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The Effect of Simulation-Based Training on Nursing Students' Communication Skill, Self-Efficacy and Clinical Competence for Nursing Practice

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Abstract

Background: Simulation-based training is a new strategy in teaching that gives the students good opportunities to learn and apply what they learn in nursing care safely. **Aim:** This study conducted to evaluate the effects of simulation-based training on nursing students' communication skill, self-efficacy and clinical competence in practice. **Subjects and Methods:** Quiz-experimental design was used in this study (pre-posttest intervention), it was carried out on 100 nursing students first semester in 2019 using low and high-fidelity simulators. This study was carried out at College of Applied Medical Sciences-Bshia University. **Data Collection**: demographic data, communication skill, self-efficacy and clinical competence questionnaires. Analysis is done by SPSS version 20 software. **Results:** Participants who received the simulation-based training, showed statistical significant improvement in communication skill, self-efficacy, and clinical competence scores after participation in the simulation program ($t = -32.64$, $p = 0.001$; $t = -19.9$, $p = 0.001$; 16.4, $p = 0.001$). Also, there are significant relation between gender and clinical competency ($t = 2.768$, $p < 0.05$). **Conclusion:** Simulation-based training in medical courses is effective in enhancing communication skill, self-efficacy and clinical competence. Multiple-patient simulations as a teaching-learning strategy in the nursing curriculum are highly recommended.

Keywords

Simulation-Based, Nursing Students, Communication Skill, Self-Efficacy, Clinical Competence

1. Introduction

Nurse educators use many activities in clinical simulation as patient simulators for transiting student to professional nurse through more opportunities to patient care [1]. It was first implemented in selecting nursing curriculums in 1960's [2]. The simulation aims to provide students with the artificial replication of the real world situation to be knowledgeable, skillful and critically thinkers by applying complex scenarios in a safe environment. Learning on hospital patients only limits students in developing their analytical skills to problem-solving during emergency and crisis situation [3].

Multimedia sources, anatomical models, and simulators of the human body form the core of simulation-based learning. Simulation is one of the strategies that nurse educators can use to deal with situations in the clinical area, which cause stress and anxiety among student nurses as well as situations such as a fear of making mistakes, negative responses to the suffering and death of patients [4]. Oermann & Gaberson [5] also note that students develop psychomotor and technological skills to improve the students' critical thinking skills through clinical situations and make independent decisions.

Nursing educators facilitate learning of theoretical and practical clinical skills among student nurses, and help students to combine theory and practice at all levels by applying appropriate teaching approaches and simple techniques. The clinical area is ideally the primary place of learning practical skills for student nurses. However, the competition for learning opportunities between nursing students and allied health and medical students restricts nursing students learning activity that leads to sub-optimal experiences for content integration and mastery. The increasing number of student nurse intake restricts student nurses learning activities, thus increasing the importance of incorporating simulation into the nursing curriculum as an alternative to clinical placements and for replacing clinical hours [6] [7].

Effective communication is the stone base with patient interactions and intervention that essential to achieve desired patient outcomes. Therapeutic communication skills are significantly confirmed in the core curriculum [8]. Tosterud *et al.* [9] suggest that "Simulation as a way to learn communication skills at basic level nursing and learn the students to be effectively lead conservation in a safe, virtual, simulated clinical environment". However, communication skill is sole of several topics in the development of nurses' clinical competence [10]. The survey done by Gantt [11] in which he uses the Clark simulation evaluation rubric from two different nursing colleges, evaluated area were assessment, history gathering, critical thinking, communication, patient teaching, and to recognize necessary diagnostic studies. In psychomotor domain simulation-based nursing as educational intervention was highly effective. Kim *et al.* [12] also evidence the impact of simulation-based education when not relative to fidelity level, so it is important to use a proper level of simulation to meet all the educational goals and outcomes. Self-efficacy is defined as individuals beliefs to attain

capable for learning and performing actions at designated levels of performance [13].

In education, self-efficacy is associated with student success by positively academic performance achievement, predictor of students' motivation, and self-regulatory outcomes [14] [15]. Valizadeh *et al.* [16] reported that improvement of self-efficacy among undergraduate nursing students after applying simulation to learn peripheral venous catheterization in children. Other studies [17] [18] [19] also reported that simulation-based training has a positive impact on improving self-efficacy in nursing students after participating in simulation scenarios.

