

ORIGINAL RESEARCH

Opinion of nursing undergraduates on the use of simulation as a teaching strategy

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ABSTRACT

Simulation has been increasingly used as a teaching strategy because it resulted in significant learning, met the objectives of problem-based pedagogy and focused on teaching skills. It also promoted the safety of patients and protected them from unsafe procedures. From this perspective, was made a descriptive study using a quantitative approach, with the aim was to elicit the opinion of a group of students on the use of simulation as a teaching strategy. The research was conducted in a nursing program at a private university in the city of São Paulo, Brazil, in September 2012 according to research ethical guidelines. The data were collected with 26 undergraduate students who, after providing informed consent, completed a questionnaire with questions regarding the sample characteristics, and a perception scale related to personal satisfaction, aims, levels of scenarios and learning through using simulation. Data were categorized and the results showed that the greatest impact upon learning through simulation involved the promotion of patient safety, satisfaction during the teaching-learning process and tailoring of the complexity of the scenarios. In conclusion, the students' satisfaction and self-confidence in relation to learning through simulation demonstrate its effectiveness in the educational process.

Key Words: Nursing education, Simulation, Teaching strategy, Problem-based learning

1. INTRODUCTION

Academic education has been increasingly linked to professional competence in the workplace, which is believed to play an important role in the development of future professionals. It is, therefore, the responsibility of academic institutions to seek methodological strategies that provide ways for the teaching and learning process, so that their students can develop technical competencies and a critical-reflective awareness of themselves, other people, and their environment. In so doing, they can develop their own knowledge and practices.^[1]

Simulation has been increasingly used as a teaching strategy

because it resulted in significant learning, met the objectives of problem-based pedagogy and focused on teaching skills. It also promoted the patient safety and protected them from unsafe procedures.^[1-3] Simulation entails the creation of a protected educational environment, which simulates scenarios involving health care practices wherein learning takes place through caring for simulated patients, accompanied by a professor in the role of facilitator.^[4] This provides opportunities to the students to repeat the technique and learn from their mistakes, developing critical awareness and learning to learn.^[2] After a scenario is carried out, there is a discussion and an analysis session for the respective practice (debriefing), creating opportunities for reflection and redirecting the

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actions performed.^[2-5]

New educational technologies have been increasingly incorporated into health education, simulation being one of them.^[6] However, their effectiveness in learning also depends on the actors involved in the process, a fact that still continues to be an object of research.^[3] It is believed that the receptivity of the student toward learning through simulation could favor the use of this strategy and generate positive results. In light of this, it was decided to conduct this study whose objective was to elicit the opinion of a group of students on the use of simulation as a teaching strategy.

2. METHOD

This was a descriptive study, with a quantitative approach. The research was conducted in the city of São Paulo, Brazil, in an institution of higher education, which has a Simulation Center that is considered a benchmark in Latin America, as well as the availability of advanced technology for teaching students from a wide variety of programs in the School of Health Sciences.

All the twenty-six students of the third year (evening session) of the undergraduate nursing program who attended the Clinical Practice III discipline participated in the study. The educational institution and the Ethics Committee (Process CAAE-0177.0.201.000-11) approved the research. All the students voluntarily agreed to participate in the study and signed a Free and Informed Consent Form. All the students participated in the simulation classes, and supervised practices simulation.

The data collection instrument was a questionnaire with semi-structured questions, which consisted of two parts. The first part contained questions to characterize the group of participants and the second contained a validated scale for personal satisfaction, aims, levels of scenarios and the efficacy of learning through the use of simulation as a teaching tool from the perspective of this group of students. The preparation of this tool was based on the experience of the authors in designing simulations for the assessment of nursing student learning.

For the data collection and analysis, it was used a five-point Likert scale, in which a value was assigned to each response varying from +2 to -2. For the response "Totally Disagree with the Statement" (TDS), a value of -2 was assigned. For the response "Disagree with the Statement" (DS), a value of -1 was assigned. For the response "Undecided" (UND), a value of 0 was assigned. For the response "Agree with the Statement" (AS), a value of +1 was assigned. For the response "Totally Agree with the Statement" (TAS), a value

of +2 was assigned.

The simulation practices addressed the pre and intra hospital emergency care to patients in critical condition. The simulation was developed following the learning cycle: after the theoretical module students participated in skill practices and scenarios team with debriefing. Further, they held the Objective Structured Clinical Exam (OSCE), and participated in the clinical practice in hospitals. Were used low and medium simulators to the simulated practices and high-fidelity simulators for the scenarios. Data collection was performed at the end of the module, which is about two months long. Data were collected in September 2012 in the classroom, tabulated electronically and then, statistically analyzed. The answers of the nursing undergraduated students were classified in variables wich composed different main categories related to the use of simulation as a teaching tool.

