Proposal of Strategies to Create a Case of Virtual Patient for Nursing Education

Kayoko Hirano¹, Yukie Majima², and Kiyoko Tokunaga¹
¹Faculty of Health Science Department of Nursing, Kyoto Koka Women’s University, Kyoto, Japan
²Osaka Prefecture University, Osaka, Japan
Email: {k-hirano, k-tokunaga}@mail.koka.ac.jp, majima@cs.osakafu-u.ac.jp

Abstract—In 2011, nursing practice skills, which are the core of undergraduate nursing programs, were assessed with the expectation of developing nursing practitioners, researchers, and educators possessing a broad range of professional knowledge and research capability. Particularly, the acquisition of problem-solving approaches in nursing practice poses a challenge for the development of nursing processes that are customized for each patient. This study was undertaken to examine a class design in nursing skills education that aims to have nursing students create patient cases, image the patients, and foster nursing practice skills with individuality. Proposal of learning strategies to create a case of virtual patient for nursing education. After the training, a questionnaire survey was administered. We summarize the effects of students independently creating patient cases. First, creating patient cases independently can promote imaging of patients by students. Second, by having discussions, more information can be extracted in a specific manner. And, Learning to create patient cases can foster a high level of thinking ability.

Index Terms—nursing practice, nursing skill, virtual patient, class design

I. INTRODUCTION

In Japan, the number of nursing universities has increased rapidly since 1992, from 14 universities in 1992 to 234 universities in 2014. Social expectations are high for undergraduate nursing education. Nevertheless, it has been pointed out that a gap separates the nursing skills to be learned and the capabilities that are expected for clinical practice. Although the level of achievement of nursing skills at the time of graduation has been indicated in concrete terms, the gap has not been filled. One reason might be that students experience few patient cases because of the difficulty in securing practice facilities.

In 2011, nursing practice skills, which are the core of undergraduate nursing programs, were assessed with the expectation of developing nursing practitioners, researchers, and educators possessing a broad range of professional knowledge and research capability. Particularly, the acquisition of problem-solving approaches in nursing practice poses a challenge for the development of nursing processes that are customized for each patient.

II. CURRENT SITUATION AND PROBLEMS OF NURSING SKILLS EDUCATION

A. Problems in Learning the Nursing Process

The nursing process includes processes of planning, implementation, and evaluation, ranging from information collection and assessment to nursing diagnosis [1]. Therefore, developable learning using cases occupies an important place in fostering thinking ability. In learning, cases of simulated subjects presented on paper (paper case materials) are often used. However, paper case materials do not provide sufficient patient information. They have limits in imaging of the subjects [2]. Consequently, learning to understand the patient comprehensively, including physical aspects, is necessary before undertaking clinical practice that addresses various cases.

B. Educational Materials and Methods Aimed at Fostering Nursing Practice Skills

In response to these circumstances, effective learning strategies aimed at fostering nursing practice skills were considered. Video materials, simulators, and simulated patients (SP) were introduced into education. In addition, because of the development of Information and Communication Technology (ICT), learning support for preparation and review became possible through e-Learning, such as viewing of nursing skill images, submission of assignments, and confirmation of knowledge.

In recent years, education methods have been included in basic nursing education, including skills education using simulators and the enhancement of judgment and practical skills under set conditions. However, because simulators are expensive, few are owned by nursing universities. Moreover, they are seldom fully used.

The consideration of simulation education using e-Learning has been proposed as a method for patient cases to promote clinical reasoning [3], [4]. In a study conducted by Majima et al., teachers developed cases for nursing practice to resolve difficulties in learning through lectures, training, and practice in nursing education. Then they put them into practice [5].

The importance of question-posing learning by learners (including investigation of the improvement of
extracting specific information fostered learners’ thinking ability and facilitated the imaging of patients, as learning effects resulting from that nursing students themselves created cases [11]. Table I presents a “Comparison of Patient Cases by Creator.”

<table>
<thead>
<tr>
<th>Who made the case?</th>
<th>Author</th>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of Information</td>
<td>Small</td>
<td>Increase or decrease based on the teaching objective</td>
<td>Limitlessly increases/develops</td>
</tr>
<tr>
<td>Imaging of the picture of the patient</td>
<td>Difficult</td>
<td>Somewhat difficult</td>
<td>Easy</td>
</tr>
<tr>
<td>Practice</td>
<td>Difficult</td>
<td>Difficult</td>
<td>Assistance with understanding individuality</td>
</tr>
<tr>
<td>Effectiveness of Suggested Answers</td>
<td>With developed example(s)</td>
<td>Learning how to develop abstractly</td>
<td>No developed example</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning how to develop</td>
<td>Able to learn thought processes</td>
</tr>
</tbody>
</table>

Study objective

This study was undertaken to examine a class design in nursing skills education that aims to have nursing students create patient cases, image the patients, and foster nursing practice skills with individuality.

III. METHODOLOGY

In the study, we attempted to provide learning that adopted case creation in a nursing skills training subject.

A. Target Students

Ninety-four (94) first-year undergraduate nursing students.

B. Training Method

Group organization: four to five students run a group. In all, 25 groups were formed.

Class content: Course unit “Excretion care”, 180 min long with a lecture and a training session.

Learning was conducted in order of pre-assignment, lecture (90 min), training (90 min), and post-assignment. The lecture includes case examination. An e-learning system was used to present assignments, administer questionnaires, and submit assignments. The class design is shown in Fig. 1.

