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RESEARCH ARTICLE

Nursing Students' Perception of Clinical Simulation in the Eastern Region of Saudi Arabia

Nabat Al Malki[1], Amani Almutairi[1,*], Bayan Alsulami[1], Haneen Altwairqi[1], Ibtihal Alruwaybie[1], Manal Albugami[1] and Mawahib Al Malki[1]

[1]*Department of Nursing, Prince Sultan Military College of Health Sciences, Dhahran, Saudi Arabia*

Abstract:

Background:

Simulation in nursing has advantages for performance, psychomotor skills, and clinical learning. In addition, simulation has been reported to show a positive impact, which may guide nurse instructors with regard to the conditions beyond which patient simulation is more practical than the traditional learning style.

Objective:

The study aimed to evaluate the perceptions of nursing students studying at the College for Health Sciences in the eastern region of Saudi Arabia.

Methods:

A quantitative study design was used in this study. A descriptive survey was conducted using a convenience sample of nursing students at the College for Health Sciences in the eastern region of Saudi Arabia. The questionnaire consisted of 10 questions presented on a four-point Likert scale.

Results:

A total of 103 nursing students participated in the study with a response rate of 85%. The majority (70%) were Bachelor program students, while 30% were Bridging program students. Most respondents' age ranged between 18–22 (55%). The respondents' level of the program that they were enrolled in while taking the survey was as follows: first year (17%), second year (20%), third year (28%), and fourth year (35%). Students demonstrated the strongest agreement with the statement "simulation helped in better understanding the concepts in the clinical setting" with a mean of 3.0. However, the lowest mean score of 2.74 was for the statement "simulation was realistic and students experienced nervousness during their simulation sessions".

Conclusion:

The results conclude that simulations help students better understand concepts in clinical settings, provide them with valuable learning experiences, and help them stimulate critical thinking abilities.

Keywords: Perception, Nursing students, Clinical simulation, Psychomotor skills, Health care, Clinical learning.

1. INTRODUCTION

Many healthcare educational institutions, including nursing colleges, have incorporated training and teaching curricula within a safe environment through the utilization of patient simulation. It aims to develop practical skills of the healthcare

* Address correspondence to this author at the Department of Nursing, Prince Sultan Military College of Health Sciences, Dhahran, Saudi Arabia;
Tel: +966550399353; E-mail: amani.m.almutairi@hotmail.com

students in a safe environment prior to dealing with real patients. It also includes critical thinking and decision-making practice [1]. The use of simulation, particularly in nursing colleges, has been widely used as a method of teaching and learning. Students gain more knowledge and experience in treating real patients in clinical settings in terms of having critical thinking abilities in different situations with the repeated performance of objectively measured abilities by simulation, enhancing in-depth learning, professional skills,

and responsibilities. High fidelity simulation (HFS) also improves nursing skills and helps to transform theory into reality. HFS has also indicated its use in the acquisition of professional knowledge and skills in an intra-professional peer learning simulation within a real-based clinical experience [2]. In addition to that, it was found that bachelor science of nursing students (BSN) showed high skill performance, confidence, collaboration, and leadership with simulation [3]. Students evaluate the simulation as a learning tool in helping them to be less nervous and more confident in caring for a real patient. The simulation environment provides real-life scenarios to understand the concepts and gain skills and values necessary for realistic nursing care. The simulation helps to assess reasoning abilities and efficiency, gain expertise before a real patient is cared for, and evaluate new devices before implementing patient safety concepts into the training program for real patients [4, 5].

For the past three years, simulations have been integrated into the nursing education program for the students at the College for Health Sciences in the eastern region of Saudi Arabia. Yet, nursing students' perceptions and experiences regarding the adoption of simulations in nursing programs and their advantages in the learning process and learning environments are not exposed. Therefore, studying these views will help overcome strains students encounter in a real clinical situation. Consequently, the study findings would assist educators in improving the practice through integrating the simulation into the clinical training and sustaining the effective application of the simulation session.

