The High Fidelity Simulation Training and Its Impact on Nursing Students' Satisfaction, Self Confidence and Their Performance in Pediatric Real Situation: A Comparative Study

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Abstract: Improvement of safe nursing training in entry-level nursing learners needs special concern from nurse professors. High-fidelity simulation (HFS) has been planned as a new, additional education-learning strategy to develop the transfer of learner self-confidence and proficiency to the practical nursing setting. Purpose: The purpose of this research was to examine the High-Fidelity Simulation Training and its impact on nursing students' satisfaction, self -confidence and their performance in pediatric real situation. Methods: A quasi experimental design was used in carrying out the present study. The purposive sample was conducted from (104) pediatric nursing students in college of nursing Qassim University in KSA and (81) pediatric nursing students in college of nursing Port Said University in ARE. Findings: All of the nursing students were satisfied with all items of satisfaction regarding current learning and self-confidence in learning by simulation sessions, The means of Port Said nursing students were more than means of Qassim students regarding total Students' satisfaction and self-confidence, all participant learners were satisfied with simulation sessions that were a positive way to learn and improve the learners to face the real life of the patients after the simulation session, all of the learners satisfied regarding evaluation of their feedback and the majority of the participants have adequate performance regarding items of child' head to toe assessment in clinical after simulation sessions. Conclusions: the high fidelity simulation training had a positive impact on nursing students' satisfaction, self-confidence and their performance in pediatric real situation in both Port Said and Al Qassim University.

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1. Introduction

Simulation in nursing learning has a current been accepted as a vital portion in allowing nursing learners to advance many preparation and practical chances during their nursing educations **(1).** Neonates and children safety be based on a proficient nurse to assess, examine, and identify changes in a patient's condition and to intervene properly. Pediatric nurse instructors are challenged to create alumni who can carefully and efficiently deal with difficult children conditions **(2)**. Nurses must be prepared with appropriate proficiencies, information, and abilities that support with present place of work requirements **(1).**

Nursing learners must be learning with novel techniques that enhance their preparation for recent century nursing**.** So that provide advanced level of nursing care, alumni must to have proficiencies in decision making, critical thinking, guidance group and quality improvement **(3).** Simulation learning experiences, are well-defined as actions that be like real or possible clinical conditions **(4)** which allow the participant to integrate critical thinking, decision-making and psychomotor skills **(5)** Simulation also is the credibility otherwise the level to which the simulation capability or equipment methods realism **(6).**

Simulators are three categories of fidelity which are low, medium and high. *Low fidelity simulators;* a manikin that is intended for training of a particular ability and characterizes a specific anatomical part of the body (i.e. arm used for learning intravascular injections **(5)**. Role instructors are static and absence detail or realism **(7).** Medium fidelity simulators; that use computer equipment to help learners in learning heart, lung and bowel sounds. High fidelity simulators; full body manikins that can be automatic to deliver realistic physiologic changes in reaction to a learner's interference **(8)** Newly a meta-analysis established that simulation-based training develops learning outcomes with a medium to great effect, compared with old-style teaching or no intervention **(9).** A nurses' confidence in their abilities is vital to the best nursing care. Merely when nursing learners have confidence in their own capabilities are they competent to move focus to the requirements of their patients. Shifting from their

own needs to that of a patient is vital to being a safe and proficient expert which require modern methods for demonstration as simulation **(10)**.

Nurses educators must be recognize that teaching students to care for children requires focus on developing students to think in methods rare to adult practice such as the assessment of children versus adults. Students must be educated on how vital sign values change according to age, general and systemic physical examination, the various levels of cognitive improvement, and how to advance trust resulting in cooperation of a fearful child **(11)** Decreased numbers of pediatric inpatients have created challenges for nurse educators to meet students' pediatric nursing learning needs, such as knowledge acquisition, communication and psychomotor skills **(12).** Often students may not even be permitted to perform procedures or exercise decision making skills because of patient safety concerns **(13).** Simulated scenarios can help ensure students are adequately prepared for clinical, utilizing skills through hands-on learning in a safe risk-free environment through the use of life-sized, life-like manikins **(14).**

The implementation of new innovative teaching modalities, such as HFS, is one option that has been explored to address educational gaps, while also meeting current student desires for increased technology in the learning environment **(15).** The educator has the ability to stop the scenario as it is evolving to discuss the current situation or to repeat the scenario to allow students to make improvements in their care **(16).** It is difficult to control learning in such a manner in the real clinical setting. HFS provides a learner-centered approach, an interactive environment offering the three domains of learning: cognitive, psychomotor and affective **(17).**

Figure (1) reviews the knowledge gaining from summary to simulation in theory, simulation application in training, updating and responses and lastly the process of information attainment. **(18)**

