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Nursing Students' Satisfaction and Confidence Through Simulation-Based Teaching-Learning

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Abstract

Introduction: Great advances in technology have made a difference in how simulation is used today. Nursing programs have made simulation laboratories scenarios that allow students to practice their clinical skills. Simulation is not only a tool but a teaching strategy that integrates the knowledge base, practical skills, clinical judgment, and critical thinking. **Objective:** Determine the level of satisfaction and confidence obtained by nursing students through simulation-based teaching-learning. **Methodology:** The design of this study is a descriptive correlational one. **Results:** The research sample consisted of 150 students enrolled in the nursing program of a university institution in Puerto Rico. The representation of the female group stood out with 76% (n = 114). Thirty-six of the participating students (24%) identified as male. The responses of 50% of nursing students pointed to a high level of satisfaction obtained through simulation-based learning. While 97.4% of the students were awarded a high level of self-confidence in learning through simulation. **Conclusions:** The results revealed that simulation as a means of learning in nursing students promotes their level of satisfaction and self-confidence, which would be reflected in confidence in managing patients in the clinical environment. The study suggests that simulation is a valid learning activity for nursing students.

Keywords: patient simulation, nursing, nursing students, confidence, nursing education

1. Introduction

The growing demand for highly competent nursing professionals has created an opportunity for schools to improve their curricula, with the aim of ensuring an adequate supply of personnel in health institutions (Deng, 2015; Ahmed et al., 2022). The economic situation of universities and the proliferation of nursing schools has resulted in some programs relaxing admission requirements (Urra-Medina et al., 2022; Urra-Medina et al., 2017). This has led to students with fewer academic skills entering nursing programs, finding difficulties in meeting degree requirements and necessary professional competencies (Urra-Medina et al., 2022; Urra-Medina et al., 2017).

This increase in enrollments has brought new challenges to be overcome by higher education institutions. In the 2020-2021 academic year, with 885 nursing students, compared to the 2021-2022 academic year, which reached 2,408 students, shows an increase of almost double, with 172.9%. This growth is related to the proliferation of new nursing programs in Puerto Rico, which went from 22 programs in the 2000s to 42 programs in 2020. This expansion has made the availability of clinical areas in Puerto Rico difficult, since each nursing student must complete hundreds of hours of clinical training, complicating the search for adequate clinical placements for all (Amaro-López et al., 2019; Fawaz et al., 2018; Bowling et al., 2018). Despite the difficulties in finding clinical placements and in response to the shortage of practice centers (Egenes, 2012; MacIntyre et al., 2009; Sowerby, 2015), nursing programs continue to expand their offerings, and new schools are being opened. As a result, this complicates the placement of students in clinical internships, reducing the possibility of acquiring clinical skills for future nursing professionals in real scenarios in Puerto Rico (Rivera Fraticelly, 2023). To help meet the need for clinical experiences, nursing schools are becoming high-fidelity clinical simulation center scenarios to expand and strengthen the clinical experience (Posada-Morales & Muñoz-Astudillo, 2020). Some research supports the effectiveness of these simulation experiences in relation to exam results and student learning outcomes (Chen et al., 2020; Shorey & Ng, 2021; Fernández-Batalla & Jiménez-Rodríguez, 2015), but there are

others that say that students do not achieve the expected results (Vásquez Orjuela & Hernández Osses, 2021; Yuan et al., 2011; Wright et al., 2018; Clapper & Kardong-Edgren, 2012; Nehring & Lashley, 2009).

The above supports the main objective of this research, which was aimed at determining the level of satisfaction and confidence obtained by nursing students through simulation-based teaching-learning. This objective reaches significant relevance, since in Puerto Rico since the 2000s, most nursing programs have simulation centers, which in principle aim to facilitate nursing students' development of their clinical competencies (Barteit et al., 2021; Hauze et al., 2019).

