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# Impact Of Clinical Simulation On The Learning Of Technical Skills In Health Professionals

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**Summary**
Clinical simulation has emerged as a vital tool in the education of health professionals, transforming the way in which technical skills are acquired and honed. Objective: to determine the effectiveness of clinical simulation in improving technical competencies and student satisfaction. A quantitative approach was used, applying a structured survey with a validated questionnaire based on the Likert Scale, the sample included 81 students from the Faculty of Health of the State University of the South of Manabí. Cronbach's alpha was calculated, obtaining a coefficient of 0.99, which indicates high reliability in the items evaluated. The results showed that 42% of the participants considered their simulation experience as satisfactory, and 30% recognized improvements in their technical skills. However, 34% were neutral regarding these advances. Concluding that clinical simulation is positively valued by many students, there are areas for improvement, especially in the connection between theory and practice.

**Keywords:** Clinical simulation, medical education, technical skills, professional training, health competencies.

## Introduction

Nursing is the science and millenary art of care, it has its own conceptual theoretical body that supports its principles and objectives, it also has its own scientific method "the Nursing Care Process" that contains procedures and techniques aimed at the health care of people. Since its inception, Nursing education has been characterized by the integration of theoretical and practical knowledge through different teaching-learning models, among which competency-based education stands out. At present, an unprecedented demand for higher education can be observed, manifested by sociocultural and economic diversification, which forces new generations to be prepared with new skills and abilities. (1)(2)

Clinical simulation has emerged as a fundamental tool in the education of health professionals, revolutionizing the way technical skills are taught and learned. This educational approach not only provides a safe environment for practice, but also allows students to experience real-world situations without the risk of endangering patients. Through simulation, trainees can develop essential

competencies, such as decision-making, effective communication, and stress management, which are crucial in the practice of medicine.(3)

Simulation is a tool that allows students to perform procedures through representations close to reality, using simulators of different fidelity. It is especially useful in disciplines with practical bases. Clinical simulation addresses pedagogical models, such as Miller's, which establishes "know-how" competencies. This model encourages the active participation of the student as the protagonist in the simulated scenario, with the accompaniment of the teacher, and is complemented by systematic methods that facilitate the achievement of essential competencies in professional training.(4)

On the other hand, health education adds variables that make the educational process even more complex since it requires the incorporation of knowledge, skills, attitudes and values necessary to train future professionals in the area. Likewise, this educational process must be aligned with the context, rapid sociocultural changes and emerging needs. From the above, it can be deduced that not only an adequate educational process is required for the development of competencies in the area of health, but also strategies that allow a comprehensive evaluation of the competencies acquired.(5)

Traditionally, the skills were taught to patients, usually after an explanation from the teacher or a theoretical class. This model has been preferred for years, but today it is questioned due to the risks to patients, even with proper supervision. In addition, it is critical to consider the right of patients to receive interventions based on the best available options. Studies indicate that clinical simulation enhances the retention of knowledge and practical skills. By simulating realistic scenarios, active learning is promoted that increases confidence and allows performance to be evaluated, identifying areas for improvement before critical situations.(6)

The use of simulation in the clinical teaching scenario has been a technological support of great value because it improves and reinforces teaching processes, optimizes the learning of the health professional in training, allowing the student to improve their skills through feedback practices in a risk-free environment, and strengthens the evaluation processes by determining in a more real way the progress of students in the acquisition of cognitive, motor and attitudinal skills in a comprehensive and at the same time independent way in a clinical scenario closer to reality. (7)(8)

Advances in technology, particularly simulated techniques, have opened up new teaching-learning possibilities for Medicine and Nursing, which increases patient safety and improves quality care. Students in training in professions in the area of health, due to their theoretical-practical training, require scenarios in which they can consolidate knowledge, develop competencies in a safe way and reduce adverse events

## Material and methods

The study was conducted with a quantitative approach, using numerical data and statistical analyses to generalize results about a specific population. Through an exhaustive bibliographic review, the existing theories were supported, which allowed a better interpretation of the variables in the context of the study. The study is descriptive, non-experimental, cross-sectional and focuses on offering a clear and detailed representation of the observed reality, combining the direct observation of the researcher with the knowledge acquired from other authors. To collect data, a structured survey was used, which includes a validated questionnaire that allows specific answers to be obtained about the attitudes and perceptions of the students.

