Clinical versus Simulation Training among Pediatric Nursing Students regarding Competency level to Care of Preterm Infants

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Abstract

Background: Nowadays simulation is taking an important place in training and education of healthcare professionals, moreover simulation allows for assessment and evaluation of the students" performance. **Aim:** The aim of the study was to evaluate the effect of clinical versus simulation teaching among pediatric nursing students regarding competency level to care of preterm infants. **Design:** A quasi-experimental design **.Sample:** A purposive sample which included 95 students, which divided randomly into two groups (the study and control). **Setting:** the study was conducted at Faculty of Nursing, Palestine University and governmental Hospitals in Gaza strip. **Tools:** A pre/post designed questionnaire and observation checklist **Results:** The study revealed that, there were statistically significant differences between simulation group which had higher competency level with P value < 0.001 regarding to care of premature infants compared with the clinical group. **Conclusion:** Study students who have simulation had a better competency level with care of the premature infants. **Recommendations:** The study recommended that; create simulation training program as a strategy in nursing clinical training especially care of premature infants.

Key words: Clinical teaching – Simulation methods – Competency – pediatric nursing students.

Introduction

Simulation is a teaching and learning strategy which consists of a set of activities that seek to replicate real contexts, it is effective in acquiring knowledge and skills through experience and drawing on practical problem solving and development of technical skills in a safe and controlled environment. National League for Nursing (2013) &Teixera, Felix, (2015). It enables the student or beginning professional to experience situations in a safe and ethical environment, simulation promotes active learning, collaboration, and reflection to enhance students' critical thinking skills; and provides a strategy to achieve learning outcomes and evaluate the effectiveness of teaching methods and technology in meeting the needs of the students **Billings &** *Halstead* (2016) and Foronda et al., (2015).

World health organization (WHO) has provided standards for nursing education and recommended the use of innovative teaching strategy of simulation in nursing education. Simulation based education allows for the practice of skills and techniques, for competence newborn care in lifelike situation including teamwork communication. In addition, simulation education shows an effective, beneficial and innovative method of teaching in health professionals education Tawalbeh and Tubaishat (2014), Agrawal et al., (2016) & WHO (2016).

Health professional are increasingly using simulation as a strategy and a tool for teaching and learning at all levels that need clinical training. Simulation is considered an effective solution to replace some real life clinical exposure hour as nursing and other health professional` programs are facing challenges of inadequate clinical learning opportunities **Miller**, (2014)& Hayden et al.,(2014).

Prematurity is a major health problem of neonates because it is a leading cause of infant mortality. Preterm birth, defined as childbirth occurring at less than 37 completed weeks or 259 days of gestation, is a major determinant of neonatal mortality and morbidity and has long-term adverse consequences for health. It represents the highest percentage of high risk group and accounts for the largest number of admissions to Neonatal Intensive Care Unit (NICU). The true incidence of preterm birth among the developing countries varies from country to another and from one geographic region to another within a country. However, about 7-12% of deliveries in developing countries are preterm Grav et al., (2012), Stacy B, (2010).

Clinical simulations are a valuable alternative to teach students nursing skills by simulating nursing situations and medical conditions can recognize and manage. Moreover, the heightened use of clinical simulation as teaching method is mainly due to limited clinical sites in specialty areas of practice for students, such as pediatrics, NICU and maternal child health, as well as a push for higher enrollments in nursing programs to meet health care needs **Nehring, (2016).**

One of the benefits of patient simulations is that these can be specifically designed for students to demonstrate learning at the application, synthesis and evaluation levels, as well as simulation do not replace the need for learning in the clinical practice setting, but allows the student to develop their assessment, critical thinking and decision making skills in a safe and supportive environment **Kardong-Edgren et al., (2014) &Valler-Jones et al.,** (2013).

