

## Clinical Ability, Learning-Attitudes, and Self-Confidence among Nursing Students in Their First High-Fidelity Simulation Training

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### Abstract

**Objectives:** This is a descriptive study to investigate the clinical ability, learning attitudes, and self-confidence in nursing students after simulation training.

**Methods:** The participants of this study were 54 third-year nursing students in a city in Korea who had never received simulation-based education. Simulation training was conducted during the 'adult nursing practice' curriculum in the third year at the beginning of clinical practice, during the 10 hours of 'surgical system nursing'. The topic of the simulation scenario was 'nursing care for patients after abdominal operations'. Data were analyzed with SPSS 22.0, using mean, standard deviation, and percentage.

**Results:** The results of the simulation training showed that all the groups were able to perform the 'hand washing' items for the clinical ability. In addition, the average score of learning-attitude after simulation training was 4.0 points (out of 5 points). Among the average scores, 'recognition of my weaknesses and strengths' averaged 4.4 points, 'active discussions and opinions shared through debriefing' averaged 4.3 points, and the lowest scoring item, 'decreased anxiety in clinical practice', averaged 3.4 points. The confidence score after the simulation training was 6.5 (out of 10).

**Conclusions:** If simulation training were carried out continuously rather than once, it could help nursing students have confidence in learning attitudes and patient care. In order for nursing students to have practical experience with clinical situations, simulation training needs to be continuous.

**Keyword:** clinical ability, learning attitude, self-confidence, simulation.

### Introduction

Clinical practice in nursing is an essential part of the curriculum. Practical training in the clinical field provides the opportunity for nursing students to apply theoretical knowledge to clinical situations and to acquire the knowledge, skills, and attitudes to cope with various practical situations [1, 2]. Clinical practice is the preparatory process for nursing students who will need to demonstrate their ability in multidimensional nursing care, including in complex social contexts. Through clinical practice, nursing students acquire the knowledge and skills to deal with the complexity, uncertainty, and conflicts encountered in clinical practice, to develop the ability to problem-solve clinical situations independently, and to acquire comprehensive knowledge about nursing [3, 4].

However, despite the importance of clinical practice, nursing

students experience stress from the variety of situational challenges, psychological burdens, and equipment that they must deal with in unfamiliar clinical environments. In terms of interpersonal relationships, nursing students also experience fear of making mistakes in relationships with patients and caregivers, and in communication with doctors and nurses [5-7]. In addition, the current field of clinical education has limitations in providing sufficient clinical training for students, owing to the lack of effective education methods, shortage of clinical educators, mindfulness of patient rights, and lack of variety in available practical cases [8-10].

Therefore, in order to supplement the limited practical education, simulation training, which is similar to the clinical field, was sought as a way to effectively improve the clinical ability of students [11, 12]. As a result, simulation training has been widely used as an educational tool in the healthcare field for more than 15 years [13, 14].

As the complexity and severity of patients increases, new and various interventions based on knowledge and technology are being tried, and nurses with proper judgment and clinical coping skills are needed more [15, 16]. Therefore, the present nursing education should teach students the skills, attitudes, and knowledge required of nurses, as well as the requirements for the roles and tasks of clinical practice after graduation. In order to realize this, simulation training is provided to replicate various clinical situations [17].

This study was conducted to verify the effectiveness of simulation training using SimMan® (Laerdal, Norway), a high-fidelity human patient simulator. In our organization, a high-fidelity simulation education system was established in 2014, and a two-year simulation education curriculum was run. Therefore, the simulation training is not systematized yet, and it is still improving. The results of this study will be used as a baseline for the application of simulation training course.

### Purpose of Study

The purpose of this study was to investigate the clinical ability, learning attitude, and self-confidence after nursing students' first simulation training. The specific objectives were as follows:

- 1) To evaluate the clinical ability of nursing students receiving simulation training.
- 2) To investigate the learning attitude of nursing students after simulation training.
- 3) To investigate the self-confidence of nursing students after simulation training.

### Material and Methods

#### Study Design

This is a descriptive study to investigate the clinical ability of nursing students who received simulation training for the first time, and to assess learning attitudes and self-confidence after simulation training.

