

EFFECT OF HIGH FIDELITY SIMULATION ON STUDENTS' KNOWLEDGE OF OBSTETRICS EMERGENCIES, CONFIDENCE AND SATISFACTION AT FACULTY OF NURSING PORT SAID UNIVERSITY

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ABSTRACT

Background: Simulation is constantly being used by nurses and other health practitioners as a method for teaching and learning at all stages of clinical training. **Aim:** Assess the effect of high fidelity simulation on students' knowledge of obstetrics emergencies, confidence and satisfaction at faculty of nursing Port Said University. **Subjects and method: Design:** A quasi-experimental research design was used. **Setting:** Clinical obstetric laboratory skills, Faculty of nursing Port Said University, Port Said governorate, Egypt. **subjects:** All students in third year (120 students) who completed their maternity nursing courses of the academic year 2019-2020. **Tools:** A structured interviewing questionnaire, NursOB scale and satisfaction likert scale were used. **Results:** Statistically significant improvement were revealed in all areas of tested knowledge regarding clinical simulation and different obstetrical and gynecological emergencies at the post ($P=.005$) and follow-up phases ($P=.000$). Also, statistically significant improvement in confidence level were revealed at the post (92.60%) and follow-up phases (52.80%). Mean score of student nurses satisfaction 4.60 ± 0.487 about high fidelity simulation training program compared to 3.88 ± 0.63 at pre programme phase. In addition, statistically significant positive correlation between total satisfaction, knowledge and confidence level ($P =.010$). **Conclusion:** High-fidelity simulation is an important teaching method that allow nursing students to acquire the needed clinical knowledge, confidence level as well as satisfaction that allow them to apply management of obstetric emergencies. **Recommendations:** To ensure safety in management of various obstetric emergencies, more high-fidelity simulation should be used instead of traditional clinical practice in the nursing student's educational curriculum.

Keywords: High fidelity; Simulation; Nursing Students; knowledge; Confidence; Satisfaction.

INTRODUCTION

The challenge for nursing education is to prepare graduates to deal with the challenges of today's health-care setting as a result of inadequate training. New nurses must be able to care for women in a fast-paced setting that stresses clinical competence and precise, timely decision-making skills as soon as they graduate (Buerhaus, Skinner, Auerbach & Staiger, 2017).

In the nursing curriculum, simulation has been identified as an important teaching technique that affects learning, competency development, self-confidence, and protection. It's a scenario designed to reflect clinical practice in real-world environments and help learners reach the clinical setting better prepared (Eyikara & Baykara, 2017). It can be used to teach clinical skills, as well as theory and assessment. It often emphasizes the application of knowledge, skills, and critical thinking. In nursing education, simulation is regarded as an immersive teaching-learning tool that allows students to practise their clinical skills over and over till their skills improve (Abelsson & Bisholt, 2017).

Learners may use simulation to develop their cognitive, affective, and psychomotor skills when working through different clinical scenarios in a protective and supportive setting (Fong, 2013). Students may apply their theoretical knowledge, learn from their errors without harmful action to the patients, learn from their peers, and bridge the gap between knowledge and clinical practise using simulation methods (Onello & Regan, 2013). In addition, simulation using high fidelity simulation (HFS) techniques entails creating a convincing real-world environment that includes a sophisticated mannequin, software, and real-world medical equipment and staff to approximate real-world conditions and imitate clinical settings (Tuoriniemi & Schott-Baed, 2008). They can be programmed to generate a variety of critical case scenarios to which the student must competently react while evaluating vital functions such as heart rate and rhythm, respiratory rate, oxygen saturation, blood pressure, lung sounds, and body temperature. This pedagogical gold standard allows students to learn advanced clinical skills in virtual reality before applying them in a real-world environment (Shrestha, 2016).

Moreover, simulation in nursing education boosts nursing students' optimism before they treat real patients. Furthermore, for a good simulation programme,

students must have a positive attitude (Magnetico, 2017). In a simulation-based analysis, Hurst (2015) centered on nursing students' impressions of selected aspects of HFS on students' self-confidence and satisfaction. Satisfaction is a feeling of pleasure that comes from achieving one's goals. It refers to satisfaction with learning through scenarios in the setting of simulation. Furthermore, it is linked to higher levels of participation and motivation in the teaching and learning process, as motivated students learn more and better (Baptista, Martins, Pereira & Mazzo, 2014). Self-confidence is the belief in one's own ability to make sound decisions and perform well. 10 Putting a premium on performance has been linked to a smoother transition from theoretical understanding to clinical practice (Jeffries, 2018).

The most important relationship discovered was between students' academic year (sophomore and senior students). Students thought HFS was a successful teaching strategy, which gave them a sense of great satisfaction and self-confidence. On the same area, simulation increased nursing students' satisfaction and self-confidence in their clinical practises among 117 nursing students participating in a nursing programme that included 30% clinical simulation (Omer's, 2016).