Simulation is allow for the assessment and evaluation of the student performance, whereby if the student demonstrates a mistake, inaccurate in preterm infant assessment or slow clinical decision making, premature infant health is not affected and the student has the opportunity to learn from the experience **Ricketts**, (2016)

Magnitude of the study:

Clinical simulation methods are very important and used to achieve specific goals related to learning or evaluation. It allows the student to develop their assessment, critical thinking and decision making skills in safe and supportive environment. Meanwhile. simulation allows the assessment and evaluation of the student performance; student has opportunity to learn from experience. The simulation improves patient safety and help student nurse achieve competence and linking their theoretical knowledge with clinical practice. Because of this, the student should know what training simulation is. This has to be part of the learning process to enable the students to obtain performance, which constantly shifts and changes, without any help from others. This ultimately will increase educational success **Debourgh and Prion (2014) & Billings (2015).**

Aim of the study:

The aim of the study was to evaluate the effect of clinical versus simulation teaching among pediatric nursing students regarding the competency level to care of preterm infants.

Hypothesis of the study:

The studied students who are receiving simulation teaching will have a higher competence level toward care of preterm infants than clinical training.

Subject and methods

Research design:

A quasi- experimental design was utilized in this study to achieve the aim of the study.

Setting:

The study was conducted at Neonatal Intensive Care Units in European, Shifa and Naser Hospitals affiliated to Palestinian Ministry of Health in Gaza Strip.

Type of sample:

A purposive subjects consisting of 95 students were selected from the previously mentioned setting during the academic year 2014-2015. The study sample was divided into two groups, study (48) and control (47). Both groups were subjected to the same routine training experience offered by the study setting, while the simulation training was implemented to study group only. The study group students were divided into subgroups.

Inclusion criteria:

The enrolled students in the 3rd grade during the academic year 2014- 2015 regardless their age, residence.

Exclusion criteria:

Students were irregular academic attendance, as well as the students missing two consecutive sessions of the simulation education techniques.

Tools of data collection:

Data were collected through using the following tools (pre / post):

1- Structured questionnaire tool prepared by the researcher:

It was designed by the researcher after reviewing the related literature. It was written in English language to assess characteristics of students as well as students' knowledge about simulation methods. It was covering the following items:

A- The first part was intended to collect data about the demographic characteristics of the studied students to provide a descriptive data regarding students' age, gender andmarital status.

B- The second part: It was covering the following items:

1- The studied student' knowledge related to preterm infants as definition, etiology, sign and symptoms, complication, and care of preterm infants.

2- The studied student' knowledge related to training by simulation method as definition, types, and characteristics in care of premature infants. The questionnaire was filled by the researcher for each student. Time consumed for completion of each form was around 15-20 minutes according to student's physical and mental readiness.

Scoring System

According to the answers obtained from students, a scoring system was followed. Each question was scored from 1 to 2 degree according to the importance and weighing of its items. The total score for the questionnaire was 100 grades (100%). The studied students' answers were checked using a model key answer and accordingly, their knowledge was categorized into: satisfactory (scored 60% and more) and unsatisfied (scored less than 60%).

3- Observational Checklist:

It adapted from Ebrhim et al., (2006) to assess students in both groups regarding to the competency level to care of preterm infants as measuring axillary temperature, gavage feeding, suctioning, eye care, cord care, intravenous infusion, oxygen therapy, and care of incubator.

Scoring System:

Nursing students' actual practices were assessed individually, every procedure consists of 10 - 13 steps and every item observes for competency level for study group. 150 degrees were allocated for all steps of procedures according to weight of each step; the total practice was divided into two levels: competent level: 85% and more, incompetent level: less than 85%.

Operational Design

Preparatory phase

Tools of data collection were designed, developed and adopted by the

researchers based on the literature of review under supervision of experts in the field of pediatrics nursing. A review of the past, current related literature covering all aspects of simulation training by using available books, journals, articles and magazines was done to be acquainted with the various aspects of research problem, develop the study tools and content of the guiding hand out to implement the simulation method.

The simulation methods were prepared in an English language to meet the studied sample educational needs and to improve their performance. The study tools and guiding hand out were evaluated before its use for its content validity, clarity, comprehensiveness, understanding and applicability by jury of expert consultants. The necessary modifications were done as revealed by the jury then the final from was applied.

