Teaching in the high-technological clinical setting- a new approach

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**Abstract**

Teaching in the clinical setting is demanding and a complex task that many clinicians carry out without preparation. It is clear that a clinical educator must be more than just a medical expert. We developed a supervision model based on student-centered learning inspired by adult learning theories. To achieve learning the student is treated as independent learner and that learning is self-directed based on previous knowledge.

**Aim:** The purpose of this project was to evaluate the student’s experience of our developed student-centered supervision model.

**Method:** We evaluated the project, with both qualitative interviews (n=6) and questionnaires (n=15), which were analyzed quantitively.

**Result:** Student-centered learning is well suited to promoting self-directed learning in the clinical setting in critical care. Our student- and supervision model was found to enable a positive learning environment in which students and their skills were in focus. The clinical supervisor's educational ability to is crucial for the result.

**Keywords:** critical care; Student-centered; Supervision; Clinical teaching; critical care

1. Introduction

Teaching in the clinical setting is a demanding and complex task that many clinicians carry out without preparation (Ramani & Leinster 2008). Clinical education takes place in a complex context and a clinical educator must have pedagogical knowledge as well as medical expert, especially in today's critical care context, which is both advanced and highly complex (Falk 2015). The high-tech environment in critical care with severely ill patients is extremely resource-intensive, with the critical care nurses being responsible for patient care regardless of time of day. Patient care is carried out in teams, with health care personnel constantly near the patient. The specialist nurse’s duties...
include monitoring, care and treatment as well as managing highly technical equipment (Larsson & Rubertsson 2012, SFAI 2015). Most health care services lack well-educated personnel. In Sweden, education for nurses consists of a three year education, 180 ECTS (European Credit Transfer and Accumulation System), plus an additional one-year, 60 ECTS, on advanced level, which is regulated by the Swedish higher education Authority. The education provides a professional degree (post-graduate diploma in specialist nursing at a master degree in most universities in Sweden. There is a great demand for well-trained, advanced level nurses who can deliver high quality clinical education in healthcare; however, in clinical nursing, the patient's condition determines how and when the supervision of the student can be performed which has been reported in undergraduate education situations.

Students, during clinical practice must combine cognitive, psychomotor, and affective skills to respond to individual patients needs. Clinical education must consider client safety while the patient is cared for by a novice practitioner and the nurse educators must monitor client needs as well as student needs (Knowles, Holton & Swanson 2012). In this situation, time for reflection and learning could be considered less important compared to direct patient care, which is an obstacle for effective learning environment. Reports has shown that students report higher satisfaction with clinical practice, based on how the clinical practice is organized. For that reason we developed a supervision model based on student- and supervisor's centered inspired by adult learning theories (Knowles, Holton & Swanson 2012). This pedagogical model is based on the theory that learning appears when adult learners decide what they need to learn, and not based on the teacher's view of what the learners need to know. This is also called constructivism, which means that the teacher acts as a facilitator of learning and that the learner transforms theory into the daily practice. To achieve learning the learner is treated as independent and self-directed individual, which use the health care professionals own educational needs, providing a comfortable climate and opportunity for learning, and involving learners in the planning of the session (Schön 1987 Biggs & Tang 2011, Hedin 2006). Properly implemented student-centered learning has shown increased motivation to learn, greater retention of knowledge and deeper understanding of knowledge. The supervision model also uses peer learning as an important component of the learning process. Through peer learning model, each student develop new knowledge based on the knowledge they already possess. Peer learning between nursing students during clinical education had a positive impact on learning, the learning environment and helps the students to develop an ability to reflect on their own learning and achieved goals in clinical learning situations (Glynn et al. 2006, Ross & Cameron 2007).