#### Participants and Data Collection Procedure

The participants of this study were 54 nursing students in their third year who had never received simulation education. Data collection took place from March to June 2015 in the 'A' city of South Korea. Simulation training was conducted during the 'adult nursing practice' in the third year at the beginning of clinical practice, during 10 hours of 'surgical system nursing'.

#### Ethical Consideration

This research was conducted in accordance with the university ethics regulations. In order to protect the confidentiality of the subjects and the anonymity of the questionnaire responses, the data from all the investigators were statistically processed at once, the individual results were not exposed at all, and results were only used for the purpose of this study. Data were collected only from participants that voluntarily provide written consent.

#### Scenario Learning Process

The scenario learning process consisted of one scenario and two days, for a total of 10 hours. There were a total of six teams, with nine members each, for the scenario learning process. The sub-team members required for the scenario consisted of three members. (n=54, 6 group, 18 sub-group).

The scenario content consisted of exercises that could be completed in 15 minutes. The simulation exercises are included in (Table 1). The simulator used SimMan® (Laerdal, Norway) as a high-fidelity human patient simulator.

**Table 1:** Scenario learning process and contents

Day	Time	Content
First day (6 hours)	1 hour 1 hour 2 hours 2 hours	Simulation training orientation Simulation exercise Scenario case study Action plan
Second day (4 hours)	2 hours 1 hour 1 hour	Review case study Simulation action Debriefing

### Scenario Contents and Learning Objectives

The scenario was 'nursing care for patients after abdominal surgery'. The subject of the scenario was 'a 50-year-old male patient who had undergone abdominal surgery 12 hours ago and is suffering from pain'. The scenario used in this study was developed by a researcher and validated by a clinical nurse. In the scenario, the nursing process steps of problem recognition, assessment, nursing diagnosis, intervention, and evaluation were applied.

Through this scenario, the learning objectives to be achieved during the simulation training were as follows:

- 1) You can assess the condition of the subject after surgery.
- 2) You can perform postoperative nursing interventions for pain assessment and pain relief.
- 3) You can perform patient education to prevent complications after abdominal surgery.
- 4) You can use interdisciplinary cooperation to solve the health problems of the subjects.
- 5) You can use appropriate communication skills in the nursing situation.

### Study Instrument

#### Clinical Ability

To measure clinical ability, 20 items were selected for the scenario of 'nursing care for patients after abdominal surgery'. The specific items are shown in (Table 2). The content validity of each item was verified by two nursing professors and one clinical nurse. The contents of the 20 items were, 'hand washing, patient identification, checking vital signs, pain assessment, operation site assessment, emotional support and anxiety relief, position changes, application of pulse oximetry, checking the EKG monitor, notifying the doctor, oxygen and medication administration, bowel sound/gas passing check, blood bag management, education about post-operative complication prevention, pain relief assessment, appropriate communication skills, and nursing records'.

Measurements of clinical ability were evaluated by professors and simulator assistants during the simulation training, and were evaluated as 'properly performed', 'needs improvement', and 'not performed'.

**Table 2:** Results for clinical ability (group=18)

No.	Evaluation items	Perform group percentage n (%)		
		Properly performed	Needs improvement	Not performed
1	Hand washing	18 (100%)		
2	Patient identification	6(33.3%)	6(33.3%)	6(33.3%)
3	Vital signs check	13(72.2%)	5(27.8%)	
4	Pain assessment	12(66.6%)	5(27.8%)	1(5.6%)
5	Operation site assessment	5(27.8%)	12(66.6%)	1(5.6%)
6	Emotional support and anxiety relief	15(83.3%)	3(16.7%)	
7	Position change to relieve tension at the operation site (semi-fowler's position)	17(94.4%)		1(5.6%)
8	Application of pulse oximetry (SPO2) & checking the EKG monitor	7(38.9%)	8(44.4%)	3(16.7%)
9	Notifying the doctor for problem solving	14(77.8%)	2(11.1%)	2(11.1%)
10	Oxygen administration	5(27.8%)	11(61.1%)	2(11.1%)
11	Medication administration (analgesics)	8(44.4%)	9(50.0%)	1(5.6%)
12	Medication administration (antibiotic medicine)	8(44.4%)	3(16.7%)	7(38.9%)
13	Bowel sound / Gas passing check	9(50.0%)	9(50.0%)	
14	I/O check: Blood bag management	6(33.3%)	12(66.7%)	
15	Post-operative complication prevention education (deep breathing, coughing, inspirometer)	8(44.4%)	9(50.0%)	1(5.6%)
16	Post-operative complication prevention education (early ambulation)	5(27.8%)	5(27.8%)	8(44.4%)
17	Post-operative diet education (sips of water, clear liquid diet, soft diet)	9(50.0%)	9(50.0%)	
18	Pain relief assessment	3(16.7%)		15(83.3%)
19	Appropriate communication skills according to the patient's situation	15(83.3%)	3(16.7%)	
20	Nurse's records	9(50%)	9(50%)	