Exploratory phase

Pilot study Validity & Reliability

A pilot study was carried out from 10th to 24th of September 2015. The pilot study was including 10% (10 students) of the total sample size (n=105) and the pilot study was excluded from the study sample, 95 students were included in the study. The pilot study was done to ensure clarity, applicability, validity and feasibility of conduction of study tools and time needed for each tool. Based on the findings of the pilot study, necessary modifications and clarifications of some questions were done to have more applicable tools for data collection. Some questions and items were rephrased, deleted and added. Then the final forms were developed.

Field work

- The actual field work was carried out from the 10^{th} day of October 2015 and

completed in the 30th day of April 2016for data collection and implementation of the training simulation method at Faculty of Nursing, Palestine University.

- An announcement was given by the researcher one week prior to the starting date of the simulation training method to allow students to be enrolled in the study.

- The researcher was available 3 days/week (Sunday, Tuesday and Thursday) from 9 o'clock AM to 3 o'clock PM at the previously mentioned study setting; the students were interviewed and assessed in small groups (7 of students) using the study tools.

- The researcher distributed the questionnaire to the students, where the researcher explained the content of the questionnaire this take one week from 1st to 8th October 2015.

- The total number of practical session was 12 sessions, each session about 2 hrs. simulation methods of training were through cooperative training group, and suitable teaching aids were prepared and used including High fidelity technology simulation environments. Sim Baby mannequin, simulation labs, computerdriven programming which requires design, and role play of dynamic clinical scenario, video films. Learning activities were done in students' clinical labs or when the labs of students' doctors are empty.

Implementation of the program

- The implementation of the simulation training methods was carried out to the studied subjects by training on Sim Baby mannequin; it was done to the study group through two months. After pretest the studied subjects in the study group was given training for approximately 2 hrs. in each session then at the end of the sessions the post test was presented to them.

- The researcher applies each procedure in all steps in front of a student's

simulation group on Sim Baby mannequin with focus explanation and taking into account the time required to perform the procedure.

- Every student in the study group was performed the simulation training method for all procedures (measuring axillary temperature, gavage feeding, suctioning, eye care, cord care, diaper care, intravenous infusion, oxygen therapy and care of incubator).

- Then each student in the simulation group applied all procedure alone in the lab on Sim Baby mannequin and any mistake, weakest point was corrected by the researcher, every student need to 4.5 hours for all procedures.

- Then students of simulation group were go to clinical practice field in the assigned Neonatal Intensive Care Unit area of hospitals

- Each student is assessed for each procedure and registered each point on the checklist.

- All the required procedures are evaluated and analyze in simulation group and compare it with the clinical trained by clinical instructor and evaluated by researchers.

- In order to clinical group, the students were assessed individually for all steps of procedures in the clinical training on the premature infants.

Evaluation:

- After implementation of the simulation training method, questionnaire sheet were used for both groups to evaluate the outcomes of the implemented simulation technique, using the same tools pre / post after implementation of the simulation training,

- Students in the clinical teaching group were subjected only to content of the academic program offered by the nursing college without interference from the researcher, after the posttest and the hand out distributed to all students in both control and study groups.

II-Administrative Design:

An official permission was obtained by submission of a formal letter issued from Palestinian Ministry of Health in Gaza strip by written consent, and the Dean of Faculty of Nursing, Ain Shams University to Dean of Palestine College of Nursing to conduct the study in previously selected hospital at NICU. Students participated in the study as a part of their clinical time and then gave consent with regard to whether their data could be used for research purposes.

Ethical consideration

Written and oral approval was obtained from the students before inclusion in the study after clear explanation of the study objectives, data collection processes, tools and expected out comes. They were ensured about their right to withdraw from the study at any time.

Subjects who agreed to participate in the study were assured that all the data collected will be kept confidential and reported as group data. Subjects' names were not attached to the data. A code number was used in the questionnaire instead.

Being fair and avoid causing any harm among the studied students of the control group as well as the study group was considered. All benefits of the simulation technique were allowed to the studied subjects of the control group as well as the study group after completion of the posttest

Statistical Design

The collected data were organized, categorized, revised, coded, tabulated and introduced to a PC using Statistical Package for Social Sciences (SPSS 20.0 for windows; SPSS Inc., Chicago, IL, 2001).). Data were presented and suitable analysis was done according to the type of data obtained for each parameter. The following statistical techniques were used:

A - Descriptive Statistics:

- Mean, Standard deviation $\overline{(X \pm SD)}$ and range for parametric numerical data.