Competence is the ability to perform a task with desirable outcomes [20]. Kane [21] added the competency can grow through individual experience and integrate the knowledge, skills and judgment in order to perform effectively in the domain of learning for safe and ethical nursing practice

Competence-based learning (CBL) uses creative methods of teaching in the nursing degree are increased and it focuses on what students learn and not on the time spent in the classroom [22]. One of the main methods used for improving the development of competence in nursing education is clinical simulation [23]. Therefore, the purpose of the present study was to evaluate the effect of simulation-based training on nursing students' communication skill, self-efficacy and clinical competence for nursing.

1.1. Significance of the Study

Simulation can be used as a helpful learning tool and cannot replace patient interaction [24]. Little literature found in the past few years for evaluation simulation as a method of education, and also very little research's studied the correlation of student and faculty perceptions regarding simulation-based education [25].

Simulation labs in the department of nursing in applied medical college University of Bisha were started within the program, and more than eight patches graduated as staff nurses, no studies are done to evaluate the progress, methods of evaluation and the effect on nursing students competences. The aim of this pre-post study is to measure changes happen to our student who finishes most simulation needed courses in communication, self-efficacy and competences.

1.2. Operational Definitions

Simulation-Based Training: It is relevant to the care of patients with medical and critical nursing program for third and fourth year nursing students.

Self-Efficacy: "Refers to an individual's belief in his or her ability to succeed in specific situations or accomplish a task to produce specific performance attainments" [13] [26].

Competence: "Refers to ability of the student to integrate the skills, knowledge and attitudes during in clinical practice".

1.3. Aim of This Study

To evaluate the effect of simulation-based training on nursing students' communication skill, self-efficacy and clinical competence for nursing.

1.4. Research Hypothesis

H1: Students communication skill score will be different in pretest from posttest between study group whom participated in the simulation-based training course required of nursing practice.

H2: There will be a difference in self-efficacy between the study group pretest and posttest whom participated in simulation-based training course required of nursing practice.

H3: There will be a difference in clinical competence between the study group pretest and posttest whom participated in the simulation-based training in course required of nursing practice.

2. Subjects and Methods

2.1. Study Design

Quasi-experimental one-group pretest-posttest was used for this study.

2.2. Study Setting

This study was conducted at nursing department—College of Applied Medical Sciences, medical surgical and critical simulation labs in University of Bisha, Saudi Arabia. The medical labs contain moderate-fidelity medical and critical simulators.

2.3. Sample

A convenience sample of 100 junior students from third and fourth years' undergraduate nursing students.

2.3.1. Inclusion Criteria

Students enrolled in a medical surgical nursing and critical care nursing course participated in the study. Participants' Students must be enrolled in the basic and advance adult health care and critical care courses of the undergraduate nursing program, over the age of 19 and willing to participate in the study.

2.3.2. Exclusion Criteria

Students did not receive any training in all simulators related to program requirement prior to participating in this study.

2.3.3. Variables

Dependent variables: Communication skill (CS) score and self-efficacy (SES) score and clinical competence (CC) score.

Independent variables: Demographic characteristics of students and previous experience with simulators.

2.4. Instruments

Data were collected by four tools: 1) Demographic data; 2) Communication skill (CS); 3) General self-efficacy Scale (GSES); and Clinical Competence Scale (CCS).

Tool I: Demographic data: This tool developed by investigator, it includes gender, age, semester work, and previous experience with simulation related course program.

Tool II: Communication skill: It was adopted from Yoo [27], and adapted by researchers to evaluate nursing students' ability to communicate. It consists of ten questions with a 3-point LikertScale: (5) questions to locate professional attitude of the nursing students and (5) questions to determine the sufficiency of explanation given during nursing care. Scale score range from 10 to 30, high score mean high communication skill.

Tool III: Students Self Efficacy (SSE): This tool adopted by Yang and Park [28]. To assess perception about the ability to cope with a variety of different situations in life. SSE consisted of 14 items with a 5-point scale, each response starts from 1 (strongly disagree) to 5 strongly agree. Scale score range from 14 to 60, with 60 indicated, the higher the level of clinical cope. The average time to complete the tool is 4 - 5 minutes.

Tool IV: Clinical Competence (CC): Adopted from Freeth and Fry [29], it is used to assess perception of nursing students about teaching and learning in clinical skill center. It consists of 24 questions: Five about the nursing process skills, five for determining the ability of the students to perform direct nursing interventions, four for psychosocial nursing ability, four to determine ability of patient education, three to assess nursing student's performance ability, and three questions monitoring capabilities in physical examination of the patients. The responses to all questions were on 5-point LikertScale, from (1) strongly agree to (5) strongly disagree, the maximum score of 120 and minimum were 24. The average time to complete the tool is 15 - 20 minutes. It revealed the highlighting the students were positive about learning with the clinical skill centers.

