

Research Article

Satisfaction and Self-Confidence of Undergraduate Nursing Students with Simulation-Based Learning Experiences

Mamoona Iram¹, Naghma Rizvi², Nazia Ilyas³, Eunice Siaty⁴, Afshan Nazar⁵, Zohra Kurji⁶

¹Aziz Fatimah Nursing College Faisalabad, Pakistan; ^{2,5,6}Aga Khan University School of Nursing and Midwifery Karachi, Pakistan; ³College of Nursing and Midwifery Fatima Jinnah Medical University, Lahore Pakistan; ⁴Aga Khan University School of Nursing and Midwifery, Tanzania

Abstract

Background: Hands-on patient care could be best experienced through clinical rotations; however, opportunities for direct patient care for student nurses are limited due to lack of clinical sites and availability of patients, faculty shortages, and some ethical and safety concerns. The purpose to measure the satisfaction and self-confidence of nursing students with their simulation-based learning.

Methodology: This study used an analytic cross-sectional design. The study was conducted at a private university in Karachi, Pakistan, and recruited 230 nursing students using a total population sampling technique. A self-reporting questionnaire was used to collect data. ANOVA was used to see the differences in the mean scores, and Pearson correlation was used to assess the correlation between satisfaction and self-confidence.

Results: The overall mean \pm SD of satisfaction was 75.80 ± 8.93 and for self-confidence was 32.59 ± 3.61 . Findings revealed a significant difference in mean scores of satisfaction and self-confidence among the study groups, $p < 0.05$. A strong positive correlation, Pearson $r = 0.725$, $p = 0.001$, was revealed between the satisfaction and self-confidence.

Conclusion: The study discovered that simulation-based learning plays a significant role in increasing satisfaction and in building the self-confidence of nursing students, so it should be made a part of their curriculum, and integrated into all possible courses in the undergraduate nursing programs.

Corresponding Author | Mamoona Iram (MSN), Principal Aziz Fatimah Nursing College, Faisalabad, Pakistan
Email: mamoonairam50@gmail.com

Keywords | Simulation, Simulation-based learning, Satisfaction, Self-confidence, Nursing student

Introduction:

Simulation is the creation of a modified environment where a tangible system cannot be engaged. It is an appreciated methodology for preparing students from health disciplines for future clinical encounters. Simulation-based learning has been highlighted in health care education because it is a reliable source of teaching and learning, and a valuable tool for best clinical practice and safe health care delivery¹. It further

provides opportunities to the learners, to take an active role in their learning and enhances their psychomotor skills, critical thinking, clinical reasoning, and clinical competencies within a safe environment². Nursing education generally involves theoretical knowledge taught in a traditional classroom setting, technical skills practiced in skills laboratory settings, and clinical skills accomplished in affiliated hospitals. However, the integration of theoretical knowledge into practice without

compromising patient safety is a challenge in the nursing profession.³ Hands-on patient care is best experienced through clinical rotations; however, opportunities for direct patient care for student nurses are limited due to lack of clinical sites, unavailability of patients, especially in specialty and high acuity areas.^{3,4} Furthermore, faculty shortages, ethical concerns, and patient safety initiatives further decrease the chances of students to observe patient care at the bedside.⁵ In this situation, simulation-based clinical education could be considered as one of the best instructional modality for nursing students to practice their clinical and decision-making skills without compromising the patient's well-being.² Although many nursing programs have incorporated simulation experiences for their students to provide alternative clinical experience, but this leaves a skills gap in actual patients' care.⁴ This may affect the satisfaction, confidence, and preparedness of nursing students while dealing with real patients at the bedside.⁶ The literature provides support for incorporating simulation-based learning in the nursing education curriculum⁷; however, In Pakistan, the concept of simulation in nursing education has been introduced recently. Hence, continuous efforts are being made to integrate simulation into the nursing curriculum.⁸ With no known study has been conducted in the Pakistani context, investigation is much needed. The purpose of the study was to measure the nursing students' satisfaction and self-confidence with the simulation-based learning. The study assessed mean scores of satisfaction and self-confidence, and the correlation between satisfaction and self-confidence of nursing students with simulation-based learning experiences.

