

**EFFECTIVENESS OF SIMULATION OR CLINICAL SETTING AS INITIAL EXPOSURE
AMONG NURSING STUDENT AT PRINCESS NOURAH BINT ABDULRAHMAN: A
COMPARATIVE STUDY**

¹Najed Aldossery BSN., ²Mastoura Khames RN. MSN. PHD, ²Khulud Rezaq RN. MSN.

¹Bachelor of Nursing Science Princess Nourah Bint Abdulrhman University.

²Assistant Professor of Medical Surgical Nursing- Cairo University & Lecturer of Medical Surgical Nursing Princess Nourah Bint Abdulrhman University.

³Lecturer of Community Health Nursing.

***Corresponding Author: Mastoura Khames RN. MSN. PHD**

Assistant Professor of Medical Surgical Nursing- Cairo University & Lecturer of Medical Surgical Nursing Princess Nourah Bint Abdulrhman University.

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ABSTRACT

High-fidelity simulation refers to structured student learning experiences with the use of a technologically advanced computerized mannequin. The purpose of the study was evaluated the effectiveness of either Simulation or Clinical setting as the initial exposure of undergraduate geriatric nursing in their clinical training by competences and knowledge. A quasi-experimental study was used 60 geriatric nursing students on level 7 divided to two group randomly group A was going first to simulation then group B went to the clinical setting after training in basic skill lab. The competencies questioner and quizzes were completed by the student immediately pre and post the starting of geriatric practical course. The result of the study indicated that there was a statistically significant difference between two groups for the post competences questioners among specific skills. Group B was more competent than group A for the invasive skills. The simulation lab and clinical setting were complemented each other's and all of them very important for practicing competencies. The study recommended that the simulation lab should start from level 6 to gain more competence and knowledge. They must learn about simulation concept curriculum and the advantage of this course during the week of basic skill lab before starting actually in the simulation lab.

KEYWORDS: Simulation, Education, clinical setting, nursing student, competence, knowledge.

INTRODUCTION

Nursing education is building on theoretical and hands-on training given to nurses aimed to prepare them for different responsibilities of nursing practices. Nursing education is provided to nursing students by competent nurses and proficient faculties who have qualification for educational duties. Students can be engaged in active learning approach following the appropriate teaching strategies. Delivering high-quality education is depending on the teaching strategies (Jie, 2016). Teaching strategies such as lecture, role play, learning by simulation, questioning techniques, concept mapping, problem-based learning and case-based instruction are used by educators within a variety of integrated health programs aiming of advancing active learning and motivating students to become critical thinkers and problem solvers (Amy, Robert & Donna, 2007).

The purpose of nursing education is to develop nurses by equipping them with the necessary knowledge, attitude and skills to perform their duties efficiently (Cheraghi, Esmaeili, Salsali & Ghiyasvandian, 2013). Nursing

programs aimed to produce graduates who are proficient in making critical decisions regarding the care of different patients. Critical decision-making is an important aspect of nursing care. Although nursing programs work diligently to ensure that nursing students are able to make critical decisions, health care administrators continue to emphasize that there is a need for improvement in this area (Tera, 2011). With regard to reaching this goal, clinical education plays an important role in nursing education not only as an appropriate opportunity for students to apply what they have already learned in real-world settings, but it also includes a socialization process that is important for students who are entering a clinical environment. Although there is wide variety of programmers dedicated to nursing education (Cheraghi, Esmaeili, Salsali & Ghiyasvandian, 2013).

Nurses take an active role in all facets of healthcare and are expected to possess critical thinking and communications skills. Schools of nursing are required to provide students with both theory and clinical

opportunities relative to the scope of nursing (Steinhubel, 2012). Simulation is considered as a new trend of teaching strategies in health sciences. It is a science of creating a clinical scenario in an artificial clinical setting, has been an important aspect of nursing program curriculums for decades. As an adjunct to clinical experience, simulation has allowed deliberate practice in a controlled environment. Students are able to practice a procedure prior to the performance on a live patient (Frank, Lola & Suling, 2009).

High-fidelity simulation refers to structured student learning experiences with the use of a highly technologically advanced computerized mannequin. The Human Patient Simulator (HPS) is anatomically precise and reproduces physiologic responses. Students are administered sequential decision-making events within an environment that mimics a clinical setting. Instructors can control the mannequin's responses and they can respond to interventions provided by the student. Gaba (2004) describes simulation "as a strategy, not a technology to mirror, anticipate, or real situations with guided experiences in a fully interactive way (Frank, Lola & Suling, 2009).