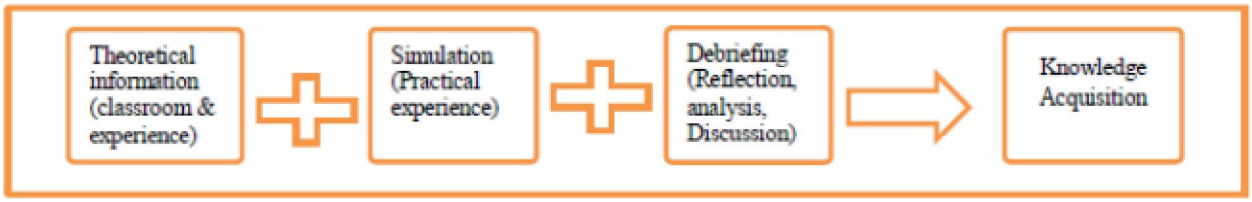
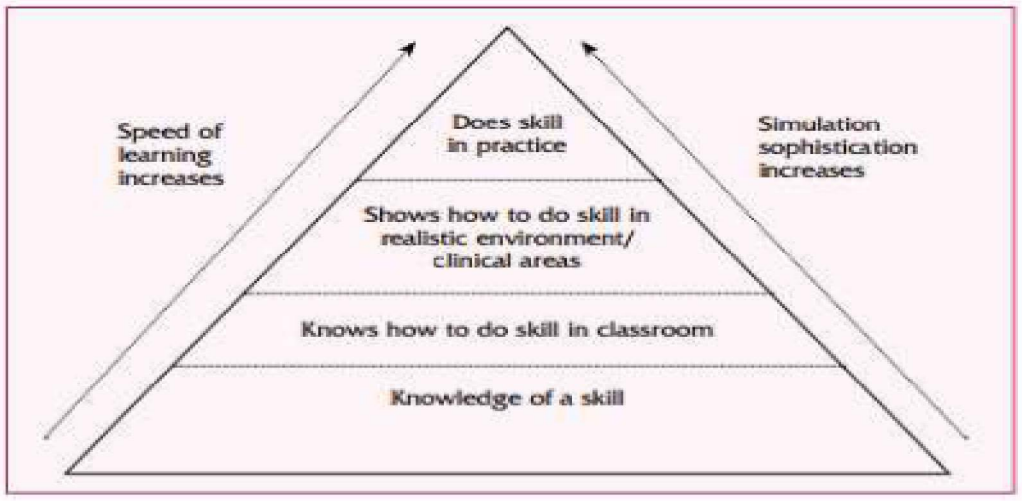


Fig (1) Process of Knowledge Attainment By Simulation

Figure (2) concluded simulation learning to the Miller's pyramid, a planned agenda for measuring and improving practical proficiency, advanced by a psychologist named George Miller in 1990. The minimum level describes the knowledge of a skill, followed by the competence on how to behavior as a proficiency, display how to apply a skill in a true situation, and applying the skill in clinical. **(19)**



Linking Simulation Learning to Millers Pyramid **(20)**

Significance of the study:

Having students complete skills, make decisions and have patients interactions in a risk-free environment enables student anxieties to decrease, increase satisfaction, efficiency, while instructors can focus in on the who, what and why of their actions in both normal and critical situations **(16)**

The aim of the study

Examine the High-Fidelity Simulation Training and its impact on nursing students' satisfaction, self - confidence and their performance in pediatric real situation.

1- Subjects and methods

Research Design

A quasi experimental design was used in carrying out the current research.

Setting

The current research was implementing in pediatric nursing department in college of nursing Qassim University in Kingdom Saudi Arabia (KSA) and Port Said University in Arab Republic Egypt (ARE).

Sample

The purposive sample was conducted from (104) pediatric nursing students in college of nursing Qassim University in KSA and (81) pediatric nursing students in college of nursing Port Said University in ARE.

Tools of data collection

Two tools were used to collect the necessary data as follows:

Tool I: A structured Interview Questionnaire

A structured interview questionnaire was developed by the researchers to collect the required data and consisted of three main parts:

Part 1: Demographic characteristics of the studied pediatric nursing students.

Demographic characteristics included age, level, Grade Point Average (GPA) and previous high fidelity stimulation (HFS) experience.

Part 2: Students' satisfaction and self-confidence after training on pediatric manikin simulation (SSSCL) adopted from **Jeffries (21).** It contained on 13-items from 1 to 5 ask the participant about their satisfaction toward simulation as a method of teaching. While the items from 6 to 13 indicated to participant self-confidence regarding simulation as a method to learning. The tool was measuring with 5-point Likert scale to each item. This survey was complete by all nursing learners that shared in the simulation session. In the closed ended questions, the learners had to select one of the choices agreed in order to response the questions (strongly disagree, disagree, somewhat disagree, somewhat agree and strongly agree). The scale ranged between score 1 to 5, score 5 being the maximum and score 1 being the minimum.

Part 3: Simulation Effectiveness Questionnaire.

This form used in the present study that contained of 18 closed ended questions. Adopted from **Goldsworthy & Graham (22)**. This tool was complete by all nursing learners that shared in the simulation session. The aim tool was to collect data related to simulation eases learning and therefore the learners were questioned how they felt regarding the simulation session, if it assisted them to learn. The language of the question tried to keep on unbiased but quiet stimulate the learner response detailed, until they feel that they don't take advantage from the simulation. The learners were inquired how the simulation encouraged their learning as it was one of the aims of the simulation as a learning instrument. Assessment of simulation is a vital part in assessing the efficiency of the scenarios to achieving the learning purposes. Certain additional components that can be assessed contain the simulation strategy, the learners' satisfaction and a existence of positive learning skills. Concluded assessment, learners' practice was improved. Simulation strategy and facilitator skills are also technologically advanced. Simulation is beneficial in assessing proficiencies for example critical thinking, making decision and judgment **(22).** In the closed ended questions, the learners had to select one of the choices agreed to response the questions (agree, somewhat agree, somewhat disagree and disagree). The scale ranged between score 1 to 4, score 4 being the maximum and score 1 being the minimum.

Part 4: Simulation Evaluation Scale Design.

It emphases on classifying declaration Score 5 Score 4 Score 3 Score 2 and Score 1. It consisted of 8 closed ended questions. It was Adopted from **Goldsworthy & Graham (22).** The tool was complete by all nursing learners that shared in the simulation session. The tool was focusing to enhance learning, Enhancing of confidence, feedback, fidelity, satisfaction, cooperation and group effort, decision making and critical thinking. In the closed ended questions, the learners had to select one of the choices agreed to response the questions. The scale ranged between Score 5 to 1, Score 5 being the maximum and Score 1 being the minimum. The emphasis subjects of the measure were on enhanced learning, improving of confidence, feedback, fidelity, satisfaction, cooperation / teamwork, making decision and critical thinking.

