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## Featured Article

# A Safety Simulation Program for Operating Room Nurses

Mi Young Lee, RN<sup>a</sup>, Sang Suk Kim, PhD, RN<sup>b,\*</sup>

<sup>a</sup>Associate Professor, Seoul National University Hospital, Seoul 03080, Republic of Korea

<sup>b</sup>Associate Professor, Red Cross College of Nursing, Chung-Ang University, Seoul 06974, Republic of Korea

## KEYWORDS

compliance;  
operating room;  
safety attitudes;  
safety awareness;  
simulation training

## Abstract

**Background:** A safety program is required for nurses in operating rooms, where accidents are frequent.

**Method:** A nonequivalent control group pre–post design was used, with convenience sampling. Data were analyzed using chi-square, Fisher's exact, and Mann–Whitney *U* tests.

**Results:** Safety attitudes ( $p = .012$ ) and compliance with safety management ( $p = .001$ ) differed significantly between experimental (27, safety simulation program) and control (22, lecture-type safety education) groups, but awareness of the importance of safety management did not ( $p = .17$ ). Associations were observed between variables ( $r = 0.455$ – $0.837$ ).

**Conclusion:** The safety simulation program was effective and useful.

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The modern medical community provides medical services with cutting-edge medical equipment and highly professional medical knowledge based on scientific developments. However, death because of medical error has the third highest overall mortality rate in America, and an annual death rate of 134,581 hospitalized patients was recently reported (Makary & Daniel, 2016). The provision of unsafe medical services not only affects patients' lives by causing physical injury (Berwick & Hackbarth, 2012) but also leads to emotional stress, depression, and guilt in medical professionals (Hobgood, Hevia, Tamayo-Sarver, Weiner, & Riviello, 2005).

Patients undergoing surgery are exposed to high risk, as operating rooms (ORs) are complex environments that involve the administration of invasive treatments and anesthesia; use of the latest equipment and scientific technology; and communication difficulties resulting from the establishment of temporary interprofessional teams, including surgeons, anesthesiologists, OR nurses, and anesthesia nurses (Steelman, Graling, & Perkhounkova, 2013). OR nurses work in environments in which accidents are highly likely to occur because of rapid changes to surgical settings and duties. Accidents may result from segmentation, specialization, heterogeneous interdependent decision-making agents, computerization of medical records, surgical instruments, and equipment. In addition, a sharp increase in the complexity of surgery because of surgical advancement and technological improvement is one of

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\* Corresponding author: [kss0530@cau.ac.kr](mailto:kss0530@cau.ac.kr) (S. S. Kim).

the causes of accidents (Gibbs, 2012; Plsek & Greenhalgh, 2001; Spruce, 2013; Taylor, 2014). According to previous studies, 82.2% of OR nurses have experienced incidents in relation to patients' safety (Jang, Kim, Seok, Oh, & Kim, 2014), including medical equipment malfunction,

### Key Points

- Safety attitudes and compliance with safety management (CSM) differed significantly between the two groups, but awareness of the importance of safety management did not.
- Awareness of the importance of safety management was significantly correlated with CSM and safety attitude, whereas CSM was significantly correlated with safety attitude.
- The program was effective in promoting operating room nurses' CSM and improved their attitudes toward safety.

counting discrepancy, specimen loss, patient injury, pressure ulcers, retention of surgical items, and wrong-site surgery, in the OR (Gibbs, 2012). Therefore, OR nurses are required to ensure organized and systematic management of patient safety during surgery. Accordingly, safety education programs are needed as they not only provide safety-related knowledge but also exert a positive effect on error prevention and management (Hwang, 2015).

Previous research on safety education for OR nurses has included an e-learning education program to prevent nursing errors (Kim, Kim, & Hwang, 2005). A case-based multimedia learning program has been developed to prevent malpractice in ORs (Park, 2015). However,

these research studies were limited as they did not include feedback for nurses or did not consider hands-on experience.

The simulation programs used in recent nursing education are considered an effective learning strategy for OR nurses who work in dangerous environments. The simulation is implemented in a safe environment, in which nursing care is provided via a team-based approach (Mullen & Byrd, 2013) and improves communication, teamwork (Dedy, Bonrath, Ahmed, & Grantcharov, 2016), and knowledge maintenance (Madani et al., 2016). Specifically, simulations that involved standardized patients (SPs) were shown to exert positive effects not only on nursing competence but also on their problem-solving ability and communication competence via direct interaction with the SP (Oh, Jeon, & Koh, 2015; Robinson-Smith, Bradley, & Meakim, 2009).

## Aim

This study aimed to examine the effectiveness of a safety simulation program involving a standardized patient

(SSPSP) for OR nurses' safety compliance by exploring the simulation as a method for teaching safety. The effects of the SSPSP (experimental group) were compared with those of lecture-type safety education (LSE; control group). The specific aims of the study were as follows:

1. To examine the difference in awareness of the importance of safety management (AISM) between the two groups.
2. To examine the difference in compliance with safety management (CSM) between the two groups.
3. To examine the difference in safety attitudes between the two groups.
4. To explore correlations between AISM, CSM, and safety attitudes.

## Theoretical Framework

The development and evaluation of the SSPSP were based on the analysis, design, development, implementation, and evaluation model.

The analysis phase involves the process of defining learning content and includes educational needs analysis, learner analysis, and environment analysis. In this study, we analyzed OR nurses' needs regarding safety education, OR nurses as study participants, and the OR as an educational environment.

The design phase involves the actualization of the instructional method in which assessment tools are developed, with instruction strategies, tactics, and media chosen based on the importance of performance goals and instructional content. In this study, we established the goals (improve AISM, CSM, and safety attitude), strategies (presentation, discussion, and simulation), and content of SSPSP education and determined evaluation strategies.

The development phase involves the process of creating instructional material that includes the creation of material after the development of draft instructions and program modification based on the results of a pilot test. In this study, we developed modules 1 to 4, trained the SP, assessed content validity, evaluated a pilot study examining the SSPSP, and finalized the SSPSP.

The implementation phase involves the process of implementing the program and includes application of the developed instructional program, its continuation within the curriculum, and the management of its maintenance and modification. In this study, 27 OR nurses participated in the SSPSP, attended a debriefing session, and shared their experiences.

The evaluation phase involves the process whereby the adequacy of the systematic and cyclical instructional program is determined (Ozdilek & Robeck, 2009). In this study, AISM, CSM, and safety attitudes were evaluated with respect to the effectiveness of the SSPSP.

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