



# The effect of Korea Advanced Life Support Simulation Practice Using Team-Based Collaborative Learning on Nursing Students' Goal Commitment, Learning Reality, and Learning Satisfaction

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## Abstract

**Purpose:** This study was conducted to determine the effects of the Korea Advanced Life Support simulation applied to team-based collaborative learning on the goal commitment, learning reality, and learning satisfaction of nursing students.

**Method:** The subjects of the study were 99 fourth-year nursing students at K University located in W city, Korea. The simulation practice was conducted for 8 hours over 1 day, and data was collected from May 10 to May 27, 2024. It was a single-group pretest and posttest design experimental study, and data were analyzed using the SPSS 25.0 program for descriptive statistics and paired t-test.

**Results:** There was a difference in goal commitment ( $t=0.52$ ,  $p=.607$ ) before and after the practice, but it was not statistically significantly higher. The learning reality after the practice was  $4.17\pm0.60$  points, and the learning satisfaction was  $4.44\pm0.69$  points.

**Conclusion:** The simulation practice applied to team-based collaborative learning was effective in improving the learning reality and learning satisfaction. Team-based collaborative learning focuses on the process of working together, allowing team members to actively interact and integrate theoretical knowledge and nursing skills while solving team tasks. Therefore, it is considered an effective educational method for improving integrated nursing competencies required for clinical phenomena, and its effectiveness needs to be confirmed through follow-up studies.

**Keywords:** *Team-based, Collaborative learning, Simulation, Advanced life support, Goal commitment, Learning reality, Learning satisfaction*

## 1. Introduction

For nursing students, clinical practice is very important because it allows them to verify integrated nursing competency by applying knowledge and practical skills to actual sites. However, in reality, clinical practice is conducted through simple observation due to patient safety and strengthening patient rights in clinical settings (Chae & Choi, 2016). Therefore, simulation practice is actively utilized to solve these problems in clinical practice and improve the efficiency of clinical practice based on theoretical knowledge (Kang, Choi, & Kim, 2013). Simulation practice is a useful learning method that allows students to actively learn basic knowledge and practical skills and acquire nursing practical skills including essential nursing skills by safely and repeatedly practicing in a clinical



environment. It has been shown to be effective in improving nursing students' critical thinking skills, problem-solving skills, and learning satisfaction (Chae & Choi, 2016). In order to increase efficiency, simulation practice is basically team-based, and problem situations are given to teams so that team members can interact with each other, integrate nursing knowledge, apply nursing practice, and evaluate it, and ultimately improve clinical practice ability (Kim & Kim, 2016). Therefore, team-based learning is a form in which team members must help each other and work together to effectively and efficiently perform the tasks presented to the team, so the way they work together affects the performance of team tasks and ultimately affects team performance (Kang, 2003). Therefore, it is very important to increase students' learning motivation and lead them to an active and positive attitude during team-based simulation practice.

There is a lack of prior research on simulation practice that applied collaborative learning to nursing students. In addition, the results of prior research that verified the effects of simulation practice showed that the learner's sense of learning reality, in which they empathize with the problem and try to solve the task, improved, and that a high sense of learning reality had an effect on improving learning satisfaction (Choi, 2021). However, there is still a lack of research on goal commitment, which means doing one's best to achieve the goal (Klein et al, 2001).

Meanwhile, the survival rate of acute cardiac arrest patients in Korea was 8.7% in 2019 (Korea Association of Cardiopulmonary Resuscitation, 2021). When a cardiac arrest patient is discovered, rapid judgment and skilled nursing intervention according to priority are very important (Kim, Lee, Lee, & Kim, 2012). Therefore, effective cardiopulmonary resuscitation should be provided to increase the survival rate of cardiac arrest patients. The Korea Association of Cardiopulmonary Resuscitation (KACPR) has developed a Korea advanced life support (KALS) course, a CPR practice program tailored to the Korea medical environment to strengthen the functions of advanced life support at the hospital level, thereby expanding educational opportunities for domestic medical professionals and medical students and enabling them to obtain qualifications. The KALS practice presents four rhythms that cause cardiac arrest and an algorithm for the treatment process for each rhythm. When 4 to 7 people form a professional CPR team and perform the treatment process in case of cardiac arrest according to the algorithm while applying various cases, they communicate actively and clearly with each other about their respective roles, treatment orders, and performance status (KACPR, 2021). Since advanced cardiopulmonary resuscitation in hospitals is a team-centered treatment, advanced cardiopulmonary resuscitation education should be provided repeatedly to nursing students who will become nurses in the future. It is a very good advantage that they can repeatedly and safely practice cardiac arrest situations that are difficult to experience in clinical settings through simulation practice. In addition, simulation practice according to various emergency situation scenarios can help prepare for cardiac arrest situations by acquiring teamwork as well as individual skills (Chae & Choi, 2016). However, there is little previous research on the effects of advanced life support simulation practice using team-based collaborative learning for nursing students. Therefore, this study was conducted to confirm the effects of team-based collaborative learning simulation practice on goal commitment, learning reality, and learning satisfaction centered on advanced life support, and to provide basic data