Methods:

This study utilized an analytic cross-sectional design. The total population sampling technique was used for this study because simulation-based learning was a newly introduced in few courses, and only a limited number of students had experienced it.⁹ A total of 275 nursing students were approached for data collection purposes as a sample. 230 students completed the questionnaire. The National League for Nursing (NLN)/Jeffries Simulation Framework serves as a guide for the researcher to identify the satisfaction level and confidence level of students as outcomes of simulation-based learning.¹⁰⁻¹¹ The nursing students experienced simulation-based learning using high-fidelity simulators at the

university. All the simulation sessions were composed of three main parts: pre-briefing period, simulation scenario, and debriefing period. In the pre-briefing, the students got orientation to the simulation-based learning environment, and they studied scenarios or procedures, such as labour and delivery, colostomy care, end of life care, and care of patients with hallucination. Also, they had a chance to ask questions from their facilitators. During the simulation sessions, the students were actively involved in their learning and practiced the above-mentioned nursing procedures by using high-fidelity simulation. The students were expected to assess the patients and provide appropriate nursing care. Afterward, students shared their feelings, emotions, reflected on the actions that they had taken during the simulation, and identified the areas for improvement with the help of their facilitators in the debriefing session.

The study was approved from Ethical Review Committee (ERC) of the University (Ref # 2019-0752-2287). The participants' confidentiality and anonymity was maintained. The study participants signed individual informed consent forms to ensure their voluntary participation. A formal permission was taken to utilize the tools for data collection. The data was collected through a self-reporting questionnaire. It was divided into three sections. The first section intended to take the demographic information of the participants. In the second section, the participants completed 18 items related to satisfaction; Satisfaction with Simulation Experience Scale (SSES) (alpha 0.88).⁶ The range of satisfaction scores was 18 to 90. The last section was consisted of 8 items to measure their self-confidence; subscale b of Student Satisfaction and Self-Confidence in Learning Scale (SSS) (alpha 0.83).¹² The range of self-confidence scores was 8 to 40. Each item of the study's questionnaire was categorized into five responses, based on the level of the agreement such as strongly disagree, disagree, unsure, agree, and strongly agree. The data were collected from February 2019 to May 2019. The participants took 20-30 minutes to complete the study questionnaire. The collected data were analyzed by using SPSS, version 20. Continuous variables were described by using mean and the standard deviation whereas; proportions and frequencies were used to display the categorical variables. The difference of mean scores of satisfaction and self-confidence among the study groups

were analyzed by using ANOVA and p-value < 0.05 was considered as significant. Moreover, Pearson correlation test was applied to examine the correlation between the scores of satisfaction and self-confidence.

Results:

A total of 230 nursing students participated in this study. Table 1 describes the demographic characteristics of the study participants.

The satisfaction of the nursing students was measured by the SSES, which consists of 18 items and is divided into three parts; debriefing and reflection, clinical reasoning, and clinical learning in Table 2. The findings revealed the mean \pm SD of the SSES, 75.80 ± 8.93 , which depicted that the study participants were satisfied with their simulation-based learning. The mean \pm SD satisfaction score of the debriefing and reflection subscale was 37.89 ± 4.97 . Students showed the lowest mean satisfaction scores in item 1 whereas the highest mean satisfaction score was reported in item 6. The mean \pm SD satisfaction score of the clinical reasoning subscale was 20.71 ± 2.91 . The findings revealed a low mean satisfaction score in item 13 and the highest mean satisfaction score related to item 14. Furthermore, the mean \pm SD satisfaction score in the clinical learning

Table 1: Demographic Characteristics (n=230)

Characteristics	n (%)
Age (in years)	Mean = 22.03 SD = 2.22
Gender	
Female	207(90)
Male	23 (10)
Class	
4 th year BScN	105 (45.7)
3 th year BScN	107 (46.5)
2 nd year Post RN BScN	18 (7.8)
Previous Job experience	
Yes	18 (7.8)
Not applicable	212 (92.2)
Years of clinical experience	
2-4	11(4.8)
5-7	5 (2.2)
>7	2 (1)
Not applicable	212 (92)
Simulation courses completed at AKU	
CIME	
Adult Health Nursing (AHN)	107 (46.5)
Reproductive Health (RH)	53 (23)
Mental Health Nursing (MHN)	52 (22.7)
Palliative Care (PC)	18(7.8)
Previous simulation experience	
Yes	0 (0)
No	230 (100)

Table 2: Mean Satisfaction Scores (n=230)