2.5. Validity and Reliability of the Tools

Face and content validity done for the tools by five expertise in the field of nursing and medical education, and necessary modifications done. The reliability of the tool (2, 3, and 4) was tested using the internal consistency method. It proved to be high with Cronbach's alpha reliability coefficients was 0.92, 0.88, and 0.90.

2.6. Pilot Study

A pilot study was conducted on ten students to check and make sure the clarity, applicability to identify any difficulties with their application, and to determine the time needed for completion of the tools.

2.7. Ethical Considerations

Verbal and written information about the purpose of the study and the proce-

dure was given for students who agree to participate voluntarily, students notified of their right to withdraw at any time without explanation. Strict confidentiality of the information provided to the researcher is assured.

2.8. Procedures

- Approval for the study was taken; the researcher based on previous literature developed tools.
- The tools were tested for validity and reliability by 5 experts from medical and nursing staff, the necessary modifications were done.
- A pilot study was done on 10 nursing students to test clarity and applicability of the tool, and time needed to conduct the study.
- Data collection carried out in the period January 2019 until April 2019.
- The methods of teaching used in the simulation-based medical education program were short lectures, video, group discussions, demonstration and re-demonstration of low and moderate fidelity simulation.
- Participants were not randomly selected and all attended simulation-based training program. The scenarios consisted of situations, that nursing student might handle like ECG, blood transfusion, intravenous injections, providing oxygen therapy, wound and stoma care, Ryle insertion and removing.
- Simulation training was conducted in the simulation lab between four to five students over a period of 16 hours/week for 3 weeks for completing simulation. However, one week before the started simulation-based learning session to prerequisite course and responsibility of each student before adult health care clinical practice started, four sessions were conducted of a total of 64 hours.
- In the first section, pre-briefing orientation was conducted, about session aims, learning outcomes and structure and delivery scenarios were presented. Explanation of nature process and allow discussion for more clarify. Then, the researchers allow students to attend nearly 10 minute's video session about the parts to explain in simulations.
- In the 2nd and 4th sessions, simulations based medical education was conducted, in which sessions included simulation explanation, clear steps of procedure and re-demonstration. After sessions (debriefing) students were allowed to give feedback by explaining the strengths and weaknesses of the simulation situations.
- Data collections through demographic data, communication skill, self-efficacy and clinical competence were assessed for all students pre-posttest after receiving the intervention, to check out the effect of simulation program effect on communication skill, students self-efficacy and clinical competence. The time for all tools collecting within 30 - 40 minutes. In addition, the total times needed for monitoring the activities through courses within 45 hours.

2.9. Data Analysis

All data were entered into a database and statistical data analysis was con-

ducted using the Statistical Package for Social Science (SPSS) software. A p-value of 0.05 was considered as statistically significant. Descriptive statistics, including frequencies, percentages, means, and standard deviation was used to describe the data. Paired t test was used to assess the differences between pre and post HFS according to communication skills, self-efficacy, and competency. An independent t test and ANOVA were used to make comparison between demographic characteristics and communication, self-efficacy, and competency.

3. Results

3.1. Descriptive Characteristics

Table 1 shows that about half (49%) of the nursing students age between 20 to 24 years. As regards study level, more than half (53%) of them were level 6. The majority of the students (66%) had no previous experience in simulation.

3.2. Impact of Patient Simulation (PS) on Communication Skill

Using the paired t-test analysis for sample (see Table 2) revealed a significant statistical difference between the pre and post HFS intervention ($t = -32.64$, $p < 0.001$). Item analysis showed also that item means scores for the post HSF intervention between 2.57 (SD = 0.50) for item 3 (Student explains to the patient what is doing and why) and 2.73 (SD = 0.45) for item 7 (Student explains to the patient that the action could be painful).

Table 3 described the comparsion between pre and post-intervention group related to self-efficacy after implementing simulation program. It reveals that a significant statistical difference regarding pre and post-intervention ($t = -19.9$, $p < 0.001$). Also, improved means scores for the post-intervention ranged from item 2 to item 7 (2.72 and 4.3 respectively).

3.3. Impact of Simulation-Based Training on Clinical Competence

Table 4 r