- Frequency and percentage of non-numerical data.

B- Analytical Statistics:

- Chi square test was used to examine the relationship between two qualitative variables.

C- P-value: Level of significance of result can be described as follow:

- Non significant (NS) difference obtained at $P{>}0.05$

- Significant (S) difference obtained at P<0.05

- Highly significant (HS) difference obtained at P<0.01

Results:

Students' characteristics	Study (n:	7 group = 48)	Control group (n= 47)		
	No.	%	No.	%	
Age/years					
19 <21	45	93.75	40	85.1	
21<23	2	4.2	5	10.6	
23≤25	1	2.05	2	4.3	
Mean±SD	21.	52 ± 1.4	20.1±1.7		
Gender					
Male	12	25.0	10	21.3	
Female	36	75.0	37	78.7	
Marital status					
Single	44	91.6	42	89.4	
Married	4	8.4	5	10.6	

Table (1): Distribution of studied students according to their socio demographic characteristics (n=9)

Table (1): showed that, the mean age of students was 21.25 ± 1.4 years and 20.1 ± 1.7 for study and control groups respectively. Whereas the majority (91.6%, 89.4%) of the studied students were single in both study and control groups respectively. According to gender it found that near to the majority (75%, 78.7%) of the studied students was female.

Figure (1): Distribution of studied students as regards to their Total Knowledge about Care of Premature Infants (n=95)



Figure (1): shows that the majority of studied students 85.26% had satisfactory knowledge about care of preterm infant, know the definition of preterm as infant born before 37 weeks, placental abnormalities is a causes of premature birth. Preterm infants were more

common among mothers who aged <20 years and >35 years. Also, reported that the preterm infants loses heat by the mechanism of evaporation, the normal range of axillary temperature of preterm infant is ranged 36.5 to 37.5 c. also, declared that preterm infant were prone to develop hypothermia due to large surface area, the studied students reported that delay of growth and development of preterm infant lead to long term complication and respiratory distress syndrome is caused by a lack of surfactant. Also, the studied students reported that the immature liver of the preterm infants were contributing to jaundice.

Figure (2): Distribution of studied students as regards to methods of used in training (n=95)



Figure (2): illustrated that, more than third 37.89% of studied student used simulation method during training, near to half of them 43.16% using traditional clinical methods in training, while 16.84 & 2.11 of them using round and role play methods respectively in training.

Table (2): Distribution of the studied students regards to their knowledge about preterm training simulation in skills laboratories .

	Total no=95								
Itoms	Ŋ	Yes		No	Chi-square test				
itellis	No.	%	N 0.	%	χ^2	p- value			
The simulation provides the feedback through training in preterm infants care	83	87.37	12	12.63	54.87	<0.001			
Helping the student to improve clinical training on Sim. baby for caring preterm	93	97.89	2	2.11	55.28 1	<0.001			
More safe, supportive, active learning experience than clinical training	83	87.37	12	12.63	54.87	<0.001			
Gives the students more self- confidence before clinical fields.	70	73.68	25	26.32	48.32 5	<0.001			
Decrease anxiety for students than clinical training in premature care	83	87.37	12	12.63	54.87	<0.001			
The simulation is a complex way for clinical training	10	0.53	85	89.47	4.9	0.08			

Table (2): shows that 87.37%, 97.89%, 87.37%, 73.68% and 87.37% of studied nursing students reported that simulation in skill lab has Sim.baby was provide the student

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feedback, helping the student to improve clinical training, more safe, more self- confidence, decrease anxiety in clinical fields than clinical training respectively, while 89.47% of them declared that simulation is a not a complex way for clinical training.

 Table (3) :Distribution of Simulation versus Clinical training groups as regards to their practice to ward care of premature infants post implementation.

