

# High-fidelity Patient Simulator Education for South Korean Nursing Students

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## Abstract

To this end, this study attempts to examine the effects of the use of patient simulator on the education of nursing students and provide basic materials for simulation based education program development.

The potential advantages of simulations which applied clinical situations provide opportunities to experience 'all integrated experiences'. That is, chances to experience clinical techniques, content knowledge, multidisciplinary communications, nursing assignment, nursing mediation, critical thinking and other abilities are provided as the real clinical situations.

The effects of simulation education programs in the nursing department have grown with the advantages and it was investigated that clinical performance skills, critical thinking, clinical judgement and problem solving skills have improved.

**Keyword:** High-fidelity, Patient Simulator Education, Korea, Nursing

## INTRODUCTION

Traditional knowledge delivery education in nursing covers diverse knowledge and theories in nursing theory classes; yet for the learned theory to be applied in the practice and to become the ability to cure the health problems of subjects needs clinical practice training as requirements(1). Practice education that is an application of acquired theoretical knowledge into practice can be categorized as practice education taking place in laboratory and clinical practice education in a clinical setting. Nursing students learn to develop professional ways of thinking and get comprehensive nursing knowledge by integrating acquired knowledge and technology by learning skills and techniques to deal with complex, uncertain, conflicting practical situations surrounding subjects from clinical practice and also by self-education and self-exploration (2). However, as clinical setting does not allow any slight mistake on the living human and as more subjects tend to speak more loudly in protecting their rights to the point of refusal to students' mediation, nursing students become severely unstable and strained feeling burdens from probable mistakes out of immature nursing skills, which led students to be unsatisfied for having negative attitude toward clinical practice ending up with observation based practice and ending up with observation based(3).

Besides, the gap between theory and practice, shortage of practice teaching professors, outpatient based clinic system,

shortened hospitalization period of quick bed turnover rate, reduced acute diseases, the worsening severity and chronicization by particular diseases are detrimental to students' varied clinical experiences and subjects' approaches for current medical environment(4). Thus, it is now clear that nursing students are having a lot of difficulties although clinical practice education is very critical in their learning. As a result, inadequate clinical practices of nursing students has become challenges of nursing education continuously; therefore, demands for diverse educational methods for them to experience practice based training are rising(5).

Simulation is a teaching strategy found as a practical alternative to the shifting learning methods, which students learn essential and basic clinical skills before their introduction to clinical practice and improve their abilities of clinical performance by taking advantage of virtual scenarios (6). Simulation has merits in that it poses no danger to human being by putting the subject's safety at the top priority and allows students to standardize and repeat the required techniques in a safety situations devised as similar as the real field. Also, students can experience rare or complex clinical situations as real(7). Despite much efforts done to train nurses who can provide safe and effective nursing services, clinical practice education isn't enough to prove the learning effects. Simulation education which was devised to maximize the nursing subjects' safety and to fill the gap between theories and practices based on 'Best Practice' is a new training method as an alternative to the traditional clinical practice based nursing education, which creates complex scenario as similar and real as the clinical fields. Attempts to apply this teaching method into patient simulator continue.

To this end, this study attempts to examine the effects of the use of patient simulator on the education of nursing students and provide basic materials for simulation based education program development.

## HIGH-FIDELITY PATIENT SIMULATOR EDUCATION

Simulation in the medical sector has started from manufacturing mannequins used for training mouth to mouth resuscitation invented by Peter Safer in 1960s. Since then, continued development and advancement led to various practice education including cardiopulmonary resuscitation, endotracheal intubation and surgical operations (8). Simulation shows forward and repetitive observations of known etiology and improves learning effects of participants by providing training chances against dangers without any risky factors.

Particularly, the simulation brought no danger to human and thus has won explosive popularity in the 1990s in the U.S. where patients' rights are often highlighted. Types of simulation can apply various methods and techniques according to the goals of education and the term, fidelity, is categorizing the types. Fletcher(1995) defined fidelity as the degree of accuracy expressed in the simulation in comparison with real experience. According to the definition, low fidelity model is often used in practice and appraisal of special techniques as a partial skill training model(9).

