

Problem-Based Learning and e-Learning Methods in Clinical Practice

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Abstract. The purpose of this study is to describe the curriculum development and introduction of problem-based learning pedagogy (PBL) in the undergraduate nursing education at Savonia University of Applied Sciences in Iisalmi unit. The main points to be described are the integration of PBL and e-learning methods and nursing students' learning outcomes in clinical practice. PBL pedagogy develops information literacy skills, critical thinking and evidence-based nursing skills, communication, co-operation and team working skills, problem solving and self-assessment skills. Integration of PBL and e-learning methods in clinical practice has developed nursing competencies, reflection of learning and peer support of nursing students. The most important results are peer support, feedback and a teacher's encouragement when using e-learning methods.

Keywords. Problem-based learning (PBL), e-learning, clinical practice, learning outcomes

1. Introduction

Since the establishment of the Universities of Applied Sciences in Finland in 1990's pedagogical methods have been developed. The aims of this development have been to find learning methods that emphasize activity, functionality, self-directed learning and co-operation between students. Information and communication technologies have developed and this means better e-learning platforms than before. Because of this it is important to create new e-learning methods. Problem-based learning (PBL) method is one answer to the demands of activity, functionality, co-operation and self-directed learning of students. PBL pedagogy is a holistic approach which is based on experiential, functional, contextual and constructive learning theories. Problems in really nursing practice or social reality are the basis of the learning. PBL method can be used widely and integrated into e-learning methods when we are reaching for higher level learning [1].

The use of problem-based learning develops many professional skills, because it requires skills in searching and synthesizing knowledge, communicating verbally and nonverbally and working in a group. Self-assessment and peer review are important components of professional skills in nursing practice, too. Evaluation is an essential part of the whole PBL process. [2] When PBL and e-learning methods are integrated the role of a tutor teacher and the relationship between students and the tutor teacher are very important. The tutor teacher's effective feedback and guidance could improve students' urge to use PBL and e-learning methods and learning effectiveness. [3]

We have used PBL pedagogy in the undergraduate nursing education at Savonia University of Applied Sciences in Iisalmi unit since autumn 2005. From the start we wanted to integrate PBL and e-learning methods, because we use e-learning methods systematically in all teaching. The introduction of a new learning method and the integration of two methods demand good planning, good co-operation and hard work from all nursing teachers for many years.

The purpose of this study is to describe the development work in the undergraduate nursing education at Savonia University of Applied Sciences in Iisalmi unit. The main points to describe are the integration of PBL method and e-learning methods and nursing students' learning outcomes in clinical practice.

2. Development of Problem-Based Learning Method in Nursing Education

We have developed the curriculum of the undergraduate nursing education step by step. Poikela and Poikela [4] said that the best way to adapt PBL pedagogy is to gain experiences as a learner in the PBL process. The first step was before when starting PBL method that we teachers studied the PBL method. We used the method in our planning meetings and at the same time we practiced the tutorial working. The second step was to study our curriculum. It is important to integrate subjects, theoretical, practical and experiential knowledge together. We have created seven themes on the content of the curriculum. We planned objectives, contents and topics for the tutorial working in every theme. The tutorial working is the most important part in PBL pedagogy. We also have expert lectures, seminars, laboratory and clinical skills training, project working and study visits. We wrote tutorial guides for students and teachers. All this work was completed in small teacher groups. Before using PBL method in the undergraduate nursing education we had worked on curriculum planning nearly for two years. It goes without saying that we integrated e-learning methods into PBL, because we had used e-learning methods for many years. Conversation forums and other learning tasks are saved in the e-learning platform and students document their tutorial works there, too.

The third step was to develop the clinical practice. We have nine clinical practice periods in our undergraduate nursing education. The duration of one period is from three weeks to six weeks. We examined the objectives, contents and assessment criterion of every period. The objectives have been drawn up on basis of nurses' core competencies. We wrote a clinical practice guide book for every period. The guide book consists of objectives, tasks, assessment criterion and practical guides for clinical practice. We have also developed web questionnaire for the assessment of clinical practice. Our goal was to deepen clinical practice by utilizing PBL pedagogy and e-learning methods. E-learning methods advance also students' nursing informatics and net nursing skills [5].

The fourth step in our development process will be the co-operation with our exchange universities. We will utilize PBL method and e-learning platform in our common study module of elderly health promotion. These studies will start in January 2009.

3. Integration of Problem-Based Learning and e-Learning Methods in Clinical Practice

We have integrated PBL and e-learning methods in clinical practice in many ways. We have web tutorials and guided web conversations. Web tutorial means that students have their tutorials in the e-learning platform. A patient case is a trigger for students' learning. E.g. one student in a small group has planned a patient case with her/his mentor in the clinical practice. The web tutorial could consist of chat or/and long time conversations. Students define a patient's needs and plan the care. They search for new information from Internet, library and from professional experts in their clinical practice place. This tutorial working integrates theoretical and practical knowledge and supports students to adopt evidence-based nursing.