1.1 Setting

The supervision model was initiated and implemented at a critical care unit with 13 beds with critical care nurses responsible for patient care on a nurse/patient ration of 1:1, 69 percent of the critical care nurses at the unit had a master's degree with additional training in supervision. Three critical care nurses with teaching responsibilities at the unit initiated the project and linked a group of clinical critical care nurses (n=15) within the unit to the project. These critical care nurses had an extensive experience of critical care and supervision in both theory and practice. An introduction day started the project, with discussions of the core concepts of student centeredness. The supervisors worked day and night shifts on a regular basis, which meant that all supervisors were responsible for all students throughout the entire clinical education period. In the traditional supervision model, a student is supervised by a critical care nurse responsible for the care of one patient (1: 1: 1) throughout the clinical training period. We have developed a peer learning model in which two students are supervised by one critical care nurse who is responsible for the care of one patient (2: 1: 1) and the students take turns being in charge of patient care throughout the week. The educational supervisors have the overall responsibility for the daily planning of student learning. Based on this model, we assumed that the student would take a more prominent role and work more independently, and the supervisor would step back and join in when needed to ensure at all times that care was performed correctly. The purpose of this study was to evaluate the student’s experience of the developed student-centered supervision model.
2. Method

To evaluate the project, mixed methods with both qualitative interviews (n=6) and questionnaires (n=15) were used to explore the students’ experience of the student-centered supervision model.

2.1 Participants

The sample consisted of all nursing students during their specialist education in critical care (n=15) that during the project period (January-December 2013) were part of a clinical educational period (4-8 week/period) at one intensive care unit. The evaluation took place after the assessment of the student's competence was completed. All students participated and the interviews took place when the students were off duty. The author, who did not participate in the student's supervision, conducted all the interviews. The interviews started with one open question: How did you experience the learning model at our unit? The interviews varied between 30-45 minutes and were transcribed in direct relation to the interview.

The questionnaire was developed by a peer group of experienced clinical teachers to evaluate the overall model of student centeredness. The questions were: How did you experience the overall supervision? How was your experience of peer learning in the clinical setting? How did you experience that the supervisor had responsible for more students than you? All questions were answered on a Likert scale from 0 (not good at all) to 10 (very good) and space for the participants’ own comments was included.

2.2 Analysis

The analysis of the interviews was performed by using content analysis described by Krippendorff (2004). The aim of such an analysis is to describe the experience of the participants using their own words and not to investigate underlying mechanisms or meanings (Graneheim & Lundman 2004).

First, whole sets of words were analyzed to ensure an open coding process with no preconceived notions. Thereafter, the entire text was divided into units of meaning, which were organized into categories and subcategories. Repeated checks of the original text were performed in order to ensure that no changes were made. During the analysis, there were repeated discussions with clinical educators who were not involved in the project until consensus was reached.

The strategies designed by Graneheim and Lundman (2004) to maximize the credibility, reliability and validity of data were employed. The questionnaire was analyzed and presented by descriptive statistics (per cent and numbers).

2.3 Ethics

The study received ethical consideration and no potential harm was found. The students and the health care manager approved this pedagogical project. The interviews with the students took place after their clinical period and were not part of any assessment of their competence. The participation was voluntary and the participants were assured of confidentiality and their right to withdraw from the study at any time without further explanation. The questionnaire was distributed to all students after they finished the clinical period, and by completing and returning the questionnaire the students gave their informed consent. The researcher were not involved in teaching or grading the participants.
3. Result

3.1 Evaluation of the peer learning model (1: 1 vs 1: 2) (n = 6)

In a comparison of previously supervision model with only one supervisor throughout the entire clinical training period our model was evaluated as "totally different" from what was expected. The results show that students perceived the individual supervision as a watch and learn session. It was reassuring for them to recognize the role of students as followers (as it has always been) and they found it difficult to break this pattern. At the beginning the focus was the supervisor’s knowledge, and the students (apprentices) learned to mimic the supervisor. They followed their supervisor and did as they were told without any reflection. The students discovered eventually that "things" concerning the patient "just happened". They realized that the supervisor did many things without discussing them with the students. The students avoided taking the initiative because they had the feeling that they "knew nothing" and "did not really dare to ask questions" because they were unsure whether they should know this already or not.

During our student- and supervision-centered model, the roles became reversed. Now, students and their knowledge were in focus. Suddenly it was "real" and the students had to take responsibility, and discovered that they could do so. They experienced personal growth with the supervision model and their confidence increased, along with their ability to take the initiative. The students had to make sure that everything was considered and planned for, otherwise nothing happened for the patient. Together with another student, they could pose questions to each other on their own level, and the reflections helped them to increase their knowledge. They learned from each other, and after the peer learning session they went to the supervisor with their thoughts, which meant that they felt secure in what they had come up with. However, at the beginning of the training period, the students had to get to know each other to make the roles clear. "Who was the supervisor became less important", but it was reassuring that they were there. The students discovered that "suddenly there was a supervisor there" and took responsibility when the patient’s condition required immediate care. The supervisor was "present but still far away."