### Learning Attitude after Simulation Training

For learning attitude after simulation training, we used the tool of Ko et al. (2010) [18]. It is composed of 12 questions in total, five items about learning motivation (interest in the class, motivation in the nursing field, a systematic approach to nursing problems, self-awareness of strengths and weaknesses, and decreased anxiety about clinical practice), five items about learning habits (identifying problems, selecting priorities, using rational evidence for priorities, exploring appropriate interventions for problems, and using rational evidence for intervention), and two items about learning methods (criteria for achieving goals and the debriefing process).

Each question is rated on a 5-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree). The reliability at the time of development was 0.740, and the reliability was 0.926 in this study. Learning attitude was measured by self-assessment after the simulation training.

### Self-Confidence after Simulation Training

After the simulation training, self-confidence about providing nursing care for the patient was evaluated by using the VAS (Visual Analogue Scale), from 1 point (very low) to 10 points (very high). Higher scores indicate higher self-confidence. The measure of self-confidence was measured by self-assessment after the simulation training.

### Data Analysis

The collected data were analyzed using IBM SPSS Statistics 22.0. The descriptive statistics (frequency, percentage, mean, and standard deviation) were used for clinical ability, learning attitude, and self-confidence. Clinical ability was analyzed using performance frequency and percentage of groups. Learning attitude and self-confidence were analyzed by mean and standard deviation.

### Result

#### Clinical Ability of Nursing Students

The clinical performance evaluation results of the nursing students who performed the simulation for the first time are shown in (Table 2). Of the 18 groups, all 'properly performed' items were 'hand washing' items. The most frequent item in the 'not performed' item was 'pain relief assessment'.

#### Learning Attitude after Simulation Training

(Table 3) shows the results of the nursing students' learning attitudes after the simulation training. The overall average was 4.0 (out of 5). The highest score was on 'Through simulation training, I could learn and approach some problems of nursing systematically' at 4.4 points, and 'Debriefing enabled me to discuss with other students and share opinions actively' at 4.3 points. Next, 'Through simulation training, I could learn and approach some problems of nursing systematically' and 'I could find the proper nursing interventions

to solve the patient's problems' were 4.1 points. The lowest score was 'decreased anxiety about clinical practice' at 3.4 points.

**Table 3:** Learning-attitude after simulation training (N=54)

No	Items	Mean ± SD (min 1-max 5)
1	The interest in the class rose and my desire to study increased.	4.0 ± 0.63
2	Debriefing enabled me to discuss with other students and share opinions actively.	4.3 ± 0.65
3	Through simulation training, I could learn and approach some problems of nursing systematically.	4.1 ± 0.63
4	Through this simulation training, I got motivated to study more than before in nursing.	4.0 ± 0.63
5	Through this learning method, I realized my weaknesses and strengths.	4.4 ± 0.53
6	Through this simulation training, the anxiety of clinical practice decreased.	3.4 ± 0.86
7	I could diagnose the patient's conditions with knowledge which I have learned.	3.9 ± 0.55
8	I could identify the nursing problem and set priorities.	3.8 ± 0.73
9	I could find reasonable evidence for the priorities of the nursing problems.	3.8 ± 0.67
10	I could find the proper nursing interventions to solve the patient's problems.	4.1 ± 0.63
11	I could find rational evidence for the nursing intervention.	4.0 ± 0.63
12	I could explain the criteria to evaluate the goal achievement of the nursing interventions.	3.9 ± 0.63
	Average score	4.0 ± 0.43

SD, Standard deviation

### Self-Confidence after Simulation Training

The average score of self-confidence in patient care after simulation training was 6.5 points (out of 10 points). (Table 4) shows the distribution of scores.