Therefore, this study can contribute to positive social change by motivating local nursing schools to reevaluate the effectiveness of experiences in laboratories that use high-fidelity simulators. By providing data on student satisfaction with this educational strategy and the self-confidence they acquire during practice with simulators, they can improve the quality of nursing education. With these results, changes can be proposed, from the students' own experiences, that increase the effectiveness of the simulation experience. As Plotzky et al. (2021) and Smith et al. (2016) state, when efforts are made to improve simulation experiences, future nursing graduates may be better prepared for similar experiences in real life.

In the Private University of Puerto Rico program where the study was conducted, simulation has recently been implemented as a learning alternative before clinical experiences in real scenarios. However, the benefit of simulation in the laboratory for the acquisition of student confidence in patient management and the satisfaction they feel when participating in these educational experiences has not been validated, which supports the main objective and justification of the study.

Given the above, the research question that this study aims to answer is: What is the level of satisfaction and confidence that nursing students acquire through simulation-based learning?

2. Method

The study is conducted in a nursing bachelor's program in the Caguas Region, Puerto Rico, with a population of 600 students. A non-random sample of 150 students was selected through convenience sampling. Inclusion criteria were students enrolled in nursing, of both genders, who had participated in simulations and were willing to participate voluntarily in the study. Students from other programs, who had not participated in simulations or who refused to participate were excluded. The data was obtained through a questionnaire entitled: Student Satisfaction and Self-Confidence in Learning. It consists of 13 premises and two sections. The first section measures Satisfaction in current teaching with 5 premises and the second section measures Self-confidence in learning with 8 premises. The premises must be answered through a Likert scale ranging from Strongly agree to Strongly disagree. This instrument was originally created in English by the National League for Nursing (NLN). Its reliability was evaluated using Cronbach's Alpha coefficient, obtaining values of 0.94 for the satisfaction dimension and 0.87 for the self-confidence dimension. These results indicate high internal consistency of the instrument. For the statistical analysis, SPSS program, version 20.0 was used. In addition, measures of central tendency, frequencies, and percentages were handled. To correlate the variables, Pearson's correlation coefficient was used and a significant value of $p<0.05$ will be considered.

To comply with the regulations for the protection of human beings in research studies, the researchers followed the requirements established by the Institutional Review Board (IRB) of Ana G. Méndez University (UAGM). The IRB, which serves as an institutional ethics committee, approved the study before its implementation. The data collection process included orientation for participants, distribution of information sheets and questionnaires, which were completed anonymously and deposited in a sealed ballot box. Throughout the recruitment and data collection process, the ethical principles of autonomy, confidentiality, privacy, and anonymity of the participants were respected.

3. Results

The profile of the participants highlighted the representation of the female group with 76% (n = 114). In terms of marital status, almost all the students (91.3%, n = 137) reported that they were single. Most participating students were 25 years old or younger (82.7%) (see Table 1).

Table 1. Demographic Profile of the Nursing Student Sample

Variable	f	%
Gender		
Male	36	24.0
Female	114	76.0
Marital status		
Married	9	6.0
Single	137	91.3
Divorced	3	2.0
Other	1	0.7
Age		
Under 21 years	51	34.0
21 to 25 years	73	48.7
26 to 30 years	13	8.7
31 years or older	13	8.7

Table 2 outlines the educational profile of the study participants. There was participation from students in the nursing bachelor's degree (89.3%, n = 134) and the associate degree (10.7%, n = 16). All associate level students and two bachelor's students were in their second year of study (12%, n = 18). While many participating students who were pursuing a bachelor's degree in nursing were in their fourth year (34.7%, n = 52) of study.

Table 2. Educational Profile of the Nursing Student Sample

Variable	f	%
Academic program		
Bachelor of Nursing	134	89.3
Associate Degree in Nursing	16	10.7
Year of study		
Second year	18	12.0
Third year	33	22.0
Fourth year	52	34.7
Fifth year	47	31.3

The first research objective was aimed at describing the level of satisfaction obtained by nursing students through simulation-based learning. In Table 3, it is evident that 74% were in a global score described by the response of being totally in agreement and 21.3% agreed. This awarded 95.3% of students at a level that represents high satisfaction. The participants obtained a mean of 4.69 (SD = 0.581).