Tool II: observational checklist

It was measure students' performance regarding pediatric head to toe assessment in first actual clinical situation after training on pediatric manikin simulation. It contained on (getting ready, Anthropometric measurement, Vital signs, general appearance, Heart tone, Head, face and neck, chest, abdomen, neuromuscular assessment and after procedure record and wash hand). The scoring system for each step of the clinical checklist was given 2 grade if done correctly and 1 grade if done incorrectly and not done, with total performance score of (2) grades.

Simulation Implementation

1- **Pre simulation (pediatric nursing department in college of nursing Qassim and port Said University)**

Pre data about the simulation session and the research's aim was given to whole third and fourth year (Qassim University) and third year (Port Said University) nursing students. Thirty minutes was offered to all nursing students in (Qassim University) and (Port Said University) class lecture. The students get informed about the proposed simulation and taught what it was all about. Furthermore, consent forms beside signs were gained from all the learners who shared in the simulation session before the day of the simulation.

Physical examination

- **Nursing college in Qassim University** was divided simulation session into (4) sections as pre lab on (4) days using tools, PowerPoint, video at the beginning, then students are divided into (4) groups, each group has (26) students and redemenstration is done in the nursing skill lab for each group on two days regarding Child physical assessment from head to toes from (10 am: 1 pm, then all students were distributed on Buraidah Maternity and Children Hospital, Qassim, KSA. Evaluation was done for each student apart, in which (11) students were evaluated every day and (16) students will be evaluated in the last day, each students consumed about (20-25 minutes) to complete physical examination from (quarter past 8 am to quarter past one pm), all evaluation was done around ten days, with range of two days each week (through 5 weeks at the first semester of academic year (2017-2018)
- **Nursing college in Port Said University** was divided simulation session into (3) sections as pre lab on three days using tools, PowerPoint, video at the beginning, then students are divided into (6) groups, each group has (13-14) students and re-demonstration is done in the nursing skill lab for each group on three days. The first day was for vital signs and second day for growth measurement and the third day for general physical assessment form (10 am: 2 pm) then all students were distributed on three general hospitals (Port said, El Nasr and Port Fouad). The evaluation was done for each student apart, in which (8) students were evaluated every day, each student consumed about (20-25 minutes) to complete physical examination from (quarter past 8 am to quarter past to one pm) all evaluation was done around twelve days, with range of two days each week (through 6 weeks at the first semester of academic year (2017-2018).

Simulation days

The plan of the simulation day is involved. The period was kept from 8:30 am till 13:45pm with coffee and lunch break allocated in between. To assistant out with the simulation, two nursing instructors were allocated to supervise the entire process in addition to offer direction where needed. A total of (104) students in Qassim University and (81) students in Port Said University attended the simulation session. A photocopy of the Classify, Condition, Experience, evaluation and dispersed to each of the learners clarifying the process they had to monitor.

Post simulation (104 pediatric nursing students from college of nursing Qassim University and (81) from college of nursing Port Said University)

Next the simulation session, forms and assessment documents were delivered out to be complete by the learners. The emphasis of the assessment scale was to acquire response on the effect of the simulation session on learners and how it affected their learning; Learner satisfaction and Self-confidence in learning, and stimulation effectiveness, tool evaluation scale were collected from the students on session in the faculty Hall after evaluation that done in the hospital.

Field Work (College of nursing Qassim University and Port Said University

The researchers attended the Pediatric departments 2 days/week for data collection each student was individually interviewed to complete tool (1) and tool (II)**.** Data was collected during 3 months, starting from September 2017 to November 2017.

Pilot Study

A pilot study was conducted on 10 pediatric nursing students in Qassim University and 8 nursing students in Port Said University to assess the clearness of questions and to measure the time needed for complete the tools. No adjustment was done to the instruments; hence studied students' who participated in the pilot study were involved in the research sample.

Administrative and Ethical Considerations

An official permission for collection of data was obtained by submission of an official letter issued from the Dean of the college of nursing both Qassim University and Port Said University to offered the director of Buraidah Maternity and Children' Hospital, Qassim, KSA and three general hospitals in Port said, El Nasr and Port Fouad, Egypt. The researchers was obtained a written consent from the studied 3rd & 4th year students after explanation of the goal and steps of the research, plus reassurance of keeping privacy and secrecy of learners' information. Processes about ethical concerns during the simulation application were so taken into consideration to avoid any form of distress or lack of respect to the learners.

Statistical Design

Data were reviewed, coded, entered, analyzed and tabulated using SPSS version 23. Both descriptive statistics (frequency, percentage) and inferential statistics (Pearson correlation and chi-square tests)

were used according to type of variables. P value less than 0.05 was considered significant.

3. Results

Table (1) shows that the majority of nursing students' age was between 21-23 years and they had an experience regarding care patients in both Port Said and Qassim Universities. Also, the table reflects that 30.9 % of nursing students in Port Said University had grade A+. While, 26.9% of nursing students in Qassim University had grade B+. All nursing students were at level 3 in Port Said University compared by half the nursing students in Qassim University.

Table (2) clarifies the Perception of nursing students among Port Said and Al Qassim university regarding Students' satisfaction and self-confidence by simulation session. All of the participants students were satisfied with all items of satisfaction regarding current learning and self-confidence in learning by simulation sessions with no statistical significance difference in both studied group except in the teaching materials used in this simulation were motivating and helped me learn was statistical significance difference. The means of Port Said nursing students were more than means of Qassim students regarding total Students' satisfaction and self-confidence with no statistically significance difference between both studied groups.