It is crucial to bridge the gap that exists between what students learn in the classroom and what occurs in their clinical practice. In theory, the use of patient simulators was facilitated the transfer of learning to related real-life challenges, helping students understand and successfully manage actual patient care situations. As the use of simulation in nursing education has grown, it has become necessary to provide quantitative data to objectively determine its value. Case studies that provide the chance to discuss real-life situations and nursing challenges are another effective teaching strategy to develop critical thinking skills in nursing students (Goodstone, Cino, Glaser, Kupferman, & Demberneal 2013)

Clinical experience has been always an integral part of nursing education. It prepares the nursing student to be able of doing as well as knowing the clinical practice. The clinical practice stimulates students to use their critical thinking skills for problem-solving (Sharif & Masoumi, 2005). Clinical experience is one of the most anxiety-producing components of the nursing program which has been identified by nursing students. Lack of clinical experience, unfamiliar areas, difficult patients fear of making mistakes and being evaluated by faculty members were expressed by the student as anxiety-producing situations in their initial clinical experience (Sharif & Masoumi, 2005). The success of clinical training relies on the ability of a student to apply relevant knowledge and theoretical principles to competent nursing problem-solving action. However, without enough opportunity of caring for real patients in a clinical setting, nursing students have difficulty in adjusting to complicated nursing situations after they graduate from nursing colleges (Kim & Jang, 2011; Malouf & West, 2011). Such obstacles have facilitated

innovative training strategies in nursing and simulation has emerged as one of the viable alternatives. (Eong, Sang & PARK, 2015).

Critical thinking was selected as a variable for the study because it is an important aspect of nursing practice. The American Association of Colleges of Nursing (1998) reported that critical thinking is a core competency in baccalaureate nurses. Nurse educators have sought to teach critical thinking through a variety of methods. Even though manufacturers suggest that the use of human patient simulator (HPS) enhanced critical thinking and problem-solving, this has not been well documented (Shin, Sok, Hyun & Ja Kim, 2014).

Significance of the study

Princess Nourah Bint Abdulrahman University has a well-prepared simulation center for the health sciences colleges. It is included high fidelity simulators which have an effective role in the practicing skills in nursing. It allows to develop case scenario and student can demonstrate and training the same with the hospital. Moreover, it is considered as an artificial hospital.

Purpose of the study

This study was evaluated the effectiveness of either Simulation or Clinical setting as the initial exposure of undergraduate Geriatric Nursing in their clinical training by competences and knowledge.

Statement of the problem

The researcher was like to determine the effectiveness of either Simulation or Clinical setting as the initial exposure in the competency and knowledge of the students. Moreover is the simulation training have an effective role in the elimination of mistakes that may be happening in the real setting. It can be used as the basis for the academic unit of the college of nursing in the planning of the student exposure.

Research hypotheses

H1: Student who started their training by simulation learning was more competent than the direct hospital training.

H2: Student who started their training by simulation learning was gain knowledge more than directly hospital training.

Methodology

Research Design

The investigator was used quasi-experiment design for the current study. The quasi-experimental design is included manipulation and one of the randomization or control.

Subject & Setting

This study was applied to 60 geriatric nursing student Nursing College at princess Nourah Bint Abdulrahman University.

Instrument

Two tools were used to collect the data. The first tool is assessing the knowledge gain which is the Pre-quiz. It was being developed by the researcher including multiple and true /false questions regarding the knowledge was be given during the first week. The second tool was the Modified Clinical Competence Questionnaire which was used to assess the competencies of the students. This tool included 47 items divided into two categories nursing professional behavior and skill competencies. It developed by Liou & Cheng, 2013. The 47 scale is described: 1- Do not have a clue; 2. Know in theory, but not confident at all in practice; 3. Know in theory, can perform some parts in practice independently, and needs supervision to be readily available; 4. Know in theory, competent in practice, need contactable sources of supervision; 5. Know in theory, competent in practice without supervision.

Data collection Procedure

The procedure of this study was taken place in three phases, which were preliminary, implementation and evaluation phase. The description of these phases was as following:

Preliminary phase: this is the preparation phase. The investigators were assessed the clinical setting (real hospital) to design the three case scenarios which included chronic obstructive pulmonary disease, level of consciousness and depression criteria. Students were practice using these scenarios in the simulation lab. The investigator has formulated a quiz to test the gain of knowledge before and after exposure to training. The duration of this phase was one month starting from November 2016.