	Mean	SD
Debriefing and Reflection		
1. "The facilitator provided constructive criticism during the debriefing"	3.96	0.85
2. "The facilitator summarized important issues during the debriefing"	4.23	0.70
3. "I had the opportunity to reflect on and discuss my performance during the debriefing"	4.13	0.90
4. "The debriefing provided an opportunity to ask questions"	4.23	0.80
5. "The facilitator provided feedback that helped me to develop my clinical reasoning skills"	4.33	0.79
6. "Reflecting on and discussing the simulation enhanced my learning"	4.38	0.70
7. "The facilitator's questions helped me to learn"	4.30	0.65
8. "I received feedback during the debriefing that helped me to learn"	4.23	0.78
9. "The facilitator made me feel comfortable and at ease during the debriefing"	4.11	0.85
Clinical Reasoning		
10. "The simulation developed my clinical reasoning skills"	4.19	0.75
11. "The simulation developed my clinical decision making ability"	4.13	0.81
12. "The simulation enabled me to demonstrate my clinical reasoning skills"	4.16	0.68
13. "The simulation helped me to recognize patient deterioration early"	3.85	0.82
14. "This was a valuable learning experience"	4.39	0.69
Clinical Learning		
15. "The simulation caused me to reflect on my clinical ability"	4.26	0.63
16. "The simulation tested my clinical ability"	4.24	0.66
17. "The simulation helped me to apply what I learned from the case study"	4.32	0.66
18. "The simulation helped me to recognize my clinical strengths and weaknesses"	4.36	0.70
Total Score	75.80	8.93

Table 3: Mean Self-Confidence Scores (n=230)

Items	Mean	SD
1) "I am confident that I am mastering the content of the simulation activity that my instructors presented to me"	3.93	0.68
2) "I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum"	3.92	0.66
3) "I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting"	4.19	0.56
4) "My instructors used helpful resources to teach the simulation"	4.12	0.74
5) "It is my responsibility as the student to learn what I need to know from this simulation activity"	4.23	0.69
6) "I know how to get help when I do not understand the concepts covered in the simulation"	4.03	0.78
7) "I know how to use simulation activities to learn critical aspects of these skills"	4.10	0.63
8) "It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time"	4.08	0.80
Total Score	32.59	3.61

subscale was 17.18 ± 2.09 , which revealed that the students reported satisfaction regarding all the items of clinical learning subscale.

Table 3 shows the self-confidence scores of the study participants. The mean \pm SD self-confidence score of the study participants was 32.59 ± 3.61 , which revealed that the students felt confident with simulation-based learning. Study revealed a low mean score of self-confidence related to the item 1 and 2, while the highest mean score of self-confidence related to the item 5.

Table 4 shows ANOVA regarding the differences in the mean scores of satisfaction and self-confidence among the study participants. The findings revealed a significant difference in the mean scores of satisfaction and self-confidence among the three study groups $p < 0.05$. The post hoc analysis, by applying Bonferroni correction, depicted that the satisfaction score of the fourth year BScN participants was statistically significantly different, ($p = 0.001$), from third-year BScN participants, but not statistically significant, ($p = 0.06$), from second year post-RN BScN participants. Moreover, the self-confidence score of the fourth year BScN participants was not statistically significantly different from the participants of third-year BScN and second year post-RN BScN, as the p-values were 0.05 and 0.07, respectively.

A strong Positive correlation, $r = 0.725$, was found between the satisfaction and self-confidence of the undergraduate nursing students having simulation-based learning experience, by applying the Pearson correlation test. It shows that the satisfaction and self-confidence are correlated, and the increase in satisfaction

scores increases the self-confidence and vice versa.

Table 4: Difference in the mean scores of satisfaction and self-confidence among the study participants (ANOVA)

Variables	Fourth year BScN M \pm SD (n= 105)	Third year BScN M \pm SD (n= 107)	Second year Post- RN BScN M \pm SD (n= 18)	p- value
Satisfaction	73.38 \pm 10.37	77.71 \pm 6.60	78.50 \pm 8.81	0.001*
Self- Confidence	31.88 \pm 3.93	33.05 \pm 3.31	33.94 \pm 2.57	0.015*

*p value significant at 0.05

Discussion:

The current study found similar results to the several studies conducted in Australia, Canada, and Portugal, which highlighted that simulation promotes active engagement of the students in their learning process and students mark high satisfaction and self-confidence with simulation-based learning.¹³⁻¹⁷ However, the low satisfaction score in item 1 and 13 could be due to a new methodology, introduced recently only in a few courses, and the faculty might need some training to develop expertise in utilizing simulation methodology. The other reason could be students' readiness, appreciation, and receptiveness towards new methodology. This could be overcome by training the faculty members and by improving the debriefing methods.⁶ A low mean satisfaction score of item 13 should be investigated further as it is directly related to the patients' safety. The simulation scenarios should be re-examined critically and thoroughly, and flawless and ideal scenarios, close to real situations should be used in the simulation.