Table (3) reveals that all participant students were satisfied with simulation sessions that were a positive way to learn and be well organized to cope with patients' real life after the simulation session. Also, they feel further experienced in examination for basic signs of life for a patient. Also, students that shared were challenged and additional confident in making decision, solving problem and critical thinking, learned more from seeing other classmates challenge the simulation scenarios, the briefing, thinking and group discussion sessions were appreciated and learned in assisting to know what to do well and what went incorrect. Also, the majority of students gained confidence and improved learning skills through the experience. Also the table clarified that no statistically significance difference between both studied groups in all items related to simulation experience except the participants feel better prepared to deal with real life patients and recommend this method of teaching was statistical significance difference. It shows that means of Port Said nursing students were more than means of Qassim students regarding total satisfaction to simulation experience with statistically significance difference between both studied groups.

Table 1: Socio-Demographic Characteristics of the Studied Sample (N=185)

Items	Port Said University (ARE)		Al Qassim University (KSA)	
	Nursing college		Nursing College	
	Number	percent	Number	percent
Age				
18-	9	11.1	19	18.3
21-	67	82.7	67	64.4
24-	5	6.2	6	5.8
more than 26	0	0.0	12	11.5
Total	81	100.0	104	100.0
Level				
level 3	81	100.0	52	50.0
level 4	-		35	33.7
NBP	-	-	17	16.3
Total	81	100.0	104	100.0
Grade				
A+	25	30.9	3	2.9
A	13	16.0	17	16.3
B+	4	4.9	28	26.9
B	1	1.3	21	20.2
C+	15	18.5	15	14.4
C	23	28.4	7	6.7
D+	-	-	11	10.6
D	-	-	2	1.9
Total	81	100.0	104	100.0
Experience				
Yes	59	56.7	80	76.9
No	22	21.2	24	23.1
Total	81	77.9	104	100.0

ARE: Arab Republic of Egypt, KSA: Kingdom Saudi Arabia

Table (4) demonstrates that, all of the participants students satisfied regarding evaluation of their feedback as the students felt that the session helped them identify their weaknesses and areas of improvement, teamwork and satisfaction as the participants were able to work in a team to accomplish the task delegated to them. Also, participants felt satisfied with this learning method as it was new and informative to them. As regards to enhanced learning, decision making and boosting of confidence and fidelity, the students felt that the simulation sessions greatly boosted their confidence to practice, this is due to simulation experienced day, causing the participants to experience the reality of simulation on a manikin that can perform basic human functions. This table shows that means of Port Said nursing students were more than means of Qassim students regarding total Evaluation Scale results about the patient simulation effectiveness session with no statistically significance difference between both studied groups.

Table (2): Perception of nursing students among Port said and Al Qassim university regarding Students' satisfaction and self-confidence By simulation sessions (Port Said No= 81) Qassim (No =104)

Items	Nursing College	Satisfactory		Unsatisfactory		χ2	P-value
		No	%	No	%		
1. The teaching methods used in this simulation were helpful and effective	**Port said**	77	95.1	4	4.9	.262[a]	.758
	Qassim	97	93.3	7	6.7		
2. The simulation provided me with a variety of learning materials and activities to promote my learning the pediatric curriculum.	**Port said**	80	98.8	1	1.2	3.325[a]	.081
	Qassim	97	93.3	7	6.7		
3. I enjoyed how my instructor taught the simulation	**Port said**	77	95.1	4	4.9	1.996[a]	.184
	Qassim	92	89.3	11	10.7		
4. The teaching materials used in this simulation were motivating and helped me learn	**Port said**	79	97.5	2	2.5	4.582[a]	.042
	Qassim	93	89.4	11	10.6		
5. The way my instructor (s) taught the simulation was suitable to the way I learn	**Port said**	77	95.1	4	4.9	.121[a]	.733
	Qassim	99	96.1	4	3.9		
6. I am confident that I am mastering the content of the simulation activity that my instructors	**Port said**	78	97.3	3	3.7	1.839[a]	.234
	Qassim	95	91.3	9	8.7		
7. I am confident that this simulation covered critical content necessary for the mastery of pediatric curriculum.	**Port said**	79	97.5	2	2.5	.275[a]	.697
	Qassim	100	96.2	4	3.8		
8. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical	**Port said**	78	97.3	3	3.7	.134[a]	1.000
	Qassim	99	96.1	5	4.8		
9. My instructors used helpful resources to teach the simulation	**Port said**	76	93.8	5	6.2	.724[a]	.431
	Qassim	94	90.4	10	9.6		
10. It is my responsibility as the student to learn what I need to know from this simulation activity	**Port said**	79	97.5	2	2.5	.684[a]	.470
	Qassim	99	95.2	5	4.8		
11. I know how to get help when I do not understand the concepts covered in the simulation	**Port said**	78	97.3	3	3.7	.816[a]	.517
	Qassim	97	93.3	7	6.7		
12. I know how to use simulation activities to learn critical aspects of these skills	**Port said**	78	97.3	3	3.7	.816[a]	.517
	Qassim	97	93.3	7	6.7		
13. It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time.	**Port said**	78	97.3	3	3.7	.134[a]	1.000
	Qassim	99	96.1	5	4.8		
Total Satisfaction	**Port said**	1.9630±.19003				T.900	.070
	Qassim	1.9327±.25177					

Table (5) illustrates that The majority of the participants have adequate performance regarding items of child' head to toe assessment except 65.4%,66.7%,58.0% of nursing students in Port said University have inadequate performance compared by Qassim University regarding assessment of Head, face and neck, Abdomen, and Neuromuscular with the highly statistical significance differences in both groups. The table clarifies that 50.6%, 63.0% of students in Port said University have adequate performance regarding general appearance and After the procedure compared by 85.6%, 100.0% of student in Qassim University with the highly statistical significance differences in both groups. Also, it shows that means of Qassim nursing students were more than means of Port Said students regarding total performance of child' head to toe assessment in the clinical after the simulation effectiveness session with highly statistically significance difference between both studied groups.