Little is known about the perceptions of nursing students using clinical simulation in Saudi Arabia [6]. Therefore, it is necessary to have an informative study to appraise whether simulation adds value to the students' learning. For that reason, the study's aim was to evaluate the perceptions of nursing students using clinical simulation at the College for Health Sciences in the eastern region of Saudi Arabia.

1.1. Research Questions

• What are the perceptions of nursing students toward the clinical simulation program?

• Does simulation affect the students' clinical practice and critical thinking ability?

• Does the debriefing session help nursing students understand the clinical practice aspects?

1.2. Literature Review

The research has found that simulation teaching in nursing has advantages for performance, psychomotor skills, and clinical learning. The research indicates that simulation education has a moderate to high impact that may guide nurse instructors with regard to the conditions beyond which patient simulation is more practical than the traditional learning style [7]. In general, in nursing education, simulation should be incorporated at different levels by taking different learning approaches and using the proper methodologies necessary for learning [8]. The simulation can be a viable option for gaining clinical experience for nursing students. The research has

found that sequent simulation experience is a valuable and an effective method as a learning tool [9, 10]. The study's findings showed that the majority of the students suggested that they were well prepared for their clinical training as a result of the simulation practice. In this study, the significant finding was that during the simulation scenario session, the clearer the learning objectives, the better were the chances for problem-solving and critical thinking abilities in students of nursing college [11].

A study aimed to evaluate whether simulation adds value to the training of nursing students for clinical practice. A voluntary purposeful sample of nursing college students was invited to participate in a focus group interview. The results of the data showed that simulation adds value in the training of students for clinical practice; the results have been grouped under the following themes: simulation preparation; experience and feelings of engaging in simulation; value for clinical practice; goals/outcomes of learning; and how to develop simulation to better prepare students for clinical practice. In conclusion, the purpose of this research was to know if simulation adds value to the clinical experience of nursing students in preparing them. While this was a small sample, the findings have shown simulation to add value to the clinical practice of students. Simulation participation builds their abilities, skills, and confidence, and prepares them for what to expect in the clinical setting. Simulation training seems to be directly transferable to clinical practice. Lecturers have a vital role to play in promoting simulation teaching and learning by maintaining a secure environment in which students can make mistakes and learn from them in a constructive manner. It is important to have direct, organized learning goals, and to use directed reflection in the debriefing to ensure that a safe learning environment is maintained [12]. In addition [13], simulation using standardized patients (SPs) in the learning of nursing students can have significant beneficial effects on their cognitive, affective, and psychomotor domains. A meta-analysis research has concluded that simulation-based learning using SPs may have a beneficial effect on self-efficacy and motivation for learning that impacts the development of information and clinical skills. Also, it indicates that, if properly applied, an SP instructional approach can be used as an active learning technique in academic settings.

In addition, the research is also aimed at exploring the effectiveness of simulation technology in nursing education from the point of view of students themselves. The study has found that most students express positive attitudes regarding utilizing simulation technology in nursing education. With great technical advancements, the ability to model patients has become more advanced, and virtual reality has transitioned to real-time with respect to training and education. Nursing training and education are developing remarkably and necessitate a high degree of attention in evaluation methods, such as critical thinking and problem-solving. Simulation provides opportunities in a secure and stable environment for education and training. Ongoing research is not adequate to justify that clinical education is repositioned by simulation, but simulation persists as an ideal bridge between the theoretical framework and implementation. In general, most nursing students have positive attitudes regarding using simulation in their training and teaching [14].