Implementation Phase: It was be taken one month starting from December 2016. Permission was being taken from the IRB. The subject who agree in participating the study signed the consent letter. All subjects spent one week in the basic skill lab practice which included low fidelity simulators and revising all skills (psychomotor and communication skills) as preparation for training in simulation lab and clinical setting (hospital). All students were exposed to the pre-quiz at the last day of the first week. The 60 students were be divided into two groups (A, and B as the following table). Each group spent one week in hospital and simulation lab and train in the high fidelity simulators. This simulator was work as patient with certain criteria (case scenario, Appendix III).

Group	Week 1	Week2	Week 3	Week4
Group A	Basic Skill Lab	Simulation Lab	Clinical Training	Clinical Training
Group B	Basic Skill Lab	Clinical Training	Simulation Lab	Clinical Training

Evaluation phase: finally, the subject was be evaluated using the two previous tools. Post-quiz was be used by the end of the fourth week (Appendix II). It was the same pre-quiz which given before at the end of the first week. The competencies of the subjects were being evaluated using the competence questionnaire (Appendix I) which was being given in the fourth week after finishing their training in the simulation lab and hospital training.

Statistical design: Statistical Package for the Social Sciences (SPSS) was being used by the investigator to analyze the data. The tests that were being used is a mean and standard deviation and Wilcoxon test the significance of the result on P-value ≤ 0.05 .

Ethical Consideration or confidentiality

Consent was obtained from each participant for taking part in the study. The participants were assured of anonymity and the ethical principles adhered. The participant's name was be coded to keep information private. The procedure was being explained to the subject including the benefits, risks, and duration of the study.

RESULT

It illustrated the following parts : The mean difference among Competencies Measured in the Clinical pre Competence Questionnaire, The mean difference among post Competencies Measured in the Clinical Competence Questionnaire, The final mean difference among pre & post Competencies Measured in the Clinical Competence Questionnaire and final pre & post quizzes' which investigate the knowledge.

Table 1: The mean difference among pre Competencies Measured in the Clinical Competence Questionnaire.

		Mean	Ranks	Mean Rank	Sum of Ranks	(Z)	Sig P (value)
Nursing professional behavior.							
Following health and safety precautions	Pre A	2.60	Negative Ranks	3.50	10.50	1.473	0.141
	Pre B	2.83	Positive Ranks	5.75	34.50		
Taking appropriate measures to prevent or minimize risk of injury to self	Pre A	2.76	Negative Ranks	3.50	10.50	0.000	1.000
	Pre B	2.75	Positive Ranks	3.50	10.50		
Taking appropriate measures to prevent or minimize risk of injury to patients	Pre A	2.96	Negative Ranks	3.00	12.00	1.342	0.180
	Pre B	2.84	Positive Ranks	3.00	3.00		