Table 3. Level of Satisfaction Obtained by Nursing Students Through Simulation-Based Learning

Satisfaction level	f	%
Low		
Disagree	1	0.7
Moderate		
Undecided	6	4.0
High		
Agree	32	21.3
Strongly agree	111	74.0
Total	150	100.0

Note. Mean (M) = 4.69, with standard deviation (SD) = 0.581.

The second objective of the study was aimed at describing the level of confidence to manage patients by nursing students through simulation-based learning. The analysis of the responses provided in the questionnaire reflected a high level of confidence in managing patients by nursing students through simulation-based learning. Table 4 summarizes that 64.7% of students were in a global score described by the response related to strongly agree and 32.7% agreed. This reveals that 97.4% of students who participated in the study were awarded a level that represents high self-confidence in the learning that was carried out through simulation. The participants obtained a mean of 4.61 (SD = 0.565).

Table 4. Level of Confidence Obtained by Nursing Students Through Simulation-Based Learning

Confidence level	f	%
Low		
Disagree	1	0.7
Moderate		
Undecided	3	2.0
High		
Agree	49	32.7
Strongly agree	97	64.7
Total	150	100.0

Note. Mean (M) = 4.61, with standard deviation (SD) = 0.565.

The third objective of the study was aimed at determining the relationship between the variable's satisfaction and confidence of nursing students when using simulation as a teaching method. The responses of the nursing students who completed the questionnaire pointed to a positive and significant correlation between their satisfaction with the simulation experience and self-confidence to manage patients when using said experience as a method in their teaching-learning process ($r = 0.671$, $p = .000$). The result obtained met the criterion of $p<0.05$ that was established to consider that there is statistical significance, as can be seen in Table 5.

Table 5. Correlation Between Satisfaction and Confidence of Nursing Students When Using Simulation as a Teaching Method

Variables	Satisfaction with the current experience	Self-Confidence in learning
Satisfaction with the current experience	Pearson Correlation 1	0.671**
	Sig. (bilateral)	0.000
	n 150	150

Note. Correlation is significant at the 0.01 level (bilateral). Source: Own research.

The last objective was aimed at analyzing the relationship between satisfaction and acquired confidence and simulation as a means of learning in nursing students. The statistical analysis that was carried out to address this research objective involved examining the correlation of the variables satisfaction and confidence when considering the previous experience of students with simulation as an activity or means of learning. The results obtained suggest that the use of simulation provides nursing students with satisfaction with this learning experience and opportunities that promote self-confidence for patient management in their clinical practices. The satisfaction statement of the students determined the existence or demonstration of self-confidence through simulation as a valid learning strategy or activity. According to Table 6, the Pearson r correlation coefficients were positive and significant both in the group of students with previous experience with simulation ($r = 0.579$, $p = 0.000$) and those who did not have it ($r = 0.712$, $p = 0.000$). In both cases with $p<0.05$.

Table 6. Correlation Between Satisfaction and Confidence of Nursing Students When Considering Their Experience with Simulation

Has previous experience with simulation	Pearson r Value	Approximate significance
Yes	Pearson Correlation	0.579
	Valid cases n	78
No	Pearson Correlation	0.712
	Valid cases n	72
Total	Pearson Correlation	0.671
	Valid cases n	150

In summary, the results analyzed in relation to this research objective support the effectiveness of simulation as a learning method in nursing education. This methodology not only promotes student satisfaction but also encourages greater acquisition of confidence. Students who participated in the course simulation activity and who had previous experience in this type of practice reported higher levels of satisfaction with the learning received. Furthermore, these same students demonstrated higher percentages regarding their level of security for patient management. These findings underscore the value of simulation as an effective pedagogical tool in the training of nursing professionals.