Moreover, a study was conducted to find out how

simulation training affected nursing students' perceptions of including patient families' assessments in their treatment plans. A control group of 56 and an intervention group of 67 senior nursing students from the King Saud Bin Abdulaziz University for Health Sciences, College of Nursing, Jeddah, respectively, were randomly allocated as part of this quantitative, experimental research. The instrument was divided into three sections: a role-play survey, a Van Gelderen family rubric, and personal information. In this study, a total of 123 nursing students participated. Their ages ranged from 19 to 23 and from 23 and older, with the control group's mean age being 21.3 (1.3) and the experimental group's mean age being 22.2 (1.1). The mean scores in the experimental group increased post-training phase compared to the pre-training phase, with a statistically significant difference at $p < 0.05$. In contrast to the statistically significant difference between the two groups observed in the post-training phase, there were no discernible differences between the control and experimental groups in the pre-training period. In contrast to the statistically significant difference between the two groups observed in the post-training phase, there were no discernible differences between the control and experimental groups in the pre-training period. The study's conclusion showed scenario-based standardized patient-simulated exercises, supervised by committed faculty and combined with reflective debriefing activities, to be an efficient way to close the knowledge gap between theory and its practical application in clinical practice. In order to address and potentially close the theory-practice gap for graduates when they enter clinical practice, the study also recommended curriculum revisions to include family assessment in the practice of nursing as well as evidence-based strategies, like learning activities that use standardized clients or high-fidelity simulation technology [15].

On the other hand, both students and faculty agreed that critical thinking was enhanced by simulation. After introducing additional services and faculty development, faculty expectations of simulation learning have improved. The use of high-fidelity simulation is more favorable for faculty to simplify clinical learning. Moreover, alertness to the value of training and encouragement for faculty members who are less experienced with simulation learning style has improved. Students' perceptions remained overwhelmingly positive towards clinical simulation, which involved groups embracing the challenge, reality, and critical thinking that allow for technology. However, in simulation learning, some students remained cynical and anxious. Therefore, it is significant for faculty to be alert to differences in expectations of students and create secure and stable learning environments [16].

Besides, an investigation aimed to build a substantive theory of the high-fidelity simulation-based learning (HF-SBL) dynamics of nursing students by discussing the experiences of HF-SBL of nursing students and defining factors that affect HF-SBL. As a method of this study, the constructivist grounded theory was used. 23 semi-structured interviews were conducted among 16 undergraduate nursing students in memo writing. All of the data collected were handled using NVivo 11. A theoretical model of HF-SBL dynamics, containing process and four HF-SBL influencing factors, was constructed by this research. In addition, the students' perception during HF-SBL

of a lack of psychological fidelity was established and highlighted. There is no argument that HF-SBL has advantages in nursing education. However, due to the disadvantages of HF-SBL, nursing educators should be careful to assume that HF-SBL is the ultimate alternative to clinical placements. However, the insufficiently realistic experience for students is one of the constraints (particularly of psychological aspects of care and communication). While HF-SBL can imitate clinical environments, real clinical contexts cannot be replicated completely and the practice of professional socialization cannot be achieved. In nursing education, clinical settings are irreplaceable, and HF-SBL is not a clinical placement panacea for learning problems. As a supplemental instructional technique, HF-SBL is more efficient in nursing education, along with formal clinical placements, which eventually leads to the conclusion that educators and health care practitioners can work together to develop clinical learning environments [17].

Ultimately, a research was conducted to evaluate students' perceptions related to satisfaction and self-confidence in high fidelity simulation (HFS) as a learning process. In this research, a cross-sectional descriptive correlation design was used that was performed at King Saud University (KSU) and Princess Nourah University (PUN) in Riyadh. At King Saud University (KSU) and Princess Nourah University (PNU), a total population of 404 students of levels 5 to 8 was identified from the Bachelor of Science in Nursing curriculum in the 1438-1439 academic year. This study found the most significant element in learning related to HFS to be fidelity (realism). In using HFS, the students were satisfied and self-confident. There was a significant relationship between the age profile of the participants and the academic level of students and the main features of the simulation. In conclusion, the findings demonstrated that students accepted simulation fidelity denoting real-life variables and situations. Students agreed that they were inspired to learn through instructional materials that have been used in the simulation. The findings also showed that the perception of satisfaction of students has shown no significant relationship with the participants' profiles. In terms of learning profile and self-confidence, it has been shown that only the level of the student did not substantially correlate with the level of confidence. Simulation is an effective way of teaching as a real-life instrument without threatening the patient's life and encouraging the students' performance. The simulation fidelity is the student's most important factor, and the students were satisfied and confident with existing HFS-related learning [18].