Table (3): Experience of nursing students among Port Said and Al Qassim University regarding their evaluation about the simulation effectiveness sessions

Items	Nursing College	Satisfactory		Unsatisfactory		χ^2	P-value
		No	%	No	%		
1. The simulation scenarios were designed in an effective method	Port said	73	90.1	8	9.9	2.573[a]	.142
	Qassim	85	81.7	19	18.3		
2. The facilitators instructions were clear and material provided was understandable	Port said	72	88.9	9	11.1	1.816[a]	.217
	Qassim	85	81.7	19	18.3		
3. I feel better prepared to deal with real life patients	Port said	72	88.9	9	11.1	5.073[a]	.034
	Qassim	79	76	25	24		
4. I am more knowledgeable in checking for basic signs of life for a patient	Port said	72	90	8	10	2.469[a]	.143
	Qassim	85	81.7	19	18.3		
5. I developed a better understanding of the simulation and its importance	Port said	71	87.7	10	12.3	.873[a]	.412
	Qassim	86	82.7	18	17.3		
6. I developed a better understanding of the ways and channels to follow in case of an emergency	Port said	67	82.7	14	17.3	.435[a]	.577
	Qassim	82	78.8	22	21.2		
7. I was challenged	Port said	71	87.7	10	12.3	2.470[a]	.123
	Qassim	82	78.8	22	21.2		
8. I'm now more confident in decision making, problem solving and critical thinking	Port said	69	85.2	12	14.8	1.220[a]	.340
	Qassim	82	78.8	22	21.2		
9. I am more confident in determining what to report to the doctor	Port said	67	82.7	14	17.3	.664[a]	.462
	Qassim	81	77.9	23	22.1		
10. My patient assessment skills have improved	Port said	67	82.7	14	17.3	.251[a]	.706
	Qassim	83	79.8	21	20.2		
11. I feel confident in handling patients from various religious, cultural and racial backgrounds	Port said	68	84	13	16	.349[a]	.699
	Qassim	83	79.8	21	20.2		
12. I feel more knowledgeable in being able to assess changes in a patient's condition	Port said	66	81.5	15	18.5	.081[a]	.853
	Qassim	83	79.8	21	20.2		
13. I am able to better predict what changes may occur with my real patients	Port said	68	84	13	16	.773[a]	.451
	Qassim	82	78.8	22	21.2		
14. The simulation sessions helped to understand and relate classroom theory to real life practical implementation	Port said	70	86.4	11	13.6	1.782[a]	.245
	Qassim	82	78.8	22	21.2		
15. I learned a lot from observing my peers tackling the simulation scenarios	Port said	67	82.7	14	17.3	.251[a]	.706
	Qassim	83	79.8	21	20.2		
16. Debriefing, reflection and group discussion sessions were valuable and learnedassisting me to know what went well, what to do well, and what went incorrect	Port said	70	86.4	11	13.6	1.782[a]	.245
	Qassim	82	78.8	22	21.2		
17. Have these simulation sessions been helpful in helping you to enhance your nursing knowledge?	Port said	70	86.4	11	13.6	1.042[a]	.329
	Qassim	84	80.8	20	19.2		
18. Would you recommend this method of teaching?	Port said	76	93.8	5	6.2	5.902[a]	.016
	Qassim	85	81.7	19	18.3		
Total	Port said	1.9839±.12700				T 2.225	.000
	Qassim	1.8901±.31449					

Table (6) highlights the comparison between Port Said and Al Qassim University regarding total score of students' satisfaction and self-confidence, evaluation of simulation effectiveness sessions, Evaluation Scale results and their performance items in both groups. The table reflected that the majority of nursing students were satisfied for all items with high statistically significant difference in related to their score performance in the clinical after simulation sessions.

Table (4): Experience of nursing students among Port Said and Al Qassim University regarding their Evaluation Scale results related to simulation effectiveness sessions

Items	Nursing College	Satisfactory		Unsatisfactory		χ^2	P-value
		No	%	No	%		
1. Enhanced Learning • I can honestly say that I have learnt a lot	Port said	76	93.8	5	6.2	.161[a]	.688
	Qassim	96	92.3	8	7.7		
2. Boosting of confidence • This sessions has greatly made me more confident to practice	Port said	74	91.4	7	8.6	.055[a]	.814
	Qassim	96	92.3	8	7.7		
3. Feedback • I valued the feedback as it made me aware of my errors and how I can make amends	Port said	75	92.6	6	7.4	.201[a]	.654
	Qassim	98	94.2	6	5.8		
4. Fidelity • Was the experience very real to you	Port said	74	91.4	7	8.6	.703[a]	.402
	Qassim	91	87.5	13	12.5		