**Table 4:** Score of self-confidence about patient care after simulation training (n=54)

(⊙=lowest, ⊕=highest)

⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊕
			5 (9.3%)	8 (14.8%)	15 (27.8%)	12 (22.2%)	10 (18.5%)	4 (7.4%)	

### Discussion

The purpose of this study was to investigate the clinical performance of nursing students who first experienced simulation training and to investigate their learning attitudes and level of self-confidence level after simulation training. In the first semester of clinical practice, we wanted to know how much the ability of students to perform clinical training. Also, through the first simulation training, we tried to find out what kind of learning attitudes students had.

In the evaluation of clinical ability, 'properly' performed skills were 'hand washing', 'position changes', 'emotional support and anxiety relief', and 'appropriate communication skills'. 'Not performed' items were 'pain relief', 'education about post-operative complication prevention', 'medication administration', and 'patient identification' items. The skill level of the scenario in this study was developed to match the ability of nursing students in their third year, but there were some parts that were not properly performed due to the tension caused by the first encounter with the simulation education environment. Also, basic items such as 'patient identification' seem to require a more thorough education. In a study of medical students from Moran, Green, and Blair (2017) [19], where simulation was used to prepare them for clinical practice, and students highly evaluated the realism

and the personalized feedback of the simulation. It is important to increase the opportunities of direct-nursing through simulation education and to prepare for clinical situations in a practical manner rather than being limited to observation in order to protect the rights and safety of patients. Simulation training experiences through various scenarios can improve the student's clinical performances, and these experiences can be more effective for students' clinical practice.

After the simulation training, the learning attitude was relatively good with a total score of 4.0 (out of 5 points). Specifically, the high score items were 'self-recognition of weaknesses and strengths' and 'debriefing', both of which were emphasized in the simulation. These results were consistent with Ko et al. (2010) [18], in that the results of 'self-recognition of weaknesses and strengths' were the highest. Through simulation training, it is important to have self-awareness about one's own weaknesses and strengths, so that they have learning motivation. Also, 'debriefing' scored high, and the process of debriefing is the most important step in simulation training. In general, debriefing is the stage in which students' learning is completed through structured reflection and feedback after the simulation scenario is completed [20]. Self-reflection, iterative learning, and active participation of students can lead to an interest in and a commitment to learning and positive behavior change [21]. In this study, too, the debriefing times seemed to be meaningful to students. It seemed to be helpful to be able to lead the debriefing themselves through structured debriefing.

The lowest learning attitude item was 'decreased anxiety about clinical practice'. The results of this study were somewhat different from the results of Jeong (2015) [22] study in that the simulation group had less anxiety than the group without simulation education. In this study, we could not get an accurate picture of the effect because it was investigated as a single group without an experimental group. The differences in results on reduced anxiety through simulation training are due to the evaluation of effectiveness of the training was performed only once after the simulation training. It is somewhat difficult to have the effect with only one training, and it is thought

that the student's anxiety will be sufficiently reduced if several repetitive experiences are accumulated.

After the simulation, the self-confidence level was 6.5 (out of 10 points). About 50% of the students were distributed between 6 points and 7 points. In a study by Boling and Hardin-Pierce (2016) [12], high-fidelity simulation training was useful for improving knowledge and confidence. The mean score in this study seems to be somewhat lower. However, during the debriefing period, students expressed 'if simulation training is repeated, I could get enough self-confidence'. It is somewhat difficult to improve learning attitude and self-confidence in one simulation training, and if we approach simulation education through various scenarios, it can improve students' attitudes and self-confidence.

This study is limited in that data were collected through convenience sampling, and therefore care needs to be taken generalizing the meaning of the results of this study.

### Conclusion

As a result of this study, nursing students who have received simulation training for the first time experienced learning advantages in the problem-solving process. If it is done consistently, rather than as a one-time education, it will be an effective education method for nursing students.

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