C. Pre-Assignment

The pre-assignment that we initially set was: “Create a case of a patient who needs excretion care.” However, first-year undergraduate nursing students did not have substantial clinical experiences. This was the first time for them to create a patient case. Therefore, we added the following explanation: “These are female patients who wear a diaper. You are going to change the patient’s diaper and clean the pubic region. What kind of patient will the patient be? Let’s imagine a picture of the patient.”

D. Group Discussion

In the group discussion, we introduced information that was regarded as being the most important in the patient cases created in the pre-assignment. Then, we had students discuss the following themes: “the information is regarded as insufficient” and “whether the patient case was imaginable.” Additionally, we asked students to choose the most imaginable patient case in a group, review the patient case between students, determine the roles of nurse, patient, and observer, and check the assistance method.

E. Practice

Based on each role, we asked students to provide assistance. Particularly, the observer was asked to supplement the assistance carefully and observe the assistance given by the nurse.

F. Questionnaire

After the training, we conducted a questionnaire survey of the e-learning system regarding the learning by which students created patient cases in the training class. The time for response was a week from the completion of the training. The questionnaire, which was designed to evaluate the incorporation of case creation into skills training, included the following six questions:

Q1 Was it easy to create a case?
Q2 Were you able to be aware of the information about the patient case at the training?
Q3 Did you understand other student’s cases?
Q4 Did you think that patient case creation would help future learning tasks?
Q5 Do you want to do self-practice?
Q6 Did you do practice thinking about the patient’s feelings?

As the method used to record responses, we used a five-level Likert-type scale (5-point scale): 5 (Very much so), 4 (Fairly so), 3 (So), 2 (Not so), and 1 (Not at all).

IV. RESULT

After the training, a questionnaire survey was administered. Of 94 students who took the subject, 72
students answered the questionnaire; the collection rate was 76.6%. Fig. 2 presents the results.

Figure 2. Questionnaire result about the learning

V. DISCUSSION

The objective of the study is to propose a class design aimed at fostering nursing students’ thinking ability by having nursing students create cases as a learning strategy to promote imaging of patients.

1. Were the patient cases created by students able to promote imaging of patients?

In clinical practice, the provision of nursing skills with individuality based on the nursing process is needed, not limited to knowledge and skills in school learning. The same assistance skills might actually be used with different communication and assistance methods, observing the patient’s response. Patient information given by textbooks or teachers is abstract. Cognition starts with linguistic information. Consequently, imaging of patients can be difficult for nursing students who have little or no clinical experience.

The patient cases that nursing students created this time included not only information related to excretion, but also age, the patient living environment, family background, personality, human relationships, and the condition of Activities of Daily Living (ADL). We think that students who were in the middle of learning created patient cases based on knowledge that had already been learned and things experienced to date. Many students answered that creating a patient case was easy. Results of the questionnaire show that the practice of assistance with the awareness of patients was possible by creating a case from familiar information to facilitate imaging of the patient.

2. Was it possible to foster nursing students’ thinking ability?

We asked nursing students to have a discussion in a group about the patient cases that they created. Explaining patient cases that nursing students created in a group in the first stage requires that students understand the patient information and explain it to other students in a readily comprehensible fashion. Even though nursing students think they understand the patients that were created, they can examine the consistency of the information and find insufficient information through questions and comments from other students. Furthermore, thinking ability can be fostered by integrating those pieces of information. In the learning, nursing practice with the more awareness of subjects will be possible when students participate in clinical practice.

VI. CONCLUSIONS

We summarize the effects of students independently creating patient cases.

1. Creating patient cases independently can promote imaging of patients by students.
2. By having discussions, more information can be extracted in a specific manner.
3. Learning to create patient cases can foster a high level of thinking ability.

ACKNOWLEDGMENT

This work was supported by JSPS KAKENHI Grant Number 26463265.

REFERENCES


Yukie Majima graduated from Hiroshima Prefectural Nursing School in 1984. She got her bachelor of education in 1994 and her master of education in 1996 from Kagawa University and Ph.D. in engineering in 2001 from the Okayama University of Science. She has been a professor at Osaka Prefecture University, Japan since 2009. The focus of her current research is the utilization of e-learning and information-based applications in nursing education support systems.

Kiyoko Tokunaga, Ph. Master of Nursing, is an Associate Professor of the Department of Fundamental Nursing, School of Health Science, Kyoto Koka Women’s University. She earned her Master of Nursing degree at Kitasato University Graduate School of Nursing. Research Interest: Method development and evaluation of nursing skill education using ICT. The use of collaborative learning put into nursing skill education.

Kayoko Hirano graduated from Rakuwakai Kyoto Nursing School in 1985. And she completed a non-degree graduate program of Kanazawa University and acquired the qualification of the midwife. She got her bachelor of education in 2005 from Bukkyo University with her master of nursing and in 2007 from the Shiga University of Medical Science. She is currently a research associate at Kyoto Koka Women’s University of nursing department 2010. She is a Ph.D. student of information technology at the Osaka Prefecture University, Japan. The focus of her studies is e-Learning of Nursing process for student.

Kiyoko Tokunaga, Ph. Master of Nursing, is an Associate Professor of the Department of Fundamental Nursing, School of Health Science, Kyoto Koka Women’s University. She earned her Master of Nursing degree at Kitasato University Graduate School of Nursing. Research Interest: Method development and evaluation of nursing skill education using ICT. The use of collaborative learning put into nursing skill education.