Preventing patients from problem occurrence	Pre A	2.72	Negative Ranks	5.50	38.50	0.535	0.593
	Pre B	2.63	Positive Ranks	6.88	27.50		
Adhering to the regulation of patients' and families' confidentiality	Pre A	2.84	Negative Ranks	4.80	24.00	0.905	0.366
	Pre B	2.72	Positive Ranks	4.00	12.00		
Demonstrating cultural competence	Pre A	2.84	Negative Ranks	4.50	22.50	0.707	0.480
	Pre B	2.76	Positive Ranks	4.50	13.50		
Adhering to ethical and legal standards of practice	Pre A	2.88	Negative Ranks	5.00	35.00	1.667	0.096
	Pre B	2.68	Positive Ranks	5.00	10.00		
Maintaining appropriate appearance, attire, and conduct	Pre A	2.80	Negative Ranks	5.00	20.00	0.302	0.763
	Pre B	2.75	Positive Ranks	4.00	16.00		
Understanding patient rights	Pre A	2.92	Negative Ranks	3.50	17.50	1.633	0.102
	Pre B	2.76	Positive Ranks	3.50	3.50		
Recognizing and maximizing opportunity for learning	Pre A	2.92	Negative Ranks	3.10	15.50	1.081	0.279
	Pre B	2.76	Positive Ranks	5.50	5.50		
Applying appropriate measures and resources to solve problems	Pre A	2.84	Negative Ranks	5.13	41.00	1.459	0.145
	Pre B	2.60	Positive Ranks	7.00	14.00		
Applying or accepting constructive criticism	Pre A	2.83	Negative Ranks	0.00	0.00	1.633	0.102
	Pre B	3.00	Positive Ranks	2.00	6.00		
Applying critical thinking to patient cares	Pre A	2.96	Negative Ranks	4.00	24.00	1.890	0.059
	Pre B	2.76	Positive Ranks	4.00	4.00		
Communicating verbally with precise and appropriate terminology in a timely manner with patients and families	Pre A	2.84	Negative Ranks	4.50	31.50	1.155	0.248
	Pre B	2.68	Positive Ranks	6.75	13.50		
Communicating verbally with precise and appropriate terminology in a timely manner with healthcare professionals	Pre A	2.76	Negative Ranks	4.00	16.00	0.302	0.763
	Pre B	2.80	Positive Ranks	5.00	20.00		
Understanding and supporting group goals	Pre A	2.88	Negative Ranks	5.00	35.00	1.667	0.096
	Pre B	2.68	Positive Ranks	5.00	10.00		
Taking a history for new admissions	Pre A	2.60	Negative Ranks	4.00	20.00	0.796	0.426
	Pre B	2.72	Positive Ranks	7.00	35.00		
Skill Competencies							
Performing and documenting patient health assessment	Pre A	2.75	Negative Ranks	4.00	20.00	0.312	0.755
	Pre B	2.80	Positive Ranks	6.25	25.00		
Answering questions for patients or families	Pre A	2.80	Negative Ranks	3.50	14.00	0.000	1.000
	Pre B	2.79	Positive Ranks	4.67	14.00		
Educating patients or families with disease-related care knowledge	Pre A	2.75	Negative Ranks	4.50	22.50	0.000	1.000
	Pre B	2.72	Positive Ranks	5.63	22.50		
Charting and documentation	Pre A	2.76	Negative Ranks	4.00	20.00	0.312	0.755
	Pre B	2.79	Positive Ranks	6.25	25.00		
Developing care plan for patients	Pre A	2.72	Negative Ranks	3.00	9.00	0.879	0.380
	Pre B	2.84	Positive Ranks	4.75	19.00		
Performing shift report	Pre A	2.72	Negative Ranks	6.00	48.00	0.733	0.464
	Pre B	2.56	Positive Ranks	7.50	30.00		
Performing hygiene and daily care routines	Pre A	2.96	Negative Ranks	3.60	18.00	1.667	0.096
	Pre B	2.73	Positive Ranks	3.00	3.00		
Providing rest and comfort measures	Pre A	2.76	Negative Ranks	7.00	70.00	1.941	0.052
	Pre B	2.46	Positive Ranks	7.00	21.00		
Assessing nutrition and fluid balance	Pre A	2.79	Negative Ranks	0.00	0.00	0.250	0.803
	Pre B	3.00	Positive Ranks	2.50	10.00		
Assessing elimination	Pre A	2.84	Negative Ranks	0.00	0.00	1.732	0.083
	Pre B	3.00	Positive Ranks	2.00	6.00		
Assisting activities and mobility, and changing position	Pre A	2.68	Negative Ranks	8.25	82.50	1.414	0.157
	Pre B	2.42	Positive Ranks	7.50	37.50		
Providing emotional and psychosocial support	Pre A	3.00	Negative Ranks	0.00	0.00	0.000	1.00
	Pre B	3.00	Positive Ranks	0.00	0.00		
Performing venipuncture	Pre A	2.56	Negative Ranks	4.00	16.00	0.289	0.773
	Pre B	2.58	Positive Ranks	5.00	20.00		
Starting intravenous injections	Pre A	2.56	Negative Ranks	6.38	25.50	0.711	0.477