for operating simulation practice.

## 2. Method

### 2.1 Research Design & Subject of the Study

This study is an experimental study with a single-group pre-post design to verify the effectiveness of simulation practice applying team-based collaborative learning [Table 1]. The subjects of this study were nursing students in their 4th year at K University located in W City, Korea. The specific selection criteria were as follows: first, those who completed the theory course of the cardiovascular system; second, those who had a Basic Life Support certificate; third, those who had not completed the KALS course; and fourth, those who understood the purpose of this study, voluntarily expressed their intention to participate in the study, and signed the consent form. In order to supplement the internal validity of the study as much as possible, the subjects were recruited from one university, received the same theory course of the cardiovascular system, and had students who had no experience in the KALS course participate, thereby controlling the intervention of a third variable during the study period. In addition, the post-test was conducted immediately after the simulation practice in May 2024 to control the test effect caused by other simulation practices. The number of subjects was calculated using the G-Power 3.1.9.2 program. The minimum number of participants was 44 with a two-sided test, significance level ( $\alpha$ ) of .05, effect size ( $d$ ) of .50, and power ( $1-\beta$ ) of .80. Considering the dropout rate of over 20%, the target number of participants was 57, and 108 participants, which was more than the expected number, were recruited. Of these, 99 who agreed to the study were selected as the final research subjects.

**Table 1. Korea Advanced Life Support simulation practice program using team-based collaborative learning**

| Step | Time (minutes) | Contents   | Team-based collaborative learning  |
|------|----------------|--|--|
| 0    |                | Pre-study: Self-study  |  |
| 1    | 50             | Orientation<br>Pre test<br>Simulation practice content and progress<br>Simulation practice room guide<br>Explanation of team-based collaborative learning method | -Focus on the process of working together<br>-Focus on interaction between team members  |
| 2    | 90             | scenario1. Team-based collaborative learning application simulation<br>Shockable rhythm (ventricular fibrillation/Pulseless ventricular tachycardia)             | -All team members participate and share their opinions<br>-After each practice, team members praise and encourage each other<br>-Share opinions on what went wrong |
|      | 90             | scenario2. Team-based collaborative learning application simulation<br>Nonshockable rhythm (Asystole/Pulseless electrical activity)                              |  |
|      | 90             | scenario3. Team-based collaborative learning application simulation<br>Shockable & Nonshockable rhythm (mixed  |  |



|   |    |   |  |
|---|----|---|--|
|   |    | rhythm)   |  |
| 3 | 50 | Theoretical summary of rhythm and drugs related to cardiac arrest through team-based collaborative learning<br>Watching KACPR video (good and bad cases of professional life support team activities)<br>Putting self-study and team learning in parallel | - Team members' final group agreement on cardiac arrest cases, priority issues, and problem-solving directions |
|   | 60 | Practice of core nursing skills   |  |
|   | 80 | Evaluation (Team Simulation)  |  |
| 4 | 90 | Comprehensive Debriefing<br>Post test   | - Encourage team members to praise each other's abilities and contributions.                                   |

## 2.2 Tool of the Study

Goal commitment means making a decision to attempt a goal, and doing one's best to achieve the goal without giving up easily once the decision is made (Klein et al, 2001). The goal commitment measurement tool used the scale suggested by Klein et al. (Klein et al, 2001) and the research tool suggested by Jo (2015). There are five items in total on a 5-point Likert scale, and the three negative items (1, 2, 3) were converted to reverse. The score range is 5 points to a maximum of 25 points, with a higher score indicating stronger goal commitment. Cronbach's  $\alpha$  was .83 in the study by Klein et al. (2001), .75 in the study by Jo (2015), and .79/.74 pre/post in this study.