3.2 Evaluation of the overall model of clinical teaching model (overall model, peer learning, more students/supervisor) through a questionnaire (n = 15):

The evaluation showed that 99 per cent (n=14) of all students considered the learning environment and supervision model to be excellent. The students felt there was authenticity in the learning situation; however, improvement concerning the peer learning model as well as having a supervisor with more than one student needed more attention (figure I).
There were a few negative aspects described by students; a lack of communication between students (n=2), high demands from severely ill patients (n=2), and lack of time for reflection (n=1).

4. Discussion

To our knowledge our study is one of the first descriptions of clinical supervision performed by clinicians in a high technological environment such as a critical care unit throughout the entire clinical period of students’ higher education to specialists in critical care. The student-centered model has mostly been reported from the academic setting (Sun et al. 2014, Ross & Cameron 2007, Glynn et al. 2006, Stenberg & Carlsson 2015, Secomb 2008) and only a few reports from the clinical setting (mostly from specialized educational units) have been found (Stenberg & Carlsson 2015).

Our student- and supervision model was found to enable a positive learning environment in which students and their skills were in focus for the entire clinical period of 4-8 weeks. The result is well in line with the result of Sun et al. (2014) who reported that students’ clinical thinking can be improved using a student-centered model. Student-centered education is an approach in which students influence their own pace of learning as well as the content and activities that support learning. This learning model places the student, not the supervisor, at the center of the learning process. This puts high demands on the supervisor’s ability to teach as well as ensure safe patient care during critical care. In the academic setting the supervisor's role has been reported to be to provide the students with opportunities to learn independently and to coach them in the skills they need to do so effectively (Collins & O’Brian 2003). However, whether or not this is applicable in the clinical setting has yet to be discovered. During nursing education Sundler et al. (2014) show that students with a personal preceptor had more positive experience of the supervisory relationship and of their clinical placement with an impact on students' satisfaction on the clinical learning environment. This result is not in line with our result which shows that student satisfaction of the learning environment are positive if student centered supervision is performed during specialist education. All our supervisors were responsible for all students throughout the entire clinical education period. More research on the
role of supervisors and their assessment during student-centered clinical supervision should be conducted in the future.

As reported by Collins and O’Brian (2003), properly implemented student-centered learning can lead to increased motivation, greater retention of knowledge and a deeper understanding all of which is supported by our results.

Through this peer learning model, each student developed the knowledge they already possessed, as described by Glynn et al. (2006) and Ross (2007), and by working in pairs with other students, they continually shared knowledge and jointly solved problems that arose during care of critically ill patients.

The students felt that the clinical learning environment was "for real", which meant that students' self-confidence increased and they took the initiative during patient care.

The results of Carlsson & Idvall (2014) and Stenberg & Carlson (2015) show that peer learning between nursing students during clinical education had a positive impact on learning and the learning environment. However, negative aspects were also found which could be seen in the light of our results which showed that peer learning feels valuable when students are prepared for the model, and when supervisors also are prepared so they can support the students in their learning environment. Research shows negative aspects, such as lack of communication strategies between undergraduate nursing students, and the impact of differences in personality and learning styles, all of which is supported by our results (Secomb 2008, Carlsson & Idvall 2014). Further research to explore peer learning during higher-education as well as in the clinical setting is needed.

There are limitations to this study. The small sample size could have had an impact on the results. Further studies on the supervision model and its impact on student’s learning and clinical knowledge in higher education should be performed in the future. The need to evaluate the impact of using adult learning theories and the use of several supervisors is proposed.

5. Clinical implications

Educational interventions using student-centered learning are well suited to promoting learning in the clinical setting. Our student- and supervision model was found to enable a positive learning environment in which students and their skills were in focus. However, it put high demands on the supervisor's educational ability to "be present but still far away", and continued pedagogical discussions are needed to support the supervisors.

Take Home Messages

- Student centered supervision is well suited in the clinical setting
- Supervisors should be present but still far away
- Peer-learning can be used in high-technological units

Notes On Contributors

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Appendices

Declarations

The author has declared that there are no conflicts of interest.

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