In particular, it was sought to measure the degree of satisfaction of students of a Health career, with respect to clinical simulation, using an instrument adapted to the Likert Scale. called "Quality and Satisfaction" adapted to the Liker Scale, where 1= to Strongly disagree: 2 = Disagree; 3 = Equal; 4= Agreed; 5= Strongly agree (9), to determine the level of reliability of each of the items to be assessed, Cronbach's Alpha was applied. The study population includes students legally enrolled in the Faculty of Health Sciences at the State University of Southern Manabí. It is important to note that informed consent was applied, allowing them to participate in the study, freely and not forcing them, always emphasizing respect and autonomy for the study subjects, in addition, the respective institutional permission was obtained.

## Results

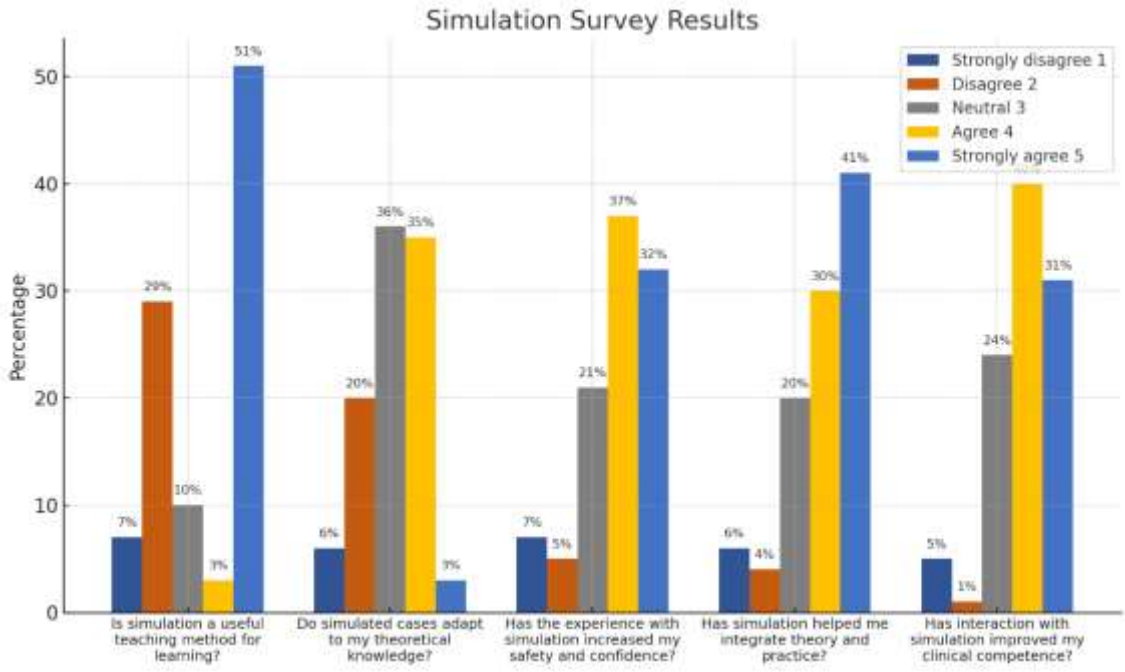
The sample was made up of 81 students legally enrolled in the Faculty of Health, Cronbach's Alpha Coefficient of 0.99 (Table 1) was applied, which denotes a high reliability or internal consistency, which means that the items are very well aligned and measure the internal coefficient in a coherent way, in addition, variance was analyzed, mode, average and internal deviation.

Table 1. Items to evaluate

| Items | Variance | Fashion | Average | Standard deviation |
|---|---|---|---|---|
| Useful learning method | 1.5 | 5 | 4.07 | 1.22 |
| Adaptation to simulated cases | 1.38 | 4 | 3.84 | 1.16 |
| Security and trust | 1.31 | 5 | 3.97 | 1.14 |
| Theoretical and practical integration | 1.05 | 4 | 3.93 | 1.02 |
| Clinical Competencies | 1.03 | 4 | 3.93 | 1.01 |
| Critical Reasoning and Decision Making | 1.05 | 4 | 3.93 | 1.02 |
| Learning motivation | 1.08 | 4 | 3.93 | 1.03 |
| Team communication | 1.12 | 5 | 3.91 | 1.05 |
| Case Duration | 0.99 | 4 | 3.79 | 0.99 |
| Teacher training | 1.06 | 5 | 4.09 | 1.02 |
| Simulation Experience | 1.13 | 4 | 3.93 | 1.05 |
| Own experiences | 1.14 | 4 | 3.85 | 1.06 |