Preventable errors in health care continue to be a major source of concern, resulting in increased accountability for nurses and other health care practitioners in terms of patient safety and quality of care. The competency of the obstetric (OB) nurses is often linked to the mismanagement of OB emergencies. OB emergencies are pregnancy-related complications that can endanger the lives of both the mother and the baby during pregnancy, labour, and delivery (Fransen, Banga, van de Ven, Mol, & Oei, 2015). Also, OB emergencies are stressful, unpredictable, and may present an ethical problem, necessitating quick decisions that can put staff's skills and experience to the test (Fransen et al., 2015).

The problem of obstetrical emergency mismanagement is a global concern. The most common cause of adverse events affecting the management of these emergencies was identified as insufficient staff training, especially among newly trained nurses (Ameh and van den Broek, 2015; Fransen et al., 2015). Obstetric emergencies can be predicted based on certain risk factors before they become life-threatening. The rarity of life-threatening situations makes it difficult to prepare nursing staff to recognize and appropriately manage them (Osman, H., Campbell,

O.M.R., & Nassar, A.H. ,2009). Therefore, high fidelity simulation practice should become an essential part of the education of nursing students to enhance their knowledge, clinical skill confidence, satisfaction regarding obstetrics emergencies and prepare them well to work in clinical environment.

Significance of the study

In both routine and emergency scenarios, the emergency obstetrics nurse is responsible for providing safe and effective care. Although various factors in health care may impede a nurse's ability to give treatment when faced with an obstetrical emergency, this does not eliminate the nurse's affirmative obligation to take positive action when issues arise; As a result, enhancing maternity care is a global priority, and obstetrical emergency education could be part of the solution (WHO, 2015).

And based on that, simulation practice has become an important pedagogical method in nursing education as a result of problems in healthcare such as growing concern about patient acuity, patient safety, and clinical site shortages (Kim & Kim, 2015). Students should be use high-fidelity simulation to apply theoretical knowledge learned in classes, learn from mistakes without endangering patients, and bridge knowledge and practise gaps (Abelsson & Bisholt, 2017). Moreover, HFS aids in the acquisition of specialized knowledge and skills that increase patient care quality and can be improved and synthesized by immersive replicated scenarios (Salameh & Salameh, 2017). Meanwhile, many students still report feeling unprepared to deal with the challenges of working in the emergency health-care area. Therefore this study sought to assess the effect of high fidelity simulation on students' knowledge of obstetrics emergencies, confidence and satisfaction at faculty of nursing Port Said University.

AIM OF THE STUDY

Assess the effect of high fidelity simulation on students' knowledge of obstetrics emergencies, confidence and satisfaction at faculty of nursing Port Said University

Objectives of the study

1. Assess the nursing student's level of knowledge regarding obstetric emergencies with high fidelity simulation training?
2. Assess the nursing student's level of confidence regarding obstetric emergencies with high fidelity simulation training?
3. Assess the nursing student's level of satisfaction regarding obstetric emergencies with high fidelity simulation training?
4. Designing and implement obstetric emergencies booklet with high fidelity simulation training?
5. Evaluate the effect of obstetric emergencies booklet with high fidelity simulation training?
6. Discover the interrelationships between knowledge, confidence and satisfaction of nursing students?

Research Hypothesis

- High fidelity simulation training program has a positive effect on improving undergraduate nursing students' knowledge, confidence level and satisfaction regarding obstetrics emergencies.
- There are positive interrelationships between knowledge, confidence level and satisfaction of nursing students.

SUBJECTS AND METHOD***Deign:***

- A quasi-experimental one-group (pre-post test) research design was used.

Setting:

The study was conducted at clinical obstetric laboratory skills for third year students in Faculty of Nursing, Port Said University, in Port Said-City, Egypt.

Sample & Sampling Technique:

Convenient sample was included to all students in third year (120 students) who completed their maternity nursing courses of the academic year 2019-2020.

Tools of data collection:

Three tools were used for this research; **the first tool** was a structured interviewing questionnaire form (pre& post course knowledge assessment): It was adapted from Abdelhakm & Said (2017) in English language and modified by researcher to assess obstetric/perinatal nursing students' knowledge in dealing with five high-risk obstetric emergencies. It used at pre, post and follow up and includes three parts:

Part 1: Personal characteristics of the study nurses: included (age, gender, grade point average (GPA), previous training program).

Part 2: Assessment knowledge of student about clinical simulation and includes data about: simulation as simulation based learning experience, simulation briefing, simulation scenario, fidelity in simulation, simulation debriefing, formative assessment, summative evaluation, human patient simulators, simulation facilitation methods, simulation facilitator, simulation cues and maintaining professional integrity during simulation based experience.

Part 3: Assessment knowledge of student about five most common obstetric emergencies as: shoulder dystocia (definition, causes, complications and management), obstetrical haemorrhage (definition, types, etiology, diagnosis and management), operative delivery (definition, causes, stages, diagnosis and management), oxytocin treatment (action, indications, contraindications, complications and method of administration), and pregnancy-induced hypertension (definition, incidence, etiology, pathophysiology, classifications, diagnosis and management).