2. MATERIALS AND METHODS

2.1. Research Design

A quantitative study design was used in this study. A descriptive study was conducted using an adopted questionnaire in order to evaluate the perception of nursing students using clinical simulation at Prince Sultan Military College of Health Sciences (PSMCHS). Therefore, this study used the survey design to collect data from nursing students on their perceptions relating to the use of simulation in nursing education.

2.2. Research Sample

A convenient sample of nursing students studying at PSMCHS was used in this study. Bachelor nursing students from all levels and bridging nursing students typically holding a two-year college degree and have been working in clinical settings for years, who have been offered this program to seek and obtain a four-year or graduate degree, were also eligible to participate in this study. The exclusion criteria comprised students from other healthcare specialties. Finally, a total of 121 nursing students were eligible to participate in the study.

2.3. Research Instrument

An adopted survey was used to conduct the study. It was initially designed by Howard, Englert [19], and then modified by Alhaykan [20]. The survey used in this study was also modified and adopted from an earlier study [21]. It involved two parts and the first part included demographic data. However, permission from the author was sought before using the survey instrument, and once obtained, a minor modification was done to the demographic data as the study has been focused on the nursing specialty alone. The second part consisted of 10 questions presented on a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). This survey has been done to evaluate the students' perception of using simulation in nursing programs integrated with clinical courses in the curriculum.

2.4. Procedure

The research team distributed the survey to nursing students at Prince Sultan Military College of Health Sciences after the IRB approval in March 2021. The survey included research information and confidentiality was reassured as the survey was anonymous. A reminder was sent to the potential participants to enhance their responses. The data collected was analyzed using the Statistical Packages for the Social Sciences (SPSS) program, version 25, by applying descriptive statistics of percentage, frequency, mean, and standard deviation.

2.5. Simulation Program and Context

Simulation is a safe environment creating an educational process that mimics clinical procedures. It is a technique that can be adjusted to reflect real-life situations and that offers the chance to apply it in situations that are more like the representation of real-life settings. Nursing students have the chance to practice their clinical and interview skills in a secure environment by participating in a simulation center. Also, they have the chance to practice some of the most difficult aspects of nursing care and make mistakes without hurting anyone because the experience normally consists of an actor playing a patient and a genuine scenario in a simulated clinical setting. As students, they will make mistakes, but it is better to do so in a simulation than in a real-life clinical setting. It should be recognized that every mistake they make is a chance for learning and that it reduces the number of mistakes they will make as a nurse practitioner in a real-life clinical setting. It can also assist in identifying a student's areas of strength and development while fostering confidence in their ability to put the knowledge they have acquired in the classroom into practice.

2.6. Overview of the Simulation Session

The simulation session was based on different scenarios that matched reality cases, helping the nursing students to recognize, analyze, and make decisions, and handle real patient cases. The scenarios of simulation were related to medical-surgical nursing, psychiatric-mental health nursing, and community health nursing, all with situations relevant to learning objectives. All the nursing students participated in each scenario; during a simulation, one group participated, while the others observed and evaluated the participating group. The observers were given specific tasks in accordance with the learning objectives specified for each scenario in order to learn about holistic nursing care. In one scenario, we used a simulator (manikin); in the others, we used a standardized client (a student who was given acting instructions). Each group consisted of around 15-20 students who took part in each session for 4-5 hours. Each simulation scenario involved a briefing session, the simulation scenario, and a debriefing, explaining the equipment needed for the specific scenario, reading the patient history, and distributing tasks for the exercise participants. The other students observed the main concepts listed in the learning objectives, while the students took turns participating in one simulation scenario. In this manner, each nursing student actively participated in each scenario, and they also trained, observed, and took part in the debriefing for scenarios. Based on nursing students' responses in the survey, they showed the strongest agreement with the statement "simulation helped in better understanding concepts in the clinical setting" with a mean of 3.0. This means that simulation scenarios helped them to know how to handle such cases in real-life clinical settings. A simulation session followed a predetermined format and consisted of three distinct phases: prebriefing, simulation, and evaluation or debriefing.

