Impact of Metacognition on Clinical Judgment and Competence in Simulation-Based Blended Learning

Hye-kyung Oh, Dept. of Nursing, Daegu University, Daegu, Korea, Republic Of

ABSTRACT

This article used a within-subjects pre- and post-test comparison design to verify the impact of metacognition on clinical judgment and clinical competence in simulations using blended learning for nursing students. The study participants were 56 nursing students in their 4th year of college. The metacognition score of the participants for this study was not statistically significant. The differences in clinical judgment score and clinical competence scores reached statistical significance (t=-13.76, p<0.001; t=-9.06, p<0.001). Post-learning, the difference in clinical judgment score among 3 metacognition groups was statistically significant (F=3.76, p=0.029). The differences in clinical competence score among 3 metacognition groups pre- and post-test were statistically significant (F=3.87, p=0.027; F=6.09, p=0.004).

KEYWORDS

Blended Learning, Clinical Competence, Clinical Judgment, Clinical Reasoning, Metacognition, Nursing Process, Nursing Student, Simulation

INTRODUCTION

Securing the safety of the patients and maintaining a high quality of care are the essential elements in the practice of clinical nursing. To satisfy such requirements of society, nursing education should be able to guarantee the development of clinical competence to a certain level, at which learners are able to integrate their acquired knowledge and skills in solving patients’ health problems (Benner, Sutphen, Leonard, & Day, 2009).

Clinical reasoning in nursing is the cognitive process of nursing professionals to examine and analyze data related to a patient, apply nursing processes to solve the patient’s problems, and build relevant nursing diagnoses and plans (Fonteyn, 1991; Jones, 1988). Clinical reasoning has been emphasized as a nurse’s capacity for direct nursing practice, and various courses have been suggested to enhance clinical reasoning from undergraduate education. As direct nursing practice on clinical sites is limited, owing to patient safety issues, simulation education is widely used as a teaching approach. Simulation education enhances clinical reasoning through the experience and practice of nursing processes, which provide the problem solving skills for verifying and analyzing patients’ health problems in a safe environment that replicates the clinical environment.

Metacognition refers to the understanding and control over one’s own cognitive processes, making it an important predictor for problem-solving skills (Almeida, 2002; Desoete, Roeyers, & Buysse,
Metacognitive factors are the main facilitation strategies in simulation learning that enhance critical thinking and problem-solving skills.

Many preceding studies (Chaung, 2011; Kim, 2005) have reported that clinical competence increases with the critical thinking tendencies of nursing students. In particular, the use of simulation learning as a blended learning approach for clinical practice, in which the students can comprehensively analyze and deduce a patient’s complex health problems and perform necessary roles, is effective in enhancing clinical competence.

Therefore, this study aims to measure the influence of nursing students’ metacognition on their improvement in clinical reasoning and clinical competence after simulation learning using blended learning. It also analyzes how metacognition, which is related to critical thinking and problem-solving skills, influences learners’ abilities, and then proposes the necessary basis for verifying the effects of simulation-based blended learning.

METHOD

Design
This study used a within-subjects pre- and post-test comparison design to verify the impacts of metacognition on clinical judgment and clinical competence in simulation using blended learning for nursing students.

Participants
The study participants were 56 nursing students in their fourth year of college in Korea. The G*power 3.1 program was used to calculate the sample size of this study. A two-tailed test with .05 significance level (a), .8 statistical power (1-β), and .4 effect size (d) showed that 52 subjects were needed. All participants were enrolled in the simulation common curriculum, understood the purpose of the study, and agreed to participate.

Nursing Simulation
Simulation learning is education that provides concrete learning opportunities according to structured scenarios in a recreated clinical environment; the simulation process consists of briefing, simulation, and debriefing (Lathrop, Winningham, & VandeVusse, 2007). In this study, simulation learning involved a recreated simulation of clinical practice that allows learners to experience clinical situations based on the nursing scenarios developed by the present investigator.

The nursing simulation was carried out in seven to eight groups, each organized to have three to four students. One professor and one teaching assistant were in full charge of the simulation instruction. In considering the prior learning of senior students based on the nursing curriculum, patient cases of musculoskeletal and digestive system diseases were used in the simulation. The specific operation contents of the nursing simulation learning were course orientation, nursing skills practice using middle and low fidelity simulator and task trainer, development of patient case modules, module operation and simulation using briefing and high fidelity simulator, and debriefing.

Study Tools
Metacognition
The survey in this study utilized Yi’s version (Yi, 2004) of Pintrich, Smith, Garcia and McKrachie’s (1991) Motivation Strategies for Learning Questionnaire, which was modified and supplemented to ensure its adaptation to Korean culture. The questionnaire is composed of a total of 31 items, including 4 rehearsal, 6 elaboration, 5 critical thinking, and 12 self-regulation items. Each item was rated on a five-point Likert scale, with total scores ranging from 31 to 155. Higher scores indicated greater metacognitive ability. In Yi’s study (Yi, 2004), the Cronbach’s α was .74, whereas in this study, it was .84.
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