**Source:** Own elaboration

Figure 1. Integration, usefulness and interaction of Clinical Simulation

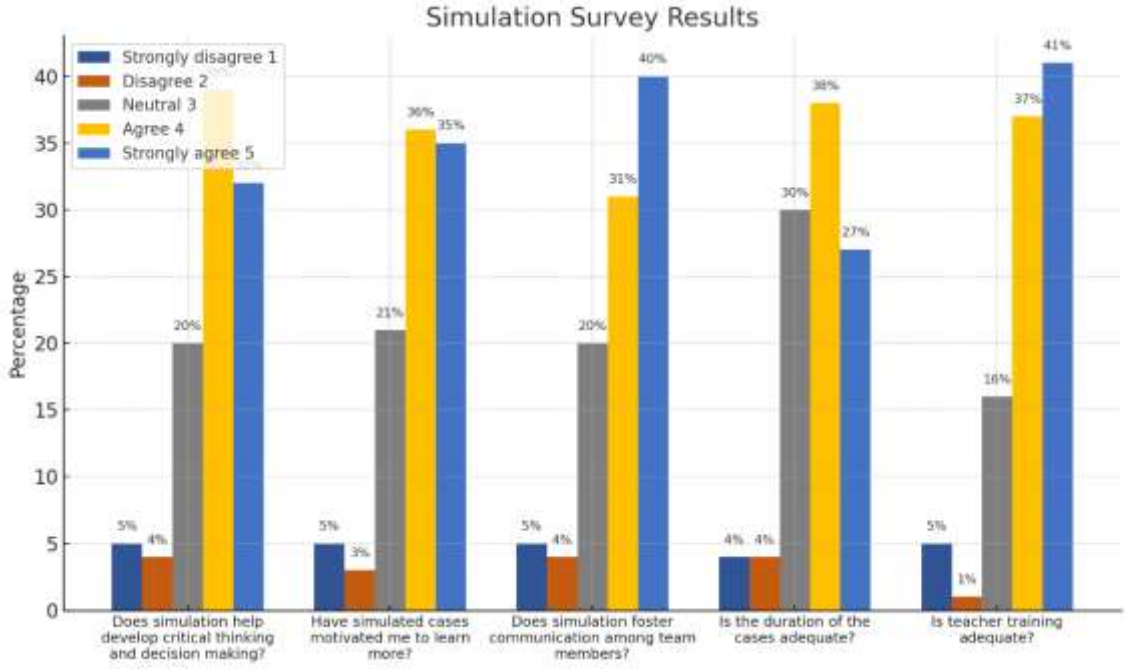



Source: Applied instrument

The graph analyzes the perception of simulation as a teaching method in learning, revealing trends and feelings that reflect the experience of the respondents. 51% consider that clinical simulation is useful, emphasizing its value in the replication of real scenarios and in facilitating the application of the theory, which is in line with other studies that were developed in various health professionals where there were satisfactory percentages of 73.9%, 90%, 92%. However, the adaptation of simulated cases to theoretical knowledge shows a lack of consensus, indicating that some students feel that simulation is not adequately integrated with theoretical content, emphasizing the need to improve this connection. (10)(11)

In terms of safety and confidence, 41% of participants feel safer thanks to simulation, a method that favors the development of interpersonal skills, which supports the findings of Broch and Castellanos (2024), who highlighted that simulation allows students to practice in a controlled environment, reducing the risk of errors in real situations. In addition, 40% of the students stated that simulation helps to integrate theory and practice, although it is necessary to optimize this relationship to maximize its effectiveness. Likewise, 40% affirm that it integrates theory and practice. Finally, 31% recognize that interaction with simulation has improved their clinical competence, highlighting the importance of designing simulations aligned with the specific competencies that students want to develop. (12)(13)