2.7. The Three Phases of Simulation

2.7.1. Prebriefing

During the simulation's prebriefing phase, nursing students are informed of what they can anticipate. It establishes the case scenario, together with the anticipated outcomes and goals. The clinical educator should lay out the guidelines and let nursing students know that it is acceptable to make mistakes. In the debriefing, they will talk about the mistakes they have made.

2.7.2. Simulation

The simulation phase must have a distinct beginning that establishes the simulation's context. The tasks are made to provide nursing students with practice using the abilities they will need in a clinical setting. They ought to be focused on the students' knowledge, skill, and experience levels. The achievement of the learning objectives is typically the endpoint.

2.7.3. Evaluation or Debriefing

The debriefing comes right after the simulation. Students get feedback from their instructor at the debriefing. They talk about the mistakes they have made and how they can get better the next time. Also, the students will be able to evaluate their own performance and apply what they have learned to what they already know.

3. RESULTS

A convenience sample of nursing students was used in this study. A total of 103 nursing students participated in the study with a response rate of 85%. The majority of the respondents were Bachelor program students (70%), while 30% were

Table 1. The frequency and percentage related to different levels of nursing programs.

Demographics Data	Frequency	Percentage
Age		
18 – 22	57	55%
23 – 27	29	28%
28 – 32	15	15%
33 and above	2	2%
Nursing program		
Bridging program	31	30%
Bachelor program	72	70%
Academic year		
First year	17	17%
Second year	21	20%
Third year	29	28%
Fourth year	36	35%
Participants' healthcare clinical experience prior to entering the program		
Yes	45	44%
No	58	56%
Participants' experience with simulation prior to entering the program		
Yes	64	62%
No	39	38%
Participants' experience with simulation while being in the current program		
Yes	103	100%
No		0%
Participants' experience with simulation		
1-3	47	46%
4-6	38	37%
7-9	13	12%
10-12	5	5%

Table 2. The nursing students' responses in percentages with mean and standard deviation.

Item	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean	SD
1. Simulation(s) in my program helped me to better understand concepts in the clinical setting.	8 (8%)	10 (10%)	59 (57%)	26 (25%)	3	2.58
2. Simulation(s) in my program provided me with a valuable learning experience.	8 (8%)	11 (11%)	65 (63%)	19 (18%)	2.92	2.49
3. Simulation(s) helped me to stimulate critical thinking abilities.	7 (7%)	20 (19%)	56 (54%)	20 (19%)	2.86	2.45
4. Simulation(s) was realistic.	10 (10%)	17 (17%)	66 (64%)	10 (10%)	2.74	2.31
5. Knowledge gained through my simulation(s) can be transferred to the clinical setting.	7 (7%)	11 (11%)	65 (63%)	20 (19%)	2.95	2.52
6. I was nervous during my simulation experience(s).	8 (8%)	24 (23%)	58 (56%)	13 (13%)	2.74	2.31
7. Because of my simulation experience(s), I will be less nervous in the clinical setting when providing care for similar patients.	13 (13%)	14 (14%)	58 (56%)	18 (17%)	2.79	2.40
8. Simulation experience(s) can be a partial substitute for clinical experiences in the hospital.	10 (10%)	17 (17%)	64 (62%)	12 (12%)	2.76	2.34
9. Simulation should continue to be an integral part of the clinical experience.	11 (11%)	12 (12%)	55 (53%)	25 (24%)	2.91	2.52
10. Debriefing after the simulation experience supported my reasoning and ability to perform in the clinical setting.	9 (9%)	16 (16%)	61 (59%)	17 (17%)	2.83	2.42

Bridging program students. Most of the respondents' age ranged between 18–22 (55%). The respondents' level of program that they were enrolled in while taking the survey was as follows: first year (17%), second year (20%), third year (28%), and fourth year (35%) (Table **1**).