3. RESULTS

In relation to the composition of the sample, there was a predominance of women (89%) and young adults, from 19 to 23 years of age (58%). Over half the students (58%) said that they were working in the field as a nursing assistant, technician or intern (46% in hospitals and 12% in other health establishments) and 42% reported not having any previous experience in the field.

The answers of the nursing students were classified in seven different categories: "Satisfaction with teaching using simulation"; "Self-confidence in learning through simulation"; "Importance of learning through simulation for patient safety"; "Realism and fidelity of the scenarios"; "Complexity of the scenarios"; "Information and suggestions provided during the learning process" and "Feedback". The five categories with the greatest impact on the opinion of students will be presented in Tables 1-5. Table 6 refers to the representation and impact for all the seven categories and variables analyzed.

The data from Table 1 demonstrate the opinion of students on the variables related to Satisfaction with teaching using simulation category. It was found that the variable with the greatest impact was student satisfaction with the usefulness and effectiveness of the simulation (1.46), followed by satisfaction with the educational material used (1.19).

Table 2 illustrates the results related to the variables from the Confidence in learning through simulation category. The variable with the largest impact was Confidence that a good performance will be achieved in the practical evaluations, followed by Confidence in consolidating the content learned through simulation (0.96).

Table 1. Number of responses for the variables related to Satisfaction with teaching using simulation category (n = 26)

Variables	TDS	DS	UND	AS	TAS	MI
Satisfaction with the usefulness and effectiveness of the simulation	0	0	1	12	13	1.46
Satisfaction with the variety of learning-oriented materials and activities	0	2	5	11	8	0.96
Satisfaction with the teaching materials used in the simulation for motivation and learning	0	1	1	16	8	1.19
Satisfaction with the didactic method used by the professors in the simulation	0	4	9	10	3	0.46

Note. TDS: Totally Disagree with the Statement (-2); DS: Disagree with the Statement (-1); UND: Undecided (0); AS: Agree with the Statement (+1); TAS: Totally Agree with the Statement (+2); MI: Media Impact.

Table 2. Number of responses for the variables related to Confidence in learning through simulation category (n = 26)

Variables	TDS	DS	UND	AS	TAS	MI
Confidence in consolidating the content learned through simulation	0	1	5	14	6	0.96
Confidence in the acquisition of skills to progress in the undergraduate program	1	1	3	16	5	0.88
Confidence that a good performance will be achieved in the practical evaluations	0	0	6	14	6	1.0

Note. TDS: Totally Disagree with the Statement (-2); DS: Disagree with the Statement (-1); UND: Undecided (0); AS: Agree with the Statement (+1); TAS: Totally Agree with the Statement (+2); MI: Media Impact.

The data from Table 3 sought to measure the impact of the variables related to the Importance of learning through simulation for patient safety. It was found that the variable with the greatest impact was Considers learning through simulation essential before supervised clinical practice (1.42), followed by Learning through simulation helps prevent errors

in professional practice (1.07).

Table 4 represents the impact for the variables that assessed factors related to the Complexity of scenarios. The variable with the greatest impact was Simulation provides opportunities to experience future professional activities (0.92).

Table 3. Number of responses for the variables related to Importance of learning through simulation for patient safety category (n = 26)

Variables	TDS	DS	UND	AS	TAS	MI
Simulation fostered increased confidence and safety in performing nursing procedures in supervised clinical practice	0	1	4	17	4	0.92
Learning through simulation helps prevent errors in professional practice	0	0	6	12	8	1.07
Learning through simulation assists in remembering procedures during clinical practice	0	0	5	17	4	0.96
Considers learning through simulation essential before supervised clinical practice	0	0	2	11	13	1.42

Note. TDS: Totally Disagree with the Statement (-2); DS: Disagree with the Statement (-1); UND: Undecided (0); AS: Agree with the Statement (+1); TAS: Totally Agree with the Statement (+2); MI: Media Impact.

Table 4. Number of responses for the variables related to Complexity of scenarios category (n = 26)

Variables	TDS	DS	UND	AS	TAS	MI
The simulation was tailored to the level of knowledge and competencies to be developed by the students.	2	0	7	12	5	0.69
The simulation provided a great deal of information and knowledge on how to resolve problems.	0	1	5	16	4	0.88
The simulation provided opportunities to experience future professional activities.	0	0	6	16	4	0.92
The simulation provided situations that will occur with real patients.	0	2	6	12	6	0.84

Note. TDS: Totally Disagree with the Statement (-2); DS: Disagree with the Statement (-1); UND: Undecided (0); AS: Agree with the Statement (+1); TAS: Totally Agree with the Statement (+2); MI: Media Impact.