Items	Clinical group (n= 47)		Simulation group (n= 48)		Chi- square test	
	No.	%	No.	%	χ²	p- value
Eye care						
Competent	0	0.0	25	52.1	33.222	< 0.001*
Incompetent	47	100	23	47.9		
Umbilical cord care Competent Incompetent	10 37	21.3 78.7	46 2	95.8 4.2	54.549	<0.001*
Diaper care Competent Incompetent	4 43	8.5 91.5	39 9	81.3 18.7	50.714	<0.001*
Care of incubator Competent Incompetent	13 34	27.7 72.3	36 12	75.0 25.0	21.309	<0.001*
Measuring axillary temperature Competent Incompetent	5 42	10.6 89.4	38 10	79.2 20.8	45.012	<0.001*
Gavage feeding Competent Incompetent	3 44	6.4 93.6	33 15	68.8 31.2	39.248	<0.001*
Insertion IV infusion Competent Incompetent	2 45	4.3 95.7	35 13	72.9 27.1	47.082	<0.001*

Table (3): illustrated that, statistically significant difference between simulation group and clinical group regarding eye care, umbilical cord care, diaper care, incubator care, measuring of axillary temperature, gavage feeding, and insertion of intravenous as χ^2 33.2, 54.5, 50.7, 21.3, 45.0, 39.2 & 47.0 respectively at p level <0.001.

Items	Total no=95								
	Clinical group (n=47)		Simulat (n	tion group =48)	Chi- square				
	No.	%	No.	%	χ^2	%			
Competent > 85%	5	10.6	42	87.5	56.123	< 0.001			
Incompetent <85%	42	89.4	6	12.5					

 Table (4): Distribution of studied students as regards to their total practice regarding the care of premature infants post implementation.

Table (4): clarified that, there was statistically significant difference with (P=<0.001) between clinical group and simulation group regarding total students practice of caring preterm infant, where 87.5% of study nursing students in simulation group had a higher competency level of practice, while, 89.4% of the study nursing students in clinical group had incompetent level of practice regarding the care of premature infants.

Table (5): Relationship between total knowledge regarding prematurity among studied students and their level of competency post implementation (n=95)

Total knowledge of preterm infants	Competency										
	С	linical gr	oup (n=4'	7)	Simulation group (n=48)						
	Compe	etent	Incor	npetent	Com	petent	Incompetent				
	No	%	No	%	No	%	No	%			
Satisfactory> 60	4	9.5	38	90.5	38	97.4	1	2.6			
Unsatisfactory<60	1	20.0	4	80.0	4	44.4	5	55.6			
Chi- square test	6.173										
P-value	0.033*										

Statistical significant difference p < 0.05%

Table (5): clarified that, there was a statistically significant difference with (P=0.033) between studied students' clinical and simulation groups regarding their total knowledge of prematurity and competency. Where, 9.5% were competent in clinical group compared to 97.4% were competent in satisfactory of total knowledge of preterm infants. Meanwhile, 20.0% were competent in clinical group compared to 44% of them were competent in the simulation group in unsatisfactory total knowledge of premature infant care.

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	Competency										
T (11 1 1	Clinical group (n=47)				Simulation group (n=48)						
Total knowledge	Competent Incompetent		Competent		Incompetent						
	No	%	No	%	No	%	No	%			
Satisfactory>60	5	13.2	33	90.5	32	94.1	2	5.9			
Unsatisfactory<60	0	0.0	9	100.0	10	71.4	4	28.6			
Chi square	5.420										
p- value	0.043*										

Table (6): Relation between total knowledge regarding simulation for clinical & simulation groups and their level of competency post implementation (n=95).

Statistical significant difference p< 0.05%

Table (6): shows there was a statistically significant difference with (P=0.043) between studied students' knowledge and their practice either in clinical or simulation groups regarding their total knowledge of simulation. Where, 13.2% were competent in clinical group compared to 94.1% were competent in satisfactory of total knowledge of simulation. Meanwhile, all students were incompetent in clinical group compared to 28.6% were incompetent in the simulation group in the unsatisfactory total knowledge of simulation.

Discussion:

Simulation is considered an effective solution to replace some real life clinical exposure hour as nursing and other health professional' programs are facing challenges of inadequate clinical learning opportunities. Nursing and other health professionals are increasingly using simulation as a strategy and a tool for teaching and learning at all levels that need clinical training (Miller, 2014& Hayden et al., 2014). The present study aimed to evaluate the effect of clinical versus simulation teaching among pediatric nursing students regarding competency level to care of preterm infants.