Items	Nursing College	Satisfactory		Unsatisfactory		χ2	P-value
		No	%	No	%		
5. Satisfaction • Satisfaction How satisfied are you with this learning method	Port said	74	91.4	7	8.6	.194[a]	.660
	Qassim	93	89.4	11	10.6		
6. Teamwork/collaboration • We were able to work as a team to accomplish the task done	Port said	76	93.8	5	6.2	.023[a]	.879
	Qassim	97	93.3	7	6.7		
7. Decision making • Was able to assess the situation and make the appropriate decision	Port said	72	88.9	9	11.1	.111[a]	.740
	Qassim	94	90.4	10	9.6		
8. Critical Thinking • Was able to assess the situation and analyze correctly	Port said	76	93.8	5	6.2	.023[a]	.879
	Qassim	97	93.3	7	6.7		
Total	Port said	31.4691±6.35627				T 1.552	.117
	Qassim	29.9712±6.63245					

Table (5): Evaluation of nursing students Performance among Port Said and Al Qassim university regarding child' head to toe assessment in the clinical after the simulation effectiveness sessions

Items	Nursing College	Adequate		Inadequate		χ2	P-value
		No	%	No	%		
1. Getting ready	Port said	65	80.2	16	19.8	19.269[a]	.000*
	Qassim	103	99.0	1	1.0		
2. Anthropometric measurement	Port said	77	95.1	4	4.9	.002[a]	.967
	Qassim	99	95.2	5	4.8		
3. Vital signs	Port said	80	98.8	1	1.2	1.291[a]	.256
	Qassim	104	100.0	0	0.0		
4. General appearance	Port said	41	50.6	40	49.4	26.639[a]	.000*
	Qassim	89	85.6	15	14.4		
5. Head, face and neck	Port said	28	34.6	53	65.4	22.029[a]	.000*
	Qassim	72	69.2	32	30.8		
6. Chest	Port said	74	91.4	7	8.6	9.341[a]	.002*
	Qassim	104	100.0	0	0.0		
7. Abdomen	Port said	27	33.3	54	66.7	97.913[a]	.000*
	Qassim	104	100.0	0	0.0		
8. Neuromuscular	Port said	34	42.0	47	58.0	60.828[a]	.000*
	Qassim	98	94.2	6	5.8		
9. After the procedure	Port said	51	63.0	30	37.0	45.974[a]	.000*
	Qassim	104	100.0	0	0.0		
Total	Port said	26.7778±6.37966				T-13.514	.000*
	Qassim	37.0096±3.84277					

Table (6): Nursing students satisfaction among Port Said and Al Qassim university regarding total Students' satisfaction and self-confidence, evaluation of simulation effectiveness sessions, Evaluation Scale results and their performance (N = 185).

Items	Nursing College	Satisfied		Unsatisfied		χ2	P-value
		No	%	No	%		
Total score of Students' satisfaction and self-confidence	Port said	78	96.3	3	3.7	.816[a]	.517
	Qassim	97	93.3	7	6.7		
Total evaluation of simulation effectiveness sessions	Port said	73	90.1	8	9.9	.004[a]	.953
	Qassim	94	90.4	10	9.6		
Total score Scale	Port said	76	93.8	5	6.2	.401[a]	.527
	Qassim	95	91.3	9	8.7		
Total Score Performance	Port said	59	72.8	22	27.2	32.059[a]	.000*
	Qassim	104	100.0	0	0.0		

Table (7) reflects that positive correlation between Evaluation Scale results and self- students' satisfaction and self-confidence and evaluation of simulation effectiveness sessions with highly statistical significance difference. It shows that positive correlation between student level (year) and

their performance with highly statistical significance difference, also this table illustrates positive correlation between student performance, satisfaction and self-confidence and evaluation of simulation effectiveness sessions and Evaluation Scale results with no statistical significance difference. While, the table reflects that negative correlation between experience and students' satisfaction, self-confidence and evaluation of simulation effectiveness sessions with no statistical significance difference. Also, the table reflects that negative correlation between student level and evaluation of simulation effectiveness sessions, experience and Evaluation Scale results with no statistical significance difference.

Table (7): Correlation Coefficient (r) Between Total score of students' satisfaction and self-confidence, evaluation of simulation effectiveness session, Evaluation Scale results and Performance (N= 185).

Items		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	Total score of self-satisfaction and self-confidence							
(2)	Total evaluation of simulation effectiveness sessions	.000						
(3)	Total score of Evaluation Scale results	.000	.000					
(4)	Total Score Performance	.519	.960	.997				
(5)	Experience	.573	.209	.909	.324			
(6)	Student Level (year)	.234	.731	.479	.000	.779		
(7)	Grade	.141	.114	.630	.398	.392	.019	

4. Discussion

Every nursing undergraduate in the tutorial room and laboratory site obtains the similar facts by the tutor. Nevertheless, each learner in the clinical site doesn't obtain the similar experiences. Practical learning depends on various conditions for example patient accessibility; clinical time, and clinical locations then, learners can practice difficulty to use the theory to practice associated to reduced chances in their nursing curriculum to clinical situations in which they can apply their newly learned Knowledge and skills **(23)**. High-fidelity simulation (HFS) has been planned as a innovative, additional education-learning approach to improve the transmission of learner self-confidence and proficiency to the practical nursing setting **(24).** Emphasis individual facts that establish consuming HFS mannequins to simulate real practical situation **(25)**, provided that learners with higher appropriate 'practicality' **(26).**

Furthermore, the participants who had no previous experience perceived that they improved in their communication skills from just one pediatric HFS scenario. Additionally, they felt an improvement in their communication skills after finishing the simulation scenario **(27)**.

The study findings showed that the majority of nursing students in age group (21-23years) and they have experience regarding care patients in both Port Said and Qassim University. This is consistent with **Badir et al., (28) & NCBON (29)** they reported the major percentages of nursing learners were between 20 and 25 years. In the same line with **Kelly et al., (30)** who reported that the majority of students being 25 years or younger. Also, they explained that (89.2%) of the students had previously been involved with HFS in some capability, while four (10.8%) had no HFS experience prior to the pediatric clinical course.