With regards to the students' response to the survey's item asking about their clinical experience, more than half of the respondents reported that they did not have any experience working in a healthcare setting prior to entering the program (56%), while 44% of the respondents reported to have experience working in a clinical setting prior to entering the nursing program (Table **1**). Regarding the survey's items of the student simulation experience prior to entering the nursing program as well as their simulation experience in their current program, 62% of the participants self-reported that they had simulation experience prior to entering the program, while 38% of the participants reported that they did not participate in any simulation sessions prior to entering the program. However, all of the students reported that they had at least one clinical simulation session in their current program (Table **1**).

The survey reflected in detail overall nursing students' perceptions regarding clinical simulation experience. The findings are presented in Table **2**, which includes the item number on the survey and a description of the questions. The table shows the mean score and standard deviation (SD) of the overall nursing students' perception, as well as the percentage

of each response. Table **2** shows the nursing students' response in percentages with mean and standard deviation. Overall, students self-reported a positive response to all items on the survey. Students demonstrated the strongest agreement with the statement "simulation helped in better understanding concepts in the clinical setting" with a mean of 3.0, followed by the statement "knowledge gained through simulation can be transferred to the clinical setting" with a mean of 2.95 and "simulation was a valuable learning experience" with a mean of 2.92.

4. DISCUSSION

This study aimed to evaluate nursing students' perceptions using clinical simulation at the College for Health Sciences in the eastern region of Saudi Arabia. The overall findings of the perceptions of nursing students toward the clinical simulation program revealed that simulations helped them better understand concepts in clinical settings, provided them with a valuable learning experience, and helped them to stimulate critical thinking abilities. Further, the participants expressed their agreement that the simulation sessions were realistic, and that the knowledge gained from simulations could be transferred to the clinical areas. However, nursing students reported that they were nervous during simulation experiences. This may be due to a lack of simulation experience prior to entering the program. This is consistent with the findings of a similar study where the feedback from nursing students was very positive and in favor of the use of simulation as a training method [22]. Likewise, another research concluded that nursing students showed positive responses to the simulation evaluation survey, indicating that simulation should be included in the nursing curriculum. It was also noted that students became more comfortable as they experienced more simulation sessions [19].

In Saudi Arabia, a research highlighted the positive perceptions of medical faculty members toward the integration of simulation as a teaching and training method in the undergraduate curriculum [23]. The academic staff reported that the high-fidelity nursing simulation experiences create a safe learning environment [24]. Moreover, the research has found that several learning outcomes are accomplished and improved through simulation sessions, such as procedural skills, diagnostic skills, communication skills, and self-confidence [4, 5]. Further, the research has also found that students experience nervousness during simulation sessions; however, they have shown a positive attitude toward this training [19, 20].

In addition, the participants have shown a positive response that simulation should be an integral part of the clinical experience in the nursing program. They have also reported that they will be less nervous in the clinical area when providing care for similar patients because of simulation scenarios. These findings have been supported by other researches, highlighting the majority of students to provide positive feedback regarding the integration of simulation in the curriculum. Simulation is a teaching method that provides students with a sample of a real patient situation. As a result, this helps students transition from the laboratory to a real patient setting [4, 25].

Furthermore, nursing students agreed that debriefing after the simulation experience supported their reasoning and ability to perform in the clinical setting. Similarly, other studies have reported that students consider debriefing as helpful in discussing and reflecting on the skills applied in the simulation scenario [20, 26].

CONCLUSION

This study's findings support the integration of the simulation throughout the nursing curriculum, as evidenced by the positive response of nursing students at the College for Health Sciences in the eastern region of Saudi Arabia. The results conclude that simulations help students better understand concepts in clinical settings, provide them with valuable learning experience, and help them to stimulate critical thinking abilities. Further, the participants have expressed the simulation sessions to be realistic, and that the knowledge gained from simulations could be transferred to the clinical areas. However, it has been found that students are nervous during their simulation experiences. This study was limited by the sample that was relatively small and selected from one college, which may affect the generalization of the results.