Scoring system

The questions were graded as follows: a score of (1) was given for a correct response, and a score of (0) was given for an incorrect response. The item scores were added together, and the total was divided by the number of items, yielding a mean score for the component. The mean and standard deviations of these scores were calculated, as well as their conversion into a % score. Total knowledge scores of more than 60% were considered sufficient, while scores of less than 60% were considered insufficient.

The second tool was NursOB scale was adopted from Farrar Highfield, Scharf-Swaller & Chu (2017) in English language and modified by researcher to assess

obstetric/perinatal nursing students' confidence in dealing with five high-risk obstetric emergencies (shoulder dystocia, obstetrical haemorrhage, operative delivery, oxytocin treatment, pregnancy-induced hypertension). On a scale of 0 to 10, student were asked to rate their confidence in coping with each of the five most common obstetric emergencies.

Scoring system

The five confidence items were totaled for two subscale scores ranging from 0 to 50 after each item on the scale was scored. Higher scores indicated that the participants believed they had more confidence. The item scores were added together, and the total was divided by the number of items, yielding a mean score for the component. The mean and standard deviations of these scores were calculated, as well as their conversion into a % score. Confidence was regarded satisfactory if the percent score was 60% or higher, and unsatisfactory if the percent score was less than 60%.

The third tool was satisfaction likert scale questionnaire developed by **Turatsinze, Willson, Sessions & Cartledge (2020)** in English language and modified by researcher. It consists of seven elements that were used to assess student satisfaction about simulation training program as (improve knowledge and understanding, provide constructive feedback, provide peers evaluation during the simulation, improve self-analyses, behavior and actions, improve specific tasks and skills, the scenario resembled a real-life situation and the simulation provide with learning materials and activities to promote future learning).

Scoring system

The students' level of agreement with each object was measured on a five-point scale (i.e., 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, 5-strongly agree). The mean and standard deviations were calculated after the scores were converted to a percent score. students' level of agreement was regarded satisfactory if the percent score was 60% or higher, and unsatisfactory if the percent score was less than 60%.

Validity: A panel of seven experts in the fields of obstetrics and gynaecological nursing reviewed the resources to determine their content, and changes were made as needed based on their findings.

Reliability: As shown by the high reliability of the instruments used, Cronbach's Alpha Coefficient Test revealed $r = 0.812$ for knowledge, $r = 0.842$ for confidence level, $r = 0.808$ for satisfaction, and the alpha coefficient was 0.901 for overall scale.

Field work:

Permission was first acquired from the dean of the nursing faculty at Port Said University, and then oral agreement was gained from the students who took part in the study. Assessment, planning, implementation, and evaluation were the four phases of data gathering.

Assessment phase

The researchers combed through various related literatures and created a study questionnaire for pre-test evaluation. The assessment data serve as the foundation for the program's creation. The subject materials were arranged according to the sequence in which they were required. Text books, papers, and scientific journals were used to conduct a review of national and internationally related literature for the present research.

Planning phase

After deciding the program's goals, the material was chosen after conducting extensive research on simulation and obstetric emergencies. A **pilot study** was performed on **ten** student nurses (10%) to determine the effectiveness of the tools and the time taken to implement them. Simple changes to some items in the interview questionnaire and observation sheet are all that is needed.

Nursing intervention booklet

A simulation training program booklet which includes data about:- clinical simulation as general objectives, simulation based learning experience, simulation briefing, simulation scenario, fidelity in simulation, simulation debriefing, formative assessment, summative evaluation, human patient simulators, simulation facilitation methods, simulation facilitator, simulation cues and maintaining professional integrity during simulation based experience. Also, five most common obstetric emergencies as: shoulder dystocia (definition, causes, complications, management, equipment and

procedure), obstetrical haemorrhage (definition, types, etiology, diagnosis, management, equipment and procedure), operative delivery (definition, causes, stages, diagnosis, management, equipment and procedure), oxytocin treatment (action, indications, contraindications, complications, method of administration, equipment and procedure), and pregnancy-induced hypertension (definition, incidence, etiology, pathophysiology, classifications, diagnosis, management equipment and procedure). In addition to examples, and scenario of an obstetric emergency that was developed and submitted to the study group. A systematic search of the literature is then conducted. In developing recommendations, the likely benefits, barriers, inconvenience and costs must be considered in addition to addressing students' underlying values and preferences.