The current study showed that the participant students were satisfied with all items of satisfaction regarding current learning and self-confidence in learning by simulation sessions in both groups in this line **Franklin and Burns (31)**, recorded that the National League for Nursing published in 2006 three measures related to new nurses' opinions about self-confidence, scenario design, and learning practices related to simulation. The learners were high significant of Self-satisfaction and Self-confidence regarding usage the high fidelity simulation (HFS). **Lubbers and Rossman (32)** discovered that learners were satisfied and self-confident after their simulation practice. Also, they described great levels of satisfaction with the fidelity of the simulation experience.

Kardong-Edgren et al., (33), Bradley (34), Rode et al., (35) and Anon (36) stated that simulation develops clinical decision and directed to optimistic satisfaction with the simulation lab learning setting and learning through observation, experiences and practice. It guides to the varied education styles, experiences and anticipations amongst learners in using simulated teaching. This presented that learners were capable to apply knowledge, practical skills and show proficiencies**. Yuan et al., (37)** offered positive results to impact of HFS on nursing learners' confidence and competence. Also, indicated the mean scores of knowledge and skill examinations were increased after using HFS.

The present study showed that all participants' were satisfied with simulation session that was a positive way to learn and be well organized to cope

with patients' real life after the simulation session. Also, they feel additional experienced in assessment for basic signs of life for a patient. The learners were challenged and more confident in making decision, solving problem and critical thinking, learned more from seeing other classmates deal with the simulation scenarios, the briefing, response and discussion of group sessions were appreciated and improvement in helping to understand what to do well and what went incorrect. Majority of them gained confidence and improved learning skills through the experience. This was supported by the research which was conducted by **Howard et al., (38)** who reported that learners supposed simulation assisted them to know concepts well, stimulated their critical thinking and knowledge gained and could be transmitted to the practical situation. **Solymos et al., (39)** mentioned that learners using HFS were established greater satisfaction' and confidence compared with learners using the videos. Also, Simulation sessions develop satisfaction marks of learners compared to lectures and MCQ in critical care.

Wang et al., (40), D'Souza, et al., (41), Ahn and Kim (42) and Kaddoura et al., (43) added that simulation enhanced self-confidence and satisfaction. Also, they reflected the significance of the simulation design was presented greater in the HFS group among learners as role players and observers. It illustrated 'Support', 'Problem solving' and 'Fidelity' (practicality) was meaningfully greater. Feedback from simulation enhanced reflective knowledge and critical thinking and performance in the places of education among Omani students **(44).** So, high-fidelity simulators, may comprise diverse approaches for example role plays, games, and computer programs; it motivate the learner to become an active participant, to critical thinking and to develop a portion of the learning circumstances also, learners supposed simulation helped them improved understand concepts, stimulated their critical thinking and information increased and could be transmitted to the practical situation **(45)**. Furthermore a pediatric simulation program was established for the practical rotation. These permitted learners to initiate their practical skills well-arranged and extended their general practical skills in a restricted quantity of time **(46).**

The present study showed that, all of the participants' students satisfied regarding evaluation of the feedback as the learners feel that the session assists them know their areas of weakness and strength, teamwork and satisfaction as the participants were able to work in a team to accomplish the task delegated to them. Also, Participants felt satisfied with this learning method as it was new and informative to them. As regards to enhance learning, decision making and boosting of confidence and fidelity, they felt that the simulation sessions greatly boosted their confidence to practice. This due to simulation experienced time producing the learners to skill the reality of simulation on a manikin that can achieve basic human functions. This is coordinated with the results of study conducted by **Ballangrud et al., (47), Bussard (48), and Strickland and Mach (49)** who stated that the learners felt satisfied with learning technique and satisfied with assessment feedback and improved critical thinking, clinical judgment, skill acquirement, clinical perceptive. **Sperling et al., (50) and Chapelain et al., (51)** mentioned that simulation decoded practical in knowledge with follow of clinical scenarios. From this time knowledge marks of learners enhanced with greater satisfaction to present education and self-confidence. **D'Souza et al., (52)** identified that 'Active learning', 'Different methods of education' and 'high anticipations' were meaningfully greater for satisfaction and confidence among learners applied simulation and regarding Support', 'Problem solving' and 'Fidelity was significantly developed with satisfaction**. Stewart et al., (53) and Liaw et al., (54)** indicated that, third-year nursing and fourth-year medical learners in Singapore shared in inter professional simulation planned to observe the learners' self-confidence and satisfaction in inter professional communication and opinion with inter professional training. The finding reflected that both nursing and medical learners established an important development on posttest marks for self-confidence in inter professional communication and opinion in inter professional learning among learners that received HFS before the clinical experience. While learners received HFS during or after their clinical experiences did not perceive any statistically significant development in their communication, knowledge and psychomotor skills. **Luctkar-Flude et al., (55)** reported the impacts of simulation on confidence and proficiency regarding HFS versus a traditional low-fidelity simulation to encourage self-confidence and satisfaction with learning in novel nursing learners. Learners sharing in the HFS were meaningfully further confident than those in the traditional group. Both groups conveyed advanced levels of self-confidence after the learning activities.