	Pre B	2.67	Positive Ranks	5.79	40.50		
Changing intravenous fluid bottle or bag	Pre A	2.64	Negative Ranks	4.50	22.50	0.000	1.00
	Pre B	2.63	Positive Ranks	5.63	22.50		
Administering intravenous medications (or into intravenous bags)	Pre A	2.64	Negative Ranks	5.00	15.00	1.00	0.317
	Pre B	2.75	Positive Ranks	5.00	30.00		
Administering intramuscular medications	Pre A	2.42	Negative Ranks	2.00	2.00	1.823	0.068
	Pre B	2.91	Positive Ranks	3.80	19.00		
Performing subcutaneous injection	Pre A	2.42	Negative Ranks	2.00	2.00	1.823	0.068
	Pre B	2.91	Positive Ranks	3.80	19.00		
Administering oral medications	Pre A	2.58	Negative Ranks	0.00	0.00	1.857	0.063
	Pre B	3.00	Positive Ranks	2.50	10.00		
Administering blood transfusion	Pre A	2.21	Negative Ranks	3.50	7.00	1.613	0.107
	Pre B	2.64	Positive Ranks	4.83	29.00		
Performing urinary catheter insertion and care	Pre A	2.47	Negative Ranks	1.50	1.50	1.656	0.098
	Pre B	2.82	Positive Ranks	3.38	13.50		
Performing sterile techniques	Pre A	2.79	Negative Ranks	0.00	0.00	1.342	0.180
	Pre B	2.86	Positive Ranks	1.50	3.00		
Performing postural drainage and percussion, and oxygen therapy	Pre A	2.63	Negative Ranks	5.00	5.00	1.179	0.238
	Pre B	2.86	Positive Ranks	3.20	16.00		
Performing preoperation/postoperation care	Pre A	2.48	Negative Ranks	6.50	45.50	0.474	0.635
	Pre B	2.54	Positive Ranks	8.50	59.50		
Performing enema	Pre A	2.90	Negative Ranks	0.00	0.00	3.153	0.545
	Pre B	3.00	Positive Ranks	6.50	78.00		
Performing upper airway suction	Pre A	2.68	Negative Ranks	0.00	0.00	1.857	0.063
	Pre B	3.00	Positive Ranks	2.50	10.00		
Performing tracheotomy care	Pre A	2.47	Negative Ranks	0.00	0.00	2.428	*0.015
	Pre B	3.00	Positive Ranks	4.00	28.00		
Performing nasogastric tube feeding and care	Pre A	2.60	Negative Ranks	4.00	12.00	1.645	0.100
	Pre B	2.88	Positive Ranks	6.14	43.00		
Performing chest tube care with underwater seal management	Pre A	2.16	Negative Ranks	7.50	15.00	1.675	0.094
	Pre B	2.73	Positive Ranks	5.67	51.00		
Performing wound dressing care	Pre A	2.40	Negative Ranks	7.00	42.00	1.436	0.151
	Pre B	2.67	Positive Ranks	9.40	94.00		

This table shows there is no statistical difference between the group A&B in the most of the skill. Regarding performing tracheostomy care this table shows a statistical difference was observed, group B was more competence than Group A (P-value 0.015).

H₁: Student who started their training by simulation learning was be more competent than the directly hospital training.

Table 2: The mean difference among post Competencies Measured in the Clinical Competence Questionnaire.

		Mean	Ranks	Mean Rank	Sum of Ranks	(Z)	Sig P (value)
Nursing professional behavior.							
Following health and safety precautions	Post A	2.96	Negative Ranks	4.86	34.00	2.309	*0.021
	Post B	2.52	Positive Ranks	2.00	2.00		
Taking appropriate measures to prevent or minimize risk of injury to self	Post A	2.96	Negative Ranks	4.50	24.50	1.897	0.058
	Post B	2.72	Positive Ranks	3.50	3.50		
Taking appropriate measures to prevent or minimize risk of injury to patients	Post A	2.68	Negative Ranks	5.86	41.00	0.165	0.869
	Post B	2.63	Positive Ranks	7.40	37.00		
Preventing patients from problem occurrence	Post A	2.80	Negative Ranks	0.00	0.00	2.00	*0.046
	Post B	2.96	Positive Ranks	2.50	10.00		
Adhering to the regulation of patients' and families' confidentiality	Post A	2.72	Negative Ranks	5.83	35.00	0.832	0.405
	Post B	2.58	Positive Ranks	5.00	20.00		
Demonstrating cultural competence	Post A	2.68	Negative Ranks	7.13	57.00	0.849	0.396
	Post B	2.50	Positive Ranks	6.80	34.00		
Adhering to ethical and legal standards of practice	Post A	2.80	Negative Ranks	4.80	24.00	0.905	0.366