The mean self-confidence score of the participants was similar to the findings of several studies conducted in developed countries by using both low and high fidelity simulation.^{14,18-21} Looking at individual items, a low mean score of self-confidence related to the item¹, aligned with the findings of a study.²² Whereas, a low mean score of self-confidence of item 2, contradicted the findings reported by Zapko et al.²² These low scores highlighted that students are probably getting limited opportunities for simulation-based learning or need repeated simulation exposures to develop confidence regarding the content of the simulation activity. It is important to ensure that simulation-based learning covers the important and critical points of the curriculum. Therefore, it is vital to revisit the simulation scenarios to include the critical content of the curriculum. These low self-confidence scores regarding the particular item open an area for future research, to investigate the preparedness of faculty members to conduct simulations. The current study compared the three groups based on their class levels (BScN year III, IV and Post-RN year II), but available literature have compared the groups based on the intervention group and the control group.^{23,24} In the present study, there could be different reasons for the differences in the mean scores of satisfaction and self-confidence. The three study groups experienced simulation-based learning experiences with different courses, taught by different facilitators. The fourth-year BScN was the first group that had experienced simulation-based learning for the very first time in the study setting. Since this was the first experience for the faculty, they probably also faced challenges in developing and implementing simulation for the first time. Hence, later, it became convenient for the faculty to teach through simulation, and the students became familiar and got used to the methodology. So, it got well accepted and appreciated over time, and the students who received simulation-based learning afterwards were more satisfied and self-confident, as compared to those who were the first to experience it. Besides, the second year post-RN BScN participants reported high scores of satisfaction and self-confidence, were registered nurses and the majority of them had clinical experience, ranging from two to four years. Being experienced nurses, they had already dealt with real patients independently. Hence, they were quite competent enough in the assessment and management of patients at the clinical site;

this could affect their satisfaction and self-confidence with simulation-based learning. For clarity in differences between the two different sets of students, qualitative exploratory methods can be utilized to explore the factors that lead to satisfaction and self-confidence with simulation-based learning. Study reported a strong positive correlation between the satisfaction and the self-confidence, similar to the studies conducted in USA and British Columbia.²⁵ The students with higher scores of satisfaction had also higher scores of self-confidence with simulation-based learning and vice versa.

The generalizability of the results is limited, due to a single site study. The study utilized non-random sampling technique, as simulation-based learning was recently integrated into a few courses and a limited number of students had simulation-based learning experiences. Simulation sessions of different groups were organized and offered differently, which could have affected the scores of the study participants. The satisfaction and self-confidence of the study participants could have been affected by some other factors that were not included in the study tools.

Conclusion:

The study discovered that simulation-based learning experiences play a significant role in increasing satisfaction and in building the self-confidence of nursing students. A positive correlation was revealed between the satisfaction and self-confidence scores of nursing students, having simulation-based learning experiences. This study recommended the integration of simulation-based learning in the nursing curriculum and the faculty development programs regarding the use of simulation in the study context.

Ethical Approval: Given

Conflict of Interest: The authors declare no conflict of interest.

Funding Source: None

References:

1. Jones F, Passos-Neto CE, Braghiroli OF. Simulation in medical education: brief history and methodology. *Principles and practice of clinical research*. 2015 16;1(2).
2. Williams B, Abel C, Khasawneh E, Ross L, Levett-Jones T. Simulation experiences of paramedic students: a