Guided web conversations have timetable and instructions in the clinical practice guide book. Conversations could be open or themed. In open conversations students tell free their learning experiences and comment others. Conversations have been themed with the content of the clinical practice. Themes may be for example nursing principles in practice, needs of the long time patient, esteems and attitudes to meet an elderly person. Students have to tell their own experiences and opinions but to seek evidence-based knowledge, too. New or critical incidents or shared learning diaries could also be a basis for conversations.

4. Study Questions

The study questions were:

1. How the use of PBL method effects a student's working in clinical practice?
2. What are the effects of integration of PBL and e-learning methods?
3. What is a teacher's role in student's guidance by the e-learning platform during clinical practice?

5. Methods and Materials

The data were gathered from third and fourth year nursing students and nursing teachers at Savonia University of Applied Sciences in Iisalmi unit. The first material from nursing students ($n = 14$) were gathered with an open-ended web questionnaire in December 2007 and the second material was written in students' group discussions in August 2008. There were 14 students in five groups. The data from nursing teachers ($n = 6$) were collected with an open-ended questionnaire via email in January 2008. The data were analysed with the method of content analysis.

6. Results

6.1. Effects of the use of PBL method

According to students' and teachers' answers, the use of PBL method has developed nursing students' professional skills. Information literacy skills, critical thinking and evidence-based nursing skills, communication, co-operation and team working skills, problem solving and self-assessment skills are developed during these three years when students have learned by PBL method. Students are active learners in lessons and in practice, too.

Students are interested to search for new evidence-based information for their nursing practice. Students have assisted their mentors in information searching during their clinical practice. Communication, co-operation and team working skills have helped students to work in multiprofessional teams. Students have utilized their communication and co-operation skills to act in students' groups and to guide patients in groups. Because of using PBL method students have improved meeting skills; they can act as a chairman and secretary of a meeting. Students have got courage to express and justify their opinions and seek new learning situations. Problem solving skills are developed; students seek new alternatives and justify their choices.

Effects of integration of PBL and e-learning methods

The main effects of integration of PBL and e-learning methods in the clinical practice are: advanced nursing competencies, reflection of learning and peer support. Web tutorials and guided web conversations have helped to integrate theory and practical

knowledge and improved students' nursing competencies. These learning methods have helped students to deepen their knowledge of new tasks in health care and to view the diversity in nursing care. Students have also learned new nursing methods. Information literacy skills and evidence-based nursing skills have been seen in web conversations. E-learning platform has been a safe environment where a student has been allowed to practice professional interaction and consider issues.

These learning methods have helped students to reflect and assess their own learning experiences and activity. The knowledge of other students' experiences has supported and deepened own thinking and has given new ideas and learning situations for the practice. These methods have facilitated students' peer support. Knowing learning experiences and outcomes of other students encourages student to plan new higher learning objectives for the clinical practice period. It is easy to ask and get advice from other students via e-learning platform. Students have learnt to consult each other in challenging situations.

Themed web conversations have helped to schedule clinical practice period and learning situations. Themed conversations have increased students' stress, but have improved tolerance, too.

Teacher's role in network guidance

Using PBL and e-learning method both in theory and practice has helped teachers to understand students as individuals and to monitor better their learning outcomes. A teacher's role is to attend conversations and to take part in getting feedback and new information or to correct mistakes and misunderstandings. It is important to a student to get feedback and encouragement from a teacher and see that a teacher is interested in her/his learning. A teacher is "present" via an e-learning platform and students could easily contact the teacher. The teacher guides the integration of theory and practical knowledge. She also guides conversations to an ethical and constructive way. Teachers point out if there might be some ethical problems to use patient cases as triggers in the e-learning platform.

7. Discussion and conclusion

The development and introduction of new learning methods demand plenty of work, but it is also interesting and rewarding. Our experience is also that the development and use of PBL created reflective dialogue between teachers [see 6]. The results of the study and also feedback from mentors in the clinical practice are encouraging. The main effects of integration of PBL and e-learning methods in the clinical practice were advanced nursing competencies, reflection of learning and peer support. The most important results are the peer support, feedback and encouragement of a teacher. Also Choi [3] pointed that effective feedback and the interaction between students and a teacher play an important role in the Web-based PBL.

There might be some ethical problems related to web discussions. Because of a use of a patient case as a trigger a student and her/his mentor are responsible for keeping the patient's anonymity. The web discussions will be well guided and a teacher has to attend them. We are developing a model for e-learning method in the clinical practice. The model will consist of learning objectives and tasks and instructions for web conversations. There are written roles for a teacher and mentoring nurse. This e-learning model will help students and faculty of clinical practice place to adapt new methods for clinical practice and to act in an ethical way.

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