	Post B	2.67	Positive Ranks	4.00	12.00		
Maintaining appropriate appearance, attire, and conduct	Post A	3.00	Negative Ranks	3.50	21.00	2.449	*0.014
	Post B	2.75	Positive Ranks	0.00	0.00		
Understanding patient rights	Post A	2.76	Negative Ranks	4.00	16.00	0.378	0.705
	Post B	2.71	Positive Ranks	4.00	12.00		
Recognizing and maximizing opportunity for learning	Post A	2.76	Negative Ranks	7.70	77.00	1.698	0.090
	Post B	2.46	Positive Ranks	7.00	28.00		
Applying appropriate measures and resources to solve problems	Post A	2.68	Negative Ranks	4.50	31.50	2.121	0.034
	Post B	2.42	Positive Ranks	4.50	4.50		
Applying or accepting constructive criticism	Post A	2.76	Negative Ranks	5.25	31.50	1.155	0.248
	Post B	2.58	Positive Ranks	4.50	13.50		
Applying critical thinking to patient cares	Post A	2.80	Negative Ranks	4.38	17.50	0.632	0.527
	Post B	2.71	Positive Ranks	3.50	10.50		
Communicating verbally with precise and appropriate terminology in a timely manner with patients and families	Post A	2.64	Negative Ranks	5.50	27.50	0.966	0.334
	Post B	2.79	Positive Ranks	7.21	50.50		
Communicating verbally with precise and appropriate terminology in a timely manner with healthcare professionals	Post A	2.76	Negative Ranks	5.33	16.00	0.302	0.763
	Post B	2.79	Positive Ranks	4.00	20.00		
Understanding and supporting group goals	Post A	2.72	Negative Ranks	6.25	50.00	0.924	0.356
	Post B	2.54	Positive Ranks	7.00	28.00		
Skill competencies.							
Taking a history for new admissions	Post A	2.72	Negative Ranks	4.50	22.50	0.000	1.000
	Post B	2.71	Positive Ranks	5.63	22.50		
Performing and documenting patient health assessment	Post A	2.64	Negative Ranks	4.50	18.00	1.027	0.305
	Post B	2.79	Positive Ranks	6.17	37.00		
Answering questions for patients or families	Post A	2.72	Negative Ranks	5.50	27.50	0.000	1.000
	Post B	2.71	Positive Ranks	5.50	27.50		
Educating patients or families with disease-related care knowledge	Post A	2.68	Negative Ranks	6.00	30.00	0.775	0.439
	Post B	2.79	Positive Ranks	6.86	48.00		
Charting and documentation	Post A	2.71	Negative Ranks	4.75	28.50	0.749	0.454
	Post B	2.54	Positive Ranks	5.50	16.50		
Developing care plan for patients	Post A	2.80	Negative Ranks	4.17	12.50	0.264	0.792
	Post B	2.83	Positive Ranks	3.88	15.50		
Performing shift report	Post A	2.84	Negative Ranks	3.75	15.00	1.000	0.317
	Post B	2.74	Positive Ranks	3.00	6.00		
Performing hygiene and daily care routines	Post A	2.56	Negative Ranks	6.50	58.50	0.406	0.684
	Post B	2.46	Positive Ranks	9.30	46.50		
Providing rest and comfort measures	Post A	3.00	Negative Ranks	2.50	10.00	2.000	*0.046
	Post B	2.77	Positive Ranks	0.00	0.00		
Assessing nutrition and fluid balance	Post A	2.76	Negative Ranks	5.13	20.50	2.00	*0.046
	Post B	2.79	Positive Ranks	4.90	24.50		
Assessing elimination	Post A	2.76	Negative Ranks	5.40	27.00	0.577	0.564
	Post B	2.67	Positive Ranks	4.50	18.00		
Assisting activities and mobility, and changing position	Post A	2.79	Negative Ranks	0.00	0.00	2.000	*0.046
	Post B	3.00	Positive Ranks	2.50	10.00		
Providing emotional and psychosocial support	Post A	2.76	Negative Ranks	4.50	27.00	1.414	0.157
	Post B	2.58	Positive Ranks	4.50	9.00		
Performing venipuncture	Post A	2.05	Negative Ranks	0.00	0.00	2.889	**0.004
	Post B	2.95	Positive Ranks	5.50	55.00		
Starting intravenous injections	Post A	2.21	Negative Ranks	0.00	0.00	2.598	**0.009
	Post B	2.95	Positive Ranks	4.50	36.00		
Changing intravenous fluid bottle or bag	Post A	3.00	Negative Ranks	3.00	15.00	2.121	*0.034
	Post B	2.39	Positive Ranks	0.00	0.00		
Administering intravenous medications (or into intravenous bags)	Post A	2.42	Negative Ranks	0.00	0.00	2.251	*0.024
	Post B	2.95	Positive Ranks	3.50	21.00		
Administering intramuscular medications	Post A	2.76	Negative Ranks	2.50	5.00	0.707	0.480
	Post B	2.83	Positive Ranks	3.33	10.00		