Regarding the socio-demographic characteristics of student's age, gender and

marital status, it was found that, the majority of studied students were aged between 19 to less than 21 years, the mean age of students was 21.25±1.4 years and $20.1\pm$ 1.7 for study and control groups respectively, the majority of them were female in both groups. Meanwhile, the majority of studied students were single. This finding was in agreement with a study done bv Medine. Gulpinar. and which Elizabeth. (2016),entitled "Undergraduate Nursing Students' Perception of Obstetric Skills following High- Fidelity Simulation Experience" in United State of America who found that, the mean age of the students included in the research sample was 21.09 ± 2.62 years, the majority of them were female. In relation to marital status of studied sample, it was found that, the majority of them (88.6%) were single while the minorities of them (11.4) were married. This result could be due to that, it was important for students to be enrolled at nursing faculties; they should single consent to ensure they won't marry throughout their years of studying.

The findings of the present study revealed that, most of the study nursing student had satisfactory total knowledge about care of premature infants. This might due to the interest in pediatric course especially the neonatology by giving them more credit hours consistent with the course, as well as the presence of specialized lectures with scientific and practical experience that help students to understand the course and attention to the various methods of teaching course presentation and used of appropriate tools, the study finding was in an accordance to the results of Almoul, and Kambal, (2016), the study which entitled "Pediatric nurses knowledge and practices regarding nursing management of premature infants in neonatal intensive care unit" at Soba University Hospital, Khartoum State, Sudan who reported that the majority of nurses were knowledgeable about the care preterm infants. Meanwhile, this finding was incongruent with Zubaida, (2015), who carried out study entitled "Assessment nurse's knowledge and of practice regarding care of premature baby in neonatal intensive care unit at Omdurman Maternity Hospital and Alribat University" and reported that less than half of nurses students' knowledge regarding care of premature infant was poor.

The finding of the current study revealed that, more than two thirds of the studied nursing students had an opportunity to use simulation before going to clinical field and answered that simulation is the method used in training, while near to half of them use traditional clinical training, but rarely using round and role play. This result was due to presence of laboratories in the college equipped with tools, dolls and qualified clinical instructors to be trained of nursing students before going out to practice in hospitals. This finding was supported with AlFozan, et al (2015), who carried out a study entitled "Designing, Implementing and Evaluating Preclinical Simulation Lab for Maternity Nursing Course" in King Saud bin Abdul-Aziz University, Riyadh and found that simulation has a great capacity to augment the preparation of students for clinical practice and for the development of clinical judgment and provides opportunity for beginning nursing students to rehearse infants care experiences and develop confidence in nursing skills.

The result of the present study clarified that, the great majority of studied nursing students had satisfactory answered that simulation was helping them to improve clinical training, this might be due to training with simulation method gave students self-confidence through training feedback and explanation to avoid mistakes and clarity the weaknesses points in clinical fields. This finding was accordance with **Cant, and Cooper,(2010)**, who carried out a study, entitled "Simulation based learning in nurse education" in Australia and found that the majority of

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students were improved in clinical skills after simulation. Meanwhile, this finding was supported with Agha, Alhamrani, and Khan (2015), who carried out a study entitled "Nursing students' perceptions of satisfaction and self- confidence with clinical simulation experience: in King Saud bin Abdul-Aziz University for health sciences, Saudi Arabia, found that the great majority of participants was satisfied with simulation education that gave them safe, effective, interactive, interesting, efficient, modern way of nursing education and indicated high satisfaction and enables them to improve and retain knowledge by recognize perform necessary tasks in a clinical practice.

