

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

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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.

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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

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students answered the questionnaire; the collection rate was 76.6%. Fig. 2 presents the results.

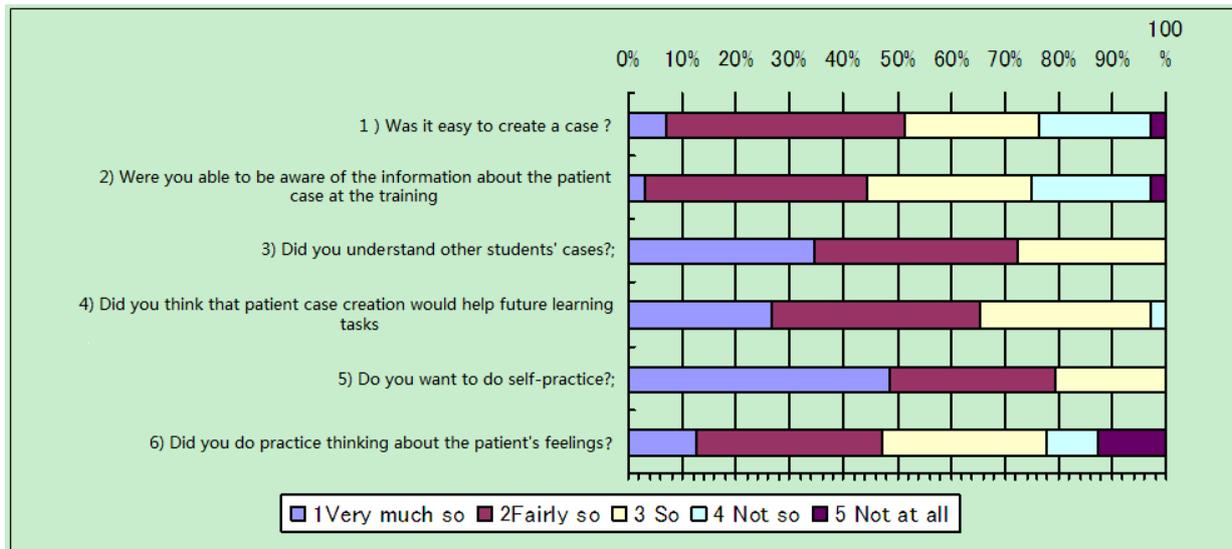


Figure 2. Questionnaire result about the learning

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.

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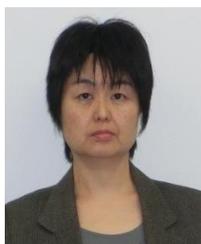
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REFERENCES

- [1] R. Alfaro-LeFevre, *Applying Nursing Process: A Tool for Critical Thinking*, Seventh ed., Paperback, 2008.
- [2] S. Etheridge and N. Bos, "Staff nurse identification of nursing diagnosis from a written case study," *Nursing Diagnosis*, vol. 3, pp. 30-35, 1992.
- [3] Y. Majima and Y. Hosoda, "The nursing skill education by visualization materials," *Journal of the Educational Application of Information Technologies*, vol. 9, no. 1, pp. 31-35, 2006.
- [4] V. Guise Ma, M. Chambers, and M. Valimaki, "What can virtual patient simulation offer mental health nursing education?" *Journal of Psychiatric and Mental Health Nursing*, vol. 19, no. 5, pp. 410-418, 2012.
- [5] Y. Majima, M. Sakoda, Y. Maekawa, and M. Soga, "Evaluation of nursing skills acquisition of reflective e-learning system for nursing students by different learning methods," in *Proc. 20th*

International Conference on Computers in Education, Singapore, 2012, pp. 460–467.

- [6] M. Okamoto, “Mondai kaiketsu sukima no kakutoku ni okeru mondai sakusei no koka,” in *Proc. 38th Annual Convention of the Japanese Association of Educational Psychology*, vol. 38, p. 368, 1996. (in Japanese)
- [7] Y. Hayashi, N. Hasanah, K. Maeda, and T. Hirashima, “Analysis of change of thinking from log data in MONSAKUN,” in *Proc. 39th Annual Conference of JSISE*, 2014, pp. 303–304.
- [8] E. A. Silver, J. Mamona-Downs, S. S. Leung, and P. A. Kenney. “Posing mathematical problems: An exploratory study,” *Journal for Research in Mathematics Education*, vol. 27, no. 3, pp. 293–309, 1996.
- [9] Y. Ito, Y. Hirai, K. Kaneko, A. Nomura, and A. Hazeyama. “Estimation of learners’ comprehension in a question-posing learning support system,” *IEICE*, vol. 112, no. 374, ET2012-69, pp. 5–10, 2013.
- [10] National Council of Teachers of Mathematics, Professional Standards for Teaching Mathematics, 1991, pp. 1–4.
- [11] K. Hirano and Y. Majima, “A proposal of instructional design to promote understanding a patient in fundamental nursing,” in *Proc. 12th International Congress on Nursing Informatics*, Taipei, 2014.



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Research Interest

Method development and evaluation of nursing skill education using ICT. The use of collaborative learning put into nursing skill education.