Performing subcutaneous injection	Post A	2.68	Negative Ranks	7.75	77.50	2.311	*0.021
	Post B	2.17	Positive Ranks	4.50	13.50		
Administering oral medications	Post A	2.75	Negative Ranks	7.58	98.50	2.368	*0.018
	Post B	2.29	Positive Ranks	10.75	21.50		
Administering blood transfusion	Post A	2.72	Negative Ranks	3.00	12.00	0.866	0.386
	Post B	2.83	Positive Ranks	6.00	24.00		
Performing urinary catheter insertion and care	Post A	2.28	Negative Ranks	5.00	30.00	2.025	*0.046
	Post B	2.71	Positive Ranks	10.60	106.00		
Performing sterile techniques	Post A	2.28	Negative Ranks	6.25	25.00	1.779	0.075
	Post B	2.67	Positive Ranks	8.00	80.00		
Performing postural drainage and percussion, and oxygen therapy	Post A	2.80	Negative Ranks	8.14	114.00	2.540	*0.011
	Post B	2.25	Positive Ranks	11.00	22.00		
Performing preoperation/postoperation care	Post A	2.47	Negative Ranks	0.00	0.00	2.121	*0.034
	Post B	2.95	Positive Ranks	3.00	15.00		
Performing enema	Post A	2.36	Negative Ranks	4.50	9.00	2.443	*0.015
	Post B	2.83	Positive Ranks	6.90	69.00		
Performing upper airway suction	Post A	2.52	Negative Ranks	9.50	133.00	1.147	0.252
	Post B	2.25	Positive Ranks	12.83	77.00		
Performing tracheotomy care	Post A	2.56	Negative Ranks	8.17	98.00	1.685	0.092
	Post B	2.21	Positive Ranks	9.50	38.00		
Performing nasogastric tube feeding and care	Post A	2.79	Negative Ranks	0.00	0.00	2.000	*0.046
	Post B	3.00	Positive Ranks	2.50	10.00		
Performing chest tube care with underwater seal management	Post A	2.36	Negative Ranks	9.36	103.00	0.347	0.729
	Post B	2.25	Positive Ranks	10.88	87.00		
Performing wound dressing Care	Post A	2.11	Negative Ranks	3.00	3.00	2.373	*0.018
	Post B	2.91	Positive Ranks	5.25	42.00		

Table 2: Relating to group A this table illustrates there was highly statistical different regarding following health and safety precautions, Maintaining appropriate appearance, attire, and conduct, Providing rest and comfort measures, Changing intravenous fluid bottle or bag, Performing subcutaneous injection, Administering oral medications, Performing postural drainage and percussion, and oxygen therapy (0.021, 0.014, 0.046, 0.034, 0.021, 0.018 & 0.011) respectively. Moreover, the same table shows a statistical difference in the taking appropriate measures to prevent or minimize the risk of injury to self, Applying appropriate measures and resources to solve problems (0.058).

Relating to group B table 2 presents that a highly statistical significant difference in the following competencies Preventing patients from problem occurrence, Assessing nutrition and fluid balance, Assisting activities and mobility, and changing position, Performing venipuncture, Starting intravenous injections, Administering intravenous medications (or into intravenous bags), Performing urinary catheter insertion and care, Performing preoperation /postoperation care, Performing enema, Performing nasogastric tube feeding and care and Performing wound dressing care (0.046, 0.046, 0.004, 0.009, 0.024, 0.046, 0.034, 0.015, 0.046 & 0.018 respectively).

Table 3: The total mean difference among the competencies and nursing behavior.

	Mean	Ranks	Mean Rank	Sum of Ranks	(Z)	Sig P (value)
Pre Nursing behaviors A	2.88	Negative Ranks	14.63	175.50	1.593	0.111
Pre Nursing behavior B	2.62	Positive Ranks	7.75	77.50		
Pre Competences Skills A	2.65	Negative Ranks	11.68	163.50	0.386	0.700
Pre Competences Skills B	2.60	Positive Ranks	13.65	136.50		
Post Nursing behaviors A	2.73	Negative Ranks	10.37	155.50	0.943	0.346
Post Nursing behavior B	2.62	Positive Ranks	13.93	97.50		
Post Competences Skills A	2.75	Negative Ranks	5.14	36.00	3.405	**0.001
Post Competences Skills B	2.87	Positive Ranks	16.06	289.00		

Table3 illustrates that no statistical differences between group A&B as regard with the pretest competencies. But there is highly statistical different showing on post competences skill (0.001).

H₂: Student who started their training by simulation learning was gain knowledge more than directly hospital training.

Table 4: The mean difference among pre & post quizzes for knowledge measurement.