Learning reality is a process in which learners actively participate in learning and have meaningful learning experiences (Kang, Park, Jung, & Park, 2009), and is composed of three sub-factors: cognitive, emotional, and social presence. The learning reality measurement tool used a research tool reviewed by an educational technology expert by Ahn (2017). There are a total of 15 items on a 5-point Likert scale, and the score range is from 15 to 75 points, with a higher score indicating a higher learning reality. In the study by Ahn (2017), the internal reliability at that time was .73 for cognitive presence, .78 for emotional presence, and .78 for social presence, and in this study, the post-test Cronbach's  $\alpha$  was .95 (cognitive reality .89, emotional reality .89, social reality .91).

Learning satisfaction means that the learner expresses a positive and satisfactory state regarding the overall learning process, such as learning experience or learning outcomes (Chung & Lim, 2000). The learning satisfaction measurement tool was developed by a previous researcher (Chung & Lim, 2000) and was used in Ahn's study (2017) after being verified by an educational technology expert. There are 8 items in total, a 5-point Likert scale, and the score range is 8 points to a maximum of 40 points, with a higher score indicating a higher learning satisfaction. In Ahn's study (2017), the internal reliability at the time was .94, and in this study, Cronbach's  $\alpha$  was .97.

## 2.3 Study Process

Each team of this simulation practice consisted of 6 members, and the total number of members was 6 groups, 3 modules, and the simulation practice for each group was conducted for a total of 8 hours over 1 day. Each role of the team members was divided into team leader, airway management, defibrillation and monitoring, drug administration, chest compression, and record keeping, considering the number of team members. The details of the simulation practice are as shown in Table 1.

## 2.4 Data Analysis



The collected data were analyzed using the SPSS Win 25.0 program. The general characteristics of the subjects, the degree of learning reality and learning satisfaction after the practice were analyzed using descriptive statistics. The difference in goal commitment before and after the team-based collaborative learning application simulation practice was analyzed using the Paired t-test.

### 3. Result

#### 3.1 General Characteristics of Study Respondents

The gender of the subjects was 82.8% female and 17.2% male, the average age was 22.52 years old, and the satisfaction with college life was highest at 49.5% for 'satisfaction', followed by 'average' at 33.3%. The satisfaction with major was highest at 57.6% for 'satisfaction', the satisfaction with clinical practice was highest at 56.6% for 'satisfaction', and the academic performance was highest at 74.7% for 'average'.

#### 3.2 Differences in goal commitment before and after simulation practice of applying team-based collaborative learning

There was a difference in goal commitment ( $t=0.52$ ,  $p=.607$ ) before and after the team-based collaborative learning application simulation practice, but it was not statistically significantly higher (Table 2).

**Table 2. Differences in goal commitment before and after simulation practice of applying team-based collaborative learning (N=99)**

| Variable        | Pre-test<br>M $\pm$ SD | Post-test<br>M $\pm$ SD | t    | p    |
|-----------------|------------------------|-------------------------|------|------|
| goal commitment | 3.89 $\pm$ 0.68        | 3.93 $\pm$ 0.74         | 0.52 | .607 |

#### 3.3 After the simulation practice of applying team-based collaborative learning, the degree of learning reality and learning satisfaction

After the simulation practice of applying team-based collaborative learning, the learning reality was 4.17 $\pm$ 0.60 points (cognitive 4.17 $\pm$ 0.63, emotional 4.11 $\pm$ 0.71, social 4.23 $\pm$ 0.69), and learning satisfaction was 4.44 $\pm$ 0.69 points (Table 3).