The present study illustrated that the majority of the participants have adequate performance regarding items of child' head to toe assessment except of nursing students in Port said University have inadequate performance compared by Qassim University regarding assessment of head, face and neck, abdomen and neuromuscular with the highly statistical significance differences in both groups. In this context, **Hart et al., (56)** referred that nurses must have high level of self-confidence in their skills to behavior, proper health assessments, achieve effective

management, participate as an active team group and diagnose client decline events. **Megel et al., (57)** who found that practice with HFS before clinical in the pediatric setting reductions learners' anxiety as they are competent to practice psychomotor skills on the manikin. Following the HFS learning activity, learners felt extra comfortable implementation the head to toe assessment on a pediatric patient. **Lindsey & Jenkins (58)** found that the majority of learners who following head to toe assessment simulation sessions reported that they feeling well prepared to undertake physical assessment during the simulation sessions. Moreover, the students had the opportunity to practice the skills of physical assessment. Head to toe assessment is reflected a general proficiency essential in nursing, and a skill necessary by a variety of health professionals, including nurses, for effective health assessment. Head to toe assessment using a manual technique is a highly developed skill requiring considerable practice in order to achieve proficiency. In addition, **Michelle et al. (59),** stated that (HFS) is reflected a standard teaching in high-risk productions to deliver an opportunity for safe and careful skills. Health care professionals have been focusing on low-fidelity simulation in teaching for several years to educate physical assessment and psychomotor skills. However, it is only in latest years that innovated training nursing tutors have initiated to emphasize on HFS in combined methodology to education cognitive talents with practical abilities to enhance practical skills.

The study findings reflected that the majority of students were satisfied in both groups regarding self-satisfaction and self-confidence, simulation sessions effectiveness, evaluation scale and performance. This in the same line with **Hayden et al., (60),** who mentioned the significance of education products for learners will remain to play an integral role in simulation. There is continuous indication to support learner education and simulation as an educational method within the nursing program. Also, learners' opinion of their information increased after the simulation session; the learners feel that information can be transmitted from simulation to the practical situation with no significance in learner products following simulation versus traditional practical teaching. This data is vital of how the nursing learner knows simulation in their improvement through the nursing curriculum. **Pauly-O'Neill, et al., (13)** reported that their research supports a combination of classroom, simulation and clinical education for nursing students. Learning through simulation can benefit students when they transition from student to novice practicing nurses in high acuity complex care areas and have to experience new situations.

The current study reflects that positive correlation between evaluation Scale results, self-satisfaction and self-confidence and evaluation of simulation effectiveness sessions with highly statistical significance difference. Also, this study illustrated a positive correlation between performance and self-satisfaction and self-confidence and evaluation of simulation effectiveness sessions and evaluation scale results. In the same line with **Andree (61)**, who mentioned that simulation in health education has been shown to raise confidence, psychomotor and professional abilities, and therefore positively effect on learner preparation for practical situation. It is recognized as a valued instrument to provide and involve learners in realistic patient care meetings without the possible to cause patient harm. Undergraduate nursing learners in a pediatric nursing syllabus were involved in an extended multi-scenario simulated clinical shift previous to practical situation. The simulation focused on a difficult area of skill, learners taking the chance to apply a various of psychomotor skills, making decision, leadership, team work and other professional attributes integral for effective transmission into the practical situation. **Bowling (62)** stated that learner's achievement better skills that enhanced after a simulated learning skill. Furthermore it was supported by **Andree (61)**, that Simulated scenarios utilizing high fidelity simulators as an adjunct to pediatric education can help the quality of care which nursing students provide to patients. Simulated scenarios can help ensure students are adequately prepared for clinical, utilizing skills through hands-on learning in a safe risk-free environment through the use of life-sized, life-like manikins.

McCallum (26) established HFS proficiencies deliver low-risk learning chances for learner share in 'typical' practical nursing conditions. Oversaw simulation proficiencies permit learners to training on patient care without stressful atmosphere, nevertheless help to reduction related fears of failure with live patients. As an environment may increase learner self-confidence and competence during actual practical situation. The literature is supplied with researches in which learners explain greater application for learning using simulation **(63 and 64)**. Students experience simulation as engaging, with the potential to improve learning by stimulating critical thinking **(Starkweather & Kardong-Edgren (65) and Blum et al., (23)**.

Young and Jung (66) demonstrated that integrating a one-time simulation into the improving syllabus has important effects on knowledge and practical reasoning grades. However there is still absence of indication for how much HFS is needed in the nursing syllabus for extreme effectiveness; the

results recommend that contribution has a positive effect on students' cognitive ability. Also, the findings showed that learners in the simulation group recorded higher significant on practical reasoning skill and associated information than those in the educational lecture group. The proficiency skills are the greatest influential basis of self-efficacy or confidence data has vital effects for the competence learning model of educational attainment.

Conclusion:

So this study concluded that, the high fidelity simulation training had a positive impact on nursing students' satisfaction, self-confidence and their performance in pediatric real situation in both Port Said and Al Qassim University.

High-fidelity simulation (HFS) permits for the improvement of apprentices' cognitive, affective, and psychomotor skills in a realistic repetition of a health care situation. With the fast rise of simulation training, there has been a great improvement in the attention paid to its effective use. In other words, the way it is combined into the nursing program is significant. To be effective, HFS must be combined into the curriculum and not be seen as a separate instructive instrument.

Recommendations:

This study recommended with:

1- High fidelity simulation training in all schools, institutions and faculties of nursing.

2- Continuous training for staff members in colleges institutes and schools to use high fidelity simulation labs in students training.

3- Continuous development of training models to achieve real simulation of reality as possible.

4- Giving every student the opportunity to practice the simulated model before exposed to real situation.

5- Development of Evidence-Based Clinical Simulation Scenarios that extremely imitate the real situations.

6- Providing undergraduate nursing education with a simulation-based curriculum for clinical reasoning development and knowledge acquisition.

7- Using as valuable instruments by nurse educators for the development, implementation, and evaluation of simulation activities in nursing college.

8- Further research is necessary to demonstrate improvement in clinical outcomes after simulation training between nursing staff.

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