Implementation of the intervention phase

The research was conducted at the previously listed place from the first of October 2019 to the end of March 2020. Following the pretest, the intent of the study was explained to the participants after obtaining written permission from the nursing faculty (Port Said University). The researcher conducted face-to-face interviews with all study participants to illustrate the study's intent. The study's completion is entirely voluntary, according to the student nurses. Then, the researcher divided the participants into ten classes and distributed subject materials to each group, which included a curriculum outlines, reading material covering knowledge content, and skills check lists to be used during the programme to determine individual skills and anticipated learning outcomes. The training program covered the 5 priority obstetric emergencies separately across six training days from 9am to 11 pm. Each day contain four sessions. The first and second session involves theoretical part of each obstetrics emergency. Third session included application of skills and fourth session included revision that was achieved following a brief demonstration on how to handle the scenario by the simulation facilitator. To improve students' nursing skills and promote critical thought, the simulation mannequin was pre-programmed with the assigned scenario. If the scenario started, the participants were in responsibility of assessing, observing, and recognizing the patient's condition, as well as intervening. The time of each session was about 30 minutes. First day training involved welcoming, briefing on the program learning objectives, used simulator, related equipment and knowledge about clinical simulation. Second day training included knowledge and skills about

oxytocin management. Third day training included knowledge and skills about operative vaginal delivery. Fourth day training involved knowledge and skills about obstetric hemorrhage. Fifth day training included knowledge and skills about shoulder dystocia. Six day training included knowledge and skills about pregnancy induced hypertension.

Evaluation and follow up phase

After engaging in each scenario, participants were given a post-test evaluation of their knowledge, confidence, and satisfaction. Each participant was also given a two-month follow-up evaluation of their knowledge and confidence level.

Ethical Considerations :

Approval letter from the dean of the faculty will be taken for permission to do the study. Then, after explaining the study's purpose, qualified students gave their oral consent; they were told that participation was completely voluntary. Furthermore, the questionnaire was distributed anonymously, and students were told that all information would be kept confidential and used solely for research purposes and will maintain their privacy. They were also informed that they had the right to withdraw from the study at any time without any justification.

Data Analysis:

The information gathered was tabulated, and the findings were statistically evaluated with appropriate tests. The statistical software Statistical Package of Social Science (SPSS), version 20, was used to analyze the data. Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Percentage, mean values, and standard deviation were the metrics used. Quantitative data were expressed as means \pm SD and qualitative data were expressed as numbers and percentages. To determine the relationship between the dependent and independent variables, the correlation coefficient was determined. The level of significance was set at $p < 0.05$. Furthermore, each Likert scale item was analyzed and represented using means before being combined to form total section scores that were weighted out of 100 to provide significance.

RESULTS:

Table (1): shows distribution of nursing student according to their personal characteristics. It's evident that their age ranges from 20-21 with the highest percentage (59%) more than 21years old. About more than two third of nursing student (69.2%) was female compared to about one third of nursing student was male. Great majority of nursing student (82.5%) had 2-3.6 GPA, 15.8% had >3.6 GPA and the least percentage (1.7%) had <2 GPA.

Table (2): displays the distribution of student nurses based on their clinical simulation knowledge. In all areas of tested expertise, statistically relevant improvements were seen at the post ($P=.000$) and follow-up phases ($P=.011$). While all areas of expertise showed some decrease during the follow-up period, they were still statistically significant higher than the baseline.

Table (3): illustrates distribution of the student nurses according to their knowledge about different OB/ GYN emergencies. In all areas of tested knowledge, statistically relevant improvements were seen at the post ($P=.005$) and follow-up phases ($P=.000$). Despite the fact that all areas of knowledge showed some decline during the follow-up period, there were still statistically significant higher than the pre- program levels.

Figure (1): illustrates distribution of the student nurses according to their total knowledge about clinical simulation course training. It's evident that statistically significant improvement were revealed in all area of tested knowledge regarding clinical simulation and different OB/ GYN emergencies at the post (90% & 90.70% respectively) and follow-up phase (57.9% & 59.30% respectively). While all areas of knowledge showed some decrease during the follow-up period, they were still statistically significant higher than the baseline.

Table (4): illustrates distribution of the student nurses according to their confidence level in different OB/ GYN emergencies. In all areas of confidence level, statistically significant improvements were observed at the post ($P=.551$) and follow-up phases ($P=.000$). Despite the fact that all areas of confidence level showed some deterioration during the follow-up stage, they were still statistically significant higher than the pre- program stage.

Figure (2): shows distribution of the student nurses according to their total confidence level in different OB/GYN emergencies. It's evident that statistically significant improvement in confidence level were revealed at the post (92.60%) and follow-up phases (52.80%). Even though all areas of confidence showed some decrease during the follow-up period, they were still statistically significant higher than pre-program levels.

Table (5): Illustrated distribution of the student nurses according to their satisfaction pre and post-simulation training program. All of the student nurses were satisfied after their learning from the high fidelity simulation training programme with a mean 4.60 ± 0.487 compared to a mean of pre programme baseline 3.88 ± 0.63 and there is statistically significant improvement ($P=0.0002$).

Table (6): presents correlations coefficient between of satisfaction, knowledge and confidence level of nursing student. The results indicated that total satisfaction, total knowledge and total confidence had a statistically significant positive association ($P =.010$), according to the findings.