	Mean	Ranks	Mean Rank	Sum of Ranks	(Z)	Sig P (value)
Pretest quiz A	1.24	Negative Ranks	3.50	17.50	1.633	0.102
Pretest quiz B	1.08	Positive Ranks	3.50	3.50		
Posttest quiz A	1.20	Negative Ranks	2.00	2.00	0.577	0.564
Posttest quiz B	1.25	Positive Ranks	2.00	4.00		
Pretest quiz A	1.24	Negative Ranks	6.50	39.00	0.000	1.000
Posttest quiz A	1.24	Positive Ranks	6.50	39.00		
Pretest quiz B	1.05	Negative Ranks	3.50	3.50	1.633	0.102
Posttest quiz B	1.25	Positive Ranks	3.50	17.75		

Table (4) shows that there is no statistical different mean between group A&B regarding pre and post knowledge test.

DISCUSSION

The discussion will cover the main sections as follows: the mean difference among competencies measured in the clinical pre/post and total competence questionnaire and finally the knowledge differences among the groups. The current study revealed that no statistical differences between group A & B in the most of the skills in the pretest competencies, this result is considered logic because the group A & B expose to the same skills in the same duration and they didn't demonstrate any of these skills hardly in the previous semesters. Regarding the tracheostomy care some of students group B they exposed to this skill previously and have a good chance to practice it in the previous courses.

For testing the first hypothesis which was the student who started their training by simulation learning was be more competent than the direct hospital training. The researcher can't reject or accept the hypothesis one as indicated from result current study. This result revealed that the group A performed better than group B in health and safety precautions, maintaining appropriate appearance, attire, and conduct, providing rest and comfort measures, changing intravenous fluid bottle or bag, performing subcutaneous injection, administering oral medications, performing postural drainage and percussion, oxygen therapy, then taking appropriate measures to prevent or minimize risk of injury to self, applying appropriate measures and resources to solve problems. Which is a quite skills and they can be performed hardly in the simulation center. Moreover, these skills are determined by the investigators to be applied on the high fidelity simulators. So students demonstrated and re-demonstrated these skills frequently in the simulation. Training in the simulation lab has a positive impact on the student's different competencies. This result is supported by many studies implemented in this field. Studies evidenced that simulation has a variety of advantages to the healthcare professionals. It ameliorates nursing clinical practice (Kinsman, et.al 2012 & McCaughey, 2010), nursing critical thinking (Schubert, 2012 & Secomb, 2012), communication skills (Young, 2012). Kelly added that Simulation can intensify

chances for nursing students training who will be able to deliver risk-free and fitted care to patients.

Group B has a highly statistical significant difference in the following competencies preventing patients from problem occurrence, assessing nutrition and fluid balance, assisting activities and mobility, and changing position, performing venipuncture, starting intravenous injections, administering intravenous medications (or into intravenous bags), performing urinary catheter insertion and care, performing preoperation /postoperation care, performing enema, performing nasogastric tube feeding and care and performing wound dressing care, most of these skills are invasive which is more applicable to the real patient more than simulators. This group of the subject found a chance for hard training at real clinical setting on invasive competencies. Moreover, the current study presented that highly statistical differences between group A and group B, which means group B who started real clinical training as a first exposure more competent than group A who exposed to simulation training first. This means that in the geriatric specialty the simulation training is not effective on the student's performance. This result is supported by Frank, Coke & Suling (2009) they mentioned that no statistical differences based on rating mean among the clinical performance demonstrated by simulation-based assessment between the groups with simulation-based learning, a combination of simulation-based and bed-side actual clinical experience, and bed-side actual clinical experience alone.

H2: Student who started their training by simulation learning was gain knowledge more than directly hospital training. The result revealed that no different relating to knowledge on pre and post quizzes so, the simulation lab and clinical setting have not effected directly on the students' knowledge. So this result rejected the second hypothesis that simulation training hasn't effect on gaining knowledge among geriatric student. Frank, Coke & Suling (2009) approved this response in their report about the effectiveness of human patient simulation on baccalaureate nursing students' transfer of learning. They noticed that no statistically significant differences between the three groups for gaining knowledge.

CONCLUSION

The finding of the study concluded that simulation learning and clinical setting its complement each others and all of them very important for a nursing student. A nursing student can be gain more competences skill and a chance to experience some other procedures in the simulation lab that can't allow to do it in the hospital as student training. Nursing student after attended the simulation lab can be dealing with many situations under stress such as medication error and gain more self-confident. The initial exposure for simulation learning and hospital training haven't significant effect on the competences and gaining knowledge among geriatric students.

RECOMMENDATION

Regarding the result from this research study the investigator provide the following recommendation:

- The simulation lab should be starting from early level to gain more competence and knowledge.
- Raising awareness regarding the simulation learning and training on High fidelity simulators.
- This research can be replication at the different scenario with different nursing specialties.
- Hospital training is more competent for developing and exposing of invasive procedures.

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