process provided support in maintaining focus on the nurse's area of responsibility, which could easily be lost.

The nursing process promotes deep learning; to understand, analyze and apply knowledge in meaningful ways, giving students a holistic perspective on the patient's situation and independence in problem-solving skills. This can be understood as Levett-Jones et al.'s (2010) description of clinical reasoning, the process by which nurses come to an understanding of a patient's problem, plan and implement interventions, evaluate outcomes and reflect on and learn from the process. Students in the present study expressed that once they gained an understanding of this invisible process, it was consolidated and presented automatically. They viewed the nursing process as a significant professional competence and useful in various contexts. This is related to Kistler and Tyndall's (2022) description of the threshold concept, whereby an understanding of a threshold concept results in a changed perception and reveals invisible connections between things. It is important for education to identify and facilitate learning of threshold concepts (Brown et al., 2022). Concept-based learning and teaching can be a way to enable knowledge transfer and learning in nursing by focusing on deep learning of concepts and their use in different contexts (Higgins and Reid, 2017). Benner (2001) also claims that learning in context should be central in nursing education, supporting the premise that when the nursing process is used explicitly in different contexts, meaningful learning and rote memory develop. Jonsén et al. (2013) requested a tool for bridging the gap between theory and practice; students must have the opportunity to combine theoretical knowledge with evidence-based knowledge to develop nursing interventions.

Results of this study indicate that the nursing process provides support to view complex contexts holistically. A review from Tan et al. (2021) identified the need to improve the teaching of physical assessment skills in relation to nursing with an emphasis on depth rather than breadth. Similarly, Warne et al. (2010) found that students who are exposed to the whole individual nursing process over a longer period of time and with the same patient, are more likely to gain a deeper understanding of nursing and responsibility than those who take a more task-oriented approach. The nursing process as a model can thus facilitate the transfer of knowledge and create meaning to concepts by stimulating critical thinking and providing a holistic perspective. Kolb's Experiental Learning Theory can be a valuable framework for facilitating the integration of the nursing process. Experiental learning emphasises the importance of learning through experiences and reflection (Kolb, 2014). By following Kolb's learning cycle, nurses can enhance their ability to integrate the nursing process into their practice. They can continuously learn from their experiences, critically evaluate their actions and adapt their approach to patient care. Kolb's theory can be used to form various educational learning and training strategies that cater diverse learning styles and promote a holistic understanding of knowledge through integration of theory and practice.

Through a deeper understanding of the nursing process, students gained increased insight into the nurse's area of responsibility and its significance for patient safe care. A review by Kaihlanen et al. (2018) indicated that this achieved competence facilitated the transition from nursing student to a registered nurse. This achieved competence consisted of, among other factors, the student's ability to connect theory to practice and implement the nursing process, clinical reasoning and critical thinking. This can also be connected to Nabizadeh-Gharghozar et al. (2021) description and development of clinical competence in nursing. Clinical competence is a continuous process which can be developed through educational support as an application of knowledge. The nursing process can support the development of clinical competence and thus the transition to registered nurse.

6. Methodological discussion

Several criteria were used to assess the rigour of the study. The criteria included trustworthiness which involves credibility, dependability, conformability and transferability.

To strengthen credibility, nurse students from six universities in Sweden were recruited and interviewed. Including participants from different universities allowed for diverse perspectives on the research question, as Graneheim et al. (2017) point out that participants from different universities can illuminate the research question from different points of view compared with a single educational institution. Moreover,

interviewing final-year students ensured that they possessed the required knowledge and skills aligned with the education's objectives. The study was conducted with a relatively small sample size, which could be seen as a limitation; however, the sample size was appropriate to the study aim. The interviews provided rich descriptions and data saturation gradually emerged, indicating an optimal sample size (cf. Elo and Kyngäs, 2008; Graneheim et al., 2017).

To ensure dependability, the study's design, method, data collection and analysis were thoroughly described. The abductive approach, moving back and forth between theory and empiricism (cf. Graneheim et al., 2017), contributed to revealing meaningful patterns explicitly and implicitly. Abduction can be relevant in data analysis when the researcher wants to clarify and concretise complex concepts (Veen, 2021). The use of the nursing process as a deductive grid allowed the identification of pertinent elements even when not expressed verbatim. The four authors actively participated and stepwise reflected on the findings, which can be seen as a triangulation (cf. Holloway and Galvin, 2017).

The process of analysis from coding to categorisation took place with a low degree of abstraction and interpretation. To maintain closeness to the data all text was kept in Swedish until the end of the analysis process. This is both a strength and a limitation, as the authors of this study are nurses and teachers in nursing education. However, the authors' rich variation of experience strengthened the study's confirmability (cf. Elo et al., 2014). To further enhance confirmability, a low degree of abstraction and interpretation was employed during the analysis process. The study also adhered to the COREQ checklist for qualitative studies (Tong et al., 2007).

Regarding transferability, the study assumes that its findings can be applicable to similar contexts. However, variations in educational and care settings should be considered and readers are encouraged to evaluate the transferability (cf. Graneheim et al., 2017).

7. Conclusion

This study shows that the nursing process model can stimulate a holistic assessment and deep learning in patient situations when theory and practice are aligned. When the nursing process is visible and verbalised, problematisation and reflection of the theory in practice is supported and, therefore, the transfer of knowledge in practical situations and development of clinical competence in nursing is facilitated. To be perceived as a meaningful model, nurse students need to receive support and opportunity to apply the nursing process when meeting patients during clinical education. A supportive learning environment and competent supervisors are important prerequisites. Higher education in collaboration with clinical practice needs to identify what promotes and hinders the learning of important concepts that are essential to providing effective and safe nursing care. It is, therefore, important to use a pedagogical models for students and supervisors to facilitate the integration nursing process in practice. Kolb's theory of experiential learning offers a suitable model that highlights the iterative nature of learning, involving experience, reflection, conceptualization and active experimentation. A conclusion that can be drawn is that, by facilitating and supporting nursing students in developing skills in combining theoretical knowledge, practical experience, critical thinking and clinical reasoning, they are better equipped to provide safe and efficient care. To understand the theory-practice gap in relation to the nursing process, there is a need of future studies from other perspectives, such as the perspective of registered nurses.

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CRediT authorship contribution statement

Ulrika Löfgren: Conceptualisation, Methodology, Validation, Data collection, Writing – original draft, Writing – reviewing and editing. **Birgitta Lindberg:** Conceptualisation, Methodology, Validation, Writing – original draft, Writing – reviewing and editing and Supervision. **Britt-Marie Wälivaara:** Conceptualisation, Methodology, Validation, Writing – original draft, Writing – reviewing and editing and Supervision. **Ulrica Strömbäck:** Conceptualisation, Methodology, Validation, Writing – original draft, Writing – reviewing and editing and Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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