- cross-cultural examination. *Advances in medical education and practice*. 2016;7:181.
3. Kim J, Park JH, Shin S. Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis. *BMC medical education*. 2016 ;16(1):1-8.
 4. Baptista RC, Martins JC, Pereira MF, Mazzo A. Students' satisfaction with simulated clinical experiences: validation of an assessment scale. *Revista latino-americana de enfermagem*. 2014 Sep;22:709-15.
 5. Hayden JK, Smiley RA, Alexander M, Kardong-Edgren S, Jeffries PR. The NCSBN national simulation study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation*. 2014 Jul 1; 5(2):S3-40.
 6. Levett-Jones T, McCoy M, Lapkin S, Noble D, Hoffman K, Dempsey J, et al. The development and psychometric testing of the Satisfaction with Simulation Experience Scale. *Nurse education today*. 2011;31(7):705-10.
 7. Tosterud R, Hedelin B, Hall-Lord ML. Nursing students' perceptions of high-and low-fidelity simulation used as learning methods. *Nurse education in practice*. 2013; 13(4):262-70.
 8. Dias J, Zuberi RW. Establishing a Simulation Centre in Karachi, Pakistan. *COJ Nursing & Healthcare*. 2018; 1(4).
 9. Polit D.F. and Beck C.T. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 10th Edition, Wolters Kluwer Health, Philadelphia, 2017.
 10. Durham CF, Cato ML, Lasater K. NLN/Jeffries simulation framework state of the science project: Participant construct. *Clinical Simulation in Nursing*. 2014; 10(7): 363-72.
 11. Jeffries PR, Rodgers B, Adamson K. NLN Jeffries simulation theory: Brief narrative description. *Nursing education perspectives*. 2015 ;36(5):292-3.
 12. Franklin AE, Burns P, Lee CS. Psychometric testing on the NLN Student Satisfaction and Self-Confidence in Learning, Simulation Design Scale, and Educational Practices Questionnaire using a sample of pre-licensure novice nurses. *Nurse education today*. 2014;34(10): 1298-304.
 13. Cant RP, Cooper SJ. Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review. *Nurse education today*. 2017;49:63-71.
 14. Hall K. Simulation-based learning in Australian undergraduate mental health nursing curricula: a literature review. *Clinical Simulation in Nursing*. 2017 ; 13(8): 380-9.
 15. Whelan T, Shi X, Andony K, Yorke S, Poonai S. Evaluating Learners' satisfaction Following Perioperative Nursing Simulation Training/Evaluer La Satisfaction Des Apprenants Suite A Une Formation En Soins Perioperatoires En Laboratoire De Simulation. *Ornac Journal*. 2018 ;36(3):12-23.
 16. Levett-Jones T, Andersen P, Reid-Searl K, Guinea S, McAllister M, Lapkin S, et al. Tag team simulation: An innovative approach for promoting active engagement of participants and observers during group simulations. *Nurse Education in Practice*. 2015;15(5):345-52.
 17. Padilha JM, Machado PP, Ribeiro A, Ramos J, Costa P. Clinical virtual simulation in nursing education: randomized controlled trial. *Journal of medical Internet research*. 2019;21(3):e11529.
 18. Meska MH, Mazzo A, Jorge BM, Souza-Junior VD, Negri EC, Chayamiti EM. Urinary retention: implications of low-fidelity simulation training on the self-confidence of nurses. *Revista da Escola de Enfermagem da USP*. 2016 ;50:831-7.
 19. Curtis E, Ryan C, Roy S, Simes T, Lapkin S, O'Neill B, et al. Incorporating peer-to-peer facilitation with a mid-level fidelity student led simulation experience for undergraduate nurses. *Nurse Education in Practice*. 2016 ;20:80-4.
 20. Omer T. Nursing Students' Perceptions of Satisfaction and Self-Confidence with Clinical Simulation Experience. *Journal of Education and Practice*. 2016;7(5):131-8.
 21. Valizadeh L, Amini A, Fathi-Azar E, Ghiasvandian S, Akbarzadeh B. The effect of simulation teaching on baccalaureate nursing students' self-confidence related to peripheral venous catheterization in children: a randomized trial. *Journal of Caring Sciences*. 2013;2(2): 157.
 22. Zapko KA, Ferranto ML, Blasiman R, Shelestak D. Evaluating best educational practices, student satisfaction, and self-confidence in simulation: A descriptive study. *Nurse education today*. 2018 Jan 1;60:28-34.
 23. Kim JY, Kim EJ. Effects of simulation on nursing students' knowledge, clinical reasoning, and self-confidence: A quasi-experimental study. *Korean Journal of Adult Nursing*. 2015;27(5):604-11.
 24. Kim YJ, Noh GO, Im YS. Effect of step-based prebriefing activities on flow and clinical competency of nursing students in simulation-based education. *Clinical Simulation in Nursing*. 2017;13(11):544-51.
 25. Aljohani AS, Karim Q, George P. Students' satisfaction with simulation learning environment in relation to self-confidence and learning achievement. *Journal of Health Science*. 2016;4(5):228-35.