Table 1: Distribution of the nursing students according to their personal characteristics (n=120)

Personal characteristics	No.	%
Age (years)		
≤ 20	49	41
>21	71	59
Gender		
Female	83	69.2
Male	37	30.8
Grade point average (GPA)		
<2	2	1.7
2-3	99	82.5
>3.6	19	15.8

Table (2): Distribution of the student nurses according to their knowledge about clinical simulation throughout the training phases (N=120)

Simulators Variables		Pre-simulated training (N=120)		Post-simulated training (N=120)		2 months Follow up (N=120)		P-value 1	P-value 2
		No.	%	No.	%	No.	%		
Simulation based learning experience	Correct	54	45%	116	96.7%	74	61.7%	.000*	.011*
	Incorrect	66	55%	4	3.3%	46	38.3%		
Simulation briefing	Correct	28	23.3%	108	90%	66	55%	.000*	.011*
	Incorrect	92	76.7%	12	10%	54	45%		
Simulation scenario	Correct	32	26.7%	116	96.7%	46	38.3%	.000*	.011*
	Incorrect	88	73.3%	4	3.3%	74	61.7%		
Fidelity in simulation	Correct	40	33.3%	108	90%	71	59.2%	.000*	.011*
	Incorrect	80	66.7%	12	10%	49	40.8%		
Simulation debriefing	Correct	60	50%	108	90%	66	55%	.000*	.011*
	Incorrect	60	50%	12	10%	54	45%		
Formative assessment	Correct	58	48.3%	105	87.5%	71	59.2%	.000*	.011*
	Incorrect	62	51.7%	15	12.5%	49	40.8%		
Summative evaluation	Correct	71	59.2%	105	87.5%	84	70%	.000*	.011*
	Incorrect	49	40.8%	15	12.5%	36	30%		
Human patient simulators	Correct	50	41.7%	116	96.7%	74	61.7%	.000*	.011*
	Incorrect	70	58.3%	4	3.3%	46	38.3%		
Simulation facilitation methods	Correct	49	40.8%	108	90%	80	66.7%	.000*	.011*
	Incorrect	71	59.2%	12	10%	40	33.3%		
Simulation facilitator	Correct	60	50%	108	90%	74	61.7%	.000*	.011*
	Incorrect	60	50%	12	10%	46	38.3%		
Simulation cues	Correct	44	36.7%	105	87.5%	54	45%	.000*	.011*
	Incorrect	76	63.3%	15	12.5%	66	55%		
Maintaining professional integrity during simulation based experience	Correct	50	41.7%	116	96.7%	74	61.7%	.000*	.011*
	Incorrect	70	58.3%	4	3.3%	46	38.3%		

P-value 1: Significance between before/after

P-value 2: Significance between before/follow up

***significant at $P \leq 0.05$**

Table (3): Distribution of the student nurses according to their knowledge about different OB/ GYN emergencies throughout the program phases (N=120)

Simulators Variables		Pre-simulated training (N=120)		Post-simulated training (N=120)		2 months Follow up (N=120)		P-value 1	P-value 2
		No.	%	No.	%	No.	%		
Oxytocin management	Correct	12	10 %	108	90%	74	61.7%	.005*	.000*
	Incorrect	108	90%	12	10%	46	38.3%		
Operative vaginal delivery	Correct	30	25%	116	96.7%	71	59.2%	.005*	.000*
	Incorrect	90	75	4	3.3%	49	40.8%		
Obstetric hemorrhage	Correct	26	21.7%	108	90%	66	55%	.005*	.000*
	Incorrect	94	78.3%	12	10%	54	45%		
Shoulder dystocia	Correct	40	33.3%	105	87.5%	74	61.7%	.005*	.000*
	Incorrect	80	66.7	15	12.5%	46	38.3		
Pregnancy induced hypertension	Correct	34	28.3%	108	90 %	71	59.2%	.005*	.000*
	Incorrect	86	71.7	12	10%	49	40.8%		

P-value 1: Significance between before/after

P-value 2: Significance between before/follow up *significant at P≤0.05

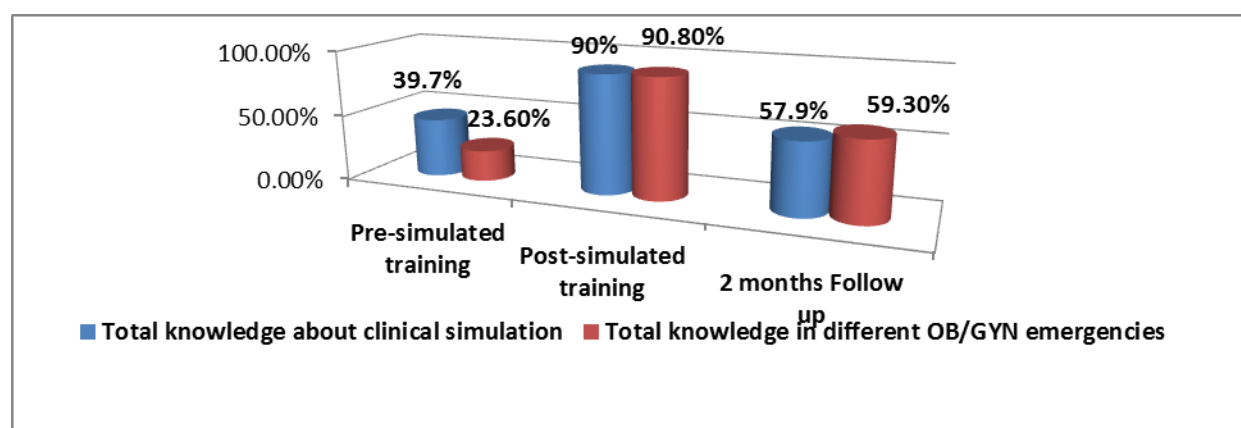


Figure (1): Distribution of the student nurses according to their total knowledge about clinical simulation course training program throughout the program phases