The data from Table 5 show the impact for the variables that assessed factors related to Feedback. It was noted that the variable with the greatest impact was Simulation enables students to perform a self-analysis of actions and behavior (1.0).

Table 5. Number of responses for the variables related to Feedback category (n = 26)

Variables	TDS	DS	UND	AS	TAS	MI
The feedback is always constructive.	2	0	4	15	5	0.80
The feedback always comes at the right time.	1	2	8	13	2	0.50
The simulation enables students to perform a self-analysis of actions and behavior.	0	2	3	14	7	1.0
There is an opportunity to receive guidance and feedback from the professor after the simulation in order to build new levels of knowledge.	1	4	5	12	4	0.53

Note. TDS: Totally Disagree with the Statement (-2); DS: Disagree with the Statement (-1); UND: Undecided (0); AS: Agree with the Statement (+1); TAS: Totally Agree with the Statement (+2); MI: Media Impact.

The data from Table 6 demonstrate the impact of all the categories and variables analyzed. It was found that the most important factors for learning through simulation, for the group studied, were the importance of the simulation for patient safety (4.38) and the satisfaction that the methodology gives students during the teaching-learning process (4.07), followed by complexity of scenarios (3.34) and self-confidence in learning through simulation (2.84).

Table 6. Number of responses of the seven categories (n = 26)

Category	TDS	DS	UND	AS	TAS	MI
Satisfaction with teaching using simulation	0	7	16	49	32	4.07
Self-confidence in learning by simulation	1	2	14	44	17	2.84
Importance of the simulation for patient safety	0	1	17	57	29	4.38
Realism and fidelity of the simulation	4	2	7	28	6	1.15
Complexity of the scenarios performed	2	3	24	56	19	3.34
Information during learning through simulation	5	12	18	35	8	1.11
Feedback	4	8	20	44	18	2.46

Note. TDS: Totally Disagree with the Statement (-2); DS: Disagree with the Statement (-1); UND: Undecided (0); AS: Agree with the Statement (+1); TAS: Totally Agree with the Statement (+2); MI: Media Impact.

4. DISCUSSION

Nursing professionals are required to have a solid foundation of knowledge as well as a variety of skills to carry out their work, such as communicating with patients, performing physical examinations and clinical reasoning, among others.^[1,7] Therefore, learning through using of a human patient simulator is optimum in that it can, to a certain extent, be compared to a real therapeutic environment since the same clinical conditions that a professional might encounter with an actual patient can be reproduced through highly accurate simulations of different scenarios. The major advantage of this learning method is that the simulation can be repeated as many times as necessary until proficiency is achieved, measuring both the student's technical performance and attitude.^[8-11]

Educational professionals face a constant challenge in es-

tablishing interpersonal relationships with students, which is an important in order to coordinate the teaching-learning process and so that the methods used can achieve their proposed objectives. There are factors that may interfere with the desired objectives such as the structure of the educational institution, the social conditions of the students and available resources. So, the teaching strategies used by professors must be able to raise awareness and involve students in the learning process, clarifying their role in this process.^[12]

This study found that students were responsive to simulation activities. The category Satisfaction with learning through simulation had the greatest impact, particularly in terms of usefulness, effectiveness, educational materials used and motivation for learning, demonstrating that simulations mobilize students to study, as seen in Table 1.

The learning process should be seen as dynamic, personal

and complex, involving not only environmental influences, but also those attributed to the subject being learned. Therefore, guiding the educational process requires a solid understanding of the external and internal conditions that influence learning, as well as an understanding of the way processing occurs and how people learn.

As far as the challenges to be overcome in the educational process, it is believed that self-confidence is an indispensable tool during every stage of academic life. However, if at some stage this tool is undermined by the negative attitude of a participant in the learning environment, self-confidence may be shaken and interest in learning may be affected, generating in students a fear of failure, and feelings of ineptitude that are not publicly confessed, but hinder learning.

Simulation poses challenges and promotes the development of self-confidence in that students can review their performance and correct their actions, knowing that their errors did not expose anyone to risk, but resulted in learning opportunities for all. In this study, students reported that education using simulation fostered learning and boosted confidence that they will perform well in the practical evaluations (see Table 2).