AUTHORS' CONTRIBUTION

N.M. and M.M. described the study, planned and supervised it, and drafted the manuscript; H.T. and I.R., conceived the study, and gathered and analysed data from previous studies. A.M., B.A., and M.B. assisted with the data analysis, supervision, final editing, and reviewing. The manuscript's published form was approved by all authors after they had read it.

LIST OF ABBREVIATIONS

HFS	=	High Fidelity Simulation
BSN	=	Bachelor Science of Nursing Students
SPs	=	Standardized Patients

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval to conduct the study was taken from the IRB committee at Prince Sultan Military College of Health Sciences, Saudi Arabia (IRB No: IRB-2021-NUR-014).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee, and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

The study's purpose and objectives were clearly explained to the participants, who then gave their consent.

STANDARDS OF REPORTING

COREQ guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data used in this study will be available from corresponding author [A.A] upon request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

[1]   Alqarni A. Respiratory Therapy Student Perception of Patient Simulation Education at a Large Urban University. : Thesis, Georgia State Universit2015.

[2]   Badir A, Zeybekoğlu Z, Karacay P, *et al.* Using high-fidelity simulation as a learning strategy in an undergraduate intensive care course. Nurse Educ 2015; 40(2): E1-6.
[http://dx.doi.org/10.1097/NNE.0000000000000134] [PMID: 25693075]

[3]   Kirkpatrick A, Ball S, Connelly S, *et al.* Intraprofessional simulation's impact on advanced practice and baccalaureate student self-efficacy. Clin Simul Nurs 2018; 16: 33-9.
[http://dx.doi.org/10.1016/j.ecns.2017.11.005]

[4]   Nuzhat A. Role and challenges of simulation in undergraduate curriculum. Med Teach 2014; 36(Suppl 1): S69-73.
[http://dx.doi.org/10.3109/0142159X.2014.886017]

[5]   Madhavanprabhakaran G, Al-Khasawneh E, Wittmann L. Perceived benefits of pre-clinical simulation-based training on clinical learning outcomes among Omani undergraduate nursing students. Sultan Qaboos Univ Med J 2015; 15(1): e105-11.
[PMID: 25685368]

[6]   Omer TY. *Nursing Students' Perceptions on Standardized Debriefing Experience After Clinical Simulation.* IOSR-JNHS. Arábia Saudita 2018; 7(5): 59-66.

[7]   Shin S, Park JH, Kim JH. Effectiveness of patient simulation in nursing education: Meta-analysis. Nurse Educ Today 2015; 35(1): 176-82.
[http://dx.doi.org/10.1016/j.nedt.2014.09.009] [PMID: 25459172]

[8]   Tosterud R. Simulation used as a learning approach in nursing education: Students' experiences and validation of evaluation questionnaires. : Karlstad University, Faculty of Health, Science and Technology, Department of Health Sciences.2015.

[9]   Zapko KA, Ferranto MLG, Blasiman R, Shelestak D. Evaluating best educational practices, student satisfaction, and self-confidence in simulation: A descriptive study. Nurse Educ Today 2018; 60: 28-34.
[http://dx.doi.org/10.1016/j.nedt.2017.09.006] [PMID: 28987895]

[10]   Kaddoura M, Vandyke O, Smallwood C, Gonzalez KM. Perceived benefits and challenges of repeated exposure to high fidelity simulation experiences of first degree accelerated bachelor nursing students. Nurse Educ Today 2016; 36: 298-303.
[http://dx.doi.org/10.1016/j.nedt.2015.07.014] [PMID: 26260522]

[11]   Kim KH, Lee A, Avila S, Ouyang A, Walker A. Application of High Fidelity Simulation for Acquisitions of Nursing Skills. Int J Innov Educ Res 2015; 3(1): 78-95.
[http://dx.doi.org/10.31686/ijier.vol3.iss1.302]

[12]   Briscoe J, MacKay B, Harding T. Does simulation add value to clinical practice?: Undergraduate student nurses' perspective. Kaitiaki Nursing Research 2017; 8(1): 10-5.