Table (4): Distribution of the student nurses according to their confidence level in different OB/ GYN emergencies throughout the program phases.

		Pre-simulated training (N=120)		Post-simulated training (N=120)		2 months Follow up (N=120)		P-value 1	P-value 2
		No.	%	No.	%	No.	%		
Oxytocin management	Low	6	5%	0	0%	0	0%	.551	.000*
	Moderate	80	66.7%	8	6.9%	46	38%		
	High	34	28.3%	112	93.1%	74	62%		
Operative vaginal delivery	Low	8	6.6%	0	0%	0	0%	.551	.000*
	Moderate	80	66.6%	4	3.6%	49	41.2%		
	High	32	26.8%	116	96.4%	71	58.8%		
Obstetric Hemorrhage	Low	10	8.3%	0	0%	0	0%	.551	.000*
	Moderate	82	68.3%	12	10.3%	46	38%		
	High	28	23.4%	108	89.7%	74	62%		
Shoulder Dystocia	Low	12	10%	0	0%	0	0%	.551	.000*
	Moderate	80	66.6%	15	12.4%	46	38%		
	High	28	23.4%	105	87.6%	74	62%		
Pregnancy induced hypertension	Low	12	10%	0	0%	0	0%	.551	.000*
	Moderate	80	66.7%	4	3.4%	54	44.8%		
	High	28	23.3%	116	96.6%	66	55.2%		

P-value 1: Significance between before/after

P-value 2: Significance between before/follow up

***significant at $P \leq 0.05$**

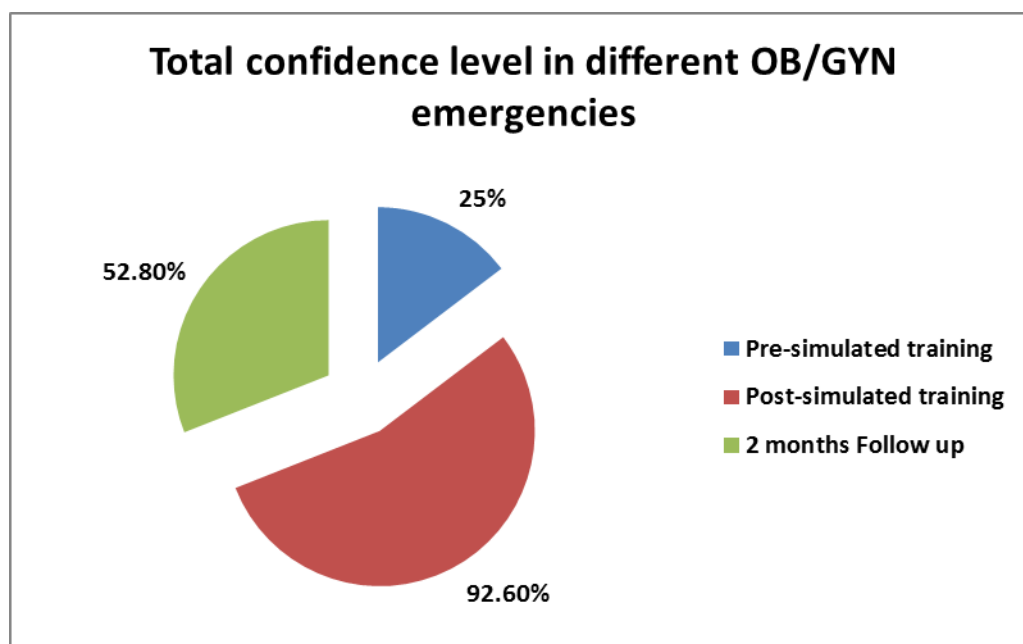


Figure (2): Distribution of the student nurses according to their total confidence level in different OB/GYN emergencies throughout the program phases

Table (5): Distribution of the student nurses according to their satisfaction before and after simulation training program (N=120)

Items	Pre-simulated training Mean / SD	Post-simulated training Mean / SD	t	P-value
Improve knowledge and understanding	4.10±0.81	4.67 ± 0.479	2.99	0.0037*
Provide constructive Feedback	3.93±0.89	4.53 ± 0.681	5.02	0.0001*
Provide peers evaluation during the simulation	3.93±0.94	4.50 ± 0.682	2.87	0.0052*
Improve self-analyses ,behavior and actions	3.51±1.10	4.73 ± 0.521	6.48	0.0001*
improve specific tasks and skills	3.14±1.08	4.57 ± 0.817	5.15	0.0001*
The scenario resembled a real-life situation	4.21±0.95	4.50 ± 0.682	3.38	0.0015*
The simulation provide with learning materials and activities to promote future learning	4.31±0.75	4.57 ± 0.817	3.50	0.0007*
Aggregate mean score	3.88±0.63	4.60 ± 0.487	3.95	0.0002*

Data are presented as mean ± SD

*significant at $P \leq 0.05$

Table 6: Correlations coefficient between of satisfaction, knowledge and confidence level of nursing student.