Some authors conducted studies to validate simulation as a teaching methodology for training health students and professionals around the world, emphasizing its importance for the acquisition of competences for professional practice and patient safety.^[13-15]

Patient safety has become a global concern and the subject of several international conferences. Every year tens of millions of patients worldwide suffer disabling injuries or die because of unsafe health practices.^[16] Such errors affect one in ten patients, and this estimate is even higher in developing countries. This situation has further reinforced the importance of innovation and investment in training methodologies focused on learning and the practical application of knowledge acquired by health professionals.^[17]

Many managers and professors are now aware of the advantages and benefits of simulation for health professionals and students, and understand that such training is vitally important and a good alternative for achieving better results in professional training. In this research it was found that the category "patient safety" was deemed as the second biggest advantage for the use of simulation in the training process, especially when performed before supervised clinical practice, since students consider that learning through simulation helps prevent errors in professional practice, as shown in Table 3.

It should be stressed that simulation is not intended to replace

the contact between patients and students, as this is critical in the training of health professionals.^[18] It is hoped that simulation will enhance learning and help surmount the limitations of practicing with real patients, such as the difficulty of repeating a particular procedure. In real life practice there are certain situations that require taking a position and making decisions quickly, which in traditional teaching limits the decision making process to demonstration and observation. In such cases, simulation enables training in a variety of situations, often rare in occurrence, until a high level of proficiency is achieved.^[18]

In the planning of scenarios, an important aspect is fidelity (realism), which should be adapted to the level of competence of the students and attempt to adhere to the objectives set by the instructor. In this study, the results for the group in question showed that the fidelity and realism of the scenarios carried out for learning through simulation had smaller and similar impacts. It is interesting to note that although students felt that the scenarios could have been better, they still considered themselves satisfied with the usefulness and effectiveness of the simulation performed during the semester, as evidenced in Table 1.

To facilitate the student's immersion, realistic scenarios should provide highly accurate environments that transport students into the units where the care is provided. The preparation of the clinical case requires experience on the part of professors so that all the details are included and students are able to engage in clinical reasoning and decision-making.

The introduction of active methodologies such as simulation in curriculums offers students the opportunity of significant learning experiences and teaches students to learn to learn. It has been observed, perhaps due to the high level of realism of the scenarios, the opportunity for reflection and repetition of procedures, that simulation has become an important teaching methodology. An important fact was the use of dummies in teaching psychomotor skills in the health field, highlighting the need to replace human beings and preserve their physical integrity.

There are a number of challenging situations in the use of simulation, such as: adapting the simulation to the curriculum content; maintaining discipline, regularity of use, and participation in simulation processes. Also challenging is the time required for developing new scenarios; time to correct and evaluate the activities; and guidance about care through the use of simulators.^[10]

The competencies professors consider fundamental for the didactic use of simulation are related to concepts, attitudes and procedures that require specific technical and cognitive

knowledge, both on the part of professors and on the part of students. Setting clear objectives for the actions to be performed, ability to work in a team and establishing proper communication with students and other professors were some of goals of this method.^[8] In this study, the students pointed out that the simulation provided them with the opportunity to experience future professional actions by supplying them with problem-solving tools (see Table 4).

Another important characteristic in learning through simulation and which contributes to the development of competencies is the process of providing feedback to the students, which describes and addresses their performance in a given situation or activity. Feedback should lead to a set of actions that students undertake to improve their learning, become more autonomous and responsible and to evaluate and regulate their work.^[4,19]

Learning from feedback requires that it be given in a constructive and positive way that will help the student to reflect critically and devise a plan to improve in practice. Students gradually become aware of their level of competence and seek to improve, which are essential processes to develop the habit of critical reflection. Thus, feedback can be introduced in a natural way, making the learning environment safe and students less hesitant to accept criticism and suggestions. As they accept them, they will more easily become active agents in the learning process, seeking training in their weak areas.

Feedback is considered a fundamental aspect of simulation, since it instills in students the habit of reflection. In this study, the participants agreed that simulation promotes self-analysis of actions and behavior (see Table 5). The value

attributed by students to this practice will most likely lead them to incorporate it later in their professional practice.

5. CONCLUSION

The results demonstrate the importance of simulation in the learning process for the group studied, which considered this methodology as important for patient safety. It is believed that the satisfaction and self-confidence experienced by students in relation to learning through simulation may have contributed positively in performing supervised clinical practice. Thus, it can be concluded that simulation is an important teaching methodology that helps train more confident, critical and reflective professionals, who value excellence in care.

It's considered that this study has some limitations, such as the viewpoint regarding student only one subject on which may have higher or lower affinity that may reflect the results. Although the results were significant, considering that generalizations cannot be made, because further researches are needed with larger numbers of participants, with multiple studies themes and especially with methods that have greater power of evidence, such as randomized controlled trials or others.

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CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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