4. Discussion

The results of the study conducted in Puerto Rico indicate a high level of satisfaction among nursing students with simulation-based learning. These findings are consistent with those of Alconero-Camarero et al. (2019), who reported satisfaction levels above 89%, although with emphasis on different aspects. Martín Espinosa et al. (2016) also found high satisfaction (84.8%) among students, highlighting debriefing as the most valued stage. On this, Negrão Baptista et al. (2014) emphasize the importance of student satisfaction for involvement and motivation in learning. However, it is important to note that not all studies report high levels of satisfaction with simulation. Swenty and Eggleston (2011), Zulkosky (2010) and Negrão Baptista et al. (2014) have identified factors that can decrease satisfaction, such as lack of familiarity with technology, rigor in simulator management,

lack of practice by some teachers, fear of damaging equipment, and preference for real patients. These contradictory results suggest the need for a deeper analysis to optimize the use of simulators in nursing education.

Similarly, the study conducted in Puerto Rico revealed a high level of confidence among nursing students to manage patients after simulation-based learning. Many participants reported an increase in their self-confidence, especially in recognizing their learning responsibility and using useful resources. These findings are consistent with the study by Cummings and Connelly (2016), which found 95% confidence in eight aspects evaluated after exposure to simulation. Herron et al. (2019) confirm the positive impact of simulation on student satisfaction, self-confidence, and knowledge. Zapko et al. (2018) highlight the National League for Nursing's endorsement of simulation as a necessary approach in nurse training, emphasizing that serial simulations can increase student satisfaction and confidence. These studies suggest that repeated experience in simulation can lead to a significant increase in confidence and active learning in nursing students.

Likewise, the research revealed a positive and significant relationship between the satisfaction and confidence of nursing students when using simulation as a teaching method. Students satisfied with the simulation experience showed high levels of self-confidence, suggesting that greater satisfaction leads to greater security in managing patients. These findings are consistent with various studies: Lubbers and Rossman (2016), Khalaila (2014), Dearmon et al. (2013) and Olaussen et al. (2019) who reported a significant increase in knowledge, confidence, satisfaction, a decrease in anxiety after being exposed to simulation and active learning. These studies support the importance of simulation in increasing the confidence and satisfaction of nursing students, better preparing them for real clinical scenarios.

Finally, the relationship between satisfaction, acquired confidence, and previous experience with simulation was analyzed. Both groups of students, with and without previous experience, showed high levels of satisfaction and confidence, although the percentages were higher in the group with experience. A significant relationship was found between satisfaction and the variety of materials, teaching methods, and motivating materials. In terms of confidence, both groups highlighted the responsibility of learning and the use of useful resources. These findings are consistent with several studies: MacKinnon et al. (2017) and Hanshaw and Dickerson (2020) found that simulation increased confidence in practice; Cardoza and Hood (2012) noted that simulation prepared students for frequent and infrequent clinical scenarios; Laschinger et al. (2008) reported high satisfaction with simulators for learning clinical skills; and Lapkin et al. (2010) observed that simulation improved knowledge acquisition, critical thinking, and student satisfaction. However, the need for more research is emphasized to evaluate the transfer of skills to the real practice environment.

5. Conclusions

The study shows that nursing students obtained a high level of satisfaction through simulation-based learning. In addition, practically all the participants expressed having acquired self-confidence through this learning method. Likewise, it was determined that there is a positive and significant relationship between the variable's satisfaction and confidence of nursing students when using simulation as a teaching method. In the two groups of students, with or without previous experience with simulation, a high level of satisfaction and confidence was mostly observed. It is concluded that simulation as a means of learning in nursing students promotes their level of satisfaction and self-confidence, which would be reflected in security to manage patients in the clinical environment. In this way, the study suggests that simulation is an activity that validates learning for nursing students.

Despite the positive results, this study has some limitations that should be considered. These include the use of a convenience sample limited to a single university institution in Puerto Rico, which could affect the generalization of results to other educational contexts. Additionally, the study focused on students' perception of their satisfaction and confidence, without objectively evaluating the impact on actual clinical performance. For future research, it is recommended to implement longitudinal designs that evaluate the transfer of skills from the simulated environment to real clinical practice, as well as comparative studies between different educational institutions. It would also be valuable to investigate the correlation between levels of satisfaction and confidence acquired through simulation and objective clinical performance outcomes in real scenarios. This would allow for more robust validation of the effectiveness of this pedagogical strategy in nursing education.

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