Total satisfaction score	Total knowledge score	Total Confidence level score
Pearson Correlation	.664	.098
Sig. (2-tailed)	.010*	.010*

DISCUSSION

Simulation has been identified as a useful teaching tool in nursing curriculum that influences learning, competency development, self-confidence, and safety (Norman, 2012). It's a scenario created to reflect clinical practise in real-world settings. It can be used to teach clinical skills, as well as theory and assessment. It often emphasizes the application of knowledge, skills, and critical thinking. In nursing education, simulation is recognized as an interactive teaching-learning tool that allows students to practise their clinical skills over and over before they master them (Eyikara & Baykara, 2017).

Furthermore, in order to conform with healthcare requirements, professional development programmes and other teaching and learning events must be updated on a regular basis (Amatullah, 2018). Thus, the present research was based on study hypothesis that high fidelity simulation training program has a positive effect on improving undergraduate nursing students' knowledge, confidence level and satisfaction regarding obstetrics emergencies and there are statically significant positive interrelationships between them.

According to the current study, the level of knowledge gained after training was higher at the post-program and follow-up assessments than at the pre-program evaluation. This may be due to the fact that, great majority of student nurse's GPA was satisfied and between 2-3.6. In addition, more than half of nursing students are girls, and it is known in our society that the educational achievement of girls is higher than that of boys (Ullah & Ullah, 2019).

This is in line with the results of Gates, Parr & Hughen (2012) who investigate effects of high-fidelity simulation participation on knowledge acquisition in 104

undergraduate nursing students and stated that, students who were involved in high-fidelity simulation experience gained knowledge and performed substantially better on tests than those who did not. These results provide conclusive evidence that high-fidelity simulation may be a viable alternative to conventional clinical practise. More specifically, the findings can aid nursing boards in better regulating the use of high-fidelity simulation in future clinical setting.

Also, the current study showed significant effect of high fidelity simulated training program on nursing student's confidence levels. This may be due to the fact that, high fidelity simulation (HFS) methods have a significant impact on the training process's outcome, with this method's use of technology and advanced innovative strategies resulting in a better experience and outcomes (Fernández Alemán, Carrillo de Gea and Rodríguez Mondéjar, 2011; Iley et al., 2011; Sherriff, Burston and Wallis, 2012; Hsu, Pan and Hsieh, 2016; Chen, Chen Lee, Chang, Yeh, 2017).

This is similarly supported by Cant & Cooper (2017), in a recent comprehensive report on simulation-based education in undergraduate nursing, analyzed the findings of approximately 700 primary studies in the literature conducted between 2010 and 2015. According to their findings, simulation-based education improved psychomotor ability development, increased self-efficacy, and resulted in high levels of satisfaction among trainee.

In this context, Harder (2010) also stated that her comprehensive analysis resulted in an improvement in knowledge, clinical skills, and confidence with simulation learning. Leschinger et al. (2008) found mixed results in terms of increased knowledge, practice, and confidence. Meri en, van de Ven, Mol, and Houterman (2010) conducted a systematic analysis that focused at eight studies that used SBT and found that seven of them showed that teamwork in simulation improved staff knowledge, skills communication, and success in handling OB emergencies. Moreover, Omer (2016) mentioned that their participants expressed high levels of confidence in their ability to administer accurate health evaluations, provide successful interventions, work as a team member, and identify patient decline events.

In the present study, all items of satisfaction are significantly associated with the overall nursing students' satisfaction towards high fidelity simulation training

program with mean score 4.60 compared to pre programme baseline 3.88. This may be due to the fact, the students were more satisfied with their experiences after the simulated experience as a real-world environment, which helps students gain skills and knowledge. Furthermore, the educators paid close attention to both of these factors in order to increase nursing students' overall satisfaction.

This result is consistent with Basak, Unver, Moss, Watts, Gaiosio (2016) study which found that high level of satisfaction among nursing students after participating in high fidelity simulation and their perceptions in high-fidelity mannequin simulation were found to be higher than their perceptions in low-fidelity mannequin simulation. Also Alammary (2017) mentioned that, overall mean score of satisfaction in learning with nursing simulation was 3.76 to 4.0 (pre and post training program respectively) among Saudi undergraduate nursing students.