Education with patient simulator is considered as a new change in medical education and training and thus much attention is given to this. On the global scale, simulation based education is increasing from 2% in 1994 to 30% in 2003(10). Therefore, simulation education using patient simulator today is on the way of active introduction.

Simulation education is a teaching method that requires educators' thorough preparations for the use of the equipments. Literatures including Lee Sun ok(8) and others presented the overall process of simulation education by stages as following. First, Set the educational goal which is related to courses learners took before the scenario development. After the goal setting, information regarding patient(name, age, gender, allergic response, past medical history, currently taking medication), doctor's prescriptions and test results is to be provided. Second, a scenario realization is a process which learners go through orientations about subjects' introduction and environment about the simulation, define their roles and take the lead.

Third, debriefing is for learners to explain the feelings about scenario realization between learners and educators after the realization and to analyze the learned materials systematically. Through the briefing, learners gain generalized knowledge by exchanging information between educators and learners and improve critical ways of thinking. Time is assigned as similar as that of scenario realization. Educators receive learners uncritically and learners share their feelings about realization comfortably without any competitive mind and analyze provided nursing services focusing on the basis.

While 80% of simulation education takes place at the debriefing stage, the immediate discussion on the mistake is carried out to convey detailed information, and critical ways of thinking is improved through discussion and examination with an increase in the knowledge of communications and clinical performance skills. Lastly, simulation education allows medical practitioners in several sectors to learn how to co-work and how to organize through interactions in team training and to provide educational opportunities to improve performance skills by teams while students can learn with more active attitudes (11). Morrison and Borden(2006) has claimed that team based education is the most effective with less than ten members and, in particular, four team members would be the most appropriate for the roles of team leaders and effective performance for tasks by each role (12). Jeffries stated that the result of simulation based professional cardiac resuscitation education on anesthesiologists showed that the subjects of less than 6 months and over 6 months respectively show 71% and 30% of performance skills by relevant guidelines and have

failed to pass the performance skill test after two years of education, which emphasized the importance of repetitive learning(13).

Among precedent studies abroad on simulator effects, scenarios on post surgery nursing were divided into three groups(traditional case study, static mannequins, patient simulator) and all the students in each group were tested on the education effects after video watching in the study of Jeffries(13). The study result showed that groups with patient simulator showed significant difference from other groups in self-confidence and satisfaction improvement and the knowledge performance skill and acquisition had no significant difference. In this study, learning effects after the use of patient simulator were in line with other research results that had positive influence on students' improved satisfaction and confidence, learning motivations, critical thinking, clinical decision, clinical judgement (14).

In the study of Yang Jinju(2), while the experiment group who has received simulation based education showed significant improvement in problem solving skills and self-reporting clinical performance skills than the control group; yet were not effective in improving critical thinking, proposing unsupervised learning using learning channels of videos. Regarding other emergency situations, it was proved to be effective in anxiety reduction, increased confidence in using emergency equipment and education satisfaction, improved knowledge and performance skills (15).

## CONCLUSION

In order for nursing students to increase the critical ways of thinking and clinical judgement, not a short-term systematic simulation education programs need to be established, which requires that studies to examine the effects of simulation education are to be primarily conducted. Therefore, this study attempted to examine the effects of simulation education programs on the improvement of clinical performance skills.

The potential advantages of simulations which applied clinical situations provide opportunities to experience 'all integrated experiences'. That is, chances to experience clinical techniques, content knowledge, multidisciplinary communications, nursing assignment, nursing mediation, critical thinking and other abilities are provided as the real clinical situations. The effects of simulation education programs in the nursing department have grown with the advantages and it was investigated that clinical performance skills, critical thinking, clinical judgement and problem solving skills have improved.

Simulation education can be standardized and repeated for learners to conduct nursing mediation with subjects and aimed to cooperate among adept nurses and team members via experiences with clinically appropriate subjects. As the result of experiment shows, nursing students come to be confident through situations where positive appraisals are conducted by promoting mediation roles and helping ways of thinking through providing proper clues in the performance and proper complexity based on the study goal. And successful mediation via proper nursing assessment allow nursing students to have higher confidence in coping with complex issues(16).

The final examinations concludes that there are various education methods and effects of simulation training and education methods which could have similar effects drawn from the simulation education in the clinical fields are deemed to be necessary.

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