**Table 3. After the simulation practice of applying team-based collaborative learning, the degree of learning reality and learning satisfaction (N=99)**

| Variables               | M $\pm$ SD      | Range |
|-------------------------|-----------------|-------|
| <b>learning reality</b> | 4.17 $\pm$ 0.60 | 1~5   |
| cognitive               | 4.17 $\pm$ 0.63 |       |
| emotional               | 4.11 $\pm$ 0.71 |       |
| social                  | 4.23 $\pm$ 0.69 |       |



learning satisfaction

4.44±0.69

1~5

#### 4. Discussion

The characteristic of this study is that it verified the effectiveness of simulation practices that applied team-based collaborative learning, which had almost no previous studies. Based on the research results, the following are the discussion points. Collaborative learning emphasizes the process in which two or more learners interact and learn to achieve a common goal, and it differs from cooperative learning that emphasizes successful achievement of learning goals (Nam & Yu, 2016). The KALS simulation practice learned in this study is team-based collaborative learning that focuses on the process in which all team members intervene and solve a problem-solving situation together rather than finding the right answer, and it is presumed that the results regarding goal commitment were not statistically significant. Goal commitment refers to making a decision to attempt a goal and doing one's best to achieve it, and the results appear when consistency is maintained (Jo, 2015). Since goal commitment is an important factor in predicting goal achievement (Klein et al., 2001), research on diverse learning methods that can improve it in simulation practices conducted as a team should continue to be attempted.

After the simulation practice of applying team-based collaborative learning, the learning reality score was high, and the cognitive reality and social reality scores, which are sub-elements of learning reality, were also high. Although it is difficult to make a direct comparison because a different tool was used in this study, the results of the study on the effectiveness of simulation education (Cho & Hwang, 2016) targeting nursing college students with a single-group design were the same as in this study. On the other hand, the emotional reality score was lower than the cognitive and social reality. This is because it is inferred that the emotional burden of not being able to actively express one's emotions in an emergency situation such as cardiac arrest and having to lead the situation as a team leader was not significant in improving emotional reality.

Meanwhile, the learning satisfaction score of this study was also high. There is a research result that the learning satisfaction of the experimental group was statistically significantly higher than that of the control group in the effect of simulation education targeting new nurses (Lee & Ahn, 2019), but it is difficult to directly compare because it is a control group pretest and posttest design study and the target was new nurses. It was different from the research result of the qualitative study, Team-based simulation learning experience of nursing students (Kang et al, 2013), that the simulator was not completely human-like, did not feel real, or did not focus. However, in the process of taking turns in taking on roles among team members to experience all roles, they enjoyed the learning process while repeatedly learning various scenarios and immersing themselves in simulation practice, and they interacted with team members and encouraged each other to successfully complete a scenario, forming a positive relationship, and feeling proud of proper nursing performance, which can be said to be in the same context as the results of this study. Simulation practice is a safe and repeated practice on models, not real patients, in a practice environment that reproduces actual clinical situations, so there may be limitations in reproducing clinical sites where various situations occur. Since active team interaction enhances learning satisfaction (Kang et al, 2013), if teams are formed while considering personal factors when organizing simulation practices, the sense of learning reality and learning





satisfaction can be further enhanced.

Through the above research results, it was confirmed that the simulation practice applying team-based collaborative learning is an effective method to improve learning reality and learning satisfaction. In particular, the theoretical knowledge, nursing skills, and teamwork acquired in an environment where mistakes are allowed through team-based collaborative learning applied to KALS simulation practice can quickly and effectively respond to various emergency situations in clinical settings and develop practical abilities. In addition, it is thought that it can contribute to the growth of nurses who can perform accurate interventions by efficiently cooperating with fellow nurses and demonstrating effective teamwork even in emergency situations.

However, since the sample group of this study was limited to one university and was a convenience sample, it is difficult to represent all nursing students, and since it was conducted as a single-group pre-post design without a control group, it is difficult to conclude that it is an effect of applying team-based collaborative learning, so there are limitations in generalizing the research results.

Based on the results of this study, the following follow-up studies are suggested.

First, this study applied a single-group pre-post study design, but in future studies, it is necessary to apply a study design with an experimental group and a control group to identify the effect of team-based collaborative learning application simulation practice.

Second, it is necessary to continuously identify the effect of team-based collaborative learning application simulation by applying a control group study design according to the ability of nursing college students to respond to emergency situations in clinical settings after practice KALS simulation applying team-based collaborative learning.

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