In addition Gudayu, Badi, and Asaye (2015) study which found, the average score for learning satisfaction after training program was 54.2 percent. Since simulation was a recent addition to their programme, and their students had no prior experience with such advanced devices, students were more satisfied.

Regarding the relationship between student nurses, knowledge, confidence level and satisfaction, the current study's findings revealed a statistically significant positive association between total knowledge, satisfaction, and confidence level score ($p=.010$). This result in agreement with Lewis and Ciak's (2011) research into the effects of simulation laboratory experiences on student satisfaction, self-confidence, and knowledge. The results revealed a substantial increase in knowledge ($p<.01$). Simulation improves student knowledge and confidence in performing skills, according to their findings. Also, AE, AR, AE& AA (2018) study which found that total knowledge, satisfaction and confidence score have a statistically significant positive correlation ($p=0.000$).

Therefore, simulation has been revealed to be an effective teaching technique that promotes learning, competency development, safety, and self-confidence (Norman, 2012). Simulating setting or community-based environments reduces uncertainty, resulting in a more consistent and predictable learning environment. In addition, simulation has been proposed as a substitute for patient in clinical practice. The National Simulation Study was undertaken by the National Council of State

Boards of Nursing (NCSBN) to see whether clinical time could be efficiently replaced by simulation time. The study's findings revealed that simulation can be an effective educational tool for nursing students' clinical education (Jimenez, 2017).

CONCLUSION

Based on the findings of today's study, it can be concluded that the nursing students showed an improvement of their knowledge, confidence and satisfied about health education program that provided about management of OB emergencies. So, it can be concluded that, high-fidelity simulation is an efficient teaching method and an innovative pedagogical approach that allows them to gain the necessary clinical knowledge, confidence, and satisfaction to apply in a safe and supervised environment, ensuring quality care and patient safety in the management of OB emergencies they encounter in their actual clinical environment.

RECOMMENDATIONS

Based on the results it can recommend that replace traditional clinical teaching methods by high fidelity simulation to be part of nursing student's educational curriculum to ensure the highest level of quality and safety in the management of various OB emergencies.

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تأثير برنامج محاكاة عالي الدقة على معلومات الطلاب بطوارئ التوليد والثقة والرضا بكلية التمريض جامعة بورسعيد

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الخلاصة

في الأونة الاخيرة، اصبح يتم إستخدام المحاكاة بإستمرار من قبل الممرضين والممارسين الصحيين الآخرين كأسلوب وطريقة للتعليم والتعلم في جميع مراحل التدريب السريري. و لقد أصبحت المحاكاة عالية الدقة جانباً مهماً من تعليم التمريض في السنوات الأخيرة. هدفت هذه الدراسة إلى تقييم تأثير برنامج محاكاة عالي الدقة على معلومات الطلاب بطوارئ التوليد و الثقة و الرضا بكلية التمريض جامعة بورسعيد. طرق وادوات البحث: تم استخدام تصميم بحثي شبه تجريبي. مكان الدراسة : تمت الدراسة في معامل مهارات النسا و التوليد ، كلية التمريض جامعة بورسعيد علي جميع طلاب الفرقة الثالثة (120 طالب/طالبة) الذين أكملوا مقرر تمريض الأمومة و النسا و التوليد للعام الدراسي 2019-2020. الأدوات: تم استخدام ثلاث ادوات لجمع البيانات الخاصة بالبحث، نموذج المقابلة الشخصية المنظم ومقياس رقمي NursOB ومقياس الرضا لجمع البيانات المطلوبة. النتائج: كان هناك دلالة احصائية في مستوى المعرفة المختبرة فيما يتعلق بتطبيق برنامج تدريب محاكاة علي حالات طوارئ النسا و التوليد المختلفة بعد الدراسة ومراحل المتابعة. كما تم الكشف عن تحسن معتد به إحصائياً في مستوى ثقة جميع طلاب التمريض و رضاهم عن التعلم من خلال برنامج تدريب محاكاة عالي الدقة مقارنة بمتوسط درجه رضاهم قبل البرنامج. ايضا ، توجد علاقة ارتباط موجبة ذات دلالة إحصائية بين الرضا التام ومستوى المعلومات وثقتهم بنفسهم. الخلاصة: يُعد برنامج تدريب المحاكاة عالي الدقة طريقة تدريس مهمة ونهجاً تربوياً مبتكراً يسمح لطلاب التمريض باكتساب المعلومات السريرية المطلوبة وتحسين مستوى الثقة بالإضافة إلى رضاهم الذي سيسمح لهم بتطبيق إدارة حالات طوارئ النسا و التوليد التي يواجهونها في بيئتهم السريرية الفعلية. التوصيات: لضمان السلامة في إدارة حالات طوارئ النسا و التوليد المختلفة ، نوصي باستخدام برنامج تدريب محاكاة أكثر دقة بدلاً من الممارسة السريرية التقليدية في المناهج التعليمية لطلاب التمريض.

الكلمات المرشدة: برنامج تدريب محاكاة عالي الدقة، المعلومات، الثقة، الرضا لطلاب كلية التمريض.