[13]   Oh PJ, Jeon KD, Koh MS. The effects of simulation-based learning using standardized patients in nursing students: A meta-analysis. Nurse Educ Today 2015; 35(5): e6-e15.
[http://dx.doi.org/10.1016/j.nedt.2015.01.019] [PMID: 25680831]

[14]   Awad MS, Abdullah MK, Ibrahim RH, Abdulla RK. Nursing students' attitudes toward simulation technology in nursing education. International Journal of Emerging Technologies in Learning (iJET) 2019; 14(14): 31.
[http://dx.doi.org/10.3991/ijet.v14i14.10571]

[15]   Khalil AI, Hantira NY, Alnajjar HA. The Effect of Simulation Training on Enhancing Nursing Students' Perceptions to Incorporate Patients' Families Into Treatment Plans: A Randomized Experimental Study. Cureus 2023; 15(8): e44152.
[http://dx.doi.org/10.7759/cureus.44152] [PMID: 37638259]

[16]   Landeen J, Pierazzo J, Akhtar-Danesh N, Baxter P, van Eijk S, Evers C. Exploring student and faculty perceptions of clinical simulation: A Q-sort study. J Nurs Educ 2015; 54(9): 485-91.
[http://dx.doi.org/10.3928/01484834-20150814-02] [PMID: 26334334]

[17]   Lee JJ, Yeung KCY, Clarke CL, Yoo J. Nursing Students' Learning Dynamics and Perception of High-Fidelity Simulation-Based Learning. Clin Simul Nurs 2019; 33: 7-16.
[http://dx.doi.org/10.1016/j.ecns.2019.04.008]

[18]   Aldhafeeri F. Perception of satisfaction and self-confidence with high fidelity simulation among nursing students in government universities. Edu Prac 2020; 11(11): 137-46.

[19]   Howard VM, Englert N, Kameg K, Perozzi K. Integration of simulation across the undergraduate curriculum: Student and faculty perspectives. Clin Simul Nurs 2011; 7(1): e1-e10.
[http://dx.doi.org/10.1016/j.ecns.2009.10.004]

[20]   Alhaykan A. Students' Perceptions of Using Simulation In Respiratory Therapy Program. : Thesis, Georgia State University2015.

[21]   Al Enazi FH. Healthcare students' perceptions of simulation education at an urban university. : Thesis, Georgia State University2017.

[22]   Alinier G, Hunt B, Gordon R, Harwood C. Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. J Adv Nurs 2006; 54(3): 359-69.
[http://dx.doi.org/10.1111/j.1365-2648.2006.03810.x] [PMID: 16629920]

[23]   Ahmed S. Medical teachers' perception towards simulation-based medical education: A multicenter study in Saudi Arabia. Med Teach 2016; 38(Suppl 1): S37-44.
[http://dx.doi.org/10.3109/0142159X.2016.1142513]

[24]   Ganley BJ, Linnard-Palmer L. Academic safety during nursing simulation: Perceptions of nursing students and faculty. Clin Simul Nurs 2012; 8(2): e49-57.
[http://dx.doi.org/10.1016/j.ecns.2010.06.004]

[25]   Medley CF, Horne C. Using simulation technology for undergraduate nursing education. J Nurs Educ 2005; 44(1): 31-4.
[http://dx.doi.org/10.3928/01484834-20050101-06] [PMID: 15673172]

[26]   Kable AK, Arthur C, Levett-Jones T, Reid-Searl K. Student evaluation of simulation in undergraduate nursing programs in Australia using quality indicators. Nurs Health Sci 2013; 15(2): 235-43.
[http://dx.doi.org/10.1111/nhs.12025] [PMID: 23240779]