The finding of the current study revealed that, there was a statistical significant difference between the simulation group and clinical group regarding to their practice of preterm finding infants. This confirms that procedures was easy, understood, accepted and safe method, when students first trained on simulation. This finding was supported with Gallina, et al., (2016), which carried out a study entitled "Care of premature after the first day from birth" in a Northeastern Italian Hospital, and found that, there were significant difference between simulation and clinical group in prematurity care. In the same line these results were supported with Qiaoya, et al., (2016), the study which entitled" Novel visual nasogastric preterm feeding: feasibility and efficiency study in a manikin" in China who reported that the simulation group was significantly more than clinical group in feeding of preterm infant and showed that simulation group was more efficient and safer than clinical group. As regard to the relation between the studied nursing simulation group versus clinical training group and their total practice of caring for preterm infants, the finding of the current study revealed that there is a statistical significant difference between both groups. This may due to using and encouraging simulation teaching method in the lab by training the students before clinical training in the field. This result is in accordance with Ferguson, (2013), who carried out study entitled "Training clinical judgment skills for interpreting feeding behavior in preterm infants: A comparison of video and in vivo simulation" in USA and found that the majority of study simulation training was more effective than traditional methods for students training. Meanwhile, the results supported with Medine, Gulpinar, (2016), who carried out a study entitled "Undergraduate nursing students' perceptions of obstetric skills following High-Fidelity Simulation Experience" in USA and reported that the majority of students has learning opportunities through simulation practice application and students were satisfied with performing application with simulation.

As regard to the relation between the studied nursing simulation group versus clinical group and their total practice, this finding revealed that there was a highly statistical significant difference between the simulation group and clinical group regarding total practice of caring for premature infants. This may due to using and encouraging simulation teaching method in the lab by training the students to care of premature infants before clinical training in the field. This result is in accordance with Ferguson, (2013), who carried out a study entitled "Training clinical judgment skills for interpreting feeding behavior in preterm infants: A comparison of video and in vivo simulation" in East Tennessee State University USA and found that the majority of study simulation training was more effective than traditional method for students training. Meanwhile, the results was supported with Medline, Gulpinar, and Elizabeth, (2016), who carried out a study entitled "Undergraduate nursing students perceptions of obstetric skills High Fidelity simulation following experience" in United State University and reported that the majority of students has learning opportunities through simulation practice application and students were satisfied with performing application with the simulation.

It was clear from the current study finding that, there was a statistical difference between significant total practice of simulation and clinical groups and their level of competency. This might due to the result of intensive lecture on the course of pediatric and neonatology, and use different ways to get updated knowledge about care of preterm infants and participation in workshops, conferences and new research. These finding were supported with Al Hadidi, and Suleiman, (2012), who carried out a entitled "Comparison study between clinical simulation and traditional teaching for cardiopulmonary knowledge and skills"

in faculty of nursing Amman, Jordon and found that the majority of nursing students showed significant difference between the participants of the High Fidelity simulator training group and the participants of the traditional training group to measure the effects of training session supported by simulation on the retention of knowledge and skills of nursing students.

It was clear from the current study finding that, there was a statistical significant difference between total knowledge simulation group and clinical group regarding their level of competency. This might due to the result of the clinical training for students in special laboratories and used of simulation as an effective way to care for preterm infants before training in NICU and experience of clinical instructors in neonates that help to obtain high efficiency in the care of preterm infants. This finding were supported with Lo et al., (2015), who carried out a study entitled "BSN students' perception of satisfaction and self-confidence after an Experience" in Ohio, USA and reported that, the students in study group had great knowledge after high fidelity simulation versus traditional students control group. This results provide evidence to support an effective simulation teaching strategy that helps to improve student' knowledge and practice of preterm infant in applying clinical skills and provides nurses opportunity to provide students experiences in the care of preterm infants. These results simulation reflect that the method technique had a positive impact on the studied students' skills and practice regarding simulation in care of preterm infants at NICU.

Conclusion

Based on results of the current study, it can be concluded that studied student who has receiving simulation teaching had a competency level related to practice toward care of premature infants. Therefore, the result ensures that using simulation as a strategy for clinical teaching improves study nursing student practice for caring of premature infants.

Recommendation

According to the result of the current study, the following recommendations are suggested:

- Further and future researches to learn the importance of using simulation methods in different nursing specialties and the possibility of generalization to all universities.

- Teach simulation as strategy in nursing clinical training and planning neonatal simulation training courses for pediatric nursing students who are in close contact with premature infants.

- Create an integrated program for students including basic skills in how to use the technique of simulation methods

- Implement the simulation methods of guidance and counseling that help students to develop their nursing care.

- Preparation of advanced nursing skills lab tools to teach students simulation methods.

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