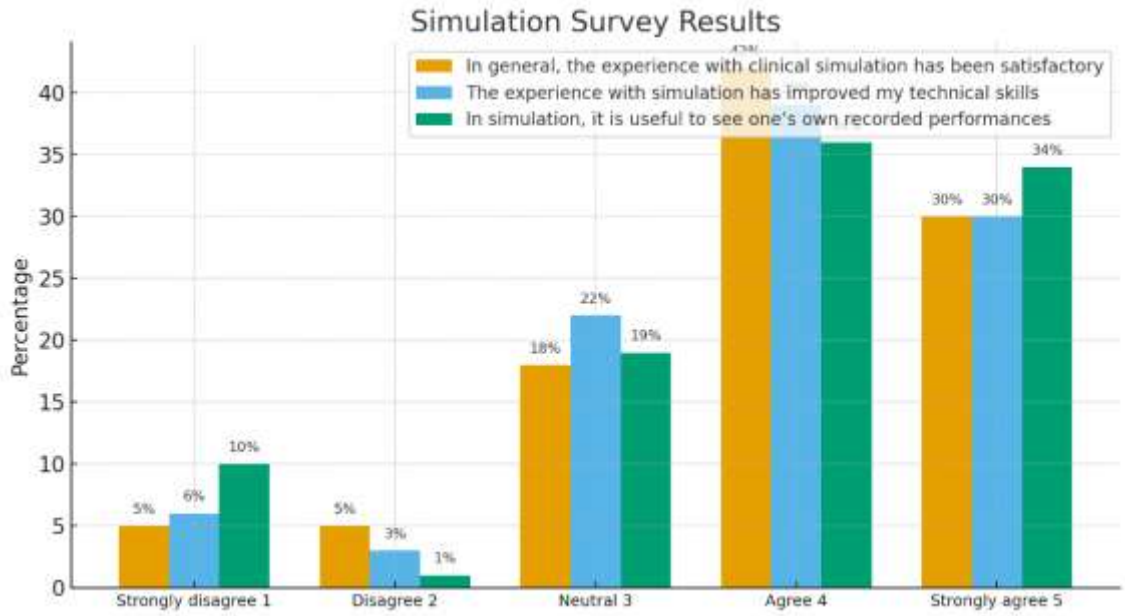
Figure 2. Critical Reasoning, Motivation, Communication and Training




Source: Applied Instrument

A positive perception towards the use of clinical simulations in the educational field is evident, 49% and 54% "strongly agree" that they help to develop critical reasoning, decision-making, motivation to learn and team communication, which reinforces the results of García et al. (2020). who stated that clinical simulation facilitates the application of theoretical knowledge in practical scenarios. However, the lack of consensus in the adaptation of simulated cases to theoretical knowledge indicates that some students do not perceive a clear connection between both aspects. This coincides with authors such as Baquero et al., (2019), who point out that one of the limitations of clinical simulation is the difficulty in aligning simulated scenarios with theoretical content, which can affect the effectiveness of learning. In addition, it promotes essential cognitive and social skills. Likewise, the duration of the cases is perceived as adequate by 53%, highlighting that a well-balanced design that maintains interest without causing fatigue. In this way, teacher training is also valued positively, with 49%, emphasizing the importance of having well-trained teachers who allow an enriching experience for students to face real challenges. (14)

Figure 3. Experiences




Source: Applied instrument

Regarding general satisfaction and improvement of technical skills, 42% agree or strongly agree that their experience has been satisfactory, valuing simulation as an effective tool in their training, this methodology allows students to face practical situations in a controlled environment, increasing their confidence and preparation. which coincides with the findings of Ayala et al., highlighted that clinical simulation improves students' confidence and preparation to face real situations in controlled environments. Similarly, 34% were neutral about improving their technical skills. Next, 6% express strong dissatisfaction, this case may be due to a lack of connection between theory and practice or because the simulations do not adequately reflect reality. (15)

Regarding the improvement of technical skills, 30% consider that simulation has contributed to this aspect, although 34% are neutral, indicating that there is a considerable group that does not perceive a significant change in their skills. This could be due to individual differences in learning style or a lack of constructive feedback. The option to "watch their own recorded performances" allows students to reflect on their performance and recognize areas for improvement, since a self-evaluation that is accompanied by constructive feedback helps to correct their mistakes.(16)

**Conclusion**

Clinical simulation has established itself as a fundamental tool in the training of health professionals, proving to be effective for the development of technical skills, critical reasoning and decision-making. The results of this study, along with the evidence provided by recent research, support that simulation offers a safe and controlled environment where students can practice clinical procedures, face complex situations, and receive immediate feedback, which contributes to improving their confidence and competence before interacting with real patients.

However, although the majority of participants perceive simulation as a satisfactory and useful methodology, it is important to recognize that a significant percentage of students are neutral or dissatisfied with certain aspects, such as the integration between theory and practice. However, to optimize its impact, it is necessary to address the areas of improvement identified, such as the integration of theory and practice and the personalization of feedback. With a well-structured approach and trained teachers, clinical simulation will continue to be a cornerstone in the training of healthcare professionals, contributing to safer and higher quality medical care.

**Conflict of interest